

NANOMETRICS INC
Form S-4
March 28, 2005
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As filed with the Securities and Exchange Commission on March 28, 2005

Registration No.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM S-4
REGISTRATION STATEMENT
Under
The Securities Act of 1933
NANOMETRICS INCORPORATED

(Exact name of registrant as specified in its charter)

California
(State or other jurisdiction of
incorporation or organization)

3829
(Primary Standard Industrial
Classification Code Number)
1550 Buckeye Drive

94-2276314
(I.R.S. Employer
Identification Number)

Milpitas, California 95035

(408) 435-9600

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Paul B. Nolan

Chief Financial Officer

Nanometrics Incorporated

1550 Buckeye Drive

Milpitas, California 95035

(408) 435-9600

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

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Aaron J. Alter, Esq.

Thomas R. King, Esq.

Michael S. Ringler, Esq.

Robert K. Ranum, Esq.

Wilson Sonsini Goodrich & Rosati

Fredrikson & Byron P.A.

Professional Corporation

200 South Sixth Street

650 Page Mill Road

Suite 4000

Palo Alto, California 94304-1050

Minneapolis, MN 55402-1425

(650) 493-9300

(612) 492-7000

Approximate date of commencement of proposed sale to the public: As soon as practicable after the effectiveness of this registration statement and the satisfaction or waiver of all other conditions under the merger agreement described herein.

If the securities being registered on this form are to be offered in connection with the formation of a holding company and there is compliance with General Instruction G, check the following box. ☐

If this form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Amount to be Registered (1)	Proposed Maximum Offering Price Per Unit N/A	Proposed Maximum Aggregate Offering Price (2)	Amount of Registration Fee (2)
Common Stock, no par value per share			\$237,531,056	\$28,000

- (1) In accordance with Rule 457(o) under the Securities Act of 1933, as amended, the number of shares is not set forth herein. Pursuant to Rule 457(o), the registration fee has been computed on the basis of the maximum aggregate offering price of shares of registrant's common stock expected to be issued upon completion of the merger of August Technology Corporation with Major League Merger Corporation, a Minnesota corporation and wholly-owned subsidiary of registrant.
- (2) Estimated solely for the purpose of calculating the registration fee in accordance with Rules 457 (c) and (f) of the Securities Act of 1933, as amended, based upon the product of: (i) 19,927,102, the maximum number of shares of August Technology common stock that may be exchanged in the merger (the sum of (a) 17,901,593 shares of August Technology common stock outstanding as of March 24, 2005, and (b) 2,025,509 shares of August Technology common stock issuable upon the exercise of outstanding options as of March 24, 2005), multiplied by (ii) \$ 11.92, the average of the high and low prices for shares of August Technology common stock as reported on the Nasdaq National Market on March 23, 2005.

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment that specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

The information in this joint proxy statement/prospectus is not complete and may be changed. Registrant may not sell these securities until the registration statement filed with the Securities and Exchange Commission, of which this document is a part, is declared effective. This joint proxy statement/prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer, solicitation or sale is not permitted or would be unlawful prior to registration or qualification under the securities laws of any such jurisdiction. Any representation to the contrary is a criminal offense.

Subject to completion, dated March 28, 2005

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JOINT PROXY STATEMENT/PROSPECTUS

MERGER PROPOSED YOUR VOTE IS VERY IMPORTANT

The respective boards of directors of Nanometrics Incorporated, which we refer to as Nanometrics, and August Technology Corporation, which we refer to as August Technology, have unanimously approved the merger of August Technology with Nanometrics pursuant to the terms and conditions of a merger agreement, dated as of January 21, 2005, between Nanometrics and August Technology. Following the completion of this merger, which we refer to as the August merger, Nanometrics will be renamed August Nanometrics Inc. and we sometimes refer to this combined company as August Nanometrics throughout this joint proxy statement/prospectus. If we complete this merger, August Technology shareholders will receive 0.6401 of a share of August Nanometrics common stock for each share of August Technology common stock they own at the completion of the merger and August Technology will become a wholly-owned subsidiary of Nanometrics. Based on the number of shares of Nanometrics and August Technology outstanding on January 21, 2005, August Technology shareholders will hold approximately 46.5% of the fully-diluted shares of August Nanometrics common stock immediately after this merger, and Nanometrics shareholders will hold approximately 53.5% of the fully-diluted shares of August Nanometrics common stock immediately after this merger. Nanometrics common stock trades on the Nasdaq National Market under the symbol NANO.

Nanometrics and August Technology cannot complete the August merger unless Nanometrics shareholders approve the issuance of shares of August Nanometrics common stock in the August merger and August Technology shareholders approve the merger agreement and the August merger. These matters, among others, are included in the proposals to be voted on at the annual meeting of Nanometrics and the special meeting of August Technology, as more fully described in this joint proxy statement/prospectus. More information about Nanometrics, August Technology and the August merger is contained in this joint proxy statement/prospectus. **We encourage you to read this joint proxy statement/prospectus carefully before voting on the August merger, including the section entitled Risk Factors beginning on page 31.**

Nanometrics also is taking this opportunity to call and hold its 2005 annual meeting of shareholders. At the Nanometrics annual meeting, Nanometrics is submitting three additional proposals for the consideration and approval of its shareholders. First, Nanometrics is proposing to reincorporate under the laws of the State of Delaware through a merger with one of its wholly-owned subsidiaries, Minor League Merger Corporation. Throughout this joint proxy statement/prospectus, we refer to this merger as the reincorporation merger. Nanometrics cannot complete the reincorporation merger without the approval of its shareholders, as more fully described in this joint proxy statement/prospectus. The August merger, however, is not contingent on the completion of the reincorporation merger. As a result, if we complete the August merger and the reincorporation merger, August Nanometrics will be a Delaware corporation. If we complete the August merger but not the reincorporation merger, August Nanometrics will be a California corporation. For ease of reference, when we refer to Nanometrics throughout this joint proxy statement/prospectus, we are referring to Nanometrics Incorporated, in its current corporate form as a California corporation or to Minor League Merger Corporation, as the Delaware successor to Nanometrics Incorporated following the reincorporation merger.

Second, Nanometrics is proposing the election of seven directors to its board of directors. If Nanometrics seven director nominees are elected and we do not complete the August merger, Nanometrics new directors will hold office until the next annual meeting of Nanometrics shareholders. If Nanometrics seven director nominees are elected and we complete the August merger, however, four of Nanometrics director nominees will resign

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(leaving three Nanometrics directors on the August Nanometrics board of directors), August Technology will select three of its directors to join the August Nanometrics board of directors and these six directors (the three remaining Nanometrics directors and three directors appointed from the August Technology board of directors) will select a seventh individual to join the August Nanometrics board of directors. Nanometrics has not yet selected the three directors who will remain on the August Nanometrics board of directors nor has August Technology selected the three directors who will join the August Nanometrics board of directors if the August merger is completed.

Third, Nanometrics is proposing that its shareholders ratify the appointment of BDO Seidman, LLP as Nanometrics independent registered public accounting firm for Nanometrics fiscal year ending December 31, 2005.

The Nanometrics board of directors unanimously recommends that Nanometrics shareholders vote:

FOR the proposal to approve the issuance of shares of August Nanometrics common stock in the August merger;

FOR the proposal to approve the reincorporation merger;

FOR Nanometrics seven director nominees to the Nanometrics board of directors; and

FOR the proposal to ratify the appointment of BDO Seidman, LLP as Nanometrics independent registered public accounting firm for Nanometrics fiscal year ending December 31, 2005.

The August Technology board of directors unanimously recommends that the August Technology shareholders vote FOR August Technology's proposal to approve the merger agreement and the August merger.

The proposals are being presented to the respective shareholders of each company at their respective meetings. The dates, times and places of the meetings are as follows:

For Nanometrics shareholders:

, , a.m., local time

For August Technology shareholders:

, , a.m., local time

Your vote is very important. Whether or not you plan to attend your respective company's meeting, please take the time to vote by completing and mailing to us the enclosed proxy card or, if the option is available to you, by granting your proxy electronically over the internet or by telephone. If your shares are held in street name, you must instruct the record holder of your shares in order to vote.

Sincerely,

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John D. Heaton
President and Chief Executive Officer
Nanometrics Incorporated

Jeff L. O Dell
Chairman and Chief Executive Officer
August Technology Corporation

None of the Securities and Exchange Commission, any state securities regulator or any regulatory authority has approved or disapproved of these transactions or the securities to be issued under this joint proxy statement/prospectus or determined if the disclosure in this joint proxy statement/prospectus is accurate or adequate. Any representation to the contrary is a criminal offense.

This joint proxy statement/prospectus is dated _____, 2005, and is being mailed to shareholders of Nanometrics and August Technology on or about _____, 2005.

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ADDITIONAL INFORMATION

This joint proxy statement/prospectus incorporates by reference important business and financial information about Nanometrics and August Technology from documents that are not included in or delivered with this joint proxy statement/prospectus. For a more detailed description of the information incorporated by reference into this joint proxy statement/prospectus and how you may obtain it, see the section of this joint proxy statement/prospectus entitled *Additional Information Where You Can Find More Information* beginning on page 185.

You can obtain any of the documents incorporated by reference into this joint proxy statement/prospectus from Nanometrics or August Technology, as applicable, or from the Securities and Exchange Commission, through its website at www.sec.gov. Documents incorporated by reference are available from Nanometrics and August Technology without charge, excluding any exhibits to those documents, unless the exhibit is specifically incorporated by reference as an exhibit in this joint proxy statement/prospectus. Nanometrics shareholders and August Technology shareholders may request a copy of such documents by contacting either Nanometrics or August Technology, as appropriate, at:

Nanometrics Incorporated

1550 Buckeye Drive

Milpitas, California 95035

Attn: Investor Relations

August Technology Corporation

4900 West 78th Street

Bloomington, Minnesota 55435

Attn: Investor Relations

In addition, you may obtain copies of the information relating to Nanometrics, without charge, by sending an e-mail to investors@nanometrics.com or by calling (408) 435-9600.

You may obtain copies of the information relating to August Technology, without charge, by calling The Proxy Advisory Group of Strategic Surveillance, LLC at (866) 657-8728 or (212) 850-8150.

We are not incorporating the contents of the websites of the Securities and Exchange Commission, Nanometrics, August Technology or any other person into this document. We are only providing the information about how you can obtain certain documents that are incorporated by reference into this joint proxy statement/prospectus at these websites for your convenience.

In order for you to receive timely delivery of the documents in advance of the Nanometrics annual meeting and August Technology special meeting, Nanometrics or August Technology, as applicable, must receive your request no later than _____, 2005.

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NANOMETRICS INCORPORATED

NOTICE OF ANNUAL MEETING OF SHAREHOLDERS

TO THE SHAREHOLDERS OF NANOMETRICS INCORPORATED:

NOTICE IS HEREBY GIVEN that the annual meeting of shareholders of Nanometrics Incorporated, a California corporation (Nanometrics), will be held on _____, 2005 at _____ a.m., local time, at the principal offices of Nanometrics located at 1550 Buckeye Drive, Milpitas, California 95035. At the annual meeting, Nanometrics shareholders will consider and vote upon the following:

1. A proposal to approve the issuance of shares of August Nanometrics common stock in connection with the merger of August Technology Corporation with Major League Merger Corporation, a wholly-owned subsidiary of Nanometrics, pursuant to an Agreement and Plan of Merger and Reorganization, dated as of January 21, 2005, by and among Nanometrics, Major League Merger Corporation, Minor League Merger Corporation and August Technology Corporation.
2. A proposal to approve the reincorporation of Nanometrics under the laws of the State of Delaware through a merger of Nanometrics with Minor League Merger Corporation, a wholly-owned subsidiary of Nanometrics.
3. A proposal to elect seven director nominees to the Nanometrics board of directors to serve until the next annual meeting of Nanometrics shareholders at which their respective successors are elected and qualified, or until the earlier of their death, resignation or removal.
4. A proposal to ratify the appointment of BDO Seidman, LLP as Nanometrics independent registered public accounting firm for Nanometrics fiscal year ending December 31, 2005.
5. Such other business as may properly come before the annual meeting or any postponements or adjournments thereof.

The foregoing items of business are more fully described in the joint proxy statement/prospectus accompanying this notice of annual meeting of shareholders.

Only Nanometrics shareholders of record at the close of business on _____, 2005 are entitled to notice of and to vote at the annual meeting and any postponements or adjournments thereof.

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All Nanometrics shareholders are cordially invited to attend the annual meeting in person. However, to ensure representation at the annual meeting, Nanometrics shareholders are urged to mark, sign, date and return the enclosed proxy card as promptly as possible in the postage-prepaid envelope enclosed for that purpose. Any Nanometrics shareholder attending the annual meeting may vote in person even if such shareholder previously returned a proxy card for the annual meeting.

BY ORDER OF THE BOARD OF DIRECTORS,

Vincent J. Coates

Chairman of the Board of Directors and Secretary

Milpitas, California

, 2005

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AUGUST TECHNOLOGY CORPORATION

4900 West 78th Street

Bloomington, Minnesota 55435

NOTICE OF SPECIAL MEETING OF SHAREHOLDERS

TO BE HELD ON _____, 2005

To the Shareholders of August Technology Corporation:

A special meeting of the shareholders of August Technology Corporation ("August Technology") will be held at _____ on _____, 2005 at _____ a.m., local time, for the following purposes:

1. To consider and vote upon a proposal to approve the Agreement and Plan of Merger and Reorganization, dated as of January 21, 2005, by and among Nanometrics Incorporated ("Nanometrics"), Major League Merger Corporation ("Merger Sub 1"), Minor League Merger Corporation ("Merger Sub 2") and August Technology and the merger contemplated therein. Pursuant to the merger agreement, (a) Nanometrics will be merged with and into Merger Sub 2, a Delaware corporation, to reincorporate Nanometrics under Delaware law, and (b) August Technology will be merged with and into Merger Sub 1 (the "August merger"), and August Technology will thereby become a wholly-owned subsidiary of Nanometrics. In connection with the August merger, Nanometrics will be renamed August Nanometrics Inc. Holders of August Technology common stock will receive shares of August Nanometrics common stock based upon the exchange ratio described in the accompanying joint proxy statement/prospectus.
2. To transact such other business as may properly come before the special meeting or any adjournment or postponement thereof, including a proposal to adjourn or postpone the special meeting.

The record date for the special meeting is the close of business on _____, 2005. Only August Technology shareholders of record at that time are entitled to notice of and to vote at the special meeting or any adjournment or postponement thereof. To approve the merger agreement and the August merger, the holders of a majority of all the outstanding shares of August Technology common stock must vote in favor of the merger agreement and the August merger.

The attached joint proxy statement/prospectus contains more detailed information regarding the August merger and the merger agreement and includes a copy of the merger agreement.

Your vote is very important. Even if you expect to attend the special meeting, please complete, sign, and date the enclosed proxy card and return it promptly in the enclosed postage-paid envelope. If no instructions are indicated on your proxy card, your shares will be

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voted FOR the August merger. If you do not return your proxy card or vote in person, the effect is a vote AGAINST the August merger. You can revoke your proxy at any time before it is exercised by giving written notice to the secretary of August Technology, or filing another proxy, or attending the special meeting and voting in person.

If the merger agreement is approved and the August merger is consummated, you will be sent a letter of transmittal with instructions for surrendering your certificates representing shares of August Technology common stock. Please do not send your share certificates until you receive these materials.

The August Technology board of directors unanimously recommends that you vote FOR the approval of the merger agreement and the August merger.

BY ORDER OF THE BOARD OF DIRECTORS,

Stanley D. Piekos, Chief Financial Officer and Secretary

, 2005

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QUESTIONS AND ANSWERS FOR NANOMETRICS SHAREHOLDERS

The following are some questions that shareholders of Nanometrics may have regarding the matters being considered at the annual meeting of Nanometrics shareholders, as well as brief answers to those questions. Nanometrics urges you to read the remainder of this joint proxy statement/prospectus carefully because the information below does not provide all of the information that might be important to you.

Q: Why am I receiving this joint proxy statement/prospectus?

A: The respective boards of directors of Nanometrics and August Technology have unanimously approved the merger of August Technology with Nanometrics in accordance with the terms and conditions of a merger agreement, dated as of January 21, 2005, between Nanometrics and August Technology. Pursuant to the terms of the merger agreement, August Technology will merge with a wholly-owned subsidiary of Nanometrics and August Technology will thereby become a wholly-owned subsidiary of Nanometrics. We refer to this merger herein as the August merger. In connection with the August merger, Nanometrics will be renamed August Nanometrics Inc. If we complete the August merger, August Technology shareholders will receive 0.6401 of a share of August Nanometrics common stock for each share of August Technology common stock they own at the completion of the August merger. Based on the number of shares of Nanometrics and August Technology outstanding on January 21, 2005, August Technology shareholders will hold approximately 46.5% of the fully-diluted shares of Nanometrics common stock immediately after the August merger, and Nanometrics shareholders will hold approximately 53.5% of the fully-diluted shares of August Nanometrics common stock immediately after the August merger.

Nanometrics and August Technology cannot complete the August merger unless Nanometrics shareholders approve the issuance of shares of August Nanometrics common stock in the August merger. The Nanometrics board of directors is soliciting your proxy to vote FOR Nanometrics proposal to approve the issuance of shares of Nanometrics common stock in the August merger. This joint proxy statement/prospectus describes Nanometrics, August Technology and the August merger so that you may make an informed decision with respect to this merger proposal.

Nanometrics also is taking this opportunity to call and hold its 2005 annual meeting of shareholders. At the Nanometrics annual meeting, Nanometrics is submitting three additional proposals for the consideration and approval of its shareholders. First, Nanometrics is proposing to reincorporate under the laws of the State of Delaware through a merger with one of its wholly-owned subsidiaries, Minor League Merger Corporation. Nanometrics cannot complete the reincorporation merger without the approval of its shareholders, as more fully described in this joint proxy statement/prospectus. *The August merger, however, is not contingent on the completion of the reincorporation merger.* As a result, if Nanometrics and August Technology complete the August merger and the reincorporation merger, August Nanometrics will be a Delaware corporation. However, if Nanometrics and August Technology complete the August merger but not the reincorporation merger, August Nanometrics will be a California corporation.

Second, Nanometrics is proposing the election of seven directors to its board of directors. If Nanometrics seven director nominees are elected and Nanometrics and August Technology do not complete the August merger, Nanometrics new directors will hold office until the next annual meeting of Nanometrics shareholders. If Nanometrics seven director nominees are elected and Nanometrics and August Technology complete the August merger, however, four of Nanometrics director nominees will resign (leaving three Nanometrics directors on the August Nanometrics board of directors), August Technology will select three of its directors to join the August Nanometrics board of directors and these six directors (the three remaining Nanometrics directors and three directors appointed from the August Technology board of directors) will select a seventh individual to join the August Nanometrics board of directors. Nanometrics has not yet selected the three directors who will remain on the August Nanometrics board of directors nor has August Technology selected the three directors who will join the August Nanometrics board of directors if the August merger is completed.

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Third, Nanometrics is proposing that you ratify the appointment of BDO Seidman, LLP as Nanometrics' independent registered public accounting firm for Nanometrics' fiscal year ending December 31, 2005.

Questions and Answers about the August Merger

Q: Why are Nanometrics and August Technology proposing the August merger? (See page 85)

A: Nanometrics and August Technology believe that by combining the highly complementary, non-overlapping product lines of the two companies, August Nanometrics can generate improved long-term operating and financial results and establish a stronger competitive position in the industry. The boards of directors of Nanometrics and August Technology also believe that August Nanometrics will have the ability to provide a more comprehensive and better integrated set of tools to its customers, gain increased access to capital, create additional opportunities for marketing its products, respond more quickly and effectively to technological change, increased consolidation and industry demands, and provide more effective support coverage to its customers.

In addition, the Nanometrics board of directors believes that August Nanometrics can achieve greater scale and presence in the semiconductor equipment industry, provide an opportunity for increased sales and better integrated and broader product line, as well as provide Nanometrics shareholders with the opportunity to participate in the potential for growth of the combined company after the August merger.

Q: What are the risks of the August merger?

A: The August merger involves numerous risks and uncertainties, including, but not limited to, the following: the expense, time and disruption of Nanometrics' business related to integrating the operations of Nanometrics and August Technology; the anticipated benefits and synergies of the August merger may not be realized; the trading price of Nanometrics common stock may decline if the August merger is not completed; and customers, distributors, resellers or others may delay or defer decisions concerning Nanometrics during the pendency, or as a result of, the August merger.

We encourage you to read this joint proxy statement/prospectus carefully, including the section entitled "Risk Factors" beginning on page 31, for a complete discussion of risks associated with the August merger and August Nanometrics.

Q: What will I receive in the August merger? (See page 112)

A: If Nanometrics and August Technology complete the August merger, you will continue to hold the Nanometrics shares that you currently hold and will not receive any payment or other consideration in the August merger. However, your stock certificates will represent shares of August Nanometrics.

Q: What are the United States federal income tax consequences of the August merger to me?

A: You will not recognize any gain or loss for United States federal income tax purposes in respect of your shares of Nanometrics common stock as a result of the August merger.

Q: When do Nanometrics and August expect to complete the August merger?

A: Nanometrics and August Technology are working to complete the August merger as quickly as possible. Nanometrics and August Technology currently expect to complete the August merger by the end of the second quarter of 2005. Nanometrics and August Technology cannot predict the exact timing of the completion of the August merger, however, because it is subject to several conditions beyond their control, including approval by the shareholders of both Nanometrics and August Technology.

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Q: What vote is required by Nanometrics shareholders to proceed with the August merger? (See page 63)

A: Under applicable state law, Nanometrics cannot complete the August merger unless the issuance of shares of August Nanometrics common stock in the August merger is approved by the affirmative vote of the holders of a majority of the shares of Nanometrics common stock represented and voting at the Nanometrics annual meeting.

Q: How does the Nanometrics board of directors recommend that I vote on the August merger? (See page 88)

A: The Nanometrics board of directors unanimously recommends that you vote **FOR** Nanometrics' proposal to approve the issuance of shares of August Nanometrics common stock in the August merger.

Q: Did the Nanometrics board of directors obtain a fairness opinion in connection with its determination to proceed with the August merger? (See page 88)

A: Yes. On January 20, 2005, Adams Harkness, Inc., or Adams Harkness, financial advisor to Nanometrics, provided to the Nanometrics board of directors its oral opinion, which was subsequently confirmed by delivery of a written opinion dated January 20, 2005, that, as of the date of such opinion, the exchange ratio for August Technology common stock provided for in the merger agreement was fair, from a financial point of view, to the holders of Nanometrics common stock. The full text of Adams Harkness' written opinion is attached to this joint proxy statement/prospectus as Annex C. We encourage you to read this opinion carefully in its entirety for a description of the procedures followed, assumptions made, matters considered and limitations on the review undertaken. Adams Harkness' opinion is directed to the Nanometrics board of directors and addresses only the fairness from a financial point of view of the exchange ratio for August Technology common stock provided for in the merger agreement as of the date of the opinion. Nanometrics was required to pay Adams Harkness a fee upon the delivery by Adams Harkness of the fairness opinion and has agreed to pay an additional fee upon completion of the August merger.

Q: How do the Nanometrics directors and executive officers intend to vote on the August merger? (See page 126)

A: All of the Nanometrics directors and executive officers have entered into voting agreements with August Technology pursuant to which they have agreed to vote all of their respective shares of Nanometrics common stock in favor of Nanometrics' proposal to approve the issuance of shares of August Nanometrics common stock in the August merger.

At the close of business on January 21, 2005, the date of the merger agreement, directors and executive officers of Nanometrics and their affiliates beneficially owned and were entitled to vote 3,392,274 shares of Nanometrics common stock, collectively representing approximately 26.9% of the shares of Nanometrics common stock outstanding on that date. As of the record date for the Nanometrics annual meeting, directors and executive officers of Nanometrics and their affiliates beneficially owned and were entitled to vote _____ shares of Nanometrics common stock, collectively representing approximately _____ of the shares of Nanometrics common stock outstanding on that date.

Q: Do any of the Nanometrics directors and executive officers have any special interests in the August merger? (See page 95)

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A: In considering the recommendation of the Nanometrics board of directors with respect to the issuance of shares of August Nanometrics common stock in the August merger, you should be aware that members of the Nanometrics board of directors and Nanometrics executive officers have interests in the August merger that may be different than, or in addition to, the interests of Nanometrics shareholders generally. These interests include:

the appointment of three current directors of Nanometrics as directors of August Nanometrics upon completion of the August merger, and the appointment of certain executive officers of Nanometrics as executive officers of August Nanometrics upon completion of the August merger;

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the potential receipt of severance payments, payable to the following executive officers in the following respective amounts if they were required to resign from their respective positions with Nanometrics in connection with the August merger:

<u>Name and Title</u>	<u>Total Severance Payment</u>
Vincent J. Coates	\$ 1,024,000
Chairman of the Board and Secretary	
John D. Heaton	\$ 341,800
President and Chief Executive Officer	

and the provision of directors' and officers' insurance coverage to current directors and officers of Nanometrics following the August merger.

The Nanometrics board of directors was aware of these interests and considered them, among other matters, when making its determination to approve the merger agreement and when making its recommendation that the Nanometrics shareholders approve the issuance of shares of August Nanometrics common stock in the August merger.

Questions and Answers about the Reincorporation Merger

Q: Why is Nanometrics proposing the reincorporation merger? (See page 165)

A: The Nanometrics board of directors has determined that it is prudent to reincorporate under the laws of the State of Delaware because it is important for Nanometrics to be able to draw upon well-established principles of corporate governance in making legal and business decisions. The prominence and predictability of Delaware corporate law provides a reliable foundation on which our governance decisions can be based, and Nanometrics believes that its shareholders will benefit from the responsiveness of Delaware corporate law to their needs and the needs of the corporation they own.

Q: What will I receive in the reincorporation merger? (See page 164)

A: If Nanometrics completes the reincorporation merger, each share of Nanometrics common stock will be automatically converted into one share of Minor League Merger Corporation, which is currently a wholly-owned subsidiary of Nanometrics incorporated under the laws of the State of Delaware.

Q: What are the United States federal income tax consequences of the reincorporation merger to me? (See page 167)

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A: The reincorporation merger will constitute a reorganization within the meaning of Section 368(a) of the Internal Revenue Code of 1986. As a result, you will not recognize any gain or loss for United States federal income tax purposes as a result of the reincorporation merger.

Q: When does Nanometrics expect to complete the reincorporation merger?

A: If Nanometrics shareholders approve the reincorporation merger and the issuance of shares of August Nanometrics common stock in the August merger, Nanometrics will complete the reincorporation merger immediately prior to completing the August merger. If Nanometrics shareholders approve the reincorporation merger but do not approve the August merger, Nanometrics will complete the reincorporation as soon as practicable following the Nanometrics annual meeting.

Q: What vote is required by Nanometrics shareholders to approve the reincorporation merger? (See page 168)

A: Under applicable state law, Nanometrics cannot complete the reincorporation merger unless it is approved by the affirmative vote of the holders of a majority of the outstanding shares of Nanometrics common stock entitled to vote on the record date.

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Q: How does the Nanometrics board of directors recommend that I vote on the reincorporation merger? (See page 168)

A: The Nanometrics board of directors unanimously recommends that you vote FOR Nanometrics proposal to approve the reincorporation merger.

Q: Will Nanometrics proceed with the August merger if the Nanometrics shareholders do not approve the reincorporation merger?

A: Yes. The reincorporation merger is not a condition to completion of the August merger and Nanometrics intends to proceed with the August merger even if Nanometrics does not obtain the requisite shareholder approval to complete the reincorporation merger.

Q: Will Nanometrics proceed with the reincorporation merger if the Nanometrics shareholders do not approve the August merger?

A: Yes. If Nanometrics obtains the requisite shareholder approval to complete the reincorporation merger, but Nanometrics and August Technology do not proceed with the August merger, Nanometrics still intends to proceed with the reincorporation merger.

Additional Questions and Answers

Q: What other matters are Nanometrics shareholders being asked to vote on at the Nanometrics annual meeting? (See page 62)

A: In addition to the August merger and the reincorporation merger, Nanometrics shareholders are being asked to approve:

Nanometrics seven director nominees to the Nanometrics board of directors to serve until the next annual meeting of Nanometrics shareholders at which their respective successors are elected and qualified, or until the earlier of their death, resignation or removal; and

Nanometrics proposal to ratify the appointment of BDO Seidman, LLP as Nanometrics independent registered public accounting firm for Nanometrics fiscal year ending December 31, 2005.

Q: Will all of the Nanometrics directors elected at the annual meeting continue to serve if the August merger is completed? (See page 121)

A: No. If Nanometrics seven director nominees are elected and Nanometrics and August Technology complete the August merger, four of Nanometrics directors will resign (leaving three Nanometrics directors on the August Nanometrics board of directors), August Technology will

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select three of its directors to join the August Nanometrics board of directors and these six directors (the three remaining Nanometrics directors and three directors appointed from the August Technology board of directors) will select a seventh individual to join the August Nanometrics board of directors. Nanometrics has not yet selected the three directors who will remain on the August Nanometrics board of directors nor has August Technology selected the three directors who will join the August Nanometrics board of directors if the August merger is completed.

In addition, the August Nanometrics organizational documents will provide for a classified board of directors consisting of three classes. Class I will be comprised of one director from the Nanometrics board of directors and one director from the August Technology board of directors. Class II will be comprised of one director from the Nanometrics board of directors and one director from the August Technology board of directors. Class III will consist of one director from the Nanometrics board of directors, one director from the August Technology board of directors and the additional director selected by Nanometrics and August Technology. Class I directors will serve for an initial term of one year and for three-year terms thereafter, if re-elected. Class II directors will serve for an initial term of two years and three-year terms thereafter, if re-elected. Class III directors will serve for an initial term of three years and three-year terms thereafter, if re-elected. As noted above, Nanometrics and August Technology have not yet determined the composition of the August Nanometrics board of directors, so consequently, they have not yet determined which directors will be in the various classes of directors either.

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Q: How does the Nanometrics board of directors recommend that Nanometrics shareholders vote on these proposals?

A: Nanometrics board of directors unanimously recommends that Nanometrics shareholders vote:

FOR Nanometrics seven director nominees to the Nanometrics board of directors to serve until the next annual meeting of Nanometrics shareholders at which their respective successors are elected and qualified, or until the earlier of their death, resignation or removal; and

FOR the proposal to ratify the appointment of BDO Seidman, LLP as Nanometrics independent registered public accounting firm for Nanometrics fiscal year ending December 31, 2005.

Q: What do I need to do now?

A: You should read and consider the information contained in this joint proxy statement/prospectus carefully. You also may want to review the documents referenced under the section titled *Additional Information Where You Can Find More Information* beginning on page 185. You should then vote your shares of Nanometrics common stock in accordance with the instructions in this joint proxy statement/prospectus as soon as possible so that your shares are represented at the Nanometrics annual meeting.

Q: How do I vote or submit my voting instructions? (See page 64)

A: If you are the holder of record of your shares of Nanometrics common stock, you may vote in person at the Nanometrics annual meeting or by submitting a proxy card for the annual meeting. You can vote your shares of Nanometrics common stock by proxy by completing, signing, dating and returning the enclosed proxy card for the annual meeting and returning it in the enclosed pre-paid envelope.

If you hold your shares of Nanometrics common stock through a broker, bank or other nominee (*i.e.*, in street name), you must provide the record holder of your shares with instructions on how to vote your shares at the Nanometrics annual meeting. Please refer to the voting instruction card delivered to you by your broker, bank or other nominee for instructions on how to direct the record holder of your shares to vote your shares at the Nanometrics annual meeting. If you hold your shares of Nanometrics common stock in street name, you must obtain a legal proxy from the record holder of your shares in order to attend the Nanometrics annual meeting and vote in person. If you wish to do so, please contact the broker, bank or other nominee that holds your shares of Nanometrics common stock for instructions on how to obtain a legal proxy for this purpose.

Q: What happens if I do not vote? (See page 65)

A: If you do not vote in person at the Nanometrics annual meeting or submit a proxy card for the Nanometrics annual meeting, your shares of Nanometrics common stock will not be counted as present at the annual meeting for the purpose of determining the presence of a quorum at the annual meeting, but will have the same effect as a vote *against* approval of the reincorporation merger. Furthermore, broker non-votes will be counted as present at the annual meeting for purposes of determining the presence of a quorum at the annual meeting, but will have the same

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effect as a vote ***against*** approval of the reincorporation merger. If you submit a proxy card for the Nanometrics annual meeting and affirmatively elect to abstain from voting, your proxy will be counted as present for the purpose of determining the presence of a quorum at the annual meeting but will not be voted at the annual meeting. As a result, your abstention will have the same effect as a vote ***against*** the approval of the issuance of shares of August Nanometrics common stock in the August merger, the approval of the reincorporation merger and the ratification of BDO Seidman, LLP as Nanometrics independent registered public accounting firm for Nanometrics fiscal year ending December 31, 2005.

Q: If my shares are held in street name, will my broker, bank, or nominee vote my shares for me on the merger transaction proposals?
(See page 66)

A: No. The broker, bank, or other nominee that holds your shares of Nanometrics common stock cannot vote your shares of Nanometrics common stock at the Nanometrics annual meeting unless you provide them with instructions on how to vote your shares in accordance with the information and procedures they provided to you.

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Q: Can I change my vote after I have mailed my signed proxy or instruction form? (See page 65)

A: Yes. If you are the record holder of your shares of Nanometrics common stock, you can change your vote at any time before your proxy is voted at the Nanometrics annual meeting by:

delivering to the Nanometrics corporate secretary a signed notice of revocation;

granting the Nanometrics proxy holders a new, later-dated proxy, which must be signed and delivered to the Nanometrics corporate secretary in advance of the vote at the Nanometrics annual meeting; or

attending the Nanometrics annual meeting and voting in person. Your attendance alone, however, will not revoke your previously granted proxy.

If you hold your shares in street name and you have provided voting instructions to the broker, bank or other nominee that holds your shares of Nanometrics common stock for use at the Nanometrics annual meeting, you must follow the instructions of your broker, bank or other nominee in order to change your vote or revoke your proxy for the Nanometrics annual meeting.

Q: Should I send in my stock certificates now? (See page 65)

A: No. You should not submit your stock certificates for Nanometrics shares because your certificates will not be exchanged in connection with the August merger or the reincorporation merger.

Q: What should I do if I receive more than one set of voting materials? (See page 65)

A: You may receive more than one set of voting materials for the Nanometrics annual meeting, including multiple copies of this joint proxy statement/prospectus and multiple proxy cards or voting instruction cards. For example, if you are a record holder of your shares of Nanometrics common stock and your shares are registered in more than one name, you will receive more than one proxy card for the annual meeting. If you hold your shares of Nanometrics common stock in more than one brokerage account, you will receive a separate voting instruction card for each brokerage account in which you hold shares. In addition, if you are a shareholder of Nanometrics and a shareholder of August Technology, you will receive one or more separate proxy cards or voting instruction cards for each company. Please complete, sign, date and return each proxy card and voting instruction card that you receive to ensure that your shares will be represented at the Nanometrics annual meeting.

Q: Do I have dissenters or appraisal rights in connection with the August merger or the reincorporation merger? (See page 109)

A: No. Under applicable law, you will not have dissenters or appraisal rights in connection with the August merger or the reincorporation merger.

Q: Whom should I call with questions?

A: If you have any questions about the August merger, the reincorporation merger or any other matters described in this joint proxy statement/prospectus, or if you need additional copies of this joint proxy statement/prospectus or a proxy card for the Nanometrics annual meeting, you should contact:

Nanometrics Incorporated:

1550 Buckeye Drive

Milpitas, California 95035

Attention: Investor Relations

Tel: (408) 435-9600

Fax: (408) 232-5910

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QUESTIONS AND ANSWERS FOR AUGUST TECHNOLOGY SHAREHOLDERS

The following are some questions that shareholders of August Technology may have regarding the matters being considered at the special meeting of August Technology shareholders, as well as brief answers to those questions. August Technology urges you to read the remainder of this joint proxy statement/prospectus carefully because the information below does not provide all of the information that might be important to you.

Q: Why am I receiving this joint proxy statement/prospectus?

A: The respective boards of directors of Nanometrics and August Technology have unanimously approved the merger of August Technology with Nanometrics in accordance with the terms and conditions of a merger agreement, dated as of January 21, 2005, between Nanometrics and August Technology. Pursuant to the terms of the merger agreement, August Technology will merge with a wholly-owned subsidiary of Nanometrics and August Technology will thereby become a wholly-owned subsidiary of Nanometrics. In connection with the August merger, Nanometrics will be renamed August Nanometrics Inc. If we complete the August merger, August Technology shareholders will receive 0.6401 of a share of August Nanometrics common stock for each share of August Technology common stock they own at the completion of the merger. Based on the number of shares of Nanometrics and August Technology outstanding on January 21, 2005, August Technology shareholders will hold approximately 46.5% of the fully-diluted shares of August Nanometrics common stock immediately after the August merger, and Nanometrics shareholders will hold approximately 53.5% of the fully-diluted shares of August Nanometrics common stock immediately after the August merger.

Nanometrics and August Technology cannot complete the August merger unless August Technology shareholders approve the merger agreement and the August merger. The August Technology board of directors is soliciting your proxy to vote FOR August Technology's proposal to approve the merger agreement and the August merger. This joint proxy statement/prospectus describes Nanometrics, August Technology and the August merger so that you may make an informed decision with respect to this proposal.

Q: Why are August Technology and Nanometrics proposing the August merger? (See page 85)

A: Nanometrics and August Technology believe that by combining the highly complementary, non-overlapping product lines of the two companies, August Nanometrics can generate improved long-term operating and financial results and establish a stronger competitive position in the industry. The boards of directors of Nanometrics and August Technology also believe that August Nanometrics will have the ability to provide a more comprehensive and better integrated set of tools to its customers, gain increased access to capital, create additional opportunities for marketing its products, respond more quickly and effectively to technological change, increased consolidation and industry demands, and provide more effective support coverage to its customers.

In addition, the August Technology board of directors believes that August Nanometrics will be able to, among other things, take advantage of cross-selling opportunities, realize cost savings by consolidating certain general and administration functions and eliminating redundant expenses, create growth opportunities, provide economies of scale and create greater resources to enable it to compete more effectively with competitors.

Q: What are the risks relating to the August merger?

A: The August merger involves numerous risks and uncertainties, including, but not limited to, the following: the risk that August Technology shareholders will receive less in value for the shares of August Technology common stock if the market price of Nanometrics common stock declines; the expense, time and disruption of August Technology's business related to integrating the operations of Nanometrics and August Technology; the anticipated benefits and synergies of the August merger may not be realized; the trading price of August Technology common stock may decline if the August merger is not completed; and customers, distributors,

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resellers or others may delay or defer decisions concerning August Technology during the pendency, or as a result of, the August merger.

*We encourage you to read this joint proxy statement/prospectus carefully, including the section entitled **Risk Factors** beginning on page 31, for a complete discussion of risks associated with the August merger and August Nanometrics.*

Q: What will I receive in the August merger? (See page 112)

A: Each share of August Technology common stock will be converted into the right to receive 0.6401 of a share of August Nanometrics common stock. August Nanometrics will make a cash payment to August Technology shareholders for any fractional shares of August Nanometrics common stock they would otherwise be entitled to receive instead of issuing fractional shares. The number of shares of August Nanometrics common stock to be issued for each share of August Technology common stock is fixed and will not be adjusted for changes in the market values of Nanometrics or August Technology common stock before completion of the August merger. As a result, the value of the August Nanometrics common stock that August Technology shareholders will receive in the transaction will vary as the market price of Nanometrics common stock fluctuates.

Example: If you own 100 shares of August Technology common stock, then as a result of the August merger, you will receive 64 shares of August Nanometrics common stock and the value of 0.01 of a share of August Nanometrics common stock paid out in cash.

Q: How will August Technology stock options be affected by the August merger? (See page 113)

A: At the completion of the August merger, August Nanometrics will assume all outstanding options to purchase August Technology common stock under the August Technology 1997 Stock Incentive Plan. Each option to purchase a share of August Technology common stock outstanding immediately prior to the effective time of the August merger under this plan will become an option to purchase, on the same terms, 0.6401 of a share of August Nanometrics common stock for each share of August Technology common stock for which the option was exercisable, with the option exercise price adjusted accordingly. In addition, certain outstanding options to purchase August Technology's common stock will become fully vested and immediately exercisable as a result of the August merger. Prior to the completion of the August merger, August Technology will terminate the August Technology 2000 Employee Stock Purchase Plan and all outstanding purchase rights will be automatically exercised, unless Nanometrics instructs August Technology otherwise, and no further shares of August Technology will be issued pursuant to such plan.

Q: What are the United States federal income tax consequences of the August merger to me? (See page 106)

A: It is a condition to the August merger that each of August Technology and Nanometrics receive a legal opinion to the effect that the August merger will constitute a reorganization within the meaning of Section 368(a) of the Internal Revenue Code. Assuming that the August merger so qualifies, August Technology shareholders generally will not recognize gain or loss for United States federal income tax purposes as a result of the August merger, except for gain or loss attributable to cash received by August Technology shareholders instead of fractional shares.

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The tax consequences of the August merger to August Technology shareholders may vary depending upon each such shareholder's situation. Each August Technology shareholder is urged to consult its own tax advisors with respect to the tax consequences of the August merger.

Q: When do Nanometrics and August expect to complete the August merger?

A: Nanometrics and August Technology are working to complete the August merger as quickly as possible. Nanometrics and August Technology currently expect to complete the August merger by the end of the second

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quarter of 2005. Nanometrics and August Technology cannot predict the exact timing of the completion of the August merger, however, because it is subject to several conditions beyond their control, including approval by the shareholders of both Nanometrics and August Technology.

Q: What vote is required by August Technology shareholders to approve the August merger? (See page 68)

A: Under applicable state law, August Technology cannot complete the August merger unless the merger agreement and the August merger are approved by the affirmative vote of the holders of a majority of the voting power of all shares of common stock of August Technology entitled to vote on such matters. As of the record date for the August Technology special meeting, there were shares of August Technology common stock outstanding, which means the affirmative vote of the holders of shares of August Technology common stock is required to approve the August merger.

Q: What vote is required by August Technology shareholders to approve the reincorporation merger?

A: None. Only Nanometrics shareholders are entitled to vote on the reincorporation merger. Further, under the terms of the merger agreement, if Nanometrics does not complete the reincorporation, for whatever reason, the August merger may still be completed by August Technology and Nanometrics if all of the conditions to completing that August merger are satisfied or waived.

Q: How does the August Technology board of directors recommend that I vote on the August merger? (See page 98)

A: The August Technology board of directors unanimously recommends that you vote **FOR** August Technology's proposal to approve the merger agreement and the August merger.

Q: Did the August Technology board of directors obtain a fairness opinion in connection with its determination to proceed with the August merger? (See page 98)

A: Yes. On January 20, 2005, Needham & Company, Inc., or Needham & Company, financial advisor to August Technology, delivered to the August Technology board of directors its written opinion that, as of that date and based upon and subject to the assumptions and other matters described in the written opinion, the exchange ratio for August Technology common stock provided for in the merger agreement was fair from a financial point of view to the holders of August Technology common stock. The full text of the Needham & Company opinion is attached to this joint proxy statement/prospectus as Annex D. We encourage you to read the Needham & Company opinion carefully in its entirety for a description of the procedures followed, assumptions made, matters considered and limitations on the review undertaken. Needham & Company's opinion is directed to the August Technology board of directors and addresses only the fairness from a financial point of view to the holders of August Technology common stock of the exchange ratio for August Technology common stock provided for in the merger agreement as of the date of the opinion. August Technology has paid or agreed to pay Needham & Company a nonrefundable fee for rendering the Needham & Company opinion and an additional fee for financial advisory services. A substantial portion of Needham & Company's fees, consisting of the fee for financial advisory services, is contingent on consummation of the August merger.

Q: I have heard that Rudolph Technologies, Inc. and KLA-Tencor Corporation have made unsolicited bids to acquire August Technology. What is the status of discussions with these companies?

A: On January 27, 2005, August Technology received a letter from Rudolph Technologies, Inc., or Rudolph, stating that Rudolph is prepared to enter into a merger with August Technology based on a share exchange ratio

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of 0.6239 of a share of Rudolph stock for each share of August Technology common stock (equivalent to \$10.50 per share of August Technology common stock based on the closing price of Rudolph stock on January 27, 2005). The letter stated that each August Technology shareholder may elect to receive all cash, stock or a combination of cash and stock, subject to proration based on total cash consideration of \$40 million. Pursuant to its obligations under the merger agreement with Nanometrics, August Technology delivered a copy of the letter to Nanometrics. On the same day, Rudolph issued a press release with proposed terms that were slightly different from those described in the letter received by August Technology. The press release stated that Rudolph is prepared to enter into a merger with August Technology whereby each shareholder of August Technology will receive the value of \$2.16 per share in cash and 0.4955 per share in Rudolph common stock (equivalent to \$10.50 per share of August Technology common stock, based on the closing price of Rudolph stock on January 27, 2005). The press release stated that each August Technology shareholder would have the option to elect to receive all cash, stock or a combination of cash and stock, subject to proration based on total cash consideration of \$40 million. August Technology has indicated that it is not for sale but, in accordance with the terms of the merger agreement between Nanometrics and August Technology, it would be willing to discuss a potential transaction with Rudolph once Rudolph executes a confidentiality agreement containing provisions that are no less favorable to August Technology than those contained in August Technology's confidentiality agreement with Nanometrics. Rudolph and August Technology have been engaged in discussions to reach agreement on the form of confidentiality agreement but have not yet executed such an agreement.

On February 9, 2005, August Technology received a letter from KLA-Tencor Corporation, or KLA, regarding KLA's interest in pursuing a merger with August Technology. The letter stated that KLA proposed to acquire August Technology in a transaction in which the August Technology shareholders would receive \$11.50 in cash per share. KLA also stated that it would be willing to consider using stock as consideration. In a press release dated February 11, 2005, August Technology's board of directors reiterated that August Technology is not for sale. August Technology's board of directors also stated that it had no interest in considering KLA's cash offer, but that in order to fulfill its fiduciary obligations it would investigate the alternative of a transaction in which the consideration to August Technology shareholders would consist of KLA stock at an exchange ratio per share which reflects the intrinsic value of August Technology. The board of directors also stated it believes that several issues, including antitrust concerns, would need to be considered and resolved before any transaction with KLA could be completed. With these conditions and concerns in mind, in accordance with the terms of the merger agreement between Nanometrics and August Technology, August Technology's board of directors indicated that it would be willing to discuss a potential transaction with KLA if KLA executes a confidentiality agreement containing provisions that are no less favorable to August Technology than those contained in August Technology's confidentiality agreement with Nanometrics. KLA and August Technology have been unable to reach agreement on the form of confidentiality agreement and have had no discussions regarding the confidentiality agreement since early March.

August Technology's board of directors determined, after consulting with August Technology's financial and legal advisors, that, despite the offers from Rudolph and KLA, continuing to pursue the August merger is in the best interests of August Technology and its shareholders because it provides the highest potential long-term value for the August Technology shareholders. For a complete discussion of the consideration the August Technology board of directors gave the Rudolph and KLA offers, we encourage you to read the section of this joint proxy statement/prospectus entitled *The August Merger Background of the Merger* beginning on page 71.

On March 15, 2005, August Technology received notification of early termination of the waiting period under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended, or the HSR Act, applicable to the August merger. Termination or expiration of this waiting period is a condition to the August merger.

In addition, the Antitrust Division of the United States Department of Justice, or the Department of Justice, has notified August Technology that it has commenced an investigation into the competitive aspects of the offers submitted to August Technology by Rudolph and KLA. No further information regarding the timing or scope of the investigation was made available to August Technology.

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Q: Does a vote AGAINST the August merger mean that I am voting for August Technology to complete a deal with Rudolph or KLA?

A: No. Even if the August merger is not approved by August Technology's shareholders or cannot be completed for other reasons, there is no guarantee that any agreement can be reached on acceptable terms with either Rudolph, KLA, or any other party.

Q: How do the August Technology directors and executive officers intend to vote on the August merger? (See page 127)

A: All of the August Technology directors and executive officers have entered into voting agreements with Nanometrics pursuant to which they have agreed to vote all of their respective shares of August Technology common stock in favor of August Technology's proposal to approve the merger agreement and the August merger.

At the close of business on January 21, 2005, the date of the merger agreement, directors and executive officers of August Technology and their affiliates beneficially owned and were entitled to vote 1,120,911 shares of August Technology common stock, collectively representing approximately 6.3% of the shares of August Technology common stock outstanding on that date. As of the record date for the August Technology special meeting, directors and executive officers of August Technology and their affiliates beneficially owned and were entitled to vote _____ shares of August Technology common stock, collectively representing approximately _____ of the shares of August Technology common stock outstanding on that date.

Q: Do any of the August Technology directors and executive officers have any special interests in the August merger? (See page 104)

A: In considering the recommendation of the August Technology board of directors with respect to the merger agreement and the August merger, you should be aware that members of the August Technology board of directors and August Technology executive officers have interests in the August merger that may be different than, or in addition to, the interests of August Technology shareholders generally. These interests include:

the appointment of three current directors of August Technology as directors of August Nanometrics upon completion of the August merger, and the appointment of certain executive officers of August Technology as executive officers of August Nanometrics upon completion of the August merger;

the potential receipt of severance payments, payable to the following executive officers in the following respective amounts, if he or she were to be terminated without cause or were to resign pursuant to an involuntary termination at any time within the 18-month period following the completion of the August merger:

<u>Name and Title</u>	<u>Total Severance Payment</u>
Jeff L. O Dell	\$ 442,500
Chief Executive Officer	
David Klenk	\$ 322,500

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President and Chief Operating Officer		
Stanley D. Piekos	\$	322,500
Chief Financial Officer and Secretary		
D. Mayson Brooks	\$	315,000
Vice President, Sales and Field Operations		
Cory Watkins	\$	300,000
Chief Technical Officer		
Scott Gabbard	\$	262,500
Vice President, Finance		
Jeff Nelson	\$	41,250
Vice President, Manufacturing		

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the accelerated vesting of executive officers and directors outstanding stock options of August Technology common stock, as a result of which the following executive officers will hold options as set forth below, assuming the value of the merger consideration paid in the August merger in respect of each share of August Technology as of January 20, 2005 is \$13.10:

Name and Title	Aggregate Shares Subject to Outstanding Options	Aggregate Shares Subject to Unvested Options to be Accelerated in the Merger(1)	Weighted Average Exercise Price of All Options to be Accelerated in the August Merger	Value of Unvested Options to be Accelerated in the August Merger(2)	Weighted Average Exercise Price of All Options	Value of All Options(3)
Jeff L. O Dell	17,250	4,000	\$ 4.70	\$ 14,741	\$ 7.86	\$ 36,853
Chief Executive Officer						
David Klenk	138,591	7,791	\$ 6.74	\$ 16,112	\$ 7.85	\$ 418,269
President and Chief Operating Officer						
Stanley D. Piekos	180,632	127,100	\$ 5.83	\$ 386,430	\$ 7.08	\$ 483,037
Chief Financial Officer and Secretary						
D. Mayson Brooks	120,806	26,849	\$ 7.55	\$ 47,862	\$ 9.64	\$ 187,521
Vice President, Sales and Field Operations						
Cory Watkins	60,002	27,999	\$ 9.09	\$ 19,041	\$ 10.51	\$ 57,107
Chief Technical Officer						
Scott Gabbard	87,165	21,433	\$ 8.57	\$ 17,406	\$ 9.57	\$ 113,203
Vice President, Finance						
Jeff Nelson	45,000	45,000	\$ 7.62	\$ 34,439	\$ 7.62	\$ 34,439
Vice President, Manufacturing						

- (1) Pursuant to the terms of August Technology's 1997 Stock Incentive Plan, certain unvested options will vest at the completion of the August merger.
- (2) Illustrates the economic value of all unvested options held by each executive officer assuming the acceleration of all such unvested options in the August merger and the exercise of such options, immediately upon completion of the August merger. The economic value was calculated for each executive officer by multiplying the shares subject to in-the-money options by the difference between the value of the merger consideration as of January 20, 2005 (\$8.3851) and the exercise price of such unvested options.
- (3) Illustrates the economic value of all options held by each executive officer assuming the acceleration of all such options in the August merger and the exercise of all options, immediately upon completion of the August merger. The economic value was calculated for each executive officer by multiplying the shares subject to in-the-money options by the difference between the value of the merger consideration as of January 20, 2005 (\$8.3851) and the exercise price of such in-the-money options.

and the continued indemnification of, and provision of directors and officers insurance coverage to, current directors and officers of August Technology following the August merger.

The August Technology board of directors was aware of these interests and considered them, among other matters, in making its recommendation that the August Technology shareholders approve the merger agreement and the August merger.

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Q: Who will be on the August Nanometrics board of directors if you complete the August merger? (See page 121)

A: If Nanometrics and August Technology complete the August merger, four of Nanometrics directors will resign (leaving three Nanometrics directors on the August Nanometrics board of directors), August Technology will select three of its directors to join the August Nanometrics board of directors and these six directors (the three remaining Nanometrics directors and three directors appointed from the August Technology board of directors) will select a seventh individual to join the August Nanometrics board of directors. Nanometrics has not yet selected the three directors who will remain on the August Nanometrics board of directors and August Technology has not yet selected the three directors who will join the August Nanometrics board of directors.

In addition, the August Nanometrics organizational documents will provide for a classified board of directors consisting of three classes. Class I will be comprised of one director from the Nanometrics board of directors and one director from the August Technology board of directors. Class II will be comprised of one director from the Nanometrics board of directors and one director from the August Technology board of directors. Class III will consist of one director from the Nanometrics board of directors, one director from the August Technology board of directors and the additional director selected by Nanometrics and August Technology. Class I directors will serve for an initial term of one year and for three-year terms thereafter, if re-elected. Class II directors will serve for an initial term of two years and three-year terms thereafter, if re-elected. Class III directors will serve for an initial term of three years and three-year terms thereafter, if re-elected. As noted above, Nanometrics and August Technology have not yet determined the composition of the August Nanometrics board of directors, so consequently, they have not yet determined which directors will be in the various classes of directors either.

Q: What do I need to do now?

A: You should read and consider the information contained in this joint proxy statement/prospectus carefully. You also may want to review the documents referenced under the section titled *Additional Information Where You Can Find More Information* beginning on page 185. You should then vote your shares of August Technology common stock in accordance with the instructions in this joint proxy statement/prospectus as soon as possible so that your shares are represented at the August Technology special meeting.

Q: How do I vote or submit my voting instructions? (See page 68)

A: If you are the holder of record of your shares of August Technology common stock, you may vote in person at the August Technology special meeting or by submitting a proxy card for the special meeting. You can vote your shares of August Technology common stock by proxy by completing, signing, dating and returning the enclosed proxy card for the special meeting and returning it in the enclosed pre-paid envelope.

If you hold your shares of August Technology common stock through a broker, bank or other nominee (*i.e.*, in street name), you must provide the record holder of your shares with instructions on how to vote your shares at the August Technology special meeting. Please refer to the voting instruction card delivered to you by your broker, bank or other nominee for instructions on how to direct the record holder of your shares to vote your shares at the August Technology special meeting. If you hold your shares of August Technology common stock in street name, you must obtain a legal proxy in order to attend the August Technology special meeting and vote in person. If you wish to do so, please contact the broker, bank or other nominee that holds your shares of August Technology common stock for instructions on how to obtain a legal proxy for this purpose.

Q: What happens if I do not vote? (See page 69)

A: If you do not submit a proxy card or vote at the August Technology special meeting, your shares will not be counted as present for the purpose of determining the presence of a quorum. If you submit a proxy card and

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affirmatively elect to abstain from voting, your proxy will be counted as present for the purpose of determining the presence of a quorum but will not be voted at the special meeting. As a result, your abstention will have the same effect as a vote AGAINST the August merger.

Q: If my shares are held in street name, will my broker, bank, or nominee vote my shares for me on the merger transaction proposals? (See page 69)

A: No. The broker, bank, or other nominee that holds your shares of August Technology common stock cannot vote your shares of August Technology common stock at the August Technology special meeting unless you provide them with instructions on how to vote your shares in accordance with the information and procedures they provided to you.

Q: Can I change my vote after I have mailed my signed proxy or instruction form? (See page 69)

A: Yes. If you are the record holder of your shares of August Technology common stock, you can change your vote at any time before your proxy is voted at the August Technology special meeting by:

delivering to the August Technology corporate secretary, a signed notice of revocation;

granting a new, later-dated proxy, which must be signed and delivered to the August Technology corporate secretary in advance of the vote at the August Technology special meeting; or

attending the August Technology special meeting and voting in person. Your attendance alone, however, will not revoke your previously granted proxy.

If you hold your shares in street name and you have provided voting instructions to the broker, bank or other nominee that holds your shares of August Technology common stock for use at the August Technology special meeting, you must follow the instructions of your broker, bank or other nominee in order to change your vote or revoke your proxy for the August Technology special meeting.

Q: Should I send in my stock certificates now?

A: No. If you own shares of August Technology common stock, do not send in your stock certificates now. After the August merger is completed, you will be sent written instructions for exchanging your August Technology share certificates for certificates evidencing shares of August Nanometrics common stock.

Q: What should I do if I receive more than one set of voting materials? (See page 69)

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A: You may receive more than one set of voting materials for the August Technology special meeting, including multiple copies of this joint proxy statement/prospectus and multiple proxy cards or voting instruction cards. For example, if you are a record holder of your shares of August Technology common stock and your shares are registered in more than one name, you will receive more than one proxy card for the special meeting. If you hold your shares of August Technology common stock in more than one brokerage account, you will receive a separate voting instruction card for each brokerage account in which you hold shares. In addition, if you are a shareholder of August Technology and a shareholder of Nanometrics, you will receive one or more separate proxy cards or voting instruction cards for each company. Please complete, sign, date and return each proxy card and voting instruction card that you receive to ensure that your shares will be represented at the August Technology special meeting.

Q: Do I have dissenters or appraisal rights in connection with the August merger? (See page 109)

A: No. Under applicable law, you will not have dissenters or appraisal rights in connection with the August merger.

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Q: Whom should I call with questions?

A: If you have any questions about the August merger or any other matters described in this joint proxy statement/prospectus, or if you need additional copies of this joint proxy statement/prospectus or a proxy card for the August Technology special meeting, you should contact:

The Proxy Advisory Group of Strategic Stock Surveillance, LLC

331 Madison Avenue, 12th Floor

New York, New York 10017

Tel: (866) 657-8728 or

(212) 850-8150

Fax: (212) 850-8161

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SUMMARY

*The following is a summary of other additional information contained in this joint proxy statement/prospectus. The following summary may not contain all of the information that is important to you. We encourage you to read this entire joint proxy statement/prospectus carefully. In addition, we encourage you to read the information incorporated by reference into this joint proxy statement/prospectus, which includes important business and financial information about Nanometrics and August Technology that has been filed with the Securities and Exchange Commission. You may obtain the information incorporated by reference into this joint proxy statement/prospectus without charge by following the instructions in the section of this joint proxy statement/prospectus entitled *Additional Information Where You Can Find More Information* beginning on page 184.*

The Companies

Nanometrics Incorporated

1550 Buckeye Drive

Milpitas, California 95035

(408) 435-9600

Nanometrics is a leader in the design, manufacture, and marketing of high-performance process control metrology systems used in the manufacture of semiconductors/integrated circuits and flat panel displays. Nanometrics' metrology systems (i) measure various thin film properties, critical circuit dimensions and layer-to-layer circuit alignment (overlay) and (ii) inspect for surface defects during various steps of the manufacturing process, enabling semiconductor and integrated circuit manufacturers to improve yields, increase productivity and lower their manufacturing costs. The relative alignment of sequentially patterned thin film layers is critical to device production.

Nanometrics has been a pioneer and innovator in the field of metrology for nearly three decades. It has been selling metrology systems since 1977 and has an extensive installed base with industry leading customers worldwide, including Applied Materials Inc., Samsung, Hynix Semiconductor Inc., IBM, Intel Corporation, Micron Technology, Inc., TSMC Ltd., Renesas, Powerchip, UMC, Ebara, Chi Mei, AU Optronics and Hannstar.

Major League Merger Corporation is a transitory acquisition subsidiary that Nanometrics formed solely to effect the August merger. Minor League Merger Corporation is a transitory subsidiary that Nanometrics formed solely to effect the reincorporation merger. Neither Major League Merger Corporation nor Minor League Merger Corporation has ever conducted any business.

August Technology Corporation

4900 West 78th Street

Bloomington, Minnesota 55435

(952) 820-0060

August Technology is a world-class provider of automated defect detection and product characterization systems for microelectronic device manufacturers. August Technology's systems provide these manufacturers with information that enables process-enhancing decisions, ultimately lowering manufacturing costs, improving time-to-market and enhancing the performance of their products. August Technology combines its core competencies in machine vision technology, optics, lighting and precision motion control with its proprietary software and extensive microelectronic-specific applications experience to deliver scalable, modular systems that excel at the automated detection of advanced macro defects, which August Technology defines to be defects

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greater in size than 0.5 micron. August Technology sells its systems to many of the leading microelectronic device manufacturers throughout the world within the markets of semiconductors, advanced packaging applications, optoelectronics MEMS, data storage and other emerging markets.

August Technology has traditionally provided systems to address the automated inspection needs of the early stages of the final manufacturing or back-end of the microelectronic device manufacturing process. These needs were met primarily with August Technology's NSX Series and 3Di Series of products. In 2003, August Technology introduced the AXi Series for frontside advanced macro detection in the front-end of the wafer manufacturing process and within one year, August Technology added the E-20 for wafer edge inspection and the B-20 for wafer backside inspection. When used in combination the AXi/E-20/B-20 is the industry's first true all-surface advanced macro inspection solution allowing device manufacturers to inspect the top, edge and bottom of a wafer's surface. August Technology complements this broad inspection capability with an expanding suite of software tools designed to enhance the speed and effectiveness of the process by which device manufacturers analyze defects and make decisions regarding their manufacturing process to reduce or eliminate such defects. August Technology refers to this process as the detection-to-decision process.

The Merger Agreement (See page 112)

On January 21, 2005, Nanometrics and August Technology entered into a merger agreement providing for, among other things, the August merger and the reincorporation merger. We have attached the merger agreement to this joint proxy statement/prospectus as Annex A. We encourage you to carefully read the merger agreement in its entirety because it is the legal document that governs the August merger.

Merger Consideration (See page 112)

August Technology shareholders will receive 0.6401 of a share of August Nanometrics common stock for each share of August Technology common stock they own at the completion of the August merger.

August Nanometrics will not issue fractional shares of August Nanometrics common stock in the August merger. As a result, each August Technology shareholder will receive cash for any fractional share of August Nanometrics common stock the shareholder would otherwise be entitled to receive in the August merger.

Treatment of August Technology Stock Options and ESPP (See page 113)

At the completion of the August merger, each outstanding option to purchase August Technology common stock will be assumed by August Nanometrics and converted into an option to acquire August Nanometrics common stock. Pursuant to the terms of August Technology's 1997 Stock Incentive Plan, approximately 500,000 options of the 1.3 million options to purchase shares of August Technology common stock assumed by August Nanometrics will vest at the completion of the August merger.

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Prior to the completion of the August merger, August Technology will terminate its employee stock purchase plan and all outstanding purchase rights will be automatically exercised unless Nanometrics instructs August Technology otherwise, and no further shares of August Technology will be issued pursuant to such plan.

Non-Solicitation Restrictions (See page 118)

The merger agreement contains detailed provisions that prohibit Nanometrics and August Technology and the subsidiaries of each of them, as well as their officers, directors and representatives, from taking any action to solicit or engage in discussions or negotiations with any person or group with respect to certain types of alternative acquisition proposals. The merger agreement does not, however, prohibit either party or its board of directors from considering and recommending to the party's shareholders an unsolicited alternative acquisition proposal from a third party if specified conditions are met.

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Conditions to Completion of August Merger (See page 122)

Under the terms of the merger agreement, Nanometrics and August Technology are not required to complete the August merger until the following conditions have been satisfied:

the receipt of the approval of the issuance of shares of August Nanometrics common stock in the August merger by Nanometrics shareholders, and the approval of the merger agreement and the August merger by August Technology shareholders;

the expiration or termination of the waiting period, or any extension of the waiting period, under the HSR Act, (which condition has been satisfied) and receipt of all clearances, consents and approvals necessary for completion of the August merger under United States and foreign antitrust laws;

the absence of any legal restraints or prohibitions preventing the completion of the August merger;

the authorization for listing on the Nasdaq National Market of the shares of August Nanometrics common stock to be issued in the August merger;

the delivery to each party of tax opinions of legal counsel to the effect that the August merger will qualify as a reorganization within the meaning of Section 368(a) of the Internal Revenue Code;

the representations and warranties of each party contained in the merger agreement being true and correct, except to the extent that breaches of these representations and warranties would not result in a material adverse effect on the representing party;

the performance or compliance in all material respects of each party with all agreements and covenants contained in the merger agreement at the completion of the August merger; and

the absence of events or developments since the date of the merger agreement that would reasonably be expected to have a material adverse effect with respect to either party.

Either Nanometrics or August Technology may waive the conditions to the performance of its respective obligations under the merger agreement and complete the August merger even though one or more of these conditions has not been met. Neither Nanometrics nor August Technology can give any assurance that all of the conditions to the August merger will be either satisfied or waived or that the August merger will occur.

The reincorporation is not a condition to completion of the August merger and Nanometrics intends to proceed with the August merger even if Nanometrics does not obtain the requisite shareholder approval to complete the reincorporation merger.

Termination Rights and Fees (See page 124)

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Under circumstances specified in the merger agreement, either Nanometrics or August Technology may terminate the merger agreement. Subject to the limitations set forth in the merger agreement, the circumstances generally include if:

the August merger is not completed by September 30, 2005;

a non-appealable final order of a court or other action of any governmental authority has the effect of permanently prohibiting completion of the August merger;

the required approval of the shareholders of each of Nanometrics and August Technology has not been obtained at its respective shareholder meeting;

the other party breaches its representations, warranties or covenants in the merger agreement such that its conditions to completion of the August merger regarding representations, warranties or covenants would not be satisfied;

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the other party has not complied with the provisions of the merger agreement relating to non-solicitation and board recommendations; or

the other party consents to termination.

If the August merger is not completed under certain circumstances specified in the merger agreement, Nanometrics or August Technology may be required to pay the other \$8.3 million, plus expenses.

Accounting Treatment of the August Merger (See page 108)

August Nanometrics will account for the August merger as a purchase business combination under United States generally accepted accounting principles.

Regulatory Matters Relating to the August Merger (See page 108)

The August merger is subject to antitrust laws. Nanometrics and August Technology have made all required filings under applicable antitrust laws with the Department of Justice and the United States Federal Trade Commission, which is referred to as the FTC. On March 15, 2005, the FTC informed Nanometrics and August Technology that early termination of the waiting period associated with these filings has been granted.

Listing of August Nanometrics Common Stock (See page 109)

Nanometrics will apply to have the shares of August Nanometrics common stock to be issued in the August merger to holders of August Technology common stock approved for listing on the Nasdaq National Market.

Delisting and Deregistration of August Technology Common Stock (See page 109)

If the August merger is completed, August Technology common stock will no longer be listed on the Nasdaq National Market and will be deregistered under the Securities Exchange Act of 1934, as amended, which is referred to as the Exchange Act, and August Technology will no longer file periodic reports with the Securities and Exchange Commission.

Recent Developments

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On January 27, 2005, August Technology received a letter from Rudolph Technologies, Inc., or Rudolph, stating that Rudolph is prepared to enter into a merger with August Technology based on a share exchange ratio of 0.6239 of a share of Rudolph stock for each share of August Technology common stock (equivalent to \$10.50 per share of August Technology common stock based on the closing price of Rudolph stock on January 27, 2005). The letter stated that each August Technology shareholder may elect to receive all cash, stock or a combination of cash and stock, subject to proration based on total cash consideration of \$40 million. Pursuant to its obligations under the merger agreement with Nanometrics, August Technology delivered a copy of the letter to Nanometrics. On the same day, Rudolph issued a press release with proposed terms that were slightly different from those described in the letter received by August Technology. The press release stated that Rudolph is prepared to enter into a merger with August Technology whereby each shareholder of August Technology will receive the value of \$2.16 per share in cash and 0.4955 per share in Rudolph common stock (equivalent to \$10.50 per share of August Technology common stock, based on the closing price of Rudolph stock on January 27, 2005). The press release stated that each August Technology shareholder would have the option to elect to receive all cash, stock or a combination of cash and stock, subject to proration based on total cash consideration of \$40 million. August Technology has indicated that it is not for sale but, in accordance with the terms of the merger agreement between Nanometrics and August Technology, it would be willing to discuss a potential transaction with Rudolph if Rudolph executes a confidentiality agreement containing provisions that are no less

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favorable to August Technology than those contained in August Technology's confidentiality agreement with Nanometrics. Rudolph and August Technology have been engaged in discussions to reach agreement on the form of confidentiality agreement but have not yet executed such an agreement.

On February 9, 2005, August Technology received a letter from KLA-Tencor Corporation, or KLA, regarding KLA's interest in pursuing a merger with August Technology. The letter stated that KLA proposed to acquire August Technology in a transaction in which the August Technology shareholders would receive \$11.50 in cash per share. KLA also stated that it would be willing to consider using stock as consideration. In a press release dated February 11, 2005, August Technology's board of directors reiterated that August Technology is not for sale. August Technology's board of directors also stated that it had no interest in considering KLA's cash offer, but that in order to fulfill its fiduciary obligations it would investigate the alternative of a transaction in which the consideration to August Technology shareholders would consist of KLA stock at an exchange ratio per share which reflects the intrinsic value of August Technology. The board of directors also stated that it believes that several issues, including antitrust concerns, would need to be considered and resolved before any transaction with KLA could be completed. With these conditions and concerns in mind, in accordance with the terms of the merger agreement between Nanometrics and August Technology, August Technology's board of directors indicated that it would be willing to discuss a potential transaction with KLA if KLA executes a confidentiality agreement containing provisions that are no less favorable to August Technology than those contained in August Technology's confidentiality agreement with Nanometrics. KLA and August Technology have been unable to reach agreement on the form of such a confidentiality agreement and have had no discussions regarding the confidentiality agreement since early March.

August Technology's board of directors determined, after consulting with August Technology's financial and legal advisors, that, despite the offers from Rudolph and KLA, continuing to pursue the August merger is in the best interests of August Technology and its shareholders because it provides the highest potential long-term value for the August Technology shareholders. For a complete discussion of the consideration the August Technology board of directors gave the Rudolph and KLA offers, we encourage you to read the section of this joint proxy statement/prospectus entitled *The August Merger Background of the August Merger* beginning on page 71.

On March 15, 2005, August Technology received notification of early termination of the waiting period under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended, applicable to the August merger. Termination or expiration of this waiting period is a condition to the August merger.

In addition, the Antitrust Division of the United States Department of Justice has notified August Technology that it has commenced an investigation into the competitive aspects of the offers submitted to August Technology by Rudolph and KLA. No further information regarding the timing or scope of the investigation was made available to August Technology.

On March 14, 2005, Nanometrics announced that it has received notice of a patent infringement lawsuit brought by Nova Measuring Instruments, Ltd. alleging infringement of United States Patent No. 6,752,689, or the '689 Patent. Nanometrics believes that its products do not infringe any valid claim of the '689 patent and that the lawsuit will not have a material impact on its business and operating results.

Legal Proceedings Regarding the August Merger

On February 4, 2005, a shareholder class action lawsuit was filed in Minnesota state court against August Technology and the August Technology board of directors. The lawsuit claims that the directors breached their fiduciary duties to August Technology's shareholders in connection with their actions in agreeing to the August merger. The plaintiff seeks various forms of injunctive relief including an order enjoining August Technology and the directors from consummating the August merger.

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On February 14, 2005, a similar shareholder class action lawsuit was filed in Minnesota state court against August Technology and the August Technology board of directors. The lawsuit also claims that the directors breached their fiduciary duties to August Technology's shareholders in connection with their actions in agreeing to the August merger. The plaintiff seeks various forms of injunctive relief including an order enjoining August Technology and the directors from consummating the August merger.

James A. Bernards, Roger E. Gower, Jeff L. O'Dell, Linda Hall Whitman and Michael Wright, the members of the board of directors of August Technology who have been named as individual defendants in the two purported class actions, have collectively retained separate counsel to represent them in connection with the foregoing lawsuits. August Technology and these named individuals believe they have meritorious defenses to these claims and intend to vigorously defend these lawsuits. They have moved to dismiss these lawsuits.

Table of Contents**Summary Selected Historical Financial Data**

Nanometrics and August Technology are providing the following information to aid you in your analysis of the financial aspects of the August merger.

Nanometrics

Nanometrics has derived the following historical information from its audited consolidated financial statements for each of the five years ended January 1, 2005, January 3, 2004, December 28, 2002, December 29, 2001 and December 30, 2000, and for each of the years then ended. The information is only a summary and should be read in conjunction with Nanometrics' consolidated financial statements, accompanying notes and management's discussion and analysis of results of operations and financial condition incorporated by reference into this joint proxy statement/prospectus.

	Year Ended				
	January 1, 2005	January 3, 2004 (a)	December 28, 2002	December 29, 2001 (b)	December 30, 2000 (b)
(in thousands, except per share amounts)					
Consolidated Statement of Operations Data:					
Net Revenues:					
Products	\$ 62,911	\$ 34,592	\$ 28,669	\$ 42,653	\$ 63,468
Service	7,784	7,010	6,054	4,931	6,023
Total net revenues	70,695	41,602	34,723	47,584	69,491
Costs and Expenses:					
Cost of products	27,555	17,691	13,237	17,949	25,082
Cost of service	8,404	6,620	5,765	5,406	6,022
Research and development	12,827	13,399	13,765	10,760	9,238
Selling	11,442	11,496	10,862	9,523	10,313
General and administrative	5,137	4,689	5,104	4,177	4,258
Goodwill impairment			1,077		
Total costs and expenses	65,365	53,895	49,810	47,815	54,913
Income (loss) from operations	5,330	(12,293)	(15,087)	(231)	14,578
Interest income	276	397	583	2,576	4,129
Interest expense	(110)	(96)	(94)	(86)	(76)
Other, net	(44)	385	100	(517)	(150)
Total other income, net	122	686	589	1,973	3,903
Income (loss) before provision (benefit) for income taxes	5,452	(11,607)	(14,498)	1,742	18,481
Provision (benefit) for income taxes	426	5,860(c)	(6,230)	782	5,942
	5,026	(17,467)	(8,268)	960	12,539

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Income (loss) before cumulative effect of change in revenue recognition principle					
Cumulative effect of change in revenue recognition principle					(1,364)
Net income (loss)	\$ 5,026	\$ (17,467)	\$ (8,268)	\$ 960	\$ 11,175
Basic net income (loss) per share:					
Income (loss) before cumulative effect of change in revenue recognition principle	\$ 0.41	\$ (1.45)	\$ (0.70)	\$ 0.08	\$ 1.14
Cumulative effect of change in revenue recognition principle	\$	\$	\$	\$	\$ (0.12)
Net income (loss)	\$ 0.41	\$ (1.45)	\$ (0.70)	\$ 0.08	\$ 1.02
Diluted net income (loss) per share:					
Income (loss) before cumulative effect of change in revenue recognition principle	\$ 0.38	\$ (1.45)	\$ (0.70)	\$ 0.08	\$ 1.06
Cumulative effect of change in revenue recognition principle	\$	\$	\$	\$	\$ (0.12)
Net income (loss)	\$ 0.38	\$ (1.45)	\$ (0.70)	\$ 0.08	\$ 0.94
Weighted average common shares:					
Basic	12,320	12,043	11,878	11,691	10,986
Diluted	13,364	12,043	11,878	12,161	11,845

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- (a) The fiscal year ended January 3, 2004 included 53 weeks, whereas the other periods presented included 52 weeks.
- (b) Nanometrics adopted Statement of Financial Accounting Standards No. 142 *Goodwill and Other Intangible Assets* SFAS 142, effective January 1, 2002. The effect of not amortizing goodwill and other intangible assets in periods prior to the adoption of SFAS 142 would have resulted in net income of \$1,028 and \$11,956 for the years ended December 29, 2001 and December 30, 2000, respectively; basic earnings per common share of \$0.09 and \$1.09 for the years ended December 29, 2001 and December 30, 2000, respectively; and diluted earnings per common share of \$0.09 and \$1.01 for the years ended December 29, 2001 and December 30, 2000, respectively.
- (c) The income tax provision for the fiscal year ended January 3, 2004 includes a charge of \$6,020 relating to an increase in the deferred tax valuation allowance.

	January 1, 2005	January 3, 2004	December 28, 2002	December 29, 2001	December 30, 2000
Consolidated Balance Sheet Data:					
Cash, cash equivalents and marketable debt securities	\$ 33,868	\$ 29,892	\$ 36,866	\$ 47,227	\$ 69,788
Working capital	69,915	59,587	74,776	80,171	92,420
Total assets	133,769	121,740	134,688	142,355	144,796
Debt obligations, less current portion	2,070	2,648	3,123	3,314	4,236
Total shareholders' equity	118,156	108,441	124,106	129,845	127,009

Table of Contents*August Technology*

August Technology has derived the following historical information from its audited consolidated financial statements for each of the five years ended December 31, 2004, 2003, 2002, 2001 and 2000 and for each of the years then ended. The information is only a summary and should be read in conjunction with August Technology's consolidated financial statements and accompanying notes and management's discussion and analysis of results of operations and financial condition incorporated by reference into this joint proxy statement/prospectus.

	Year Ended December 31,				
	2004	2003	2002	2001	2000
(in thousands, except per share amounts)					
Consolidated Statement of Operations Data:					
Net revenues	\$ 68,443	\$ 40,323	\$ 25,058	\$ 29,784	\$ 31,666
Cost of revenues	31,925	18,290	11,068	12,039	12,594
Gross profit	36,518	22,033	13,990	17,745	19,072
Selling, general and administrative expenses	22,798	14,359	13,013	12,379	10,426
Research and development expenses	13,561	10,430	9,847	7,940	6,945
Total operating expenses	36,359	24,789	22,860	20,319	17,371
Income (loss) from operations	159	(2,756)	(8,870)	(2,574)	1,701
Interest income	847	407	624	1,427	978
Other income (expense)	73			(17)	
Income (loss) before provision (benefit) for income taxes	1,079	(2,349)	(8,246)	(1,164)	2,679
Provision (benefit) for income taxes	277		687	(813)	807
Net income (loss)	\$ 802	\$ (2,349)	\$ (8,933)	\$ (351)	\$ 1,872
Net income (loss) per share:					
Basic	\$ 0.05	\$ (0.16)	\$ (0.69)	\$ (0.03)	\$ 0.17
Diluted	\$ 0.04	\$ (0.16)	\$ (0.69)	\$ (0.03)	\$ 0.16
Weighted average common shares:					
Basic	17,755	14,381	13,033	12,723	11,049
Diluted	18,211	14,381	13,033	12,723	11,770
Consolidated Balance Sheet Data:					
Cash, cash equivalents and marketable debt securities	\$ 50,422	\$ 63,850	\$ 18,777	\$ 25,857	\$ 29,193
Working capital	54,962	62,819	29,376	37,171	36,872
Total assets	95,800	88,947	39,510	47,155	47,897
Retained earnings (accumulated deficit)	(8,776)	(9,578)	(7,229)	1,704	2,055

Shareholders' equity	81,465	78,477	34,867	42,523	41,685
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Table of Contents**Selected Unaudited Pro Forma Condensed Combined Financial Data**

The following selected pro forma condensed combined financial data for the year ended January 1, 2005 gives effect to Nanometrics' acquisition of August Technology as if it had occurred on January 4, 2004, the beginning of Nanometrics' fiscal year ended January 1, 2005. The selected pro forma condensed combined financial data as of January 1, 2005 gives effect to the August merger as if it had occurred on January 1, 2005. The pro forma adjustments are based upon available information and assumptions that Nanometrics' management believes are reasonable. The selected pro forma condensed combined financial data are presented for illustrative purposes only. Nanometrics and August Technology may have performed differently had they been combined for the periods and on the dates presented. Shareholders of Nanometrics and August Technology should not rely on this information as being indicative of the historical results that would have been achieved had the companies always been combined or the future results that August Nanometrics will experience after the August merger.

The pro forma adjustments are based upon certain assumptions and preliminary available information that Nanometrics believes are reasonable under the circumstances. This data is not intended to represent or to be indicative of the consolidated results of operations or financial condition of Nanometrics that would have been reported had the August merger been completed as of the dates presented, and should not be taken as representative of future consolidated results of operations or financial condition of Nanometrics. A final determination of fair values relating to the August merger, which cannot be made prior to the completion of the August merger, may differ materially from the preliminary estimates and will include management's final valuation of the fair value of assets acquired and liabilities assumed. This final valuation will be based on the actual net tangible and identifiable intangible assets of August Technology that exist as of the date of the completion of the August merger. The final valuation may change the allocations of the purchase price, which could affect the fair value assigned to the assets and liabilities and could result in a change to the unaudited pro forma condensed combined financial statements data. The pro forma adjustments are more fully described in the notes to the unaudited pro forma condensed combined financial statements found elsewhere in this joint proxy statement/prospectus.

The selected pro forma condensed combined financial data (i) have been derived from, and should be read in conjunction with, the unaudited pro forma condensed combined financial statements and accompanying notes included in the section of this joint proxy statement/prospectus entitled *Unaudited Pro Forma Condensed Combined Financial Information* beginning on page 129, and (ii) should be read in conjunction with the consolidated financial statements of Nanometrics and August Technology and other information filed by Nanometrics and August Technology with the Securities and Exchange Commission and incorporated by reference into this joint proxy statement/prospectus (in thousands, except per share amounts).

	For the Year Ended January 1, 2005
Statement of Operations Data:	
Net revenues	\$ 139,656
Income from operations	\$ 1,736
Net income	\$ 2,054
Net income per share:	
Basic	\$ 0.09
Diluted	\$ 0.08
	As of January 1, 2005
Balance Sheet Data:	
Working capital	\$ 126,406
Total assets	\$ 296,041

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Total debt, including current portion	\$	3,234
Stockholders' equity	\$	257,947

Table of Contents**Comparative Per Share Information**

The following tables set forth historical per share information of Nanometrics and August Technology and unaudited pro forma condensed combined per share information after giving effect to the August merger under the purchase method of accounting, based on an average price per share of Nanometrics common stock of \$12.57, for the period beginning two trading days before and ending two trading days after the August merger was announced. The unaudited pro forma combined financial data are not necessarily indicative of the financial position had the August merger occurred on January 1, 2005, or operating results that would have been achieved had the August merger been in effect as of January 4, 2004 and should not be construed as representative of future financial position or operating results. The unaudited pro forma condensed combined per share information is derived from, and should be read in conjunction with, the unaudited pro forma condensed combined financial statements and accompanying notes included in the section of this joint proxy statement/prospectus entitled *Unaudited Pro Forma Condensed Combined Financial Information* beginning on page 129. The historical per share information is derived from the audited financial statements as of and for the year ended January 1, 2005 for Nanometrics and December 31, 2004 for August Technology.

	Historical Nanometrics	Historical August Technology	Pro Forma Combined (1)	Pro Forma Equivalent of One August Technology Share (2)
Net income per share basic:				
Year ended January 1, 2005	\$ 0.41	\$ 0.05	\$ 0.09	\$ 0.06
Net income per share diluted:				
Year ended January 1, 2005	\$ 0.38	\$ 0.04	\$ 0.08	\$ 0.05
Cash dividends declared per share	\$	\$	\$	\$
January 1, 2005 weighted average shares used in computing (in thousands):				
Basic	12,320	17,755	23,740	
Diluted	13,364	18,211	24,979	
Book value per share:				
January 1, 2005	\$ 9.40	\$ 4.57	\$ 10.75	\$ 6.88
January 1, 2005 shares outstanding used in computing book value per share (in thousands):	12,567	17,839	23,986	

- (1) The combined pro forma data includes the effect of the August merger on the basis as described in the notes to the unaudited pro forma combined financial information included elsewhere in this joint proxy statement/prospectus.
- (2) The pro forma equivalent of one August Technology share amounts were calculated by applying the exchange ratio of 0.6401 to the pro forma combined net earnings and book value per share.

This information is only a summary and should be read in conjunction with the financial statements and accompanying notes of Nanometrics and August Technology contained in the annual reports and other information that has been filed with the Securities and Exchange Commission and incorporated by reference into this joint proxy statement/prospectus and with the unaudited pro forma condensed combined financial statements contained in the section of this joint proxy statement/prospectus entitled *Unaudited Pro Forma Condensed Combined Financial Information* beginning on page 129.

Table of Contents**Comparative Per Share Market Price Data**

Nanometrics common stock is quoted on the Nasdaq National Market and traded under the symbol NANO. August Technology common stock is quoted on the Nasdaq National Market and traded under the symbol AUGT. The table below sets forth, for the periods indicated, the high and low sale prices per share of Nanometrics common stock and August Technology common stock. For current price information with respect to Nanometrics common stock and August Technology common stock, you are urged to consult publicly available sources. No assurance can be given as to future prices, or markets for shares, of Nanometrics common stock or August Technology common stock.

	Shares of Nanometrics Common Stock		Shares of August Technology Common Stock	
	High	Low	High	Low
2004				
First Quarter	\$ 23.50	\$ 13.86	\$ 23.45	\$ 12.47
Second Quarter	18.94	10.60	17.24	11.25
Third Quarter	12.20	7.50	12.51	6.87
Fourth Quarter	17.72	11.14	10.53	6.14
2003				
First Quarter	\$ 6.11	\$ 2.85	\$ 5.38	\$ 2.20
Second Quarter	7.49	3.88	6.23	3.45
Third Quarter	15.89	6.15	14.40	6.73
Fourth Quarter	17.41	10.63	20.69	13.82
2002				
First Quarter	\$ 23.10	\$ 14.90	\$ 14.59	\$ 8.05
Second Quarter	20.35	13.16	16.35	9.35
Third Quarter	16.33	2.60	9.23	3.47
Fourth Quarter	6.30	1.82	7.40	3.89

The following table sets forth the closing prices for Nanometrics common stock and August Technology common stock as reported on the Nasdaq National Market on January 20, 2005, the last trading day before Nanometrics and August Technology announced the August merger and March 24, 2005, the last trading day before the date of this joint proxy statement/prospectus. These historical and pro forma equivalent sales prices per share reflect the fluctuating value of the Nanometrics common stock that August Technology shareholders would receive in exchange for each share of August Technology common stock if the August merger was completed on either of these dates, applying the exchange ratio of 0.6401 of a share of August Nanometrics common stock for each share of August Technology common stock.

	Nanometrics Common Stock	August Technology Common Stock	Pro Forma Equivalent Value of August Technology Common Stock
January 20, 2005	\$ 13.10	\$ 9.15	\$ 8.39
March 24, 2005	\$ 12.10	\$ 12.00	\$ 7.75

The above tables show only historical comparisons. These comparisons may not provide meaningful information to Nanometrics shareholders in determining whether to approve the issuance of shares of August Nanometrics common stock in the August merger or to August Technology shareholders in determining whether to approve the merger agreement and the August merger. Nanometrics and August Technology

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shareholders are urged to obtain current market quotations for Nanometrics and August Technology common stock and to review carefully the other information contained in this joint proxy statement/prospectus, or incorporated by reference into this joint proxy statement/prospectus, when considering whether to approve the issuance of shares of August Nanometrics common stock in the August merger, in the case of Nanometrics shareholders, or to approve the merger agreement and the August merger, in the case of August Technology shareholders.

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CAUTIONARY STATEMENT CONCERNING FORWARD-LOOKING STATEMENTS

This joint proxy statement/prospectus and the other documents incorporated by reference into this joint proxy statement/prospectus contain or may contain forward-looking statements intended to qualify for the safe harbor from liability established by the Private Securities Litigation Reform Act of 1995. These statements can be identified by the fact that they do not relate strictly to historical or current facts. We have based these forward-looking statements on our current expectations about future events. Further, statements that include words such as may, will, project, might, expect, believe, anticipate, intend, could, would, estimate, continue or pursue, or the negative of these words or expressions of similar meaning, may identify forward-looking statements. These forward-looking statements are found at various places throughout this joint proxy statement/prospectus and the other documents incorporated by reference. These forward-looking statements, including, without limitation, those relating to future actions, new projects, strategies, future performance, the outcome of contingencies such as legal proceedings and future financial results, in each case relating to Nanometrics or August Technology, respectively, wherever they occur in this joint proxy statement/prospectus or the other documents incorporated by reference herein, are necessarily estimates reflecting the best judgment of the respective management of Nanometrics and August Technology and involve a number of risks and uncertainties that could cause actual results to differ materially from those suggested by the forward-looking statements. These forward-looking statements should, therefore, be considered in light of various important factors, including those set forth in this joint proxy statement/prospectus and incorporated by reference into this joint proxy statement/prospectus. In addition to the risk factors identified elsewhere, important factors that could cause actual results to differ materially from estimates or projections contained in the forward-looking statements include, without limitation:

the ability to obtain the approvals of each company's shareholders, to obtain or meet the closing conditions in the merger agreement, including applicable tax requirements, and to otherwise complete the August merger in a timely manner;

the ability to timely and cost-effectively integrate the operations of Nanometrics and August Technology;

the ability to realize the synergies and other perceived advantages resulting from the August merger;

the ability to retain key personnel both before and after the August merger;

the ability of each company to successfully execute its business strategy;

the extent and timing of market acceptance of new products;

the ability of Nanometrics, August Technology and August Nanometrics to procure, maintain, enforce and defend their respective patents and other proprietary rights;

the effects of local, national and global economic, credit and capital market conditions on the economy in general, and on the semiconductor industry in particular, and the effects of foreign exchange rates and interest rates;

changes in laws, including increased tax rates, regulations or accounting standards, third party relations and approvals, and decisions of courts, regulators and governmental bodies;

litigation outcomes and judicial actions, including costs and existing or additional litigation associated with the August merger, and legislative action, referenda and taxation;

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the ability of Nanometrics, August Technology or August Nanometrics to continue to increase customer loyalty and maintain existing distributor, subcontractor and supplier relationships;

the ability to recoup costs of capital investments through higher revenues;

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environmental restrictions, soil and water conditions, weather and other hazards, site access matters and building permit issues;

the ability of Nanometrics, August Technology and August Nanometrics to successfully complete any future acquisitions and integrate any acquired businesses;

the effects of environmental and structural building conditions relating to our properties;

acts of war or terrorist incidents; and

the effects of competition, including locations of competitors and operating and market competition.

You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date of this joint proxy statement/prospectus or, in the case of documents incorporated by reference, as of the date of those documents. Neither Nanometrics nor August Technology undertakes any obligation to publicly update or release any revisions to these forward-looking statements to reflect events or circumstances after the date of this joint proxy statement/prospectus or to reflect the occurrence of unanticipated events, except as required by law.

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RISK FACTORS

You should carefully consider the risks described below before deciding how to vote your shares. The business, results of operations or financial condition of Nanometrics, August Technology and/or August Nanometrics could be seriously harmed if any of these risks materialize. The trading price of shares of Nanometrics and August Technology common stock may also decline due to any of these risks.

August Nanometrics will operate in a market environment that is difficult to predict and that involves significant risks, many of which will be beyond August Nanometrics' control. Additional risks and uncertainties not presently known to Nanometrics and August Technology or that management of Nanometrics and August Technology do not currently believe are important to you, also may adversely affect the August merger, Nanometrics, August Technology and/or August Nanometrics should they materialize.

Risks Relating to the August Merger

Although Nanometrics and August Technology expect that the August merger will result in benefits to the combined company, August Nanometrics may not realize those benefits because of integration and other challenges.

The failure of August Nanometrics to meet the challenges involved in integrating the global operations of Nanometrics and August Technology successfully or otherwise to realize any of the anticipated benefits of the August merger, could seriously harm the results of operations of August Nanometrics. Realizing the benefits of the August merger will depend in part on the successful integration of technology, operations and personnel. The integration of the companies is a complex, time-consuming and expensive process that, without proper planning and implementation, could significantly disrupt the respective businesses of Nanometrics, August Technology and/or August Nanometrics. The challenges involved in this integration include, but are not limited to, the following:

communicating a strategic vision to the market regarding August Nanometrics and executing on such strategic vision;

consolidating operations, including rationalizing corporate information technology and administrative infrastructures;

combining diverse product and service offerings;

coordinating sales and marketing efforts to effectively communicate the capabilities of August Nanometrics;

overcoming any perceived adverse changes in business focus, including demonstrating to existing customers of both Nanometrics and August Technology that the August merger will not result in adverse changes in customer service standards or business focus and helping customers conduct business easily with August Nanometrics;

coordinating and harmonizing research and development activities to accelerate introduction of new products and technologies with reduced cost;

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preserving customer, distribution, reseller, manufacturing, supplier, marketing and other important relationships of both Nanometrics and August Technology and resolving any potential conflicts that may arise;

minimizing the diversion of management attention from ongoing business concerns;

retaining key employees and maintaining employee morale;

addressing differences in the business cultures of Nanometrics and August Technology;

addressing the effects of August Technology's employment contracts and the differences between Nanometrics' and August Technology's employee bonus plans on August Nanometrics' employees;

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overcoming challenges involved with managing two large groups of employees in geographically disparate areas;

coordinating and combining international operations, relationships and facilities, which may be subject to additional constraints imposed by geographic distance, local laws and regulations;

overcoming any potential challenges involved with August Nanometrics' ability to comply with the Sarbanes-Oxley Act of 2002, including its ability to make the certifications required by Section 404 thereof, in a timely manner;

reducing the effects of potential litigation diverting the attention of management away from day to day integration issues;

addressing any challenges involved with August Nanometrics' ability to earn profits with the amortization of the fair value of property, plants, equipment and intangible assets; and

overcoming the challenges involved with integrating August Technology's and Nanometrics' diverse enterprise resource planning systems worldwide and minimizing any disruptions that may be caused by such integration.

August Nanometrics may not successfully integrate the operations of Nanometrics and August Technology in a timely manner, or at all, and August Nanometrics may not realize the anticipated benefits and synergies of the August merger to the extent, or in the timeframe, anticipated. The anticipated benefits of the August merger are based on projections and assumptions, including successful integration, not actual experience. The failure to integrate the businesses of Nanometrics and August Technology or to realize any of the anticipated benefits of the August merger could seriously hinder August Nanometrics' plans for product development as well as business and market expansion following the August merger.

In addition to the integration risks discussed above, August Nanometrics' ability to realize these benefits and synergies could be adversely affected by practical or legal constraints on its ability to combine operations. Even if the integration of Nanometrics' and August Technology's operations, products and personnel is successful, it may place a significant burden on management and internal resources. The diversion of management attention and any difficulties encountered in the transition and integration process could harm August Nanometrics' business, financial condition and operating results.

August Technology shareholders will receive a fixed ratio of 0.6401 of a share of August Nanometrics common stock for each share of August Technology common stock, and consequently, if Nanometrics' stock price decreases for any reason, August Technology shareholders will receive less in value for their August Technology common stock.

Upon completion of the August merger, each holder of shares of August Technology common stock will be entitled to receive 0.6401 of a share of August Nanometrics common stock for each share of August Technology common stock held by such holder at the completion of the August merger. There will be no adjustment (except for adjustments to reflect the effect of any stock split, reverse stock split, stock dividend, reorganization, recapitalization, reclassification or other like change with respect to the common stock of either company) in the number of shares of August Nanometrics common stock issued to August Technology shareholders (or reserved for issuance pursuant to assumed August Technology stock options) because of changes in the market price of either Nanometrics common stock or August Technology common stock. In addition, the parties do not have a right to terminate the merger agreement or refuse to complete the August merger based upon changes in the market price of either Nanometrics common stock or August Technology common stock.

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The share prices of Nanometrics common stock and August Technology common stock are subject to the general price fluctuations in the market for publicly-traded equity securities. The prices of both companies' common stock have experienced significant volatility in the past and have varied since Nanometrics and August Technology entered into the merger agreement and will continue to vary in the future due to changes in the business, operations or prospects of Nanometrics and August Technology, market assessments of the August

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merger, regulatory considerations, market and economic considerations and other factors. Please see the risk factor entitled *Nanometrics and August Technology's operating results are subject to fluctuations and are inherently unpredictable; if August Nanometrics fails to meet the expectations of securities analysts or investors, the stock price of August Nanometrics following the August merger may decrease significantly* beginning on page 38. These market fluctuations may adversely affect the market price of Nanometrics common stock.

Accordingly, the then-current dollar value of August Nanometrics common stock that August Technology shareholders will receive upon the completion of the August merger will depend entirely upon the market value of Nanometrics common stock at the time the August merger is completed, which may be different from, and lower than, the closing price of Nanometrics common stock on the last full trading day preceding the public announcement of the August merger, the last full trading day prior to the date of this joint proxy statement/prospectus or the date of the Nanometrics annual meeting and August Technology special meeting. Moreover, the completion of the August merger may occur some time after shareholder approval has been obtained. Neither Nanometrics nor August Technology can predict or give any assurances as to the respective market prices of its common stock at any time before or after the completion of the August merger. Nanometrics and August Technology urge you to obtain recent market quotations for Nanometrics common stock and August Technology common stock. However, this value may substantially decrease from the date you submit your proxy.

The market price of the shares of Nanometrics common stock may be affected by factors different from those affecting the shares of August Technology common stock.

Upon completion of the August merger, holders of August Technology common stock will become holders of August Nanometrics common stock. An investment in Nanometrics common stock has different risks than an investment in August Technology common stock. Former holders of August Technology common stock will be subject to additional risks upon exchange of their shares of August Technology common stock for August Nanometrics common stock in the August merger. For a discussion of the businesses of Nanometrics, and August Technology, see the documents incorporated by reference into this document and referred to in the section of this joint proxy statement/prospectus entitled *Additional Information Where You Can Find More Information* beginning on page 185.

The shares of August Nanometrics common stock to be received by August Technology shareholders as a result of the August merger will have different rights than the shares of August Technology common stock.

The rights associated with shares of August Nanometrics common stock are different from the rights of August Technology common stock. The rights of August Nanometrics common stock after the August merger will be governed by August Nanometrics' certificate of incorporation and the laws of the State of Delaware, and may be different from the rights under August Technology's articles of incorporation and the laws of the State of Minnesota. See the section of this joint proxy statement/prospectus entitled *Comparison of Rights of Holders and Corporate Governance Matters* beginning on page 139 for a discussion of the different rights associated with August Nanometrics common stock.

Some of the directors and executive officers of Nanometrics and August Technology have interests and arrangements that could have affected their decisions to support or approve the August merger.

The interests of some of the directors and executive officers of Nanometrics and August Technology in the August merger and their participation in arrangements that are different from, or are in addition to, those of Nanometrics and August Technology shareholders generally could have affected their decision to support or approve the August merger. Executive officers of August Technology will receive accelerated vesting of options in connection with the August merger and may be entitled to receive certain severance benefits in the event of such executive officer's actual or constructive termination within 18 months following the August merger. As a result, some of the directors and executive officers of

Nanometrics and August Technology may be

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more likely to recommend the August merger than if they did not have these interests. These interests are described in more detail in the section of this joint proxy statement/prospectus entitled *The August Merger Interests of August Technology Directors and Executive Officers in the August Merger* beginning on page 104.

Nanometrics and August Technology each expect to incur significant costs associated with the August merger which could harm the financial results of August Nanometrics.

Nanometrics estimates that it will incur direct transaction costs of approximately \$2.1 million associated with the August merger, which will be included as part of the total purchase price for financial accounting purposes. In addition, August Technology estimates that it will incur direct transaction costs of approximately \$4.5 million, which will be recognized and expensed as incurred. Nanometrics and August Technology believe August Nanometrics may incur charges to operations, which cannot be reasonably estimated at this time, in the quarter in which the August merger is completed or the following quarters, to reflect costs associated with integrating the two companies. There can be no assurance that August Nanometrics will not incur additional material charges in subsequent quarters to reflect additional costs associated with the August merger and the integration of the two companies.

Charges to earnings resulting from the application of the purchase method of accounting may adversely affect the market value of August Nanometrics common stock following the August merger.

In accordance with United States generally accepted accounting principles, August Nanometrics will account for the August merger using the purchase method of accounting, which may require an increase in intangible assets and inventory and a decrease in deferred revenue to their respective fair values. Further, a portion of the purchase price may be allocated to in-process research and development. Such purchase accounting adjustments may result in material recurring and nonrecurring charges to earnings that could have a material adverse effect on the market value of the common stock of August Nanometrics following completion of the August merger. Under the purchase method of accounting, August Nanometrics will allocate the total estimated purchase price to August Technology's net tangible assets and amortizable intangible assets based on their fair values as of the date of completion of the August merger, and record the excess of the purchase price over those fair values as goodwill. August Nanometrics will incur amortization expense over the useful lives of amortizable intangible assets acquired in connection with the August merger. In addition, to the extent the value of goodwill becomes impaired, August Nanometrics may be required to incur material charges relating to the impairment of that asset. Further, August Nanometrics may be impacted by nonrecurring charges related to the requirement for immediately expensing the portion of the purchase price allocated to August Technology's in-process research and development and reduced gross profit margins from the requirement to adjust August Technology's inventory and deferred revenues to fair value. These charges resulting from the application of purchase accounting could have a material impact on August Nanometrics' results of operations.

The stock prices and businesses of Nanometrics may be adversely affected if the August merger is not completed, and, under certain circumstances, Nanometrics or August Technology may be required to pay a termination fee if the August merger is not consummated.

If the August merger is not completed, the trading price of Nanometrics common stock and/or August Technology common stock may decline to the extent that the current market prices reflect a market assumption that the August merger will be completed. In addition, Nanometrics' and August Technology's businesses and operations may be harmed to the extent that customers, suppliers and others believe that the companies cannot effectively compete in the marketplace without the August merger, or there is customer or employee uncertainty surrounding the future direction of the product and service offerings and strategy of Nanometrics or August Technology on a standalone basis.

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In addition, Nanometrics and August Technology would not derive the strategic benefits expected to result from the August merger if the August merger is not completed, which could adversely affect their respective businesses.

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Further, Nanometrics and August Technology will be required to pay significant costs incurred in connection with the August merger, including legal, accounting and a portion of the financial advisory fees, regardless of whether the August merger is completed. Moreover, under specified circumstances described in the section of this joint proxy statement/prospectus entitled *The Merger Agreement Termination; Termination Fees and Expenses* beginning on page 124, either company may be required to pay the other a termination fee equal to \$8.3 million, plus any applicable costs, expenses and interest pursuant to the merger agreement.

Rudolph and KLA have made offers to merge with August Technology. If these or other companies make competitive offers to merge with August Technology, and if the August Technology board of directors decides to change its recommendation, and the August merger is not completed, the business, operating results and financial condition of August Technology and Nanometrics may be harmed.

On January 27, 2005, Rudolph informed August Technology that it was prepared to enter into a merger with August Technology. On February 9, 2005, KLA informed August Technology of its interest in pursuing a merger with August Technology. In order to discharge its fiduciary obligation to its shareholders, and in accordance with the terms of the merger agreement between Nanometrics and August Technology, August Technology has indicated that it is not for sale, but in accordance with the terms of the merger agreement between Nanometrics and August Technology, August Technology would be willing to discuss a potential transaction with Rudolph and/or with KLA if Rudolph and/or KLA executes a confidentiality agreement containing provisions that are no less favorable to August Technology than those contained in August Technology's confidentiality agreement with Nanometrics. Neither Rudolph nor KLA has thus far executed such a confidentiality agreement. If August Technology's board decides to change its recommendation and endorse one of these competing offers and the August merger is not completed, August Technology could (i) be required to pay Nanometrics an \$8.3 million termination fee, and (ii) experience a loss of reputation and goodwill and damage to employee relationships. For more detailed information, see the sections entitled *The August Merger Recent Developments* beginning on page 109 and *The Merger Agreement Termination; Termination Fees and Expenses* beginning on page 124 and the risk factor entitled *The stock prices and businesses of Nanometrics and August Technology may be adversely affected if the August merger is not completed; and, under certain circumstances, Nanometrics or August Technology may be required to pay a termination fee if the August merger is not consummated*, beginning on page 34.

If August Technology is unsuccessful in certain purported shareholder class action lawsuits recently brought against it in connection with the August merger, the August merger could be enjoined, which may adversely affect the business, operating results and financial condition of August Technology and Nanometrics.

On February 4, 2005 and on February 14, 2005, two separate purported shareholder class action lawsuits were filed in Minnesota state court against August Technology and the August Technology board of directors. These lawsuits each claim that the August Technology directors breached their fiduciary duties to the August Technology shareholders in connection with their actions in agreeing to the August merger. The plaintiffs seek various forms of injunctive relief including an order enjoining August Technology and the directors from consummating the August merger.

There can be no assurance that August Technology will be successful in the above-referenced lawsuits. If August Technology is not successful in either of these lawsuits, the August merger could be enjoined, thereby preventing consummation of the August merger which may result in indirect costs and expenses to August Technology and Nanometrics, such as significant diversion of management resources, loss of reputation and goodwill, damage to customer relationships and declines in the respective stock prices of August Technology and Nanometrics. Accordingly, if either of the above referenced lawsuits is successful, the business, results of operations and financial condition of August Technology and Nanometrics could be significantly harmed. For more detailed information, see the section entitled *The August Merger Legal Proceedings Regarding the August Merger* beginning on page 111 and the risk factor entitled *The stock prices and businesses of Nanometrics and August Technology may be adversely affected if the August merger is not completed; and, under certain circumstances, Nanometrics or August Technology may be required to pay a termination fee if the August merger is not consummated* beginning on page 34.

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Nanometrics and August Technology must continue to retain and motivate executives and key employees and recruit new employees, which may be difficult in light of uncertainty regarding the August merger and offers from Rudolph and KLA, and failure to do so could seriously harm August Nanometrics.

In order to be successful, during the period before the August merger is completed, each of Nanometrics and August Technology must continue to retain and motivate executives and other key employees and recruit new employees. Employees of Nanometrics or August Technology may experience uncertainty about their future role with August Nanometrics until or after strategies with regard to August Nanometrics are announced or executed. These potential distractions related to the August merger, as well as the unsolicited offers from Rudolph and KLA, may adversely affect each company's ability to attract, motivate and retain executives and key employees and keep such executives and key employees focused on the strategies and goals of August Nanometrics. Any failure by Nanometrics or August Technology to retain and motivate executives and key employees during the period prior to the completion of the August merger could seriously harm their respective businesses, as well as the business of August Nanometrics.

Uncertainty regarding the August merger may cause customers, distributors, resellers and others to delay or defer decisions concerning Nanometrics and August Technology which may harm either company's results of operations, and the results of operations of August Nanometrics.

Because the August merger is subject to several closing conditions and because August Technology has received unsolicited offers from Rudolph and KLA, uncertainty exists regarding the completion of the August merger. This uncertainty may cause customers, distributors, resellers and others to delay or defer decisions concerning Nanometrics or August Technology, or elect to switch to other suppliers, which could negatively affect the businesses and results of operations of Nanometrics or August Technology, as well as August Nanometrics. Prospective customers could also be reluctant to purchase August Nanometrics' products due to uncertainty about the direction of August Nanometrics products and willingness to support and service existing products. In addition, customers, distributors, resellers and others may also seek to change existing agreements with Nanometrics or August Technology as a result of the August merger. These and other actions by customers, distributors, resellers and others could negatively affect the businesses and results of operations of Nanometrics and August Technology as well as August Nanometrics.

Even though Nanometrics and August Technology have obtained the regulatory approvals required to complete the August merger, governmental authorities could still seek to block or challenge the August merger.

The August merger is subject to review by the Department of Justice and the FTC under the HSR Act. Under the HSR Act, Nanometrics and August Technology are required to make pre-merger notification filings and to await the expiration or early termination of the statutory waiting period prior to completing the August merger. We have made all required regulatory filings and have been notified by the FTC that early termination of the waiting period associated with these filings has been granted, and we have therefore obtained all regulatory clearances, consents and approvals required to complete the August merger. However, even after completion of the August merger, governmental authorities could seek to block or challenge the August merger, impose conditions or require asset divestitures as they deem necessary or desirable in the public interest. In addition, in some jurisdictions, a competitor, customer or other third party could initiate a private action under the antitrust laws challenging or seeking to enjoin the August merger, before or after it is completed. Nanometrics, August Technology or August Nanometrics may not prevail, or may incur significant costs, in defending or settling any action under the antitrust laws.

August Technology will need to obtain consents to the assignment of certain agreements it has with third parties as a result of the August merger and if it cannot obtain these consents, August Technology and/or August Nanometrics may not be able to maintain these relationships on favorable terms or at all.

August Technology is currently attempting to obtain third-party consents for some agreements requiring a consent upon a change of control, but if it is unable to do so, August Nanometrics may be forced to renegotiate

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these agreements or enter into new agreements with various third parties as a separate, stand-alone entity. The August Technology agreements requiring consent include lease agreements and other agreements with developers, strategic partners, distributors and suppliers. There can be no assurance that August Nanometrics will be able to negotiate new agreements on terms as favorable to it as those that August Technology had, or at all.

If August Nanometrics fails to develop and introduce new products and services successfully and in a timely manner, it will not be able to compete effectively and its ability to generate revenues will suffer.

Competition is intense in the markets that will be addressed by August Nanometrics. August Nanometrics' future success depends upon its ability to develop and introduce new products and services that customers and end users choose to buy. Several competitors have greater financial, engineering, manufacturing, marketing and customer support resources than August Nanometrics will have after the August merger. As a result, August Nanometrics' competitors may be able to respond more quickly to new or emerging technologies or market developments by devoting greater resources to the development, promotion and sale of products, which could impair sales of August Nanometrics' products. If August Nanometrics is unsuccessful at developing and introducing new products and services that are appealing to its customers and end users with acceptable prices and terms, August Nanometrics will not be able to compete effectively and its ability to generate revenues will suffer.

The development of new products and services can be very difficult and requires high levels of innovation. The development process is also lengthy and costly. If August Nanometrics fails to anticipate end users' needs or technological trends accurately or is unable to complete the development of products and services in a cost-effective and timely fashion, it will be unable to introduce new products and services into the market or successfully compete with other providers. In addition, if August Nanometrics fails to timely develop products that meet its customers' product planning cycles, August Nanometrics' sales volumes may be negatively impacted. As a result, August Nanometrics' revenues and gross margins could be adversely affected.

As August Nanometrics introduces new or enhanced products or integrates new technology into new or existing products, it faces risks relating to such transitions including, among other things, disruption in customers' ordering patterns, excessive levels of older product inventories, delivering sufficient supplies of new products to meet customers' demand, possible product and technology defects arising from the integration of new technology, and a potentially different sales and support environment relating to any new technology. August Nanometrics' failure to manage the transition to newer products or the integration of newer technology into new or existing products could adversely affect its business operating results and financial results.

If August Nanometrics is unable to compete successfully against existing and future competitors on the basis of product offerings or price, August Nanometrics could experience a loss in market share and/or be required to reduce prices, which could result in reduced gross margins, and which could materially and adversely affect its business, operating results and financial condition.

If August Nanometrics does not correctly anticipate demand for its products, August Nanometrics could have costly excess production or inventories or may not be able to secure sufficient quantities or cost-effective production of its products and its cost of revenues could be adversely impacted.

The demand for August Nanometrics' products will depend on many factors, including pricing levels, and it is difficult to forecast demand due in part to competition, variations in economic conditions, seasonality and changes in consumer and enterprise preferences. It is particularly difficult to forecast demand by individual product. Significant unanticipated fluctuations in demand could result in costly excess production or inventories or the inability to secure sufficient quantities or cost-effective production of August Nanometrics' products. This could adversely

impact August Nanometrics cost of revenues.

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Nanometrics and August Technology's operating results are subject to fluctuations and are inherently unpredictable; if August Nanometrics fails to meet the expectations of securities analysts or investors, the stock price of August Nanometrics following the August merger may decrease significantly.

Both Nanometrics and August Technology's operating results are difficult to predict, and vary significantly from period to period. As a result, Nanometrics and August Technology each believe that quarter-to-quarter comparisons of their respective operating results are not necessarily a good indication of what August Nanometrics' future performance will be. The recent and prolonged downturn in the semiconductor industry, combined with the lack of operating history for August Nanometrics, may make it difficult for August Nanometrics to accurately forecast revenue. Future operating results may fluctuate significantly due to several factors, many of which are outside of August Nanometrics' control and may not meet the expectations of August Nanometrics or those of securities analysts or investors. If this occurs, the price of common stock of August Nanometrics will likely decline. Factors that may cause fluctuations in August Nanometrics' operating results include, but are not limited to, the following:

changes in customer demand and spending levels and limited visibility into customers' spending plans;

changes in general economic conditions and specific market conditions related to the semiconductor, microelectronic and flat panel display industries;

changes in customer preferences for August Nanometrics' products and services;

competitive pricing pressures and new product introductions by August Nanometrics' competitors;

inability or failure to respond to changing technology within the semiconductor, microelectronic and flat panel display industries;

seasonality of demand for August Nanometrics' products and services;

variations in product costs or the mix of products sold;

the anticipated high selling prices of August Nanometrics' products which typically results in a long sales cycle and variations in the length of sales cycles;

quality issues with August Nanometrics' products;

inability of third party manufacturers to produce quality products on time;

failure to achieve targeted product cost reductions and operating expense reductions;

the timely introduction and market acceptance of new August Nanometrics' products and services;

excess inventory or insufficient inventory to meet demand; and

litigation brought against August Nanometrics.

Any of the foregoing factors, or any other factors discussed elsewhere herein, could have a material adverse effect on the business, results of operations and financial condition of August Nanometrics.

August Nanometrics will be dependent on its suppliers, some of which will likely be the sole source for certain components and elements of its technology, and August Nanometrics' production or reputation could be seriously harmed if these suppliers were unable to timely meet its demand or technical requirements on a cost effective basis.

August Nanometrics' products will contain components and subassemblies that are procured from a variety of suppliers. The cost, quality and availability of components will be essential to the successful production and sale of its products. Some components and subassemblies will likely come from sole or limited source suppliers. Alternative sources are not always available or may be financially prohibitive. If suppliers were unable or unwilling to meet August Nanometrics' demand for sole source components and if it is unable to obtain an

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alternative source or if the price for an alternative source is prohibitive, August Nanometrics' ability to maintain timely and cost-effective production of its products will be seriously harmed.

August Nanometrics will be dependent on contract manufacturers to manufacture many of the components and subassemblies for its products. August Nanometrics will not have long-term supply contracts with such manufacturers, and changes to those relationships, expected or unexpected, may result in delays or disruptions that could cause August Nanometrics to lose revenue and damage its customer relationships.

August Nanometrics will depend on independent contract manufacturers (each of whom is typically a third party manufacturer for numerous companies) to manufacture many of the components and subassemblies for its products. Neither Nanometrics nor August Technology has long-term supply contracts with such manufacturers and if August Nanometrics should fail to effectively manage its contract manufacturer relationships or if one or more of them should experience delays, disruptions or quality control problems in its manufacturing operations, August Nanometrics' ability to ship products to its customers could be delayed which could adversely affect its business and financial results.

A limited number of August Nanometrics' customers will comprise a significant portion of its revenues and any decrease in revenue from these customers could have an adverse effect on August Nanometrics.

Even though August Nanometrics' customer base is expected to increase as a result of the August merger, a large portion of August Nanometrics' net revenues will likely continue to depend on sales to a limited number of customers. During fiscal 2004, sales to Applied Materials accounted for 22% and sales to Samsung Electronics Corporation accounted for 14.6% of Nanometrics' net revenues respectively. During fiscal 2004, sales to Samsung Electronics Corporation, STMicroelectronics and Taiwan Semiconductor Manufacturing Co. each accounted for more than 10% of August Technology's net revenues. Any downturn in the business of these customers or potential new customers could significantly decrease sales to such customers which, in turn, could adversely affect August Nanometrics' net revenues and results of operations.

The long sales and implementation cycles for August Nanometrics' products, as well as its expectation that some customers will sporadically place large orders with short lead times, may cause revenues and operating results to vary significantly from quarter to quarter.

A customer's decision to purchase certain Nanometrics and August Technology products involves a significant commitment of its resources and a lengthy evaluation and product qualification process. As a result, the sales cycle may be lengthy. Throughout the sales cycle, August Nanometrics may spend considerable time and resources educating and providing information to prospective customers regarding the use and benefits of its products. Even after making the decision to purchase, customers may deploy the products slowly and deliberately. Timing of deployment can vary widely and depends on the quality and sophistication of the customer's current processing equipment, the complexity of the customer's needs, the customer's budgetary constraints as well as the internal capabilities and sophistication of the customer. Accordingly, August Nanometrics may receive purchase orders for significant dollar amounts on an irregular basis. These long cycles, as well as the expectation that customers will tend to sporadically place large orders with short lead times, may cause revenues and operating results to vary significantly and unexpectedly from quarter to quarter.

The cyclical nature of the semiconductor industry may impact August Nanometrics' operating results.

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The semiconductor industry is highly cyclical and subject to rapid technological change. From time to time, the semiconductor industry has experienced significant economic downturns, including the recent downturn, characterized by diminished product demand, accelerated erosion of prices and excess production capacity. The industry also periodically experiences increased demand and production capacity constraints. Accordingly, August Nanometrics' operating results may vary significantly as a result of general conditions in the semiconductor industry.

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Nanometrics and August Technology's products are highly technical and if they contain undetected errors, the business of August Nanometrics could be adversely affected.

Each of Nanometrics and August Technology's products are, and August Nanometrics' products will be, highly technical and complex and may contain undetected errors or defects. Some errors may only be discovered after a product has been installed and used by end customers. Any errors discovered in the products offered by August Nanometrics after commercial release could result in loss of revenue or delay in revenue recognition, loss of customers and increased service and warranty cost, any of which could adversely affect August Nanometrics' reputation, business and results of operations.

Due to the global nature of Nanometrics and August Technology's operations, particularly in Asia, economic or social conditions or changes in a particular country or region could adversely affect August Nanometrics' sales or increase its costs and expenses, which could have a material adverse impact on its financial condition.

August Nanometrics will conduct significant sales and customer support operations directly and indirectly through its facilities, distributors and resellers in countries outside of the United States and will also depend on the operations of its contract manufacturers and suppliers that are located outside of the United States. During 2004, international sales accounted for 71% of Nanometrics net revenues and 73% of August Technology's net revenues, respectively. In addition, Asia is an important region for the markets served by Nanometrics and August Technology. Nanometrics has operations in Japan, South Korea and Taiwan and August Technology has customer support centers in Taiwan and South Korea. During 2004, sales to Asian countries accounted for 67.1% of Nanometrics net revenues and 68% of August Technology's net revenues, respectively. Accordingly, August Nanometrics' future results could be materially adversely affected by a variety of uncontrollable and changing factors including, among others,

political or social unrest or economic instability in a specific country or region;

military and terrorism risks;

trade protection measures and import or export licensing requirements;

changes in a specific country's or region's political or economic conditions, particularly in emerging markets;

changes in international relations;

potentially negative consequences from changes in tax laws;

difficulty in managing widespread operations; and

difficulty in managing a geographically dispersed workforce in compliance with diverse local laws and customs.

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Any or all of these factors could have a material adverse impact on August Nanometrics' revenue, expenses and financial condition.

Third parties have claimed and may claim in the future that Nanometrics, August Technology and/or August Nanometrics is infringing their intellectual property; August Nanometrics could suffer significant litigation or licensing expenses or be prevented from selling its products if these claims are successful.

In the normal course of business, Nanometrics and August Technology have received claims of infringement or otherwise become aware of potentially relevant patents or other intellectual property rights held by other parties. For example, Nanometrics announced on March 14, 2005 that it had received notice of a patent infringement lawsuit brought by Nova Measuring Instruments, Ltd. alleging infringement of United States Patent No. 6,752,689, or the '689 Patent.

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August Nanometrics will evaluate the validity and applicability of its intellectual property rights, and determine in each case whether it must negotiate licenses or cross-licenses to incorporate or use the proprietary technologies in its products. Third parties may claim that Nanometrics, August Technology and/or August Nanometrics or its customers are infringing or contributing to the infringement of their intellectual property rights, and August Nanometrics may be found to infringe or contribute to the infringement of those intellectual property rights and require a license to use those rights. August Nanometrics may be unaware of intellectual property rights of others that may cover some of its technology, products and services.

Any litigation regarding patents or other intellectual property, including the litigation with Nova Measuring Instruments, Ltd. described above, could be costly and time consuming and could divert the attention of management and key personnel from August Nanometrics' business operations. The complexity of the technology involved and the uncertainty of litigation generally increase the risks associated with intellectual property litigation. Moreover, patent litigation has increased due to the current uncertainty of the law and the increasing competition and overlap of product functionality in the markets served by Nanometrics and August Technology. Claims of intellectual property infringement might also require August Nanometrics to enter into costly royalty or license agreements or to indemnify its customers. However, August Nanometrics may not be able to obtain royalty or license agreements on terms acceptable to it or at all. August Nanometrics also may be subject to significant damages or injunctions against development and sale of its products.

If third parties infringe the intellectual property of Nanometrics, August Technology and/or August Nanometrics or if August Nanometrics is unable to secure and protect its intellectual property, August Nanometrics may expend significant resources enforcing its rights or suffer competitive injury.

The success of August Nanometrics depends in large part on its proprietary technology and other intellectual property rights. Nanometrics and August Technology each rely on a combination of patents, copyrights, trademarks and trade secrets, confidentiality provisions and licensing arrangements to establish and protect their proprietary rights. August Nanometrics' intellectual property, particularly its patents, may not provide it with a significant competitive advantage. If August Nanometrics fails to protect or to enforce its intellectual property rights successfully, August Nanometrics' competitive position could suffer, which could harm its operating results.

Nanometrics' and August Technology's pending patent and trademark applications for registration may not be allowed, or others may challenge the validity or scope of such patents or trademarks, including the patent or trademark applications or registrations. Even if the patent or trademark registrations are issued and maintained, these patents or trademarks may not be of adequate scope or benefit to August Nanometrics or may be held invalid and unenforceable against third parties.

August Nanometrics may be required to spend significant resources to monitor and police its intellectual property rights. Effective policing of the unauthorized use of August Nanometrics' products or intellectual property is difficult and litigation may be necessary in the future to enforce its intellectual property rights. Intellectual property litigation is not only expensive, but time-consuming, regardless of the merits of any claim, and could divert the attention of August Nanometrics' management from operating the business. August Nanometrics may not be able to detect infringement despite its efforts and may lose competitive position in the market before it does so. In addition, competitors may design around August Nanometrics' technology or develop competing technologies.

Despite the efforts of Nanometrics, August Technology and August Nanometrics to protect their proprietary rights, existing laws, contractual provisions and remedies afford only limited protection. Intellectual property lawsuits are subject to inherent uncertainties due to, among other things, the complexity of the technical issues involved, and there can be no assurance that August Nanometrics will be successful in asserting its intellectual property claims. Attempts may be made to copy or reverse engineer aspects of Nanometrics', August Technology's and/or August Nanometrics' products or to obtain and use information that is regarded as

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proprietary. Accordingly, there can be no assurance that August Nanometrics will be able to protect its proprietary rights against unauthorized third-party copying or use. Infringement by others of August Nanometrics' proprietary rights could materially harm the business of August Nanometrics.

Nanometrics and August Technology have an international presence in countries whose laws may not provide protection of their intellectual property rights to the same extent as the laws of the United States, which may make it more difficult to protect such intellectual property.

As part of the business strategy of Nanometrics and August Technology, countries with large populations and propensities for adopting new technologies are targeted. However, many of these targeted countries do not have or vigorously enforce laws designed to prevent misappropriation of intellectual property or to deter others from developing similar, competing technologies or intellectual property that otherwise infringe upon existing proprietary technology. Effective protection of patents, copyrights, trademarks, trade secrets and other intellectual property may be unavailable or limited in some foreign countries. In particular, the laws of some foreign countries in which Nanometrics and August Technology are active may not protect their intellectual property rights to the same extent as the laws of the United States. As a result, August Nanometrics may not be able to effectively prevent competitors in these regions from infringing its intellectual property rights, which would reduce August Nanometrics' competitive advantage and ability to compete in those regions and could negatively impact its business.

Nanometrics and August Technology are subject to general commercial litigation and other litigation claims as part of their operations, and August Nanometrics could suffer significant litigation expenses in defending these claims and could be subject to significant damages or remedies that would harm its business.

In the normal course of business, Nanometrics and August Technology occasionally receive general commercial claims related to the conduct of their business and the performance of their products and services as well as other litigation claims. Any litigation regarding these consumer, commercial, and other claims could be costly and time-consuming and could divert the attention of August Nanometrics' management and key personnel from its business operations. The complexity of the technology involved and the uncertainty of consumer, commercial and other litigation increase these risks. August Nanometrics also may be subject to significant damages or equitable remedies regarding the development and sale of its products and the operation of its business.

If August Nanometrics fails to adequately evolve its financial and managerial control and reporting systems and processes, its ability to manage and grow its business will be negatively affected. In particular, only August Technology was required to report on its Form 10-K for 2004 its management's assessment of August Technology's internal control over financial reporting as required by Section 404 of the Sarbanes-Oxley Act of 2002 because it is an accelerated filer. Nanometrics is a non-accelerated filer and such report was not required to be included in its Form 10-K for fiscal 2004.

August Nanometrics' ability to successfully offer its products and implement its business plan in a rapidly evolving market requires an effective planning and management process. August Nanometrics will need to continue to improve its financial and managerial control and its reporting systems and procedures in order to manage its business effectively in the future. Currently, only August Technology was required to include in its annual report on Form 10-K for fiscal 2004 a management report assessing its internal control over financial reporting. Nanometrics was not required to include such a report in its Form 10-K for fiscal 2004. August Nanometrics, however, would be an accelerated filer and therefore required to make such a report when it files its annual report on Form 10-K for fiscal 2005.

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The August merger will require significant integration efforts by management. Additionally, unanticipated factors may hinder the effectiveness or delay the integration of Nanometrics and August Technology's control systems and as such, there can be no assurances regarding August Nanometrics' ability to file its reports with the

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Securities and Exchange Commission in a timely manner, or make the certifications required by the Sarbanes-Oxley Act of 2002, or the rules and regulations of the Securities and Exchange Commission promulgated thereunder. If August Nanometrics fails to continue to implement improved systems and processes, its ability to manage its business, results of operations and financial condition, and to make such certifications as required by Section 404 of the Sarbanes-Oxley Act, may be negatively affected.

Future acquisitions or investments that August Nanometrics may make could disrupt its business and harm its financial condition and may dilute the ownership of August Nanometrics stockholders.

Each of Nanometrics and August Technology has made, and August Nanometrics may continue to make, acquisitions in order to enhance its business. Acquisitions involve numerous risks, including problems combining the purchased operations, technologies or products, unanticipated costs, diversion of management's attention from its core businesses, adverse effects on existing business relationships with suppliers and customers, risks associated with entering markets in which August Nanometrics has no or limited prior experience and potential loss of key employees. There can be no assurance that August Nanometrics will be able to successfully integrate any businesses, products, technologies or personnel that it might acquire. The integration of businesses that each of Nanometrics and August Technology has acquired has been, and will continue to be, a complex, time consuming and expensive process. Additionally, if August Nanometrics fails to efficiently operate as a combined organization utilizing common information and communication systems, operating procedures, financial controls and human resources practices, its business and financial condition may be adversely affected. In the event of any such investments or acquisitions, August Nanometrics could issue stock that would dilute its then current stockholders' percentage ownership, incur debt, assume liabilities, incur amortization expenses related to purchases of intangible assets, or incur large and immediate write-offs.

The success of August Nanometrics largely depends on its ability to hire, retain, integrate and motivate a sufficient number of qualified personnel.

The future success of August Nanometrics depends on its ability to attract and retain highly skilled personnel. Nanometrics and August Technology each compensate their employees through a combination of salary, bonuses, benefits and equity compensation. If August Nanometrics fails to provide competitive compensation to its employees, it may be unable to retain them. Volatility or lack of positive performance in August Nanometrics' stock price may also affect August Nanometrics' ability to retain key employees, many of whom have been granted stock options.

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Changes in accounting for stock-based compensation could adversely affect August Nanometrics' future operating results.

Nanometrics and August Technology have historically compensated their employees, including many of their key personnel and new hires, through the issuance of options to acquire capital stock. Effective as of the third quarter of fiscal 2005, Nanometrics and August Technology will be required to expense unvested and newly issued employee stock options. This change from current accounting regulations could have a significant impact on August Nanometrics' results of operations and could affect the manner in which August Nanometrics conducts business.

War, terrorism, natural disasters, public health issues or other business interruptions could disrupt supply, delivery or demand of products, which could negatively affect August Nanometrics' operations and performance.

War, terrorism, natural disasters, public health issues and other business interruptions whether in the United States or abroad, have caused and could continue to cause damage or disruption to international commerce by creating economic and political uncertainties that may have a strong negative impact on the global economy, August Nanometrics, and its suppliers or customers. August Nanometrics' business operations would be subject to interruption by earthquake, tsunami, fire, power shortages, terrorist attacks and other hostile acts, labor disputes, medical conditions, and other events beyond its control. For example, August Nanometrics' transportation costs, insurance costs and sales efforts could become more expensive as a result of geopolitical tension. If this international economic and political instability continues or increases, the business and results of operations of August Nanometrics could be harmed. August Nanometrics will continue to consider, develop, and implement contingency plans to avoid and/or minimize potential disruptions to its business services.

Because of these and other factors affecting the business, results of operations, and financial condition of Nanometrics and August Technology, past financial performance should not be considered an indicator of the future performance of August Nanometrics, and investors should not use historical trends to anticipate results or trends in future periods.

Risks Related to Nanometrics' Business

Cyclical nature of the semiconductor and flat panel display industries has led to substantial fluctuations in demand for Nanometrics' systems and may, from time to time, continue to do so.

Nanometrics' operating results have varied significantly from period to period due to the cyclical nature of the semiconductor and flat panel display industries. The majority of Nanometrics' business depends upon the capital expenditures of semiconductor device and equipment manufacturers. These manufacturers' capital expenditures, in turn, depend upon the current and anticipated market demand for semiconductors and products using semiconductors. The semiconductor industry is cyclical and has historically experienced periodic downturns. These downturns have often resulted in substantial decreases in the demand for semiconductor manufacturing equipment, including metrology systems. Nanometrics has found that the resulting decrease in capital expenditures has typically been more pronounced than the downturn in semiconductor device industry revenues. Nanometrics expects the cyclical nature of the semiconductor industry, and therefore, its business, to continue in the foreseeable future. Recently, the semiconductor industry emerged from a sustained downturn, which had existed for the past few years. Should this trend reverse and the downturn resume, Nanometrics' business and results of operations would suffer.

Because Nanometrics derives a significant portion of its revenues from sales in Asia, Nanometrics' revenues and results of operations could be adversely affected by the instability of Asian economies.

Nanometrics' revenues from customers in Asian markets represented approximately 63.3%, 72.7% and 68.2% of Nanometrics' total net revenues in 2002, 2003 and 2004, respectively. Countries in the Asia Pacific

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region, including Japan, South Korea and Taiwan, each of which accounted for a significant portion of Nanometrics' business in that region, had experienced general economic weaknesses in 2002 and 2003, which adversely affected Nanometrics' revenues at that time.

Nanometrics depends on Applied Materials and other OEM suppliers for sales of Nanometrics' integrated metrology systems, and the loss of Applied Materials or any of Nanometrics' other OEM suppliers as a customer could harm Nanometrics' business.

Nanometrics believes that sales of integrated metrology systems will continue to be an important source of revenues. Sales of Nanometrics' integrated metrology systems depend upon the ability of Applied Materials to sell semiconductor equipment products that include Nanometrics' metrology systems as components. If Applied Materials is unable to sell such products, or if Applied Materials chooses to focus its attention on products that do not integrate Nanometrics' systems, Nanometrics' business could suffer. If Nanometrics were to lose Applied Materials as a customer for any reason, Nanometrics' ability to realize sales from integrated metrology systems would be significantly diminished, which would harm Nanometrics' business.

Nanometrics' largest customers account for a substantial portion of its revenue, and Nanometrics' revenue would materially decline if one or more of these customers were to purchase significantly fewer of its systems or if they delayed or cancelled a large order.

Historically, a significant portion of Nanometrics' revenues in each quarter and each year has been derived from sales to a relatively small number of customers, and Nanometrics expects this trend to continue. There are only a limited number of large companies operating in the semiconductor and flat panel display industries. Accordingly, Nanometrics expects that it will continue to depend on a small number of large customers for a significant portion of its revenues for at least the next several years. If any of Nanometrics' key customers were to purchase significantly fewer systems, or if a large order were delayed or cancelled, Nanometrics' revenues would significantly decline. In 2004, sales to Applied Materials accounted for 22.0% and sales to Samsung accounted for 14.6% of Nanometrics' total net revenues, respectively. In 2003, sales to Applied Materials accounted for 15.4% and sales to Hynix accounted for 12.0% of Nanometrics' total net revenues, respectively. In 2002, sales to Applied Materials accounted for 13.8% and sales to TSMC accounted for 10.9% of Nanometrics' total net revenues, respectively.

The success of Nanometrics' product development efforts depends on its ability to anticipate market trends and the price, performance and functionality requirements of semiconductor device manufacturers. In order to anticipate these trends and ensure that critical development projects proceed in a coordinated manner, Nanometrics must continue to collaborate closely with its customers. Nanometrics' relationships with its customers provides it with access to valuable information regarding industry trends, which enables Nanometrics to better plan its product development activities. If Nanometrics' current relationships with its large customers are impaired, or if Nanometrics is unable to develop similar collaborative relationships with important customers in the future, Nanometrics' long-term ability to produce commercially successful systems could be adversely affected.

Nanometrics may have difficulty meeting the requirements described in Section 404 of the Sarbanes-Oxley Act of 2002, including addressing certain significant deficiencies in its internal controls identified in connection with its fiscal 2004 year-end audit, and failure to meet such requirements could materially affect its stock price.

Nanometrics may be required to file a report on internal accounting controls, in accordance with Section 404 of the Sarbanes-Oxley Act, with its Annual Report on Form 10-K for the year ending December 31, 2005. Accordingly, Nanometrics would be required to increase the amount of documentation surrounding its internal control systems and provide evidence that its systems have been properly tested to support Nanometrics' management's conclusions. While Nanometrics continues to improve its internal control systems, including

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the companywide implementation of a new Enterprise Resource Planning System, or ERP system, there can be no assurance that its report will not disclose a material weakness. Even if Nanometrics does not identify such a material weakness, its auditors may identify a material weakness in their attestation. In the event that a material weakness is identified, Nanometrics' stock price may be adversely affected.

In connection with the audit conducted by the independent registered accounting firm BDO Seidman, LLP of Nanometrics' 2004 consolidated financial statements, BDO Seidman, LLP advised Nanometrics' management and its audit committee of certain significant deficiencies in Nanometrics' internal controls and made certain recommendations. Under the auditing standards of the Public Company Accounting Oversight Board, a significant deficiency represents a deficiency in the design or operation of internal controls in which there is a more than remote likelihood that a misstatement that is more than inconsequential but less than material could occur.

Nanometrics is currently in the process of implementing the recommendations of BDO Seidman, LLP. Additionally, Nanometrics is also in the process of augmenting its current control processes, repositioning current finance and accounting personnel and recruiting additional personnel to ensure consistently complete and accurate reporting of financial information. Nanometrics believes it will satisfactorily address most of the significant deficiencies referenced above by the end of the third fiscal quarter of 2005, although there can be no assurance that it will do so, as the proposed August merger will require significant integration efforts by management. Furthermore, remediation of Nanometrics' internal controls, required to fully comply with the Section 404 internal control assessment, may require more significant efforts by management than initially anticipated.

Nanometrics' current and potential competitors have significantly greater resources than Nanometrics has, and increased competition could impair sales of Nanometrics' products.

Nanometrics operates in the highly competitive semiconductor and flat panel display industries and faces competition from a number of companies, many of which have greater financial, engineering, manufacturing, marketing and customer support resources than Nanometrics has. As a result, Nanometrics' competitors may be able to respond more quickly to new or emerging technologies or market developments by devoting greater resources to the development, promotion and sale of products, which could impair sales of Nanometrics' products. Moreover, there has been merger and acquisition activity among Nanometrics' competitors and potential competitors. These transactions by Nanometrics' competitors and potential competitors may provide them with a competitive advantage over Nanometrics by enabling them to rapidly expand their product offerings and service capabilities to meet a broader range of customer needs. Many of Nanometrics' customers and potential customers in the semiconductor and flat panel display industries are large companies that require global support and service for their metrology systems. Some of Nanometrics' larger or more geographically diverse competitors might be better equipped to provide this global support.

If any of Nanometrics' systems fail to meet or exceed its internal quality specifications, Nanometrics often does not ship them until such time as they have met such specifications. If Nanometrics experiences significant delays or is unable to ship its products to its customers as a result of its internal processes, or for any other reason, Nanometrics' business and reputation may suffer.

Nanometrics' products are complex and require technical expertise to design and manufacture properly. Various problems occasionally arise during the manufacturing process that may cause delays and/or impair product quality. Nanometrics must actively monitor its manufacturing processes to ensure that its products meet its internal quality specifications. Any significant delays stemming from the failure of its products to meet or exceed its internal quality specifications, or for any other reasons, would delay its shipments. Shipment delays could harm Nanometrics' business and reputation in the industry.

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If Nanometrics delivers systems with defects, Nanometrics' credibility will be harmed, revenue from and market acceptance of its systems will decrease and Nanometrics could expend significant capital and resources as a result of such defects.

Notwithstanding Nanometrics internal quality specifications, Nanometrics systems have sometimes contained errors, defects or bugs when introduced. If Nanometrics delivers systems with errors, defects or bugs, its credibility and the market acceptance and sales of Nanometrics systems would be harmed. Further, if Nanometrics' systems contain errors, defects or bugs, Nanometrics may be required to expend significant capital and resources to alleviate such problems. Defects could also lead to product liability as a result of product liability lawsuits against Nanometrics or against its customers. Nanometrics has agreed to indemnify its customers in some circumstances against liability arising from defects in Nanometrics' systems. In the event of a successful product liability claim, Nanometrics could be obligated to pay damages significantly in excess of its product liability insurance limits.

Successful infringement claims by third parties could result in substantial damages, lost product sales and the loss of important intellectual property rights by Nanometrics.

Nanometrics' commercial success depends in part on its ability to avoid infringing or misappropriating patents or other proprietary rights owned by third parties. From time to time Nanometrics may receive communications from third parties asserting that its metrology systems may contain design features, which are claimed to infringe on their proprietary rights. For example, Nanometrics announced on March 14, 2005 that it had received notice of a patent infringement lawsuit brought by Nova Measuring Instruments, Ltd. alleging infringement of the 689 Patent. There can be no assurance that Nanometrics' new or current products do not infringe any valid intellectual property rights. Even if Nanometrics products do not infringe, Nanometrics may be required to expend significant sums of money to defend itself from infringement claims, as in the Nova Measuring Instruments, Ltd. lawsuit described above, or to actively protect its intellectual property rights through litigation.

Nanometrics obtains some of the components and subassemblies included in its systems from a single source or a limited group of suppliers, and the partial or complete loss of one of these suppliers could cause production delays and significant loss of revenue.

Nanometrics relies on outside vendors to manufacture many components and subassemblies. Certain components, subassemblies and services necessary for the manufacture of Nanometrics' systems are obtained from a sole supplier or limited group of suppliers. Nanometrics does not maintain any long-term supply agreements with any of its suppliers. Nanometrics has entered into arrangements with J.A. Woollam Company for the purchase of the spectroscopic ellipsometer component incorporated in Nanometrics' advanced measurement systems. Nanometrics reliance on a sole or a limited group of suppliers involves several risks, including the following:

Nanometrics may be unable to obtain an adequate supply of required components;

Nanometrics has reduced control over pricing and the timely delivery of components and subassemblies; and

Nanometrics' suppliers may be unable to develop technologically advanced products to support Nanometrics' growth and development of new systems.

Some of Nanometrics' suppliers have relatively limited financial and other resources. Because the manufacturing of certain of these components and subassemblies involves extremely complex processes and requires long lead times, Nanometrics may experience delays or shortages caused by Nanometrics' suppliers. If Nanometrics were forced to seek alternative sources of supply or to manufacture such components or subassemblies

internally, Nanometrics could be forced to redesign its systems, which could cause production delays and prevent Nanometrics from shipping its systems to customers on a timely basis. Any inability to obtain

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adequate deliveries from Nanometrics' suppliers, or any other circumstance that would restrict Nanometrics' ability to ship its products, could damage relationships with current and prospective customers, harm its business and result in significant loss of revenue.

Variations in the amount of time it takes for Nanometrics to sell its systems may cause fluctuations in its operating results, which could adversely affect Nanometrics' stock price.

Variations in the length of Nanometrics' sales cycles could cause its revenues to fluctuate widely from period to period. Nanometrics' customers generally take long periods of time to evaluate Nanometrics' metrology systems. Nanometrics expends significant resources educating and providing information to Nanometrics' prospective customers regarding the uses and benefits of Nanometrics' systems. The length of time that it takes for Nanometrics to complete a sale depends upon many factors, including:

the efforts of Nanometrics' sales force and independent sales representatives;

the complexity of the customer's metrology needs;

the internal technical capabilities and sophistication of the customer;

the customer's budgetary constraints; and

the quality and sophistication of the customer's current processing equipment.

Because of the number of factors influencing the sales process, the period between Nanometrics' initial contact with a customer and the time at which Nanometrics recognizes revenue from that customer, if at all, varies widely. Nanometrics' sales cycles, including the time it takes for Nanometrics to build a product to customer specifications after receiving an order, typically range from three to six months. Occasionally Nanometrics' sales cycles can be much longer, particularly with customers in Asia who may require longer evaluation periods. During the sales cycles, Nanometrics commits substantial resources to its sales efforts in advance of receiving any revenue, and Nanometrics may never receive any revenue from a customer despite Nanometrics' sales efforts.

If Nanometrics does complete a sale, customers often purchase only one of Nanometrics' systems and then evaluate its performance for a lengthy period of time before purchasing additional systems. The purchases are generally made through purchase orders rather than through long-term contracts. The number of additional products that a customer purchases, if any, depends on many factors, including a customer's capacity requirements. The period between a customer's initial purchase and any subsequent purchases is unpredictable and can vary from three months to a year or longer. Variations in the length of this period could cause fluctuations in Nanometrics' operating results, which could adversely affect Nanometrics' stock price.

Relatively small fluctuations in Nanometrics' system prices may cause Nanometrics' operating results to vary significantly each quarter.

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During any quarter, a significant portion of Nanometrics' revenue is derived from the sale of a relatively small number of systems. Nanometrics' automated metrology systems range in price from approximately \$200,000 to over \$1,000,000 per system; Nanometrics' integrated metrology systems range in price from approximately \$80,000 to \$300,000 per system; and Nanometrics' tabletop metrology systems range in price from approximately \$50,000 to \$200,000 per system. Accordingly, a small change in the number or types of systems that Nanometrics sells could cause significant changes in Nanometrics' operating results.

Nanometrics may sometimes experience material payment delays as a result of customer acceptance issues and such delays could negatively affect Nanometrics' results of operations.

As a result of customer acceptance issues, Nanometrics may, from time to time, experience payment delays on some of its systems. Because a significant portion of Nanometrics revenue is derived from the sale of a

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relatively small number of systems, substantial payment delays by its customers could materially and adversely affect its results of operations.

Nanometrics depends on orders that are received and shipped in the same quarter, and therefore Nanometrics' results of operations may be subject to significant variability from quarter to quarter.

Nanometrics' net sales in any given quarter depend upon a combination of orders received in that quarter for shipment in that quarter and shipments from backlog. Nanometrics' backlog at the beginning of each quarter does not include all systems sales needed to achieve expected revenues for that quarter. Consequently, Nanometrics is dependent on obtaining orders for systems to be shipped in the same quarter that the order is received. Moreover, customers may reschedule shipments, and production difficulties could delay shipments. Accordingly, Nanometrics has limited visibility into future product shipments, and its results of operations may be subject to significant variability from quarter to quarter.

Because of the high cost of switching equipment vendors in Nanometrics' markets, it is sometimes difficult for Nanometrics to attract customers from its competitors even if Nanometrics' metrology systems are superior to theirs.

Nanometrics believes that once a semiconductor or flat panel display customer has selected one vendor's metrology system, the customer generally relies upon that system and, to the extent possible, subsequent generations of the same vendor's system, for the life of the application. Once a vendor's metrology system has been installed, a customer must often make substantial technical modifications and may experience downtime in order to switch to another vendor's metrology system. Accordingly, unless Nanometrics' systems offer performance or cost advantages that outweigh a customer's expense of switching to Nanometrics' systems, it will be difficult for Nanometrics to achieve significant sales from that customer once it has selected another vendor's system for an application.

If Nanometrics is not successful in developing new and enhanced metrology systems Nanometrics will likely lose market share to its competitors.

Nanometrics operates in an industry that is subject to technological changes, changes in customer demands and the introduction of new, higher performance systems with short product life cycles. To be competitive, Nanometrics must continually design, develop and introduce in a timely manner new metrology systems that meet the performance and price demands of semiconductor and flat panel display manufacturers and suppliers. Nanometrics must also continue to refine its current systems so that they remain competitive. Nanometrics may experience difficulties or delays in its development efforts with respect to new systems, and it may not ultimately be successful in developing them. Any significant delay in releasing new systems could adversely affect Nanometrics' reputation, give a competitor a first-to-market advantage or cause a competitor to achieve greater market share.

Lack of market acceptance for Nanometrics' new products may affect Nanometrics' ability to generate revenue and may harm Nanometrics' business.

Nanometrics has recently introduced several new products to market including the Nano OCD/DUV 9010, the Nanometrics Atlas, Atlas-M, Orion and the Nano OCD 9010M. Nanometrics has invested substantial time and resources into the development of the products. However, Nanometrics cannot accurately predict the future level of acceptance of its new products by its customers. As a result, Nanometrics may not be able to generate anticipated revenue from sales of these products. While Nanometrics anticipates that its new products will become an increasingly larger component of its business, their failure to gain acceptance with Nanometrics' customers could materially harm its business.

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Additionally, if Nanometrics' new products do gain market acceptance, its ability to sell its existing products may be impeded. As a result, there can be no assurance that the introduction of these products will be commercially successful or that these products will result in significant additional revenues or improved operating margins in future periods.

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Nanometrics intellectual property may be infringed upon by third parties despite Nanometrics efforts to protect it, which could threaten Nanometrics future success and competitive position and adversely affect its operating results.

Nanometrics future success and competitive position depends in part upon its ability to obtain and maintain proprietary technology for Nanometrics principal product families, and it relies, in part, on patent, trade secret and trademark law to protect that technology. If Nanometrics fails to adequately protect its intellectual property, it will be easier for Nanometrics competitors to sell competing products. Nanometrics owns or has licensed a number of patents relating to its metrology systems, and has filed applications for additional patents. Any of Nanometrics pending patent applications may be rejected, and Nanometrics may not in the future be able to develop additional proprietary technology that is patentable. In addition, the patents Nanometrics does own or that have been issued or licensed to it may not provide Nanometrics with competitive advantages and may be challenged by third parties. Third parties may also design around these patents.

In addition to patent protection, Nanometrics relies upon trade secret protection for its confidential and proprietary information and technology. Nanometrics routinely enters into confidentiality agreements with its employees. However, in the event that these agreements may be breached, Nanometrics may not have adequate remedies. Nanometrics confidential and proprietary information and technology might also be independently developed by or become otherwise known to third parties. Nanometrics may be required to initiate litigation in order to enforce any patents issued to or licensed by Nanometrics, or to determine the scope or validity of a third party's patent or other proprietary rights. Any such litigation, regardless of outcome, could be expensive and time consuming, and could subject Nanometrics to significant liabilities or require Nanometrics to re-engineer its products or obtain expensive licenses from third parties, any of which would adversely affect Nanometrics business and operating results.

If Nanometrics chooses to acquire new and complementary businesses, products or technologies instead of developing them itself, it may be unable to complete these acquisitions or may not be able to successfully integrate an acquired business in a cost-effective and non-disruptive manner.

Nanometrics success depends on its ability to continually enhance and broaden its product offerings in response to changing technologies, customer demands and competitive pressures. To achieve this, from time to time Nanometrics has acquired complementary businesses, products, or technologies instead of developing them itself and may choose to do so in the future. For example, Nanometrics recently announced its intent to merge with August Technology, a leader in macro defect inspection. Nanometrics does not know if it will be able to complete any acquisitions, or whether it will be able to successfully integrate any acquired business, operate them profitably or retain their key employees. Integrating any business, product or technology that Nanometrics acquires could be expensive and time consuming, disrupt Nanometrics ongoing business and distract its management. In addition, in order to finance any acquisitions, Nanometrics may be required to raise additional funds through public or private equity or debt financings. In that event, Nanometrics could be forced to obtain financing on terms that are not favorable to it and, in the case of an equity financing, that results in dilution to Nanometrics shareholders. If Nanometrics is unable to integrate any acquired entities, products or technologies effectively, its business will suffer. Nanometrics ability to integrate other businesses, including August Technology, will be challenged further by its newly implemented ERP system.

Nanometrics must attract and retain key personnel with relevant industry knowledge to help support its future growth.

Nanometrics success depends to a significant degree upon the continued contributions of Nanometrics key management, engineering, sales and marketing, customer support, finance and manufacturing personnel. Nanometrics does not generally enter into employment contracts with any of its key personnel. The loss of any of these key personnel, who would be difficult to replace, could harm Nanometrics business and operating results. To support Nanometrics future growth, Nanometrics will need to attract and retain additional qualified employees. Competition for such personnel in Nanometrics industry is ongoing, and Nanometrics may not be successful in attracting and retaining qualified employees.

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Nanometrics manufactures all of its systems at a limited number of facilities, and any prolonged disruption in the operations of those facilities could reduce Nanometrics' revenues.

Nanometrics produces all of its systems in its manufacturing facilities located in Milpitas, California and through Nanometrics' subsidiaries in Japan and South Korea. Nanometrics' manufacturing processes are highly complex and require sophisticated, costly equipment and specially designed facilities. As a result, any prolonged disruption in the operations of Nanometrics' manufacturing facilities could seriously harm Nanometrics' ability to satisfy its customer order deadlines. A significant portion of Nanometrics' operations is located in Japan and South Korea, which may be subject to regional political and economic instability.

Nanometrics' efforts to protect its intellectual property may be less effective in some foreign countries where intellectual property rights are not as well protected as in the United States.

In 2002, 2003 and 2004, 69.0%, 74.8% and 71.0%, respectively, of Nanometrics' total net revenues were derived from sales to customers in foreign countries, including certain countries in Asia, such as Taiwan, South Korea and Japan. The laws of some foreign countries do not protect Nanometrics' proprietary rights to as great an extent as do the laws of the United States, and many United States companies have encountered substantial problems in protecting their proprietary rights against infringement in such countries. If Nanometrics fails to adequately protect its intellectual property in these countries, it would be easier for Nanometrics' competitors to sell competing products.

Continuing economic and political instability could affect Nanometrics' business and results of operations.

The ongoing threat of terrorism targeted at the United States or other regions where Nanometrics conducts business increases the uncertainty in Nanometrics' markets and the economy in general. This uncertainty is likely to result in economic stagnation, which would harm Nanometrics' business. In addition, increased international political instability may hinder Nanometrics' ability to do business by increasing its costs of operations. For example, Nanometrics' transportation costs, insurance costs and sales efforts may become more expensive as a result of geopolitical tension. These tensions may also negatively affect Nanometrics' suppliers and customers. If this international economic and political instability continues or increases, Nanometrics' business and results of operations could be harmed.

We will incur increased costs as a result of recent changes in laws and regulations affecting public companies.

Compliance with recent changes in laws and regulations affecting public companies, including the provisions of the Sarbanes-Oxley Act, may result in increased accounting, legal and administrative costs. In particular, Section 404 of the Sarbanes-Oxley Act of 2002 and the rules of the Securities and Exchange Commission and the Public Company Accounting Oversight Board impose new requirements with respect to the evaluation of the effectiveness of the Company's internal controls. The cost of complying with these new requirements could be substantial.

Nanometrics' quarterly operating results have varied in the past and probably will continue to vary significantly in the future, which will cause volatility in Nanometrics' stock price.

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Nanometrics' quarterly operating results have varied significantly in the past and are likely to vary in the future, which volatility could cause Nanometrics' stock price to decline. Some of the factors that may influence Nanometrics' operating results and subject its stock to extreme price and volume fluctuations include:

changes in customer demand for Nanometrics' systems;

economic conditions in the semiconductor and flat panel display industries;

the timing, cancellation or delay of customer orders and shipments;

market acceptance of Nanometrics' products and its customers' products;

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competitive pressures on product prices and changes in pricing by Nanometrics' customers or suppliers;

the timing of new product announcements and product releases by Nanometrics or its competitors and Nanometrics' ability to design, introduce and manufacture new products on a timely and cost-effective basis;

the timing of acquisitions of businesses, products or technologies;

the levels of Nanometrics' fixed expenses, including research and development costs associated with product development, relative to its revenue levels; and

fluctuations in foreign currency exchange rates, particularly the Japanese yen.

If Nanometrics' operating results in any period fall below the expectations of securities analysts and investors, the market price of Nanometrics common stock would likely decline.

Nanometrics is highly dependent on international sales and operations, which exposes it to foreign political and economic risks.

Sales to customers in foreign countries accounted for approximately 69.0%, 74.8% and 71.0%, of Nanometrics' total net revenues in 2002, 2003 and 2004, respectively. Nanometrics maintains facilities in Japan and South Korea. Nanometrics anticipates that international sales will continue to account for a significant portion of its revenues. International sales and operations carry inherent risks such as: regulatory limitations imposed by foreign governments, obstacles to the protection of Nanometrics' intellectual property, political, military and terrorism risks, disruptions or delays in shipments caused by customs brokers or other government agencies, unexpected changes in regulatory requirements, tariffs, customs, duties and other trade barriers, difficulties in staffing and managing foreign operations, and potentially adverse tax consequences resulting from changes in tax laws.

If any of these risks materialize and Nanometrics is unable to manage them, Nanometrics' international sales and operations would suffer.

Nanometrics is subject to various environmental laws and regulations that could impose substantial costs upon it and may adversely affect its business, operating results and financial condition.

Some of Nanometrics' operations use substances regulated under various federal, state, local, and international laws governing the environment, including those relating to the storage, use, discharge, disposal, labeling, and human exposure to hazardous and toxic materials. Nanometrics could incur costs, fines and civil or criminal sanctions, third-party property damage or personal injury claims, or could be required to incur substantial investigation or remediation costs, if it were to violate or become liable under environmental laws. Liability under environmental laws can be joint and several and without regard to comparative fault. Compliance with current or future environmental laws and regulations could restrict Nanometrics' ability to expand its facilities or require it to acquire additional expensive equipment, modify its manufacturing processes, or incur other significant expenses. There can be no assurance that violations of environmental laws or regulations will not occur in the future as a result of the inability to obtain permits, human error, equipment failure or other causes.

Risks Related to August Technology's Business

The microelectronic industries that August Technology serves are highly cyclical, causing significant variability in August Technology's results of operations.

August Technology primarily serves microelectronic industries and its business depends heavily upon capital expenditures by manufacturers in these industries. Microelectronic industries are highly cyclical, with

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periods of capacity shortage and periods of excess capacity; this is historically due to sudden changes in demand for microelectronic devices. In periods of excess capacity, there are often drastic changes in the timing and quantity of capital equipment purchases and investments in new technology or capacity needs by August Technology's customers. The timing, length and volatility of these periods are difficult to predict, resulting in pressure on August Technology's revenues, gross margin and net income. In addition to affecting August Technology's customers, downturns also challenge August Technology's suppliers, vendors, other partners, as well as August Technology's management, sales, engineering, manufacturing, customer service and other employees, who are vital to August Technology's success.

During downturns in microelectronic industries, customers typically reduce or delay purchases, and/or delay delivery or cancel orders. As a result, it is imperative that August Technology maintains an organization able to quickly and effectively align with market conditions, including bringing August Technology's cost structures in line with current industry and overall market conditions. At the same time, August Technology must also meet the following objectives:

- continue to serve August Technology's existing customers;
- provide new and improved solutions for new and existing customers;
- operate effectively with August Technology's suppliers; and
- motivate and retain key employees.

If August Technology is, for any reason, unable to achieve any one or more of the above objectives in an efficient, effective and timely manner, there could be a material adverse effect on August Technology's business, financial condition and results of operations. Furthermore, any delays or reductions in future purchases of capital equipment or delays or cancellations of current orders by microelectronic device manufacturers, for any reason, would likely have a material adverse effect on August Technology's business, financial condition and results of operations.

August Technology's future rate of growth is highly dependent on the development and growth of the market for microelectronic device inspection equipment.

August Technology primarily targets its products to address the needs of microelectronic device manufacturers for defect inspection and metrology. If for any reason the market for microelectronic device inspection equipment fails to grow in the long term, contrary to August Technology's current expectations August Technology may be unable to maintain current revenue levels in the short term and return to August Technology's historical growth in the long term. Growth in this market is dependent to a large extent upon microelectronic manufacturers replacing manual inspection with automated inspection technology. There is no assurance that manufacturers will undertake this replacement at the rate August Technology expects.

August Technology's sales and operating results can fluctuate significantly from period to period, which may adversely affect the market price of August Technology's stock.

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August Technology's quarterly and annual operating results are affected by a wide variety of factors that could adversely affect sales or operating results, or lead to significant variability in August Technology's operating results. In addition, because a significant portion of August Technology's revenue in any particular quarter has historically come from the sale of a relatively small number of systems, the loss of any sale could have a significant negative impact. A variety of factors could cause this variability, including the following:

order cancellations or delays in orders by customers;

the long sales cycle of August Technology's products;

decreases in capital spending by August Technology's customers;

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new product introductions by August Technology's competitors and competitive pricing pressures;

entrance into, or additional resources focused on, August Technology's markets by larger competitors;

component shortages resulting in manufacturing delays; and

delays in the development, introduction and manufacture of August Technology's products.

August Technology cannot predict the impact of these and other factors on August Technology's revenues and operating results in any future period. Results of operations in any period, therefore, should not be considered indicative of the results to be expected for any future period. Because of this difficulty in predicting future performance, August Technology's operating results may fall below expectations of securities analysts or investors in a future quarter or quarters. August Technology's failure to meet these expectations would likely adversely affect the market price of August Technology's common stock.

Global economic and political environments are important to economic conditions, and long-term continued risk or concerns regarding economic and political circumstances could decrease customer demand for August Technology's products.

Future political or related events similar or comparable to the September 11, 2001 terrorist attacks, significant military conflicts, or long term reactions of governments and society to such events, may significantly affect the willingness or ability of August Technology's customers to visit August Technology's facilities or trade shows, review August Technology's systems' capabilities and/or purchase or take delivery of August Technology's products. Such events may also affect August Technology's abilities to visit its customers, to perform application studies for its customers, and sell and deliver solutions and to service those solutions. Any decline in the willingness or ability of August Technology's customers to travel and visit August Technology's facilities, or in August Technology's ability to travel and visit its customers, could have a material adverse effect on August Technology's business, financial condition and results of operations. In addition, such events could have an adverse effect on the economy generally, and microelectronic industries in particular, causing August Technology's customers to reduce or delay capital equipment purchases.

The market acceptance of August Technology's products is critical to August Technology's growth.

Microelectronic device manufacturing equipment and processes are subject to rapid technological changes. August Technology continues to expend significant resources developing new systems, new models to existing system series and improvements or enhancements on current models. Due to the length of the product development cycles in August Technology's industries, August Technology must make these significant time and resource expenditures well in advance of any prospect of a revenue stream from such new products. If August Technology's customers do not continue to accept its current products and also accept and integrate its new products into their operations, August Technology's revenue, cash flow, operating results or stock price would be negatively and materially impacted.

August Technology's growth expectations are dependent on successfully penetrating the front-end of the microelectronic device manufacturing process.

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August Technology continues to enhance its inspection and metrology product offering for the front-end of the microelectronic device manufacturing process, a market segment that August Technology has limited experience in serving. August Technology is not a well-recognized supplier to this market, and will need to establish new customer relationships and win the confidence of these customers to compete effectively in this market. The front-end of the microelectronic device manufacturing market is dominated by large, well-established competitors with significantly greater resources and name recognition than August Technology. In order to compete effectively with these larger competitors, August Technology must develop process and applications expertise to identify the inspection needs of this market and produce cost-effective, technologically advanced solutions addressing these needs. In addition, August Technology must create and execute programs to

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effectively market to and service these customers. Failure to successfully penetrate the front-end of the microelectronic device manufacturing market would materially adversely affect August Technology's business prospects.

If August Technology is unable to keep pace with rapid technological changes by developing and introducing successful new products and technologies in a timely manner, August Technology's products may become obsolete and its business will suffer.

The microelectronic capital equipment manufacturing business is a highly competitive business and microelectronic device manufacturing equipment and processes are subject to rapid technological changes. August Technology believes that its future success will depend in large part upon its ability to continue to enhance its existing product line to meet customer needs and to develop and introduce new products in a timely manner. August Technology cannot assure you that its product enhancement efforts to improve and advance products, such as the AXi, NSX and 3Di Series, or August Technology's new product development efforts such as E-2O for edge and B-2O for backside inspection systems, will be successful or that it will be able to respond effectively to technological change. In addition, August Technology cannot provide assurance that it will be able to develop new products for the most opportunistic new markets and applications.

August Technology continues to make significant investments in research, development and engineering in new technology and/or businesses with new or complementary products, services and/or technologies, and August Technology is aware of the numerous risks associated therewith, including but not limited to:

diversion of management's attention from day-to-day operational matters and current products and customers;

lack of synergy, or the inability to realize expected synergies;

failure to commercialize the new technology or business;

failure to meet the expected performance of the new technology or business;

lower-than-expected market opportunities or market acceptance of any new products; and

unexpected reduction of sales of existing products by new products.

If August Technology is unsuccessful at developing new products and technologies, its revenue, operating results or stock price would be negatively impacted.

August Technology's products are complex and any product or process development issues could negatively impact August Technology's operations or financial results.

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August Technology's products are complex and often the applications to its customers' businesses are unique. August Technology believes that its future success will depend in part upon its ability to meet its customers' functionality and reliability requirements in a timely manner. August Technology cannot be sure that its product offerings, application assistance, enhancement efforts, or its new product development efforts will fulfill critical functionality and reliability requirements. In addition, new product offerings that are highly complex in terms of software or hardware may require application or service work such as bug fixing prior to acceptance, thereby delaying revenue recognition. If August Technology is unsuccessful in these areas, its market share, revenue, operating results or stock price could be negatively impacted.

August Technology's market is highly competitive and August Technology may lose business to larger and better-financed competitors.

The microelectronic defect inspection equipment industry is highly competitive in national and international markets. August Technology has many domestic and foreign competitors. August Technology's current primary

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competitors in final manufacturing, testing and solutions are Camtek Ltd., Hitachi, Ltd., ICOS Vision Systems, Robotic Vision Systems, Inc. and Toray Industries, Inc. As August Technology enters the front-end market, it expects to compete with larger competitors, such as KLA-Tencor Corporation and Rudolph Technologies, Inc., for certain automated macro inspection applications. Most of these competitors, as well as other potential competitors, have substantially greater financial resources and more extensive engineering, manufacturing, marketing and customer support capabilities than does August Technology. Unless August Technology is able to continue to invest significant financial resources in developing products and enhancing customer support worldwide, August Technology will likely not be able to compete effectively.

As August Technology continues to diversify into the evolving and emerging microelectronic markets, including semiconductors, advanced packaging, optoelectronics, MEMS, flat panel display, printheads, data storage, disk drives, medical devices and other similar devices, August Technology will face significantly increased completion.

August Technology's operating results could be negatively impacted if it is unable to obtain the necessary resources to invest in its growth.

August Technology intends to continue to make investments to support business growth and may require additional funds to respond to future business challenges, such as the need to develop new products and enhance existing products, enhance August Technology's operating infrastructure, acquire complementary businesses and technologies and satisfy working capital requirements. Accordingly, August Technology may need to engage in equity or debt financing to secure additional funds. Equity and debt financing, however, might not be available when needed or, if available, might not be available on terms satisfactory to August Technology. If August Technology is unable to obtain adequate financing or financing on terms satisfactory to August Technology, its ability to continue to support its business growth and to respond to business challenges could be significantly limited.

August Technology's success depends on attracting and retaining key personnel.

August Technology's future success will depend in large part upon its ability to recruit and retain highly skilled technical, manufacturing, managerial, financial and marketing personnel. The labor market in which August Technology operates is highly competitive and as a result, August Technology may not be able to retain and recruit key personnel. August Technology's failure to hire, retain, or adequately train key personnel could have a negative impact on its future financial and business results.

In addition, during the recent microelectronic industry downturn August Technology has had reductions in its work force, reduced or eliminated salary increases and for certain periods, implemented pay cuts at the management level, and reduced discretionary spending. Any of the above measures may have long term adverse effects on August Technology's ability to retain key personnel.

August Technology's business may be harmed if August Technology fails to obtain and protect its intellectual property rights.

August Technology's ability to obtain intellectual property rights and licenses and to preserve other intellectual property rights covering its products and its products under development is an important component of its ability to compete in the microelectronic defect inspection equipment industry. To protect these rights, August Technology has obtained 14 domestic patents and intends to continue to seek patents on its inventions when appropriate. As of December 31, 2004, August Technology has 53 pending patent applications in the United States and additional international applications and expects its portfolio to increase in the future. The process of seeking intellectual property protection is time-consuming and expensive. August Technology cannot ensure that:

patents will be issued from currently pending or future applications;

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its existing patents or any new patents will be sufficient in scope or strength to provide meaningful protection or any commercial advantage to August Technology;

foreign intellectual property laws will protect August Technology's intellectual property rights; or

others will not independently develop similar products, duplicate August Technology's products or design around August Technology's technology.

If August Technology does not successfully protect and then enforce its intellectual property rights, August Technology's competitive position could suffer, which could harm its operating results.

August Technology also relies on trade secrets, proprietary know-how and confidentiality provisions in agreements with employees, consultants, key customers and vendors to protect its intellectual property. Other parties may not comply with the terms of their agreements with August Technology and August Technology may not be able to adequately enforce its rights against these people.

Third parties may claim that August Technology is infringing upon their intellectual property and August Technology could suffer significant litigation costs, licensing expenses or be prevented from selling August Technology's products.

Intellectual property rights are uncertain and involve complex legal and factual questions. August Technology may be unknowingly infringing upon the intellectual property rights of others and may be liable for that infringement, which could result in significant liability for August Technology. If August Technology does infringe upon the intellectual property rights of others, it could be forced to either seek a license to those intellectual property rights or to alter its products so that they no longer infringe. A license could be very expensive to obtain or may not be available at all. Similarly, changing August Technology's products or processes to avoid infringing upon the rights of others may be costly or impractical.

August Technology may become responsible for patent litigation costs. If August Technology were to become involved in a dispute regarding intellectual property, whether its own or that of another company, it may be required to participate in legal proceedings. These types of proceedings will be costly and time-consuming, even if August Technology eventually prevails. If August Technology does not prevail, it might be forced to pay significant damages, obtain licenses, modify its products or processes, stop making products or stop using processes.

August Technology's dependence on a few significant customers exposes it to operating risks.

Sales to August Technology's ten largest customers accounted for 66%, 73% and 66%, of net revenues in 2004, 2003 and 2002, respectively. August Technology's customers are able to cancel orders, prior to shipment, with few or no penalties. If a significant customer reduces orders or delays shipments for any reason, August Technology's revenues, operating results and financial condition will be negatively affected. In addition, August Technology's ability to increase its sales will depend in part upon its ability to obtain orders from new customers for whom there is intense competition.

August Technology's dependence on subcontractors and sole or limited source suppliers may prevent it from delivering an acceptable product on a timely basis and could result in disruption of August Technology's operations.

August Technology relies on subcontractors to manufacture many of the components and subassemblies for its products and August Technology depends on single or limited source suppliers for some of its components. August Technology's reliance on subcontractors reduces the level of control it has over the manufacturing process and exposes it to significant risks such as inadequate capacity, late delivery, substandard quality and high costs.

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If a supplier were to become unable to provide parts in the volumes needed or at an acceptable price, August Technology would have to identify and qualify acceptable replacements from alternative sources of supply, or manufacture the components internally. Depending on the part, the process of qualifying subcontractors and suppliers generally takes between 60 and 180 days. August Technology generally does not have written supply agreements with its single or limited source suppliers and purchases its custom components through blanket and individual purchase orders. If August Technology were unable to obtain these components in a timely fashion, it may not be able to meet demands for future shipments. August Technology believes that it would be able to find alternative solutions if supplies were unavailable from any of August Technology's sole source suppliers, including the supplier of August Technology's image processing component. This may take time and the disruption would adversely affect August Technology's results of operations.

August Technology assembles and tests all of its products at a single facility and any disruption in the operations of that facility could adversely impact its business and operating results.

August Technology's processes for manufacturing its automated inspection systems requires sophisticated and costly equipment and a specially designed facility. August Technology assembles and tests all of its automated inspection systems at one facility located in Bloomington, Minnesota. Any disruption in the operation of that facility, whether due to technical or labor difficulties, destruction or damage from fire or earthquake, infrastructure failures such as power or water shortage or any other reason, could interrupt August Technology's manufacturing operations, impair critical systems, disrupt communications with its customers and suppliers and cause August Technology to write off inventory and to lose sales.

Failure to adjust August Technology's orders for parts and subcomponents in an accurate and timely manner in response to changing market conditions or customer acceptance of its products could adversely affect August Technology's financial position and earnings.

August Technology's earnings could be negatively affected and August Technology's inventory levels could materially increase if August Technology is unable to predict its inventory needs in an accurate and timely manner and adjust its orders for parts and subcomponents should its needs increase or decrease materially due to unexpected increases or decreases in demand for August Technology's products. Any material increase in August Technology's inventories could result in an adverse effect on August Technology's financial position, while any material decrease in its ability to procure needed inventories could result in an inability to supply customer demand for August Technology's products thus adversely affecting its revenues.

August Technology's dependence upon international customers and suppliers may reduce its revenues or impede its ability to supply products.

International sales have accounted for a significant and growing portion of August Technology's revenues in recent years and August Technology expects that the percentage of sales from international customers will continue to increase. Sales outside of the United States accounted for 73%, 76% and 52%, of August Technology's net revenues in 2004, 2003 and 2002, respectively. In addition, August Technology relies on non-United States suppliers for several components of the systems August Technology sells. As a result, a major part of August Technology's revenues and the ability to manufacture its products are subject to the risks associated with international commerce. International sales and August Technology's relationships with suppliers and customers may be hurt by many factors, including:

changes in law or policy resulting in burdensome government controls, tariffs, restrictions, embargoes or export license requirements;

political or economic instability in August Technology's target international markets;

instability caused by infectious disease or other like outbreaks, or the threat or concern thereof;

longer payment cycles common in foreign markets;

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difficulties in staffing and managing August Technology's international operations;

less favorable foreign intellectual property laws making it harder to protect August Technology's technology from appropriation by competitors;

difficulties in collecting August Technology's accounts receivable because of the geographic distance and unfavorable creditor laws; and

currency fluctuations may increase the relative price of August Technology's products in foreign markets and thereby adversely affect sales.

August Technology is also subject to risks associated with shipping products outside of the United States including shipping delays, varying business conditions, differing business cultures and cultural diversities, among other risks. If August Technology's international sales or relationships with international suppliers and customers are adversely affected by any of these factors, August Technology's financial condition could also be adversely affected.

August Technology's financial performance is highly dependent upon sales to customers in Asia.

Sales to customers in Asia accounted for 68%, 64% and 45%, of August Technology's net revenues in 2004, 2003 and 2002, respectively. August Technology expects its dependence upon the Asian market to increase. In recent years, Asia has experienced serious economic problems including currency devaluations, debt defaults, lack of liquidity and recessions. August Technology's revenues depend upon the capital expenditures of microelectronic manufacturers, many of whom have operations and customers in Asia. Serious economic problems in Asia would likely result in a significant decrease in the sale of equipment to microelectronic industries. If August Technology is unable to maintain its customer relationships in Asia, August Technology's future financial condition, revenues and operating results will be negatively affected.

August Technology will continue to rely upon distributors for a portion of August Technology's future sales, and a disruption in August Technology's relationships with these distributors could have a negative impact on August Technology's international sales.

Sales through August Technology's independent distributors represented 4%, 14% and 8%, of August Technology's net revenues in 2004, 2003 and 2002, respectively. One distributor accounts for a significant portion of these sales. The activities of these distributors are not fully within August Technology's control. Although August Technology believes that it maintains good relations with its independent distributors, the relationships may nevertheless deteriorate in the future. A reduction in the sales or service efforts or financial viability of any of August Technology's independent distributors, or a termination of August Technology's relationships with them, could harm its sales, August Technology's financial results and August Technology's ability to support its customers.

August Technology has acquired Semiconductor Technologies & Instruments, Inc., or STI, the assets of Counterpoint Solutions, Inc., or CSI, and certain assets of the DMSVision software division of Inspex, Inc., or DMSVision, and August Technology may make other acquisitions; the acquisitions of STI, CSI and DMSVision and any future acquisitions may not be successful and may adversely affect August Technology's business.

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August Technology is looking for strategic opportunities to grow and diversify its product offerings through acquisitions. In this regard, August Technology recently completed the acquisitions of STI, CSI and DMSVision. Evaluation of August Technology's business and prospects may be difficult because of August Technology's limited operating history with STI, CSI and DMSVision. There can be no assurance that August Technology will be successful in integrating the operations of STI, CSI and DMSVision, identifying other appropriate candidates, or integrating products and operations with any such candidates that August Technology may acquire.

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Any such acquisition could involve the dilutive issuance of equity securities and the incurrence of debt. In addition, the acquisitions of STI, CSI and DMSVision and future acquisitions may involve numerous additional risks, including:

the diversion of the attention of August Technology's management team from other business concerns;

risks of entering into markets or producing products where August Technology has limited or no experience, including difficulties in integrating purchased technologies and products with August Technology's technologies and products;

the potential loss of key customers of an acquired company;

the potential loss of key personnel of an acquired company;

exposure to unanticipated liabilities of an acquired company; and

greater financial requirements for purchase price and added working capital.

Even when an acquired company has already developed and marketed products, there can be no assurance that the products will continue to be successful, that product enhancements will be made in a timely fashion or that pre-acquisition due diligence will have identified all possible issues that might arise with respect to the acquired company or its products.

If a microelectronic device manufacturer is loyal to another microelectronic equipment supplier, August Technology may be unable to sell its products to that potential customer and its sales and market share could suffer as a result.

August Technology believes that once a microelectronic device manufacturer has selected one vendor's capital equipment for a production line application, the manufacturer generally relies upon that capital equipment and, to the extent possible, subsequent generations of the same vendor's equipment, for the life of the application. Once a vendor's equipment has been installed in a production line, a microelectronic device manufacturer must often make substantial technical modifications and may experience production-line downtime in order to switch to another vendor's equipment. Accordingly, unless August Technology's systems offer performance or cost advantages that outweigh a customer's expense of switching to August Technology's systems, it will be difficult for it to achieve significant sales to that customer once it has selected another vendor's capital equipment for an application.

Changes in accounting for stock-based compensation could adversely affect August Technology's results of operations.

August Technology has historically compensated its employees, including many key personnel and new hires, through the issuance of options to acquire capital stock. Effective as of the third quarter of fiscal year ended 2005, August Technology will be required to expense unvested and newly issued employee stock options. This change from current accounting regulations could have a significant impact on August Technology's results of operations and could affect the manner in which August Technology conducts business.

If August Technology cannot effectively manage its growth, August Technology's business may suffer.

August Technology intends to continue to grow by increasing its sales efforts and completing strategic acquisitions. To effectively manage August Technology's growth, August Technology must, among other things:

engage, train and manage a larger sales force and additional service personnel;

expand the geographic coverage of August Technology's sales force;

expand August Technology's information systems;

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identify and successfully integrate acquired businesses into August Technology's operations; and

administer appropriate financial and administrative control procedures.

August Technology's anticipated growth will likely place a significant strain on its management, financial, operational, technical, sales and administrative resources. Any failure to effectively manage its growth may cause August Technology's business to suffer and its stock price to decline.

Increased competition could impair sales of August Technology's products or cause it to reduce its prices.

August Technology expects its current competitors and other companies to continue to improve the design and performance of their products and to introduce new products with competitive prices and performance characteristics. Competitive pressures may from time to time require August Technology to selectively reduce prices on August Technology's systems in an effort to protect August Technology's market share. Even if August Technology reduce prices, August Technology's potential customers may choose to purchase competing products developed by August Technology's competitors, many of whom have development, production, marketing and distribution resources significantly greater than August Technology's own. Price reductions or lost sales as a result of these competitive pressures would reduce August Technology's total revenues and adversely impact its financial results.

August Technology's operations could be impaired as a result of disasters, business interruptions beyond its control or similar events, including global or regional outbreaks of infectious diseases such as severe acute respiratory syndrome.

Disasters such as earthquakes, flooding, fire, electricity failure, or accidents that affect August Technology's operations, manufacturing facility, or the health of August Technology's employees or customers could adversely affect August Technology's operating results and financial condition. Continued or future outbreaks of infectious diseases such as severe acute respiratory syndrome, or SARS, avian flu, or other similar or comparable outbreaks or fears or concerns of possible outbreaks may significantly affect the willingness or ability of August Technology's customers to visit August Technology's facilities or trade shows, review August Technology's systems' capabilities and/or purchase or take delivery of August Technology's products, as well as August Technology's ability to visit its customers, to perform application studies for its customers, to sell and deliver products, and to service those products. Any government mandated or suggested restrictions on travel, quarantines, or declines in the willingness or ability of August Technology's customers to travel and visit August Technology's facilities or August Technology's ability to travel and visit its customers, could have a material adverse effect on August Technology's business, financial condition and results of operations.

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THE NANOMETRICS ANNUAL MEETING

General

This joint proxy statement/prospectus is being provided to Nanometrics shareholders as part of a solicitation of proxies by the Nanometrics board of directors for use at the 2005 annual meeting of Nanometrics shareholders. This joint proxy statement/prospectus provides Nanometrics shareholders with information they need to know to be able to vote or instruct their vote to be cast at the Nanometrics annual meeting.

Date, Time, and Place

The Nanometrics annual meeting will be held on _____, 2005 at _____ a.m., local time, at _____.

Purpose; Other Matters

The Nanometrics annual meeting is being held to consider and vote upon the following:

A proposal to approve the issuance of shares of August Nanometrics common stock in connection with the merger of August Technology with Major League Merger Corporation, a wholly-owned subsidiary of Nanometrics, pursuant to an Agreement and Plan of Merger and Reorganization dated as of January 21, 2005, by and among Nanometrics, Major League Merger Corporation, Minor League Merger Corporation and August Technology.

A proposal to approve the reincorporation of Nanometrics under the laws of the State of Delaware through a merger of Nanometrics with Minor League Merger Corporation, a wholly-owned subsidiary of Nanometrics.

A proposal to elect seven director nominees to the Nanometrics board of directors to serve until the next annual meeting of Nanometrics shareholders at which their respective successors are elected and qualified, or until the earlier of their death, resignation or removal.

A proposal to ratify the appointment of BDO Seidman, LLP as Nanometrics independent registered public accounting firm for Nanometrics fiscal year ending December 31, 2005.

Nanometrics shareholders will also be asked to consider and vote upon any other business as may properly come before the annual meeting or any adjournments or postponements of the annual meeting. Nanometrics does not expect that any matter other than the proposals presented in this joint proxy statement/prospectus will be brought before the Nanometrics annual meeting. However, if other matters incident to the conduct of the annual meeting are properly presented at the annual meeting or any adjournment or postponement of the annual meeting, the persons named as proxies will vote in accordance with their best judgment with respect to those matters.

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Nanometrics shareholders are voting on each proposal separately. Except as described below, the vote of a Nanometrics shareholder on one proposal has no bearing on any of the other proposals, or any other matter that may come before the Nanometrics annual meeting or any adjournment or postponement thereof. In their discretion, the proxies are authorized to vote upon such other business as may properly be presented to the annual meeting or any adjournments or postponements thereof. If you vote **AGAINST** any of the proposals, the proxy holders will not be authorized to vote for any adjournments or postponements of the annual meeting, including for the purpose of soliciting additional proxies, unless you so indicate by marking the appropriate box on the proxy card for the annual meeting.

Recommendation of the Nanometrics Board of Directors

After careful consideration, the Nanometrics board of directors determined that the August merger is advisable, and is fair to and in the best interests of Nanometrics and its shareholders, and unanimously approved the merger agreement and the transactions contemplated by the merger agreement.

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The Nanometrics board of directors unanimously recommends that you vote:

FOR the proposal to approve the issuance of shares of August Nanometrics common stock in connection with the merger of August Technology Corporation with Major League Merger Corporation, a wholly-owned subsidiary of Nanometrics, pursuant to an Agreement and Plan of Merger and Reorganization, dated as of January 21, 2005, by and among Nanometrics, Major League Merger Corporation, Minor League Merger Corporation and August Technology Corporation.

FOR the proposal to approve the reincorporation of Nanometrics under the laws of the State of Delaware through a merger of Nanometrics with Minor League Merger Corporation, a wholly-owned subsidiary of Nanometrics.

FOR the proposal to elect seven director nominees to the Nanometrics board of directors to serve until the next annual meeting of Nanometrics shareholders at which their respective successors are elected and qualified, or until the earlier of their death, resignation or removal.

FOR the proposal to ratify the appointment of BDO Seidman, LLP as Nanometrics independent registered public accounting firm for Nanometrics fiscal year ending December 31, 2005.

Record Date; Outstanding Shares; Voting Rights

Only holders of record of Nanometrics common stock at the close of business on the Nanometrics record date for the annual meeting, , 2005, are entitled to notice of and to vote at the annual meeting. As of the Nanometrics record date, there were shares of Nanometrics common stock outstanding and entitled to vote at the annual meeting, held by approximately holders of record. Each record holder of Nanometrics common stock on the Nanometrics record date is entitled to one vote for each share of Nanometrics common stock owned as of the Nanometrics record date with respect to all proposals except with respect to the election of directors.

The candidates for the Nanometrics board of directors receiving the seven highest vote totals will be elected to the Nanometrics board of directors. Every shareholder voting for the election of the Nanometrics board of directors may (i) cumulate such shareholder's votes and give any one candidate a number of votes equal to the number of directors to be elected multiplied by the number of shares that such shareholders holds on the record date for the annual meeting, or (ii) distribute such shareholder's votes on the same principle among as many candidates as the shareholder may select, provided that votes cannot be cast for more than seven candidates. However, no shareholder will be entitled to cumulate votes for a candidate unless the candidate's name has been placed in nomination prior to the voting and the shareholder, or any other shareholder, has given notice at the annual meeting prior to the voting of the intention to cumulate votes.

A list of Nanometrics shareholders will be available for review at the Nanometrics annual meeting and at the executive offices of Nanometrics during regular business hours for a period of ten days before the Nanometrics annual meeting.

Admission to the Annual Meeting

Only Nanometrics shareholders, their designated proxies and guests of Nanometrics may attend the Nanometrics annual meeting. If you plan to attend the Nanometrics annual meeting and wish to vote in person, you will be given a ballot at the annual meeting. Please note, however, that if

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your shares are held in street name, which means your shares are held of record by a broker, bank or other nominee, and you wish to vote at the Nanometrics annual meeting, you must bring to the annual meeting a legal proxy from the record holder of your shares authorizing you to attend and vote at the Nanometrics annual meeting.

Quorum and Vote Required

A quorum of shareholders is necessary to hold a valid annual meeting of Nanometrics shareholders. In order to have a quorum for the transaction of business at the Nanometrics annual meeting, a majority of shares of

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Nanometrics common stock issued and outstanding and entitled to vote on the record date must be present in person or by proxy at the annual meeting. Shares that are voted FOR, AGAINST or WITHHELD FROM a matter are treated as being present at the annual meeting for purposes of establishing a quorum.

Proposal 1

Approval of the issuance of shares of August Nanometrics common stock in the August merger will require the affirmative vote of the holders of a majority of the shares of Nanometrics common stock represented and voting at the Nanometrics annual meeting.

Proposal 2

Approval of the reincorporation merger will require the affirmative vote of the holders of a majority of the outstanding shares of Nanometrics common stock entitled to vote on the record date.

Proposal 3

The candidates for the Nanometrics board of directors receiving the seven highest vote totals will be elected to serve as directors of Nanometrics.

Proposal 4

Approval by the shareholders of the selection of the independent registered public accounting firm is not required, but Nanometrics' audit committee believes it is desirable to submit this matter to the shareholders. If holders of a majority of the common stock represented and voting at the Nanometrics annual meeting do not ratify the appointment of BDO Seidman, LLP as Nanometrics' independent registered public accounting firm for Nanometrics' fiscal year ending December 31, 2005, the audit committee will consider whether it should select another independent registered public accounting firm.

Voting Agreements

All of the Nanometrics directors and executive officers have entered into voting agreements with August Technology pursuant to which they have agreed to vote all of their respective shares of Nanometrics common stock in favor of the Nanometrics' proposal to approve the issuance of shares of August Nanometrics common stock in the August merger and in favor of the reincorporation merger.

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At the close of business on January 21, 2005, the date of the merger agreement, directors and executive officers of Nanometrics and their affiliates beneficially owned and were entitled to vote 3,392,274 shares of Nanometrics common stock, collectively representing approximately 26.9% of the shares of Nanometrics common stock outstanding on that date.

As of the record date for the Nanometrics annual meeting, directors and executive officers of Nanometrics and their affiliates owned beneficially or were entitled to vote shares of Nanometrics common stock, collectively representing approximately % of the shares of Nanometrics common stock outstanding on that date.

Voting

General

Nanometrics shareholders of record as of the Nanometrics record date may vote their shares by attending the Nanometrics annual meeting and voting their shares in person or by completing, signing and dating their respective proxy cards for the annual meeting and mailing them in the postage pre-paid envelope enclosed for

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that purpose. Nanometrics shareholders holding shares of Nanometrics common stock in street name, which means that their shares are held of record by a broker, bank, or other nominee, may vote by mail by completing, signing and dating the voting instruction forms for the Nanometrics annual meeting provided by their respective brokers, banks, or other nominees and returning their respective voting instruction forms to the record holders of their shares of Nanometrics common stock. Even if you plan to attend the Nanometrics annual meeting, Nanometrics recommends that you vote by proxy prior to the annual meeting. You can always change your vote as described below.

Voting by Proxy

All properly executed proxies that are received prior to the Nanometrics annual meeting and not revoked will be voted at the annual meeting according to the instructions indicated on the proxies. If you do not specify how you wish Nanometrics to vote your shares, your shares will be voted:

FOR the proposal to approve the issuance of shares of August Nanometrics common stock in connection with the merger of August Technology Corporation with Major League Merger Corporation, a wholly-owned subsidiary of Nanometrics, pursuant to an Agreement and Plan of Merger and Reorganization, dated as of January 21, 2005, by and among Nanometrics, Major League Merger Corporation, Minor League Merger Corporation and August Technology Corporation.

FOR the proposal to approve the reincorporation of Nanometrics under the laws of the State of Delaware through a merger of Nanometrics with Minor League Merger Corporation, a wholly-owned subsidiary of Nanometrics.

FOR the proposal to elect seven director nominees to the Nanometrics board of directors to serve until the next annual meeting of Nanometrics shareholders at which their respective successors are elected and qualified, or until the earlier of their death, resignation or removal.

FOR the proposal to ratify the appointment of BDO Seidman, LLP as Nanometrics independent registered public accounting firm for Nanometrics fiscal year ending December 31, 2005.

You may receive more than one proxy card depending on how you hold your shares of Nanometrics common stock. Generally, you need to sign and return all of your proxy cards to vote all of your shares. For example, if you hold shares through someone else, such as a broker, you may get proxy material from that person.

Changing Your Vote

If you are the record holder of your shares of Nanometrics common stock, you can change your vote at any time before your proxy is voted at the Nanometrics annual meeting by:

delivering to the Nanometrics corporate secretary a signed notice of revocation;

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granting the Nanometrics proxy holders a new, later-dated proxy, which must be signed and delivered to the Nanometrics corporate secretary in advance of the vote at the annual meeting; or

attending the Nanometrics annual meeting and voting in person.

Your attendance alone, however, will not revoke your previously granted proxy. If you hold your shares in street name and you have provided voting instructions to your broker, bank or other nominee for the Nanometrics annual meeting, you must follow the instructions of your broker, bank or other nominee in order to change your vote or revoke your proxy for the Nanometrics annual meeting.

Abstentions and Broker Non-Votes

An abstention occurs when a shareholder attends a meeting, either in person or by proxy, but abstains from voting. While there is no definitive statutory or case law authority in California as to the proper treatment of

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abstentions, Nanometrics believes that abstentions should be counted for purposes of determining both (i) the presence or absence of a quorum for the transaction of business and (ii) the total number of shares of Nanometrics common stock represented and voting with respect to a proposal. In the absence of controlling authority to the contrary, Nanometrics intends to treat abstentions in this manner.

Broker non-votes are shares held by a broker or other nominee that are represented at the annual meeting, but with respect to which the broker or nominee is not instructed by the beneficial owner of the shares to vote on the particular proposal and the broker does not have discretionary voting power on the proposal. Broker non-votes will be counted for purposes of determining the presence or absence of a quorum but will not be counted for purposes of determining the number of shares represented and voting with respect to a proposal.

For proposal 1, abstentions will have the same effect as voting against approval of the issuance of shares of August Nanometrics common stock in the August merger; broker non-votes will have no effect.

For proposal 2, abstentions and broker non-votes will have the same effect as voting against approval of the reincorporation merger.

For proposal 3, neither abstentions nor broker non-votes will have any effect on the election of the seven directors.

For proposal 4, abstentions will have the same effect as voting against ratification of the appointment of BDO Seidman, LLP as Nanometrics independent registered public accounting firm for the fiscal year ending December 31, 2005; broker non-votes will have no effect.

Proxy Solicitation

Nanometrics is soliciting proxies for the Nanometrics annual meeting from Nanometrics shareholders. Nanometrics will bear the entire cost of soliciting proxies from Nanometrics shareholders, except that Nanometrics and August Technology have each agreed to share equally all expenses incurred in connection with the filing with the Securities and Exchange Commission of the registration statement of which this joint proxy statement/prospectus forms a part, and the printing and mailing of this joint proxy statement/prospectus and related proxy materials. In addition to the solicitation of proxies by mail, Nanometrics will request that brokers, banks and other nominees send proxies and proxy materials to the beneficial owners of Nanometrics common stock held by them and secure their voting instructions, if necessary. Nanometrics will reimburse those record holders for their reasonable expenses. Nanometrics also may use several of its regular employees, who will not be specially compensated, to solicit proxies from Nanometrics shareholders, either personally or by telephone, internet, telegram, facsimile or special delivery letter.

Please do not send in any Nanometrics stock certificates with your proxy cards or voting instruction forms.

Postponements and Adjournments

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Postponements and adjournments may be made for the purpose of, among other things, soliciting additional proxies. An adjournment may be made from time to time by approval of the holders of shares representing a majority of the shares present in person or by proxy at the annual meeting, whether or not a quorum exists, without further notice other than by an announcement made at the annual meeting. Nanometrics does not currently intend to seek a postponement or adjournment of the Nanometrics annual meeting.

Assistance

If you need assistance in completing your proxy card or have questions regarding the Nanometrics annual meeting, please contact Nanometrics Investor Relations at (408) 435-9600 or write to Nanometrics Incorporated, 1550 Buckeye Drive, Milpitas, California 95035, Attn: Investor Relations.

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THE AUGUST TECHNOLOGY SPECIAL MEETING

General

August Technology is sending this joint proxy statement/prospectus to the shareholders of August Technology in connection with the solicitation by the board of directors of August Technology of proxies to be voted at the special meeting. This joint proxy statement/prospectus is first being mailed to shareholders of August Technology on or about , 2005.

Date, Place, and Time

The special meeting will be held at , local time, on , 2005, at .

Purpose; Other Matters

At the special meeting, August Technology shareholders will be asked to vote on a proposal to approve the merger agreement dated as of January 21, 2005 attached to this joint proxy statement/prospectus as Annex A and the merger with Nanometrics contemplated therein. The merger agreement provides for the merger of August Technology with Major League Merger Corporation, a Minnesota corporation and wholly-owned subsidiary of Nanometrics, as a result of which August Technology will become a wholly-owned subsidiary of Nanometrics. Other terms and provisions related to the August merger are contained in the merger agreement.

August Technology shareholders may also be asked to vote upon a proposal to adjourn or postpone the special meeting, in order to (among other things) allow additional time for August Technology to solicit additional votes to approve the merger agreement and the August merger. Under Minnesota law, shareholders are permitted to consider only the matters contained in the notice at the special meeting. If other matters are properly presented and are within the purpose of the special meeting, however, the persons named as proxies will vote in accordance with their best judgment with respect to those matters.

Under Minnesota law, shareholders are permitted to consider only the matters contained in the notice at the special meeting.

Recommendation of the August Technology Board of Directors

After careful consideration, the board of directors of August Technology unanimously approved the merger agreement and the August merger and the other transactions contemplated by the merger agreement. August Technology's board of directors has determined that the August merger is advisable and in the best interests of, August Technology and its shareholders and recommends that its shareholders vote FOR the proposal. For more information on these recommendations, see the section of this joint proxy statement/prospectus entitled *The August Merger Additional August Technology Reasons for the August Merger* beginning on page.

Record Date; Outstanding Shares; Voting Rights; Quorum; Required Vote

The close of business on _____ is the record date for determining the holders of August Technology common stock who are entitled to receive notice of and to vote at the special meeting or at any adjournment or postponement of the special meeting.

August Technology has one class of common stock outstanding, no par value per share. Each holder of August Technology common stock outstanding on the record date is entitled to one vote for each share held. The holders of a majority of the outstanding shares of August Technology capital stock entitled to vote must be present at the special meeting, in person or by proxy, to constitute a quorum to transact business.

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The holders of a majority of all the outstanding shares of August Technology common stock must vote in favor of the merger agreement and the August merger in order to approve the proposal to approve the merger agreement and the August merger. On the record date shares of August Technology common stock were outstanding, held by approximately holders of record.

Admission to the Special Meeting

Only August Technology shareholders of record on the record date, their designated proxies and guests of August Technology may attend the August Technology special meeting. If you plan to attend the August Technology special meeting in person, you will be given a ballot at the special meeting. Please note, however, that if your shares are held in street name, which means your shares are held of record by a broker, bank or other nominee, and you wish to vote at the August Technology special meeting, you must bring to the special meeting a legal proxy from the record holder of the shares authorizing you to vote at the August Technology special meeting.

Quorum and Vote Required

A quorum of shareholders is necessary to hold a valid special meeting of August Technology shareholders. The required quorum for the transaction of business at the August Technology special meeting is a majority of shares of August Technology common stock issued and outstanding and entitled to vote on the record date present in person or by proxy. Shares that are voted FOR, AGAINST or WITHHELD FROM a matter are treated as being present at the special meeting for purposes of establishing a quorum.

Voting Agreements

All of the directors and executive officers of August Technology have entered into voting agreements with Nanometrics pursuant to which they have agreed to vote all of their respective shares of August Technology common stock in favor of August Technology's proposal to approve the merger agreement and the August merger and have executed and delivered to Nanometrics proxies to vote their shares in favor of such proposal. For more information, see the section of this joint proxy statement/prospectus entitled *The Merger Agreement The Voting Agreements* beginning on page 126.

At the close of business on January 21, 2005, the date of the merger agreement, directors and executive officers of August Technology and their affiliates beneficially owned and were entitled to vote 1,120,911 shares of August Technology common stock, collectively representing approximately 6.3% of the shares of August Technology common stock outstanding on that date. As of the record date for the August Technology special meeting, directors and executive officers of August Technology and their affiliates beneficially owned and were entitled to vote shares of August Technology common stock, collectively representing approximately of the shares of August Technology common stock outstanding on that date.

Voting; Proxies, Revocation

General

August Technology shareholders of record as of the August Technology record date may vote their shares by attending the August Technology special meeting and voting their shares in person, by completing, signing and dating their proxy cards and mailing them in the postage pre-paid envelope enclosed for that purpose. August Technology shareholders holding shares of August Technology common stock in street name, which means that their shares are held of record by a broker or nominee, may vote by mail by completing, signing and dating the voting instruction forms for the August Technology special meeting provided by their brokers or nominees and returning their voting instruction forms to the record holders of their shares. Even if you plan to attend the special meeting, August Technology recommends that you vote prior to the special meeting. You can always change your vote as described below.

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Voting by Proxy

All properly executed proxies that are received prior to the August Technology special meeting and that are not revoked will be voted at the special meeting according to the instructions indicated on the proxies. If you do not specify how you wish August Technology to vote your shares, your shares will be voted **FOR** the proposal to approve the merger agreement and the August merger. Proxy holders will also vote shares according to their discretion on any other matter properly brought before the special meeting.

You may receive more than one proxy card depending on how you hold your shares. Generally, you need to sign and return all of your proxy cards to vote all of your shares. For example, if you hold shares through someone else, such as a stockbroker, you may get proxy material from that person.

Changing Your Vote

August Technology shareholders may change their votes at any time prior to the vote at the August Technology special meeting. August Technology shareholders of record may change their votes by granting new proxies bearing a later date (which automatically revoke the earlier proxies) or by attending the August Technology special meeting and voting in person. Attendance at the August Technology special meeting in and of itself will not cause previously granted proxies to be revoked, unless August Technology shareholders so request. August Technology shareholders may also revoke their proxies by notifying the secretary of August Technology in writing. Written notices of revocation and other communications with respect to revocation of August Technology proxies should be addressed to:

August Technology Corporation

4900 West 78th Street

Bloomington, Minnesota 55435

Attn: Secretary

(952) 820-0080

August Technology shareholders who hold their August Technology shares in street name may change their votes by submitting new voting instructions to the record holders of their shares or by attending the August Technology special meeting and voting in person, provided that they have obtained a signed legal proxy from the record holders of their shares giving them the right to vote their shares at the August Technology special meeting. August Technology shareholders who hold their shares in street name should contact the record holders of their shares for information about obtaining legal proxies for the August Technology special meeting.

Abstentions and Broker Non-Votes

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While there is no definitive statutory or case law authority in Minnesota as to the proper treatment of abstentions, August Technology believes that abstentions should be counted for purposes of determining both (i) the presence or absence of a quorum for the transaction of business and (ii) the total number of shares of August Technology common stock represented and voting at the special meeting with respect to a proposal. In the absence of controlling precedent to the contrary, August Technology intends to treat abstentions in this manner. Accordingly, abstentions will have the same effect as a vote against a proposal.

Abstentions and broker non-votes will have the same effect as voting against approval of the merger agreement and the August merger.

Proxy Solicitation

August Technology is soliciting proxies for the August Technology special meeting from August Technology shareholders. August Technology will bear the entire cost of soliciting proxies from August Technology shareholders, except that Nanometrics and August Technology have each agreed to share equally all

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expenses incurred in connection with the filing with the Securities and Exchange Commission of the registration statement of which this joint proxy statement/prospectus forms a part, and the printing and mailing of this joint proxy statement/prospectus and related proxy materials. In addition to the solicitation of proxies by mail, August Technology will request that brokers, banks and other nominees send proxies and proxy materials to the beneficial owners of August Technology common stock held by them and secure their voting instructions, if necessary. August Technology will reimburse those record holders for their reasonable expenses. August Technology has engaged The Proxy Advisory Group of Strategic Stock Surveillance, LLC to assist it in the solicitation of proxies and provide related advice and informational support, for a service fee and the reimbursement of customary disbursements not to exceed \$35,000 in the aggregate. August Technology also may use several of its regular employees, who will not be specially compensated, to solicit proxies from August Technology shareholders, either personally or by telephone, internet, telegram, facsimile or special delivery letter.

Please do not send in any August Technology stock certificates with your proxy cards or voting instruction forms.

Postponements and Adjournments

Postponements and adjournments may be made for the purpose of, among other things, soliciting additional proxies. An adjournment may be made from time to time by approval of the holders of shares representing a majority of the votes present in person or by proxy at the special meeting, whether or not a quorum exists, without further notice other than by an announcement made at the special meeting. August Technology does not currently intend to seek an adjournment of the August Technology special meeting.

Assistance

If you need assistance in completing your proxy card or have questions regarding the August Technology special meeting, please call The Proxy Advisory Group of Strategic Stock Surveillance, LLC at (866) 657-8728 or (212) 850-8150.

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NANOMETRICS PROPOSAL 1 AND AUGUST TECHNOLOGY PROPOSAL 1

(THE AUGUST MERGER)

NANOMETRICS

AUGUST TECHNOLOGY

PROPOSAL 1

PROPOSAL 1

**APPROVAL OF THE ISSUANCE OF SHARES OF AUGUST
NANOMETRICS COMMON STOCK IN**

APPROVAL OF THE MERGER

THE AUGUST MERGER

AGREEMENT

AND THE

AUGUST MERGER

THE AUGUST MERGER

The following is a description of the material aspects of the August merger, including the merger agreement. While Nanometrics and August Technology believe that the following description covers the material terms of the August merger, this description may not contain all of the information that is important to you. Nanometrics and August Technology encourage you to carefully read this entire joint proxy statement/prospectus, including the merger agreement attached to this joint proxy statement/prospectus as Annex A, for a more complete understanding of the August merger.

Background of the August Merger

Each of Nanometrics and August Technology continually monitors the marketplace for strategic opportunities to strengthen their respective businesses. The Nanometrics board of directors and members of Nanometrics' management team have evaluated, on an ongoing basis, strategies to address the increasing consolidation in the semiconductor manufacturing equipment market. As part of this process, Nanometrics board of directors authorized John D. Heaton, President and Chief Executive Officer of Nanometrics, to contact several semiconductor manufacturing technology companies to discuss industry trends.

Beginning in early 2003, the August Technology board of directors began to consider ways to expand August Technology's market presence as well as enhance shareholder value beyond its ability to grow internally. August Technology was then engaged in a joint development program with Samsung Electronics Corporation, or the Samsung program, to position its advanced macro defect inspection products for application in the front-end or wafer processing market, a market substantially larger than the back-end of the semiconductor manufacturing process where August Technology had historically derived most of its revenues. In order to take advantage of the growing market opportunities presented by the expertise and technology generated through the Samsung program, the August Technology board of directors determined that August Technology should consider external alliances, including possible business combinations.

From April 2003 through July 2004, August Technology completed three small acquisitions adding critical inspection and defect information software systems to its product portfolio. During that time, Jeff O'Dell, August Technology's Chairman and Chief Executive Officer, and Stan

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Piekos, August Technology's Chief Financial Officer, met with industry participants and management of other larger inspection and metrology companies to assess the merits of a strategic merger or alliance that would allow August Technology to add critical mass and shareholder value.

At August Technology's regular second quarter board of directors meeting held on July 23, 2004, its management provided to the board of directors a list of six potential business combination partners, a brief description of the business and financial information regarding each prospect, a commentary on the fit of each prospect with August Technology and a description of any discussions they had previously held with each prospect. The board of directors scheduled a special meeting on September 9, 2004 to meet with management and a senior investment banker for the purpose of identifying a specific business combination candidate to pursue.

On September 9, 2004, the August Technology board of directors met with representatives of Needham & Company, an investment banking firm, and a senior industry participant to consider business development

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opportunities in the semiconductor equipment marketplace. The board of directors reviewed six potential strategic business combination partners and evaluated each against the following attributes the board of directors considered desirable in a business combination partner:

A partner with complementary products and solutions and an established presence in front-end wafer processing applications such as lithography, chemical mechanical polishing, or CMP, and etch, where August Technology products are being introduced;

A partner with its own growth momentum and with whom August Technology can deliver revenue synergies;

A partner with no or minimal product and technology overlaps that would have to be rationalized with the customer and employee base;

A partner with whom August Technology could gain leverage from common technology development investments, like automation platforms, and sales and service infrastructure and increasing costs of being a United States public company;

A partner with a strong management team operating in a similar culture of growth and innovation; and

Should the business combination take the form of a merger in which August Technology is not the surviving entity, a partner with a currency in the form of common stock that provides upside and an ownership structure allowing August Technology's shareholders to meaningfully participate in the enhanced shareholder value that August Technology believes will accrue after successful integration.

Based on its review of the candidates against these criteria, the August Technology board of directors concluded that August Technology should initiate discussions with Nanometrics. The August Technology board of directors believed that Nanometrics was an attractive merger candidate because Nanometrics' metrology products complemented August Technology's inspection products with essentially no overlap in the product lines. Combining the two companies, the August Technology board of directors believed, would allow the resulting company to offer customers a broader range of products and increase the market presence and financial strength of the company.

On September 20, 2004, Mr. Heaton visited August Technology's facility in Bloomington, Minnesota, to meet with Messrs. O'Dell and Piekos. Mr. Heaton discussed with Messrs. O'Dell and Piekos the markets and customers served by the respective products produced by Nanometrics and August Technology and the extent to which the two companies' product lines would be complementary. All agreed that customers would benefit from one supplier offering both macro defect inspection and metrology solutions. Mr. O'Dell and Mr. Piekos identified Nanometrics' strength in Japan as an attractive counterbalance to August Technology's relative weakness in the Japanese market. Similarly, August Technology's strength in Taiwan was identified as a counterbalance to Nanometrics' relative weakness in that area. Messrs. Heaton, O'Dell and Piekos also discussed the potential for market synergies and cost synergies from a business combination. During their discussion, Messrs. Heaton, O'Dell and Piekos did not agree to explore any particular relationship or transaction, but did agree to have further discussions.

On October 15, 2004, at August Technology's regular third quarter board of directors meeting, Mr. Piekos reported to the August Technology board of directors on the status of management's discussions with Nanometrics and the advantages that management perceived in a potential business combination with Nanometrics. The August Technology board of directors agreed that conversations with Nanometrics should continue and authorized the engagement of Needham & Company as August Technology's financial advisor to assist in evaluating potential new business development opportunities including the continuing business combination discussions with Nanometrics.

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On October 15, 2004, Needham & Company was formally engaged as August Technology's financial advisor with respect to possible business combinations.

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On October 20, 2004, Mr. Heaton received a phone call from Mr. Piekos during which Mr. Piekos indicated that after the visit and various analyses, August Technology would be interested in further exploring a business combination with Nanometrics.

On October 26, 2004, Nanometrics and August Technology entered into a confidentiality agreement to facilitate the exchange of information between the companies. Thereafter, Nanometrics management and other representatives of Nanometrics, including attorneys at the law firm of Wilson Sonsini Goodrich & Rosati, Professional Corporation, outside counsel to Nanometrics, began performing due diligence on August Technology. At the same time, representatives of August Technology and attorneys at the law firm of Fredrikson & Byron, P.A., outside counsel to August Technology, began performing due diligence on Nanometrics.

In November of 2004, Mr. Heaton contacted representatives of Adams Harkness, Inc. and discussed the possibility of Adams Harkness providing financial advisory services to Nanometrics in connection with a possible business combination with August Technology.

On November 11, 2004, Mr. Piekos, Ardelle Johnson, August Technology's Vice President-Strategic Marketing, and Cory Watkins, August Technology's Chief Technology Officer, met with Mr. Heaton and the Chairman of the Nanometrics board of directors, Vincent J. Coates, at Nanometrics' offices in Milpitas, California. The principal topic of the meeting concerned the technology and customer solutions offered by each of August Technology and Nanometrics and the market synergies that might be realized in a combination of the companies.

On the morning of November 12, 2004, Mr. Piekos met again with Mr. Heaton and discussed specific customers and the possibility that each company might assist the other with regard to particular customers.

On November 16, 2004, at a regularly scheduled meeting of the Nanometrics board of directors, Mr. Heaton updated the board of directors on his discussions with August Technology's representatives. The board of directors authorized Mr. Heaton to continue discussions with representatives of August Technology and to report on the progress of such discussions. Thereafter, Messrs. Heaton and Piekos agreed to the framework for holding continued discussions between the two companies regarding a possible business combination.

On November 28, 2004, Mr. Piekos contacted Mr. Heaton to further discuss the potential for a strategic transaction involving a combination of the two companies. They discussed a merger of equals in which the Nanometrics shareholders and August Technology shareholders would each hold roughly half of the shares of the combined company, Nanometrics and August Technology would have equal representation on the board of directors of the combined company, the brands established by each company would be maintained and key managers of each company would continue to play leadership roles in the combined company.

On November 29, 2004, Mr. Piekos sent to Mr. Heaton a financial analysis regarding a possible business combination between Nanometrics and August Technology. The analysis presented August Technology management's initial estimates of revenue synergies that might be obtained by each company's cross-selling of products to the other company's customers and cost synergies that might result from the consolidation of certain corporate functions. The proposed business combination reflected in the analysis assumed that August Technology shareholders would own between 42.8% and 47.8% of the combined company on a fully diluted basis and that Nanometrics shareholders would own between 52.2% and 57.2% of the combined company on a fully diluted basis.

In an e-mail transmitting the analysis described above, Mr. Piekos discussed the importance of a merger of equals structure, retaining the brand identities of the two companies, and constructing a board of directors with balanced representation from each organization, and discussed who

would hold key management positions within the combined company.

On December 7, 2004, Mr. O Dell visited Nanometrics facility in Milpitas, California to discuss aspects of the proposed business combination with Messrs. Heaton and Coates. The participants also discussed possible structures of the board of directors and management of any combined company, the possible name of the combined company and the location of various corporate activities in Minnesota and California.

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At a special meeting of the Nanometrics board of directors on December 9, 2004, the Nanometrics management team updated the board of directors on discussions with August Technology regarding a possible business combination. The Nanometrics board of directors authorized management to continue discussions with August Technology and to engage financial advisors with respect to a possible business combination with August Technology. Thereafter, Nanometrics engaged Adams Harkness to act as its financial advisor.

On December 11, 2004, Mr. Heaton met with Michael Wright, an independent member of the August Technology board of directors, at the Industry Strategy Symposium in Half Moon Bay, California. Messrs. Heaton and Wright discussed the benefits to the shareholders of Nanometrics and August Technology and shared thoughts on the discussions between Nanometrics and August Technology to date.

During the week of December 13, 2004, Mr. Heaton and other members of the Nanometrics management team traveled to August Technology's headquarters in Bloomington, Minnesota to meet with representatives of August Technology and to perform more detailed due diligence. Mr. Heaton also met with members of the August Technology board of directors to discuss the strategic vision of a potential combined company.

On December 14, 2004, during an adjournment from August Technology's regularly scheduled board of directors meeting, Mr. Heaton made a presentation regarding Nanometrics' business to the assembled August Technology board members. He reviewed Nanometrics' products, customers, markets and industry trends. Following Mr. Heaton's presentation, the August Technology board of directors reconvened its meeting and representatives of Needham & Company discussed with the August Technology board of directors their preliminary financial analysis of a possible business combination between August Technology and Nanometrics. The board of directors discussed the possibility of a merger of equals transaction in which August Technology shareholders would receive approximately 45% of the shares of the resulting combined company on a fully diluted basis and August Technology representatives would have a balanced representation on the board of directors and management of the combined company. The August Technology board of directors concluded that management of August Technology should proceed with discussions with Nanometrics.

On December 17, 2004, Roger Gower, an independent member of the August Technology board of directors, visited with Messrs. Heaton and Coates to discuss various aspects of the proposed business combination and how the combined company would provide shareholders of Nanometrics and August Technology with greater value as well as serve each company's customers better. Experiences with mergers and vision for the proposed combined company were also discussed.

Additionally, the board of directors of Nanometrics convened a special meeting to discuss the potential business combination with August Technology. Representatives of Adams Harkness were invited to give the board of directors a presentation regarding the scope of their engagement, the financial aspects of a proposed business combination with August Technology and a calendar of action items. Mr. Heaton also discussed the need to enter into a mutual nondisclosure agreement which would provide for a period of exclusive negotiations between the parties. The board of directors approved the mutual nondisclosure agreement and authorized Mr. Heaton to execute the agreement on behalf of Nanometrics.

Each of Nanometrics and August Technology executed a mutual confidentiality agreement dated December 17, 2004 which incorporated the obligations of the October 26, 2004 confidentiality agreement between the parties. The mutual confidentiality agreement prohibited both August Technology and Nanometrics from soliciting or encouraging alternative transaction proposals from other parties or furnishing any information to, or participating in any discussions with, any alternative counterparty during an exclusive negotiating period that began on December 17, 2004 and ended on January 31, 2005.

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Also on December 17, 2004, Mr. Piekos made a presentation to Mr. Heaton and members of Nanometrics board of directors regarding August Technology's business, including its products, markets, management and financial matters.

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Also on December 17, 2004, Mr. Wright received the following letter from Ken Schroeder, President and Chief Executive Officer of KLA-Tencor Corporation, indicating interest in a strategic business combination between August Technology and KLA-Tencor. The letter refers to August Technology as Ace and KLA-Tencor as King.

December 17, 2004

Mr. Michael W. Wright

Chief Operating Officer

Entegris, Inc.

3500 Lyman Blvd.

Chaska, MN 55318

Dear Michael:

I am writing to express our strong interest in pursuing a strategic combination between [Ace] and [King]. We recognize [Ace] as a leading provider of process control solutions, and have tremendous respect for the employees and management of [Ace] and their accomplishments. We commend the [Ace] team on its strong execution over the past 18 months, particularly its ability to generate strong financial performance and introduce several new products.

As such, we are enthusiastic about the prospect of putting our respective companies together. We believe the strategic and operational merits of a combination would provide significant benefits to the employees, customers, shareholders, and partners of our organizations. After substantial thought about such a combination we are convinced that, together, we could create value for our customers that will be difficult to deliver as separate companies. The combined company would be able to leverage complementary products, technology, and core competencies to address different high growth market segments, thus allowing for a strengthened focus on advancing tool performance while eliminating redundant programs. Importantly, due to the complementary nature of our businesses and product portfolios, we believe that we could accomplish this with minimal disruption to our respective companies through a seamless integration.

In response to the guidance that we received from your advisor at Needham & Company, I have requested that Credit Suisse First Boston present a preliminary, non binding indication of interest, which I have attached to this letter. As you will see in those materials, we are pleased to submit a preliminary offer of \$11.00-\$12.00 for each share of [Ace] common stock outstanding. This proposal has been based solely on publicly available information, and is subject to, among other things, the successful completion of a due diligence review of [Ace] and approval of the [King] board.

From a financial perspective, we feel that our proposal presents a very compelling transaction for your shareholders. The proposed offer price represents a 17%-28% premium to the latest closing price of [Ace] common stock, and more appropriately, a 25%-41% premium to [Ace's] current enterprise value, excluding cash.

I understand that the [Ace] Board and management team will need to review our preliminary indication of interest in detail. I hope that this will form the basis for further conversations, as our team is proposed to discuss this with you at your earliest convenience. The terms and existence of this proposal are confidential and are only to be shared with those individuals who need to know in order to evaluate the proposal. I look forward to hearing from you soon, and I hope that we will be able to work together to effect a mutually beneficial transaction.

Sincerely yours,

/s/ KENNETH SCHROEDER

Kenneth Schroeder

President and Chief Executive Officer

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On December 21, 2004, August Technology responded by letter to Mr. Schroeder stating that August Technology was not for sale and that the board of directors believed that its current strategic direction would yield substantially more value than the offer submitted by KLA. Pursuant to the terms of its mutual confidentiality agreement with Nanometrics, August Technology forwarded copies of the correspondence to Nanometrics.

Following December 17, 2004, and continuing into early January, Nanometrics and August Technology exchanged and reviewed due diligence information and conducted negotiations regarding a draft merger agreement with respect to a possible business combination.

Between December 20, 2004 and December 31, 2004, Mr. Heaton and Mr. Piekos held a number of meetings both in person and via teleconference in which they continued to discuss various aspects of the possible business combination. Also, in addition, Nanometrics and August Technology continued to exchange due diligence materials during this period, and Nanometrics legal, financial and accounting advisors traveled to Bloomington, Minnesota to perform due diligence on August Technology. Representatives of Nanometrics and August Technology also began to negotiate the terms and conditions of a definitive agreement regarding the possible business combination of Nanometrics and August Technology, including preliminary discussions around an appropriate exchange ratio.

On January 4, 2005, the Nanometrics board of directors convened a special meeting to discuss the possible business combination. Representatives of Adams Harkness and Wilson Sonsini Goodrich & Rosati, Professional Corporation, also attended this meeting. During this meeting, Mr. Heaton updated the Nanometrics board of directors on the status of his discussions with Mr. Piekos regarding a possible 100% stock-for-stock merger between Nanometrics and August Technology, in which Nanometrics shareholders would hold approximately 55% of the fully-diluted shares of the combined company's common stock immediately following the business combination. Mr. Heaton relayed to the board of directors his views on the advantages of the proposed merger, as well as certain related risks. He also discussed the advisability of reincorporating into Delaware and adopting certain charter provisions, including a classified board of directors, due to the fact that the combined company would maintain a higher profile than either of the existing companies. Representatives of Adams Harkness then discussed their preliminary analysis of potential strategic alternatives for Nanometrics. The Nanometrics board of directors requested additional analysis from Adams Harkness regarding a strategic business combination with August Technology for a subsequent meeting. Representatives of Wilson Sonsini Goodrich & Rosati, Professional Corporation, then discussed the board of directors' fiduciary duties in connection with the board's consideration of a possible business combination of Nanometrics and August Technology.

During the week of January 4th, 2005, Mr. Piekos, David Klenk, the President and Chief Operating Officer of August Technology, together with a senior August Technology business team, traveled to Nanometrics' headquarters in Milpitas, California, to meet with representatives of Nanometrics regarding integration planning and to perform more detailed due diligence.

On January 7, 2005, the Nanometrics board of directors convened a special meeting to receive an update on the proposed business combination. Representatives of Adams Harkness attended portions of this meeting. At this meeting, Mr. Heaton updated the board of directors on the status of the negotiations on a definitive agreement. Mr. Heaton also discussed the due diligence findings with the Nanometrics board of directors, which discussion included an overview of August Technology's market, an analysis of the major competitors in the market and their products. Representatives of Adams Harkness then discussed their updated preliminary analysis and responded to the board of directors' earlier request for additional information. The Adams Harkness representatives also discussed their analysis of various exchange ratio alternatives in connection with a possible business combination between Nanometrics and August Technology. The board members and their representatives discussed a number of factors related to the proposed business combination, including the governance and management of the combined company.

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Thereafter, Nanometrics, with the assistance of its legal, financial and other advisors, and August Technology, with the assistance of its legal, financial and other advisors, each continued their respective due diligence investigations of the business and operations of the other and of the proposed business combination.

On January 12, 2005, Mr. O Dell and Jim Bernards, August Technology's lead independent director, visited Nanometrics' facility in Milpitas, California to discuss aspects of the proposed business combination with Messrs. Heaton and Coates. The participants also discussed possible structures of the board of directors and management of any combined company, the possible name of the combined company and the location of various corporate activities in Minnesota and California.

On January 14, 2005, the board of directors of August Technology met with Fredrikson & Byron to review the status of the due diligence process, integration planning and negotiation of the merger agreement with respect to the proposed transaction with Nanometrics. The August Technology board of directors concluded that more progress on integration planning was necessary before execution of the merger agreement. Representatives of Fredrikson & Byron reviewed with the board of directors the terms of the draft merger agreement and discussed the board of directors' fiduciary duties with respect to its consideration of the proposed merger.

On January 17, 2005, the Nanometrics board of directors convened a special meeting that was attended by representatives of Adams Harkness and Wilson Sonsini Goodrich & Rosati, Professional Corporation. During this meeting, a representative of Adams Harkness provided the Nanometrics board of directors with a summary of the current business combination proposal, including information on the proposed exchange ratio. A representative of Adams Harkness then reviewed certain aspects of the proposed business combination. The representatives also summarized Adams Harkness' preliminary financial analysis of the business combination based on the proposed exchange ratio described above, after which the Nanometrics board of directors discussed the proposal. Thereafter, a representative of Wilson Sonsini Goodrich & Rosati, Professional Corporation, reviewed the terms of the draft merger agreement with the Nanometrics board of directors.

On January 17, 2005, Messrs. O Dell and Heaton met at August Technology's headquarters with an integration consultant and various members of August Technology management to discuss integration planning and specifically management structure for the combined organization.

On January 19, 2005, the parties' legal counsel continued negotiations on the draft merger agreement for the proposed business combination throughout the day. Wilson Sonsini Goodrich & Rosati, Professional Corporation, then distributed to the Nanometrics board of directors a revised draft of the merger agreement, reflecting the then-current state of negotiations, and a summary of their legal due diligence process and findings.

On January 19, 2005, the Nanometrics board of directors convened a special meeting. Nanometrics management provided the Nanometrics board of directors with a summary of discussions with August Technology that had taken place since the January 17, 2005 board of directors meeting and Adams Harkness reviewed its updated preliminary financial analyses of the proposed business combination based on a range of proposed exchange ratios. Representatives of Wilson Sonsini Goodrich & Rosati, Professional Corporation, reviewed the proposed merger agreement and provided a summary of the progress in negotiating its definitive terms. The representatives of Wilson Sonsini Goodrich & Rosati, Professional Corporation, also reviewed for the board of directors Nanometrics' due diligence review of August Technology. The board of directors, after thorough discussion and review, authorized management to continue to work toward finalizing the merger agreement.

On the afternoon of January 19, 2005, Nanometrics' legal counsel delivered a revised draft of the merger agreement to August Technology's legal counsel. The parties' legal counsel then continued negotiations on the draft merger agreement throughout the day and into the evening.

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On January 19, 2005, August Technology received the following letter from KLA-Tencor Corporation:

January 18, 2005

Mr. David Klenk

President

August Technology

4900 West 78th Street

Dear Mr. Klenk:

I am writing to express our disappointment with the written response that we received from you on December 21, 2004. As you know, KLA Tencor has for some time studied the possibility of a strategic business combination with August Technology. We have the highest regard for your company and employees and are convinced that the strategic, operational and financial merits of a combination are compelling and will provide significant benefits to customers and employees, as well as compelling value to August shareholders.

Following our prior correspondence of December 17, 2004, I had a chance to speak with Michael Wright, who indicated that our valuation range previously set forth was not perceived as warranting further discussions with us. Based on our work to date, which has been limited to public sources, we proposed to acquire August Technology for up to \$12 per share in cash, which now represents a 31% premium to market. We are prepared to consider a higher valuation range than set forth in our prior letter and would require a brief period of high level due diligence, principally in the areas of financial, operational and customer aspects of August Technology, in order to do so. KLA Tencor is prepared to consider using stock for some or all of the transaction consideration if that would be attractive to August Technology. Our team can be in Minnesota at your convenience to begin a due diligence review.

To reiterate, we are committed to moving forward with discussions and due diligence to reach a mutually agreeable transaction, an action supported by KLA Tencor's Executives and Board. To this end, we would appreciate hearing from you no later than January 24, 2005 and we have asked our financial advisors to also contact your representative at Needham and Co. in order to move forward expeditiously.

Sincerely yours,

/s/ KENNETH SCHROEDER
Ken Schroeder

President, Chief Executive Officer

KLA Tencor

cc: James Bernards

Roger Gower

Linda Hall Whitman

Jeff O Dell

Michael Wright

On January 19, 2005, the board of directors of August Technology met with representatives of Fredrikson & Byron and Needham & Company to discuss the letter from KLA-Tencor and the proposed business combination with Nanometrics. The August Technology board of directors considered the references to up to \$12 cash price and the potential for a higher valuation range as compared to the opportunities presented by the proposed merger with Nanometrics. The board of directors also considered August Technology's obligations under the mutual confidentiality agreement with Nanometrics. Because the mutual confidentiality agreement prohibited August Technology from entering into discussions with KLA-Tencor and because the August Technology board of directors, with the advice of its financial advisors, believed that the proposed merger with Nanometrics provided a greater opportunity for growth in value than the preliminary proposal from KLA-Tencor, the August Technology board of directors concluded that it would reject the KLA-Tencor proposal and continue with negotiations regarding the merger with Nanometrics.

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At the January 19, 2005 meeting, the August Technology board of directors also discussed with its financial advisors the proposed terms of the Nanometrics merger in light of trends in the trading prices of August Technology and Nanometrics common stock. The August Technology board of directors determined, based on the advice of its financial advisor, to propose to Nanometrics that the percentage of fully-diluted shares of the combined company allocated to August Technology shareholders should be increased from 45% to 46.5%, corresponding to an exchange ratio of 0.6401 of a share of the combined company's common stock for each share of August Technology common stock. The position of the August Technology board of directors was communicated by Mr. O Dell to Mr. Heaton during the course of the August Technology board of directors meeting. Representatives of Needham & Company reviewed with the August Technology board of directors its preliminary financial analysis of such a proposed transaction. Representatives of Fredrikson & Byron reviewed the terms of the draft merger agreement, including unresolved issues still subject to negotiation, and the status of Fredrikson & Byron's due diligence review of Nanometrics.

On January 20, 2005, Messrs. Heaton and Piekos discussed via teleconference the remaining open issues on the draft merger agreement. They agreed to an exchange ratio of 0.6401, which would result in Nanometrics shareholders owning 53.5% of the fully-diluted shares of the combined company, and resolved the remaining issues related to the merger agreement.

On January 20, 2005, the Nanometrics board of directors convened a special meeting to consider approval of the merger agreement. Prior to the meeting, the members of the Nanometrics board of directors were provided with a substantially final draft of the merger agreement. During the meeting, representatives of Wilson Sonsini Goodrich & Rosati, Professional Corporation, advised the directors of their fiduciary duties in considering the business combination and described the structure of the August merger and the provisions of the merger agreement. Representatives of Adams Harkness presented their financial analyses of the business combination and delivered Adams Harkness' oral opinion, subsequently confirmed in writing that, as of January 20, 2005 and based upon and subject to the factors and assumptions set forth in its written fairness opinion, the exchange ratio for the August merger is fair from a financial point of view to Nanometrics shareholders. Following a discussion, the Nanometrics board of directors unanimously determined that the merger was advisable, and fair to and in the best interests of Nanometrics and its shareholders, approved the August merger agreement and the proposed merger and resolved to recommend that the Nanometrics shareholders vote to approve the issuance of shares of August Nanometrics common stock in the August merger. Thereafter, legal counsel for both Nanometrics and August Technology continued to work to finalize the merger agreement.

On January 20, 2005, the August Technology board of directors met to approve the proposed merger agreement and related transactions. During the meeting, representatives of Fredrikson & Byron advised the directors of their fiduciary duties with respect to the proposed transaction and discussed with the board of directors the structure of the transaction and the provisions of the merger agreement. In connection with the approval, the August Technology board of directors formed a committee consisting of all of the non-employee directors of August Technology to consider the merger agreement and related transactions for purposes of the business combination statute of the Minnesota Business Corporation Act. Representatives of Needham & Company then reviewed their financial analysis of the business combination and delivered its opinion to the August Technology board of directors that, as of January 20, 2005, and based upon and subject to the assumptions and other matters described in the written opinion delivered to the August Technology board of directors, the exchange ratio pursuant to the proposed merger agreement was fair to the holders of August Technology common stock from a financial point of view. After a discussion, the August Technology special committee approved the proposed merger agreement and related transactions and recommended that the full August Technology board of directors approve the merger agreement and the related transactions. The full August Technology board of directors then also approved the merger agreement and the related transactions.

Following the meetings of the board of directors of each of Nanometrics and August Technology, and prior to the beginning of trading on the Nasdaq National Market, Nanometrics and August Technology executed the merger agreement as of January 21, 2005. On the morning of January 21, 2005, Nanometrics and August

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Technology issued a joint press release announcing the execution of the merger agreement and describing the August merger.

On January 27, 2005, Mr. O Dell received the following letter from Paul F. McLaughlin, Chairman and Chief Executive Officer of Rudolph Technologies, Inc:

January 27, 2005

Mr. Jeff L. O Dell

Chairman and Chief Executive Officer

August Technology Corporation

4900 West 78th Street

Bloomington, MN 55435

Dear Jeff:

You and I have from time to time discussed how a combination of Rudolph and August would make compelling business sense. Most recently, on January 20th, in an e-mail to you I again reiterated our belief that the business reasons are more compelling than ever and suggested we meet. Despite your recent announcement of an agreement with Nanometrics, we at Rudolph continue to believe that a combination of August with Rudolph remains a much more compelling transaction and therefore we make the following offer.

Rudolph is prepared to enter into a merger with August based on a share exchange ratio of 0.6239 share of Rudolph stock for each share of August common stock (equivalent to \$10.50 per share of August stock, based on the closing price of Rudolph stock on January 27, 2005). Each August shareholder may elect to receive all cash, stock, or a combination of cash and stock, subject to proration based on the total cash consideration of \$40 million and shares available in the merger. This reflects an aggregate purchase price of over \$185 million. We are prepared to meet with you as early as tomorrow and to move expeditiously to close the transaction.

We are also prepared to enter into a customary and reasonable confidentiality agreement no less favorable to August than the one between August and Nanometrics.

Together, as an integrated company we believe that improvements in operating performance, business creation opportunities and other combination benefits will generate enormous value for the shareholders of both companies. This offer enables August shareholders to realize a substantial premium over market for their shares as well as the potential for further value through continued ownership in the combined company.

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The Board of Rudolph has unanimously approved this offer, and has unanimously authorized us to proceed. We look forward to meeting with you as soon as possible to discuss our offer in detail and to achieve a prompt definitive agreement.

Very truly yours,

/s/ PAUL F. McLAUGHLIN

Paul F. McLaughlin

Chairman and Chief Executive Officer

cc: James Bernards

Roger Gower

Michael Wright

Linda Hall Whitman

John Vasuta, Esq.

Pursuant to its obligations under the merger agreement with Nanometrics, August Technology delivered a copy of the letter to Nanometrics.

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Also on January 27, 2005, Rudolph issued a press release with proposed terms slightly different from those described in the letter. The first two paragraphs of the press release stated as follows:

Rudolph Technologies Announces Merger Offer for August Technology

January 27, 2005 6:42 p.m.

FLANDERS, N.J., Jan. 27/PRNewswire-First Call/ Rudolph Technologies, Inc. (Nasdaq: RTEC) a leading provider of process control equipment for thin film measurement and macro defect inspection announced today that it has made a merger offer to the Board of Directors of August Technology Corporation (Nasdaq: AUGT).

Rudolph advised the Board of August today that Rudolph is prepared to enter into a merger with August whereby each shareholder of August will receive the value of \$2.16 per share in cash and 0.4955 a share in Rudolph common stock (equivalent to \$10.50 per share of August stock, based on the closing price of Rudolph stock on January 27, 2005). The offer would include the option for each August shareholder to elect to receive all cash, stock, or a combination of cash and stock, subject to proration based on the total cash consideration of \$40 million and shares available in the merger. This reflects an aggregate purchase price of over \$190 million. Rudolph advised the August Board that Rudolph is prepared to meet with August as early as tomorrow and to move expeditiously to close the offering. Rudolph is prepared to close the transaction in the second quarter of 2005.

On January 28, 2005, the August Technology board of directors met with representatives of Needham & Company and Fredrikson & Byron to discuss the proposal from Rudolph. Representatives of Fredrikson & Byron reviewed with the board of directors the requirements under the merger agreement with Nanometrics that must be satisfied before any discussion or negotiations with Rudolph would be permitted. The board of directors acknowledged that it did not have sufficient information to make accurate projections about the potential operations of Rudolph and August Technology as a combined entity, and that a thorough analysis required information that could be obtained only through a cooperative due diligence process. The board of directors agreed, therefore, that based on the advice of its financial advisors and legal counsel, it would further examine the Rudolph offer provided that Rudolph first executes a confidentiality agreement in the form required by the merger agreement with Nanometrics.

On February 4, 2005, the board of directors of August Technology met with representatives of Needham & Company and Fredrikson & Byron to further discuss the proposal from Rudolph. Representatives of Fredrikson & Byron discussed with the board of directors its fiduciary duties with respect to the offer and the provisions of the merger agreement with Nanometrics with respect to August Technology's ability to enter into discussions with third party bidders such as Rudolph. Representatives of Needham & Company presented a financial analysis comparing estimates of the equity value per share of August Technology common stock achievable by the end of 2006, first assuming the August merger with Nanometrics and then assuming a merger with Rudolph.

For the analysis assuming the August merger with Nanometrics, Needham & Company used projected 2005 and 2006 financial statements provided by the respective managements of August Technology and Nanometrics and revenue synergies jointly developed by management of August Technology and Nanometrics in connection with their examination of the proposed merger. Each of August Technology and Nanometrics believe sales can be increased by cross selling the other party's products to its customers. Based on estimated 2006 revenues for August Technology and Nanometrics aggregating \$236.5 million and assuming synergies that increase revenues by \$9 million and decrease expenses (through the application of the Nanometrics business model) by \$7.75 million (the middle of the range of synergies presented), pro forma 2006 earnings for August Nanometrics were estimated at \$2.14 per share of August Nanometrics stock. Based on an assumed

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price/earnings multiple of 20, this estimate converted to a projected value of \$42.77 per share of August Nanometrics common stock achievable by the end of 2006. Using the exchange ratio of 0.6401 of a share of August Nanometrics common stock for each share of August Technology common stock, this converts to a projected equity value of \$27.38 for each share of August Technology common stock achievable by the end of 2006.

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For the analysis assuming a merger with Rudolph, Needham & Company used Rudolph's publicly announced proposal for a merger resulting in August Technology shareholders receiving \$2.16 in cash and 0.4955 of a share of Rudolph common stock for each share of August Technology common stock. Needham & Company's analysis used projected financial statements for 2005 and 2006 provided by management of August Technology and projections for Rudolph published by a market analyst that regularly follows Rudolph with estimates consistent with consensus estimates of twelve analysts providing research and estimates on Rudolph stock. Consensus estimates were not used because they only include revenue and earnings per share information. Needham & Company used synergies estimated by August Technology's management, including an assumption that sales of the combined company will be less than the sum of the projected sales of the separate companies. August Technology management believes that market demand is insufficient to allow both August Technology and Rudolph to achieve their projections, particularly since August Technology and Rudolph sell competing products to the same customers. Assuming negative synergies resulting in loss of sales of \$24 million and positive synergies that decrease cost of goods sold by \$10.6 million and other expenses by \$4 million (the middle of the range of synergies presented), pro forma 2006 earnings for the combined entity were estimated at \$0.84 per share of combined company stock. Based on an assumed price/earnings multiple of 20, this estimate converted to a projected equity value of \$16.89 per share of combined company stock. Using the proposed merger consideration of \$2.16 and 0.4955 of a share of Rudolph stock for each share of August Technology common stock, this converts to a projected equity value of \$10.53 for each share of August Technology common stock achievable by the end of 2006.

On February 9, 2005, Mr. O. Dell received the following letter from Kenneth Schroeder, President and Chief Executive Officer of KLA-Tencor Corporation:

PERSONAL AND CONFIDENTIAL

February 8, 2005

Mr. Jeff O. Dell

Chairman & CEO

August Technology

4900 West 78th Street

Bloomington, MN 55435

Dear Mr. O. Dell:

I am writing to reiterate KLA-Tencor's interest in pursuing a merger with August Technology. As I have expressed in the past, we have the highest regard for August and its employees, and believe that the combination of our two organizations would create a global leader in the process control market. Further, we are convinced that the strategic, operational and financial merits of such a combination are quite compelling and would provide significant benefits to customers and employees, as well as offer a very compelling value proposition to August shareholders.

Following the communications that we have had with your advisors and board members over the past few months, we were disappointed to hear of your decision to enter into a transaction with Nanometrics. We believe that KLA-Tencor is a significantly more compelling merger partner for August and is able to bring a much broader sales and service infrastructure to support the August products and customers than what is possible with Nanometrics.

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As our financial advisor indicated to your financial advisor in December and I subsequently reconfirmed to you in my letter dated January 18, we would propose to acquire August in a transaction in which the August shareholders would receive \$11.50 in cash per share. We would also be willing to consider using stock as consideration if that would be attractive to you. We believe our offer, which translates to a 34% premium to the value implied by the agreement between August and Nanometrics and a 13% premium to the value implied by the proposal by Rudolph, represents an extremely attractive opportunity for your shareholders. We would propose to finance the transaction through our existing cash

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balance and thus would not require any contingency or delay traditionally associated with capital raising. We are also very interested in retaining key August Technology employees and would like the opportunity to discuss with you ways to ensure a seamless transition.

We and our financial and legal advisors are prepared to proceed expeditiously and are confident that our due diligence, with your cooperation, can be completed in a short period of time. We hope that you and your Board will give our proposal prompt and serious consideration.

Sincerely yours,

/s/ KENNETH SCHROEDER

Kenneth Schroeder

President and Chief Executive Officer

cc: Michael Wright, Linda Whitman, James Bernards, Roger Gower

Pursuant to its obligations under the merger agreement with Nanometrics, August Technology sent a copy of the letter to Nanometrics.

The August Technology board of directors held a meeting on February 9, 2005 to discuss the letter from KLA. Representatives of Needham & Company, Fredrikson & Byron and the law firm of Wachtell, Lipton, Rosen & Katz participated in the meeting. Legal counsel discussed with the board of directors its fiduciary duties with respect to the offer and the contractual obligations under the merger agreement with Nanometrics. Representatives of Needham & Company agreed to prepare a financial analysis for presentation to the board of directors on February 11, 2005.

On February 11, 2005, the August Technology board of directors held a meeting to review the financial analysis of Needham & Company with respect to the offer from KLA. Representatives of Needham & Company presented a financial analysis to the board of directors similar in format to the presentation made at the February 4, 2005 meeting, comparing estimates of the equity value per share of August Technology common stock achievable by the end of 2006, first assuming the August merger with Nanometrics, then assuming a merger with Rudolph, and then assuming a merger with KLA.

For the analysis assuming the August merger with Nanometrics, Needham & Company presented the same analysis that is discussed above with respect to the February 4, 2005 board of directors meeting, except that pro forma 2006 earnings for the combined August Nanometrics were estimated at \$2.13 per share of August Nanometrics common stock instead of \$2.14, due to changes in market prices in the intervening period that increased estimated amortization expense. Based on an assumed price/earnings multiple of 20, this estimate converted to a projected value of \$42.63 per share of August Nanometrics common stock achievable by the end of 2006. Using the exchange ratio of 0.6401 of a share of August Nanometrics common stock for each share of August Technology common stock, this converts to a projected equity value of \$27.28 for each share of August Technology common stock achievable by the end of 2006.

For the analysis assuming a merger with Rudolph, Needham & Company presented the same analysis that is discussed above with respect to the February 4, 2005 board of directors meeting, except that pro forma 2006 earnings for the combined entity were estimated at \$0.82 per share of combined company stock instead of \$0.84 due to changes in market prices in the intervening period that increased estimated amortization

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expense. Based on an assumed price/earnings multiple of 20, this estimate converted to a projected equity value of \$16.34 per share of combined company stock. Using the proposed merger consideration of \$2.16 and 0.4955 of a share of Rudolph stock for each share of August Technology common stock, this converts to a projected equity value of \$10.25 for each share of August Technology common stock achievable by the end of 2006.

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In order to evaluate KLA's suggestion that it was willing to use its common stock instead of cash in its proposed transaction, the August Technology board of directors requested that Needham & Company prepare an analysis of a stock-for-stock merger designed to deliver value, based on current market prices, of \$11.50 per share of August Technology common stock. Based on the closing price of KLA common stock on February 10, 2005, an exchange ratio of 0.23998 of a share of KLA common stock would be equivalent to \$11.50. For the analysis assuming such a merger with KLA, Needham & Company used projected financial statements for 2005 and 2006 provided by management of August Technology and projections for KLA published by a market analyst that regularly follows KLA. Consensus estimates were not used because they only include revenue and earnings per share information. The pro forma income statements presented in Needham & Company's analysis included various assumptions by management of August Technology with respect to cost synergies resulting from the merger. Assuming synergies that decrease expenses by \$35.3 million (the middle of the range of synergies presented) and assuming all shares of August Technology common stock were converted to KLA shares with no cash payment, pro forma 2006 earnings for the combined entity were estimated at \$1.96 per share of combined company stock. Because KLA has historically traded at a higher multiple than August Technology or Rudolph, a price/earnings multiple of 23 was assumed, resulting in a projected equity value of \$45.11 per share of combined company stock achievable at the end of 2006. Using an exchange ratio of 0.23998 of a share of KLA stock (implied from the \$11.50 per share offer) for each share of August Technology common stock, this converts to a projected equity value of \$10.83 for each share of August Technology common stock achievable by the end of 2006.

Based on this financial analysis, Needham & Company recommended that August Technology continue to pursue the completion of the Nanometrics merger because it appears to have the highest long-term value based on the analysis, assumptions and projections described above. Needham & Company noted, however, that the analysis of the August merger was based upon August Technology and Nanometrics management estimates developed after extensive due diligence while the analyses of the Rudolph and KLA merger proposals were based in part upon research analyst estimates and August Technology management estimates of synergies and cost savings that were made without the benefit of extensive due diligence. Legal counsel recommended that August Technology perform due diligence with Rudolph and KLA only if they sign confidentiality agreements that comply with the requirements of the merger agreement with Nanometrics so as to avoid jeopardizing the merger with Nanometrics. The August Technology board concluded that it should further examine both the Rudolph and the KLA proposals provided that each of Rudolph and KLA execute a confidentiality agreement as required by the merger agreement with Nanometrics.

In performing the analyses presented to August Technology's board on February 4th and February 11th, Needham & Company made numerous assumptions with respect to performance of August Technology, Rudolph and KLA as well as industry performance, general business, economic and market financial conditions and other matters, many of which are beyond the control of Needham & Company, August Technology, Rudolph and KLA. The revenue projections of August Technology and Nanometrics used by Needham & Company in its analysis were prepared by August Technology and Nanometrics, respectively, in good faith, but may not be achieved. Needham & Company relied upon the estimates of August Technology of the potential cost savings and other synergies to be derived through the application of the Nanometrics business model, including the amount and timing thereof, that may be achieved as a result of the merger proposals analyzed. Needham & Company also assumed that the research analyst projections relating to Rudolph and KLA represent reasonable estimates as to the future performance of those companies. Any projections or estimates contained in the analyses by Needham & Company are not necessarily indicative of actual values or future results, which may be significantly more or less favorable than suggested by such analyses. Additionally, the estimates of the future value of securities do not purport to be appraisals or to reflect the value at which such securities might actually be sold. Accordingly, such analyses, projections and estimates are inherently subject to substantial risks and uncertainty, including without limitation the risks set forth in the section of this joint proxy statement/prospectus entitled *Risk Factors* beginning on page 31.

On March 15, 2005, August Technology received notification of early termination of the waiting period under the HSR Act applicable to the August merger. Termination or expiration of this waiting period is a condition to the August merger.

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In addition, the Department of Justice has notified August Technology that it has commenced an investigation into the competitive aspects of the offers submitted to August Technology by Rudolph and KLA. No further information regarding the timing or scope of the investigation was made available to August Technology.

Joint Reasons for the August Merger

The boards of directors of Nanometrics and August Technology believe that by combining the highly complementary, non-overlapping product lines of the two companies, August Nanometrics can generate improved long-term operating and financial results and establish a stronger competitive position in the industry. By offering customers an enhanced suite of integrated metrology and defect inspection products, supported by an extensive, well-trained staff of service and applications engineers, August Nanometrics would be better able to service its customers and improve their return on investment. The August merger is expected to allow August Nanometrics to eliminate duplicative research and development efforts and to redeploy these resources to other research and development activities. Additionally, Nanometrics and August Technology believe that the August merger will enhance the ability of August Nanometrics to compete effectively against their larger competitors, including KLA-Tencor and Rudolph Technologies. By creating efficiencies that increase technological development, Nanometrics and August Technology believe that the August merger will greatly enhance the ability of August Nanometrics to be a stronger competitor in the highly dynamic markets for metrology and inspection products.

Each of the boards of directors of Nanometrics and August Technology has identified additional potential mutual benefits of the August merger that they believe will contribute to the success of August Nanometrics. These potential benefits include principally the following:

The combination of August Technology's defect inspection technology with Nanometrics' metrology products will allow August Nanometrics to offer a more comprehensive and better integrated set of tools to its customers and enhance its ability to compete more effectively.

August Nanometrics is expected to have greater prominence within the financial community providing increased access to capital.

The direct sales and service presence of August Nanometrics in the important Japanese semiconductor manufacturing market may increase opportunities for product orders.

The creation of a larger sales and service organization worldwide, the expansion of the companies' dedicated sales teams and a higher profile with customers and would present greater opportunities for marketing the products of August Nanometrics.

The combined experience, financial resources, development expertise, size and breadth of product offerings of August Nanometrics may allow it to respond more quickly and effectively to technological change, increased consolidation and industry demands.

The creation of a combined customer service and technical support system may permit August Nanometrics to provide more effective support coverage to its customers and make it more attractive to new customers.

The management team will combine experience in both the defect inspection and metrology markets, as well as access to other areas of the semiconductor equipment manufacturing sector.

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The combination may allow August Nanometrics to sell more products to customers in the flat-panel display and biotechnology industries.

August Nanometrics can benefit by sharing knowledge of precision staging and standalone platform systems.

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Nanometrics and August Technology have each identified additional reasons for the August merger, which are discussed in this joint proxy statement/prospectus entitled *Additional Nanometrics Reasons for the August Merger* and *Additional August Technology Reasons for the August Merger*, beginning on pages 86 and 96, respectively. Each board of directors has recognized that the potential benefits of the August merger may not be realized. See the section of this joint proxy statement/prospectus entitled *Risk Factors* beginning on page 31.

Additional Nanometrics Reasons for the August Merger

In addition to the anticipated joint reasons described above under the section of this joint proxy statement/prospectus entitled *Joint Reasons for the August Merger*, beginning on page 85, the Nanometrics board of directors believes that the following are additional reasons the August merger will be beneficial to Nanometrics and its shareholders:

Given the complementary, non-overlapping nature of the product lines of Nanometrics and August Technology, the August merger will enhance Nanometrics' ability to achieve greater scale and presence in the semiconductor equipment industry.

Combining with August Technology would provide an opportunity for increased sales to and support of current Nanometrics and August Technology customers by offering a more integrated and broader product line.

The Nanometrics shareholders would have the opportunity to participate in the potential for growth of August Nanometrics after the August merger.

The Nanometrics board of directors believes there are substantial benefits to Nanometrics and the Nanometrics shareholders that can be obtained as a result of the August merger. If the August merger is completed, the Nanometrics board of directors believes that August Nanometrics will be a leader in both metrology and macro defect inspection. At a meeting held on January 20, 2005, the Nanometrics board of directors unanimously determined that the August merger and the other transactions contemplated by the merger agreement, including the issuance of shares of August Nanometrics common stock in the August merger, are advisable and in the best interests of Nanometrics and the Nanometrics shareholders. Therefore, the Nanometrics board of directors unanimously resolved to recommend that the Nanometrics shareholders approve the issuance of shares of August Nanometrics common stock in the August merger.

The Nanometrics board of directors consulted with Nanometrics senior management as well as its legal counsel, Wilson Sonsini Goodrich & Rosati, Professional Corporation, and its financial advisor, Adams Harkness, Inc., in reaching its decisions to approve the merger agreement and the transactions contemplated by the merger agreement, and unanimously recommends that Nanometrics shareholders vote to approve the issuance of shares of August Nanometrics common stock in the August merger. Particularly persuasive among the factors considered by the Nanometrics board of directors in its deliberations were the reasons for the August merger described in the section of this joint proxy statement/prospectus entitled *Joint Reasons for the August Merger* beginning on page 85. The Nanometrics board of directors also considered each of the following factors in its deliberations:

information concerning the financial performance, financial condition, business and prospects of Nanometrics and August Technology, as well as conditions in the semiconductor equipment industry generally;

information concerning the recent and past stock price performance of Nanometrics and August Technology common stock, as well as the views of Wall Street equity analysts regarding the two companies;

the prices paid in comparable transactions involving other semiconductor manufacturing equipment companies, as well as the trading performance of the stock of comparable companies in the industry;

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the stock-based merger consideration, which preserves the financial strength of the combined company for continued business investment;

the fixed exchange ratio consideration amount, which provide a level of certainty as to the aggregate number of shares of August Nanometrics common stock to be issued to August Technology shareholders and the percentage of the total shares of August Nanometrics common stock that current August Technology shareholders will own after the August merger;

the provisions that prohibit August Technology from soliciting other acquisition offers;

the conditions to completion of the August merger, in particular the likelihood of obtaining the necessary regulatory and shareholder approvals;

the provisions that require August Technology to pay Nanometrics expenses and a termination fee of \$8.3 million, plus expenses, if the merger agreement is terminated for specified reasons;

an assessment of alternatives to the August merger, including development opportunities and other possible acquisition candidates, and the determination that the merger with August Technology was the best strategic fit and presented a unique opportunity to enhance and expand Nanometrics operations, product and service offerings and best positioned August Nanometrics for future growth; and

the written opinion of Adams Harkness dated January 20, 2005, that, as of that date, and based upon and subject to the considerations described in its opinion, the full text of which is attached to this joint proxy statement/prospectus as Annex C, the exchange ratio used in the merger consideration was fair from a financial point of view to Nanometrics shareholders.

The Nanometrics board of directors also considered a variety of uncertainties and risks in its deliberations concerning the August merger. However, the Nanometrics board of directors concluded that the potential benefits of the August merger outweighed these risks, which include, without limitation:

the risk that the potential benefits sought in the August merger might not be fully realized;

the possibility that the August merger might not be completed, or that completion might be unduly delayed, for reasons beyond Nanometrics' control;

the possibility that the August merger might not be completed and that, in certain circumstances, Nanometrics might be required to pay August Technology a termination fee of \$8.3 million, plus expenses;

the effect of the public announcement of the August merger on Nanometrics' and August Technology's respective stock prices;

the potential dilution of Nanometrics earnings per share as a result of the issuance of the shares in the August merger, and the estimated time period for the August merger to be accretive to Nanometrics' earnings per share;

the risk that efforts to integrate the two companies will disrupt August Nanometrics' operations;

the substantial costs to be incurred in connection with the August merger, including the costs of integrating the businesses of Nanometrics and August Technology and the transaction expenses arising from the August merger;

the risk that, despite Nanometrics' efforts and the efforts of August Technology after the August merger, August Nanometrics may lose key personnel;

the risk that the restrictions on the conduct of Nanometrics' business during the period between the signing of the August merger agreement and the completion of the August merger may negatively impact Nanometrics' business; and

the other risks described in the section of this joint proxy statement/prospectus entitled *Risk Factors Risks Relating to the August Merger* beginning on page 31.

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It was not practical to, and thus the Nanometrics board of directors did not, quantify, rank or otherwise assign relative weights to the wide variety of factors it considered in evaluating the August merger and the merger agreement, nor did the board of directors determine that any one factor was of particular importance in deciding that the merger agreement and associated transactions were in the best interests of Nanometrics and its shareholders. This discussion of information and material factors considered by the Nanometrics board of directors is intended to be a summary rather than an exhaustive list. In considering these factors, individual members of the Nanometrics board of directors may have given different weight to different factors. The board of directors conducted an overall analysis of the factors described above, and overall considered the factors to support its decision in favor of the August merger and the merger agreement. The decision of each member of the Nanometrics board of directors was based upon his or her own judgment, in light of all of the information presented, regarding the overall effect of the merger agreement and associated transactions on the Nanometrics shareholders as compared to any potential alternative transactions or courses of action. After considering this information, the members of the Nanometrics board of directors unanimously approved the merger agreement and the transactions contemplated by the merger agreement, including the issuance of shares of August Nanometrics common stock in the August merger and recommended that the Nanometrics shareholders approve the issuance of shares of August Nanometrics common stock in the August merger.

Recommendation of the Nanometrics Board of Directors Regarding the August Merger

After careful consideration, the Nanometrics board of directors determined that the August merger is advisable, and is fair to and in the best interests of Nanometrics and its shareholders, and unanimously approved the merger agreement and the transactions contemplated by the merger agreement.

The Nanometrics board of directors unanimously recommends that the Nanometrics shareholders vote FOR Nanometrics proposal to approve the issuance of shares of August Nanometrics common stock in the August merger.

Opinion of Nanometrics Financial Advisor Regarding the August Merger

Adams Harkness has acted as financial advisor to Nanometrics, pursuant to an engagement letter dated December 9, 2004. Nanometrics board of directors selected Adams Harkness as financial advisor based on its qualifications, expertise and reputation. In connection with Adams Harkness engagement, Nanometrics requested that Adams Harkness deliver an opinion evaluating the fairness, from a financial point of view, to the holders of Nanometrics common stock of the exchange ratio set forth in the merger agreement.

On January 20, 2005, in connection with the evaluation of the August merger by the board of directors of Nanometrics, Adams Harkness provided an oral opinion, which opinion was subsequently confirmed by delivery of a written opinion dated January 20, 2005, that, as of the date of such opinion (subject to and based upon the various qualifications and assumptions described herein and included in materials distributed to the board of directors), the exchange ratio was fair, from a financial point of view, to the holders of Nanometrics common stock. The full text of the opinion, which sets forth assumptions made, matters considered and limitations on the review undertaken in connection with the opinion, is attached as Annex C to this joint proxy statement/prospectus and is incorporated herein by reference. The opinion referred to herein does not constitute a recommendation as to how any shareholder of Nanometrics should vote with respect to the August merger or the reincorporation merger at the 2005 annual meeting of shareholders of Nanometrics. The description of the opinion is qualified in its entirety by reference to the full text of the opinion. Shareholders are urged to, and should, read the opinion in its entirety.

For purposes of developing its opinion, Adams Harkness, among other things:

reviewed certain publicly available financial statements and other business and financial information of Nanometrics and August Technology, respectively, and assumed that there had been no material change

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in the assets, financial condition, business or prospects of Nanometrics or August Technology, at the time of the opinion since the respective dates of the most recent financial statements made available to it;

reviewed certain internal financial statements and other financial and operating data concerning Nanometrics and August Technology prepared by the management teams of Nanometrics and August Technology, respectively;

considered certain financial forecasts, projections and analyses and other forward-looking financial information prepared by the management teams of Nanometrics and August Technology, respectively, and assumed that the financial results reflected in such forecasts, projections and analyses and other forward-looking financial information would be realized in the amounts and at the times projected;

discussed the past and current operations and financial condition, and the prospects of Nanometrics and August Technology, including information relating to strategic, financial and operational benefits anticipated from the August merger or the reincorporation merger, with senior executives of Nanometrics and August Technology, respectively, including discussions with such senior executives concerning cost savings and other synergies that were expected to result from the August merger or the reincorporation merger as well as their assessment of the strategic rationale for, and potential benefits of, the August merger or the reincorporation merger;

reviewed certain publicly available research estimates of research analysts regarding Nanometrics and August Technology, respectively;

reviewed the reported trading prices and trading activity for Nanometrics common stock and August Technology common stock, respectively, as well as publicly-available earnings estimates for Nanometrics and August Technology, respectively;

compared the financial performance of Nanometrics and August Technology and the trading prices and trading activity of Nanometrics common stock and August Technology common stock, respectively, with those of certain other publicly-traded companies and their securities that it deemed relevant;

reviewed the financial terms, to the extent publicly available, of certain acquisition and merger of equals transactions that it deemed relevant;

reviewed and analyzed the potential pro forma financial effects of the August merger and the reincorporation merger;

reviewed and analyzed the capitalization of Nanometrics and August Technology, respectively, as well as the projected pro forma capitalization of August Nanometrics after giving effect to the August merger and the reincorporation merger;

reviewed drafts of the merger agreement and certain related documentation, dated January 20, 2005, and the financial terms and conditions set forth therein, as well as the schedules thereto, and assumed that the final forms of the merger agreement and related documentation and the schedules thereto would not vary in any regard that is material to its analysis, and that the August merger and the reincorporation merger will be consummated in accordance with the terms thereof, including that in all respects material to its analysis, the representations and warranties made by the parties thereto are accurate and complete and the parties will comply with all of their covenants set forth therein; and

made such other studies and inquiries, and reviewed such other data, and considered such other factors as Adams Harkness deemed, in its sole judgment, to be necessary, appropriate or relevant.

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In connection with its review and in arriving at its opinion, Adams Harkness did not independently verify any information received from Nanometrics or August Technology or their representatives or otherwise made available to it. Adams Harkness relied on such information, and assumed that all such information was complete and accurate in all material respects. Adams Harkness also relied on the representations of the respective management teams of Nanometrics and August Technology that they were not aware of any facts that would

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make such information misleading. With respect to any forecasts, projections, analyses and other forward-looking financial information reviewed by Adams Harkness relating to the prospects of Nanometrics and August Technology, respectively, including information relating to the strategic, financial and operational benefits anticipated from the August merger and the reincorporation merger, Adams Harkness assumed that such forecasts, projections and analyses and other forward-looking information had been reasonably prepared or developed on bases reflecting the best currently available estimates and judgments of the management teams of Nanometrics and August Technology, respectively. Adams Harkness did not conduct, nor did it receive copies of, any independent valuation or appraisal of any of the assets of Nanometrics or August Technology. Adams Harkness was not requested to conduct and did not conduct a physical inspection of the properties or facilities of Nanometrics or August Technology. Adams Harkness assumed that any material liabilities (contingent or otherwise, known or unknown) of Nanometrics and August Technology were as set forth in the historic and projected financial statements of each company, respectively. In addition, Adams Harkness did not make an independent evaluation or appraisal of August Nanometrics after the August merger and the reincorporation merger and accordingly, it expressed no opinion as to the future prospects, plans or viability of August Nanometrics after the August merger and the reincorporation merger. Adams Harkness made no independent investigation of any legal matters involving Nanometrics or August Technology, and assumed the correctness of all statements with respect to legal matters made or otherwise provided to the board of directors of Nanometrics and Adams Harkness by Nanometrics' counsel or by August Technology's counsel.

Adams Harkness' opinion was necessarily based on financial, economic and securities market conditions prevailing as of the date thereof, and on the conditions and prospects, financial and otherwise, of Nanometrics and August Technology as known to Adams Harkness on the date thereof. Adams Harkness also took into account its assessment of general economic, market and financial conditions and its experience in similar transactions, as well as its experience in securities valuation in general. It should be understood that (i) subsequent developments may affect the conclusions expressed in Adams Harkness' opinion if it were to be rendered as of a later date, and (ii) Adams Harkness disclaimed any obligation to advise any person of any change in any matter affecting its opinion that may come to its attention after the date of the opinion. Adams Harkness did not undertake to reaffirm or revise its opinion or otherwise comment upon any events occurring after the delivery thereof and does not have any obligation to update, revise or reaffirm its opinion.

Adams Harkness also assumed that, in the course of obtaining necessary regulatory and third party approvals and consents for the August merger and the reincorporation merger, no modification, delay, limitation, restriction, or conditions will be imposed that will have an adverse effect on Nanometrics, August Technology, August Nanometrics or the contemplated benefits of the August merger and the reincorporation merger, and that the August merger and the reincorporation merger will be consummated in accordance with the terms of the merger agreement without waiver, modification or amendment of any material term, condition or agreement therein.

Adams Harkness' opinion was directed to and for the information of the board of directors of Nanometrics only and may not be relied upon by any other person or used for any other purpose without the prior written consent of Adams Harkness, except that Adams Harkness agreed that a copy of its opinion may be included in its entirety in this joint proxy statement/prospectus. Adams Harkness' opinion did not address the relative merits of the merger agreement, the August merger and the reincorporation merger or other business strategies that might be available to Nanometrics, the decision of the board of directors of Nanometrics to proceed with the merger agreement or the August merger and the reincorporation merger, or the prices at which (i) Nanometrics' common stock would trade following the announcement of the merger agreement, or (ii) August Nanometrics common stock will trade following the consummation of the August merger and the reincorporation merger.

Adams Harkness used several methodologies to assess the fairness of the exchange ratio, from a financial point of view, to the holders of Nanometrics common stock. The following is a summary of the material financial and comparative analyses undertaken by Adams Harkness in connection with providing its opinion. This

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summary is qualified in its entirety by reference to the full text of the opinion. In arriving at its opinion, Adams Harkness considered all of the financial and comparative analyses it performed and did not attribute any particular weight to any individual analysis it considered or reach specific conclusions with respect to any such analysis. Rather, Adams Harkness made its determination as to the fairness of the exchange ratio, from a financial point of view, to the holders of Nanometrics common stock on the basis of its experience and professional judgment after considering the collective results of all of the analyses described in the following pages.

The financial and comparative analyses summarized below include information presented in tabular format. In order to fully understand Adams Harkness' financial and comparative analyses, the tables must be read together with the text of each summary. The tables alone do not constitute a complete description of the financial and comparative analyses. Considering the data in the tables below without considering the full narrative description of the analyses, including the methodologies and assumptions underlying the analyses, could create a misleading or incomplete view of Adams Harkness' financial and comparative analyses.

Trading Price Ratio Analysis

Adams Harkness performed a trading price ratio analysis in which it reviewed the ratio of the closing price of Nanometrics common stock to the closing price of August Technology common stock on January 20, 2005, the date of the delivery of its opinion, the ratio of the daily closing prices of Nanometrics common stock to the daily closing prices of August Technology common stock over the twelve month period ended January 20, 2005, the Latest Twelve Months, or LTM, and the ratio of the twenty day moving average of the daily closing prices of Nanometrics common stock to the twenty day moving average of the daily closing prices of August Technology common stock over the three month and twelve month periods ended January 20, 2005. Adams Harkness also calculated the standard deviation, or the SD, of these ratios over each time period, and compared, for each time period, the range of the mean plus and minus one standard deviation to the exchange ratio of 0.6401 set forth in the merger agreement.

Adams Harkness noted that the exchange ratio was 0.6401 and that the estimated percentage ownership of former Nanometrics shareholders in August Nanometrics based on that ratio was approximately 53.5% on a fully diluted basis.

The following table sets forth the ratio of the daily closing prices of Nanometrics common stock to the daily closing prices of August Technology common stock over latest twelve months, and the ratio of the twenty day moving average of the daily closing prices of Nanometrics common stock to the twenty day moving average of the daily closing prices of August Technology common stock over the three month and twelve month periods ended January 20, 2005.

		Trading Price Ratio*		
		Mean-1SD	Mean	Mean+1SD
Closing Prices on January 20, 2005:		0.657		
Daily Closing Price	LTM:	0.662	0.867	1.072
20-Day Moving Average	LTM:	0.683	0.881	1.079
20-Day Moving Average	Last Three Months:	0.542	0.583	0.624

* Certain of the data appearing in this table differs from the data that originally appeared in the written materials Adams Harkness provided to the board of directors of Nanometrics at the time it delivered its fairness opinion, which had been based on erroneous trading price

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information obtained by Adams Harkness from a third party. Adams Harkness has determined, and has advised the board of directors of Nanometrics, that such differences would not have had any effect on its fairness opinion.

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Adams Harkness performed a contribution analysis in which it reviewed certain historical and estimated future annual and quarterly operating and financial information for Nanometrics, August Technology and August Nanometrics provided to Adams Harkness by the management teams of Nanometrics and August Technology. The annual analysis was based on the relative contributions of each of Nanometrics and August Technology to August Nanometrics' pro forma revenue, gross profit and operating income for the fiscal years ended closest to December 31, 2001, 2002, and 2003 and the LTM ended in the fiscal third quarter of 2004, as well as to August Nanometrics' estimated pro forma revenue, gross profit and operating income for the fiscal years ending closest to December 31, 2004 and 2005. The quarterly analysis was based on the relative contributions of each of Nanometrics and August Technology to August Nanometrics' revenue, gross profit, operating income, EBITDA, net income, net tangible assets, and shareholders' equity for the period from the first quarter of 2003 through the third quarter of 2004, as well as August Nanometrics' estimated revenue, gross profit, operating income (loss), EBITDA, net income (loss), net tangible assets, and shareholders' equity for the period from the fourth quarter of 2004 through the fourth quarter of 2005. Adams Harkness calculated an implied exchange ratio based on the median, high and low of the relative contributions of each company for each of such metrics over each period. The following table presents the results of the analysis and the implied exchange ratios derived:

	Implied Exchange Ratio*		
	Low	Median	High
Annual Contribution (2001-2005E)			
Revenue Contribution:	0.461	0.698	0.779
Gross Profit Contribution:	0.540	0.731	0.936
Operating Income Contribution:	0.053	0.316	0.586
	Low	Median	High
Quarterly Contribution (2003-2005E)			
Revenue Contribution:	0.516	0.668	0.908
Gross Profit Contribution:	0.384	0.722	0.988
Operating Income Contribution:	0.181	0.563	1.008
EBITDA Contribution:	0.062	0.366	0.882
Net Income Contribution:	0.032	0.529	1.227
Net Tangible Assets Contribution:	0.228	0.527	0.582
Shareholders' Equity Contribution:	0.211	0.501	0.562

* The figures presented in this table under the headings "Operating Income Calculation," "EBITDA Calculation" and "Net Income Calculation" reflect only the relevant annual and quarterly periods in which both Nanometrics and August Technology experienced positive operating income, positive EBITDA or positive net income, respectively. During certain other annual and quarterly periods analyzed by Adams Harkness but not presented in the table, one or both of Nanometrics and August Technology experienced an operating loss, negative EBITDA or a net loss.

Adams Harkness noted that the exchange ratio was 0.6401 and that the estimated percentage ownership of former Nanometrics shareholders in August Nanometrics based on that ratio was approximately 53.5% on a fully diluted basis.

Precedent Transaction Analysis

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Adams Harkness performed a precedent transaction analysis in which it assessed the relative valuations associated with selected precedent acquisitions publicly announced since January 1, 2000 it deemed relevant. Adams Harkness reviewed two sets of precedent transactions: (a) fifteen merger of equals precedent transactions (including one pending transaction), and (b) fifteen semiconductor capital equipment precedent transactions (including two pending transactions) it deemed comparable to the contemplated transaction between Nanometrics and August Technology.

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The selected merger of equal transactions were:

<u>Date Completed</u>	<u>Target Name</u>	<u>Acquiror Name</u>
Pending	Nextel Communications, Inc.	Sprint Corporation
11/16/2004	Metrocall Holdings, Inc.	Arch Wireless, Inc.
08/04/2004	Sports Authority, Inc.	Gart Sports Company
07/15/2004	Cable Design Technologies Corporation	Belden Inc.
11/12/2003	Biogen, Inc.	IDEC Pharmaceuticals Corporation
08/30/2002	Conoco Inc.	Phillips Petroleum Company
06/26/2002	Visionics Corporation	Identix Incorporated
03/26/2002	Proxim Corporation	Western Multiplex Corporation
01/30/2002	Westvaco Corporation	Mead Corporation
12/14/2001	Virata Corporation	GlobeSpan, Inc.
01/12/2001	Time Warner Inc.	America Online, Inc.
07/10/2000	Arvin Industries, Inc.	Meritor Automotive, Inc.
07/05/2000	CCB Financial Corporation	National Commerce Bancorporation
05/30/2000	Varco International, Inc.	Tuboscope Inc.
05/15/2000	Mission Critical Software, Inc.	NetIQ Corporation

The selected semiconductor capital equipment transactions were:

<u>Date Completed</u>	<u>Target Name</u>	<u>Acquiror Name</u>
Pending	DuPont Photomasks, Inc.	Toppan Printing Co., Ltd.
3/10/2005	Genus, Inc.	Aixtron Aktiengesellschaft
12/14/2004	Metron Technology, N.V.	Applied Materials, Inc.
03/19/2003	CoorsTek, Inc.	Keystone Holdings LLC
12/09/2002	SpeedFam-IPEC, Inc.	Novellus Systems, Inc.
05/15/2002	PRI Automation, Inc.	Brooks Automation, Inc.
10/29/2001	GenRad, Inc.	Teradyne, Inc.
08/01/2001	Integrated Measurement Systems, Inc.	Credence Systems Corporation
05/21/2001	Silicon Valley Group, Inc.	ASM Lithography, Inc.
01/26/2001	Applied Science and Technology, Inc.	MKS Instruments, Inc.
01/10/2001	Gasonics International Corporation	Novellus Systems, Inc.
01/03/2001	CFM Technologies, Inc.	Mattson Technology, Inc.
11/24/2000	Cerprobe Corporation	Kulicke & Soffa Industries, Inc.
05/05/2000	CVC, Inc.	Veeco Instruments Inc.
03/29/2000	Etec Systems, Inc.	Applied Materials, Inc.

Adams Harkness analyzed the premiums paid in each precedent transaction based on the closing stock price of the target company one day, one week, and four weeks prior to announcement of the respective transactions. Based on the median premium to the target's stock price one day prior to announcement, the implied exchange ratios from the foregoing data are as follows:

Implied Exchange Ratio

	<u>Low</u>	<u>Median</u>	<u>High</u>
Merger of Equals:	0.512	0.647	1.194
Semiconductor Capital Equipment:	0.719	0.929	1.606

Although the selected transactions were used for comparison purposes, none of these transactions is directly comparable to the August merger, and none of the companies in such transactions is directly comparable to Nanometrics or August Technology. Accordingly, an analysis of the results of such a comparison is not purely

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mathematical but instead involves complex considerations and judgments concerning differences in historical and projected financial and operating characteristics of the companies involved and other factors that could affect the acquisition value of such companies to which Nanometrics and August Technology are being compared.

Public Company Peer Group Analysis

Adams Harkness identified a group of publicly traded companies, referred to as the peer group companies, that it deemed comparable to Nanometrics and August Technology based on similarity of services offered, markets served and financial performance, and analyzed certain operating performance characteristics and public market valuation metrics of such peer group companies. Such information included:

LTM revenue;

LTM gross margin;

LTM operating margin;

LTM net margin;

ratio of enterprise value to LTM revenue and to 2004 and 2005 projected revenue; and

ratio of current price to 2004 and 2005 projected earnings per share.

Adams Harkness compared a variety of operating and valuation metrics for each of Nanometrics and August Technology to those same metrics for each of the peer group companies.

Adams Harkness identified the following group of ten publicly traded companies as the companies that it deemed comparable to Nanometrics and August Technology for purposes of this analysis:

Company	Enterprise Value*
	<i>(in millions)</i>
Applied Materials, Inc.	\$ 20,595
KLA-Tencor Corporation	\$ 6,579
FEI Company	\$ 680
Veeco Instruments, Inc.	\$ 669
ICOS Vision Systems Corporation N.V.	\$ 220
ADE Corporation	\$ 203
Rudolph Technologies, Inc.	\$ 194

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Zygo Corporation	\$	159
Therma-Wave, Inc.	\$	101
Nova Measuring Instruments Ltd.	\$	37

* Enterprise value is the total market value of equity plus total debt less cash and marketable securities. Data is derived from Securities and Exchange filings and share prices as of the close of trading on January 20, 2005.

Limitations of Financial and Comparative Analyses

The foregoing summaries do not purport to be a complete description of the financial and comparative analyses performed by Adams Harkness. The preparation of a fairness opinion is a complex process. Adams Harkness believes that its analyses must be considered as a whole, and that selecting portions of such analyses without considering all analyses and factors would create an incomplete view of the processes underlying its fairness opinion. Any estimates contained in Adams Harkness' analyses are not necessarily indicative of actual values, which may be significantly greater or lower than as set forth therein. Estimates of values of companies do not purport to be appraisals or to necessarily reflect the prices at which companies may actually be sold. Such

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estimates are inherently subject to uncertainty. Taken together, the information and analyses employed by Adams Harkness led to Adams Harkness' opinion that the exchange ratio was fair, from a financial point of view, to holders of Nanometrics common stock as of the date of its opinion.

Adams Harkness, as part of its investment banking activities, is regularly engaged in the valuation of businesses and their securities in connection with mergers and acquisitions, underwritings, distributions of listed and unlisted securities, private placements and valuations for corporate and other purposes. In the ordinary course of its business, Adams Harkness may actively trade or hold long or short positions of August Technology or Nanometrics' equity securities for either its customers or its own account.

Pursuant to the terms of Adams Harkness' engagement letter with the board of directors of Nanometrics, dated December 9, 2004, Nanometrics agreed to pay Adams Harkness a fee of upon the delivery by Adams Harkness of the fairness opinion and an additional fee to be negotiated upon delivery by Adams Harkness, if requested by the board of directors, of each affirmation of its fairness opinion. Adams Harkness will also receive a fee upon consummation of the August merger. Nanometrics also agreed to reimburse Adams Harkness for all reasonable fees and disbursements of its counsel and all of its reasonable travel and other out-of-pocket expenses arising in connection with its engagement, and to indemnify Adams Harkness and its affiliates to the full extent permitted by law against liabilities relating to or arising out of its engagement, except for liabilities found to have resulted from the willful misconduct or gross negligence of Adams Harkness.

Interest of Nanometrics Directors and Executive Officers in the August Merger

In considering the recommendation of the Nanometrics board of directors that Nanometrics shareholders approve the issuance of shares of August Nanometrics common stock in the August merger, you should be aware that members of the Nanometrics board of directors and Nanometrics executive officers have interests in the August merger that may be different than, or in addition to, the interests of Nanometrics shareholders generally. These interests include:

the appointment of three current directors of Nanometrics as directors of August Nanometrics upon completion of the August merger and the appointment of certain executive officers of Nanometrics as executive officers of August Nanometrics upon completion of the August merger;

the potential receipt of severance payments by certain Nanometrics executive officers; and

the provision of directors' and officers' insurance coverage to current directors and officers of Nanometrics following the August merger.

The Nanometrics board of directors was aware of these interests and considered them, among other matters, in making its recommendation that Nanometrics shareholders approve the issuance of shares of August Nanometrics common stock in the August merger.

August Nanometrics Board of Directors and Executive Officers after the August Merger

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August Technology and Nanometrics have agreed that three current directors of Nanometrics shall serve as members of the board of directors of August Nanometrics following the completion of the August merger. Additionally, August Technology and Nanometrics have agreed to take all action necessary to ensure that certain executive officers of Nanometrics, shall be appointed to serve as executive officers of August Nanometrics following the completion of the August merger. Nanometrics has not yet selected the three directors who will remain on the August Nanometrics board or the executive officers who will be appointed to serve as executive officers of August Nanometrics if the August merger is completed.

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Executive Officer Severance Payments

Nanometrics has entered into agreements with certain of its executive officers which contain change of control severance provisions. Pursuant to the terms of an agreement with Vincent J. Coates, Nanometrics Chairman of the Board and Secretary, Nanometrics is obligated to continue to pay Mr. Coates his salary and benefits for five years from the date of his resignation, in the event Mr. Coates is required to resign as Chairman of the Board and Secretary under certain circumstances, including a change of control. The estimated total severance payment to which Mr. Coates would be entitled if he were required to resign as Chairman of the Board and Secretary of Nanometrics in connection with the acquisition agreement is \$1,024,000.

Nanometrics has also entered into an agreement with John D. Heaton, Nanometrics President and Chief Executive Officer and a member of the board of directors, pursuant to which Nanometrics has agreed to pay Mr. Heaton his annual salary (excluding bonuses) for a period of one year from the date that he is required or requested for any reason not involving good cause, including a change of control, to involuntarily relinquish his positions with Nanometrics as President, Chief Executive Officer and director. If Mr. Heaton leaves Nanometrics voluntarily or if he is asked to leave under certain circumstances, no such severance payment is required. The estimated total severance payment to which Mr. Heaton would be entitled if he were required to resign his positions as President, Chief Executive Officer and director of Nanometrics in connection with the August merger is \$341,800.

Directors and Officers Insurance

Nanometrics does not maintain directors and officers insurance for its directors and officers. Under the terms of the merger agreement, Nanometrics is obligated to purchase a policy of directors and officers liability insurance covering claims arising from facts or events that occur after the August merger.

Additional August Technology Reasons for the August Merger

In addition to the anticipated joint reasons described above under the section of this joint proxy statement/prospectus entitled *Joint Reasons for the August Merger* beginning on page 85, the August Technology board of directors believes that the following are additional reasons the August merger will be beneficial to August Technology and its shareholders:

for August Technology's shareholders, customers and employees, the prospects of the strategic business combination of August Technology and Nanometrics are more favorable than the prospects of the companies as separate entities;

as a unified and diversified company, August Nanometrics will be able to take advantage of cross-selling opportunities among its significantly expanded customer base;

August Nanometrics will have greater technical expertise, as well as management and financial resources to devote to research and development consistent with each company's focus on building value by pursuing technological leadership through continuous innovation and product improvement and product differentiation;

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by pooling the resources and skills of both August Technology and Nanometrics, August Nanometrics will be better equipped to improve its competitive position in the markets previously served by August Technology and Nanometrics, respectively;

Nanometrics has a front-end tool automation platform with wafer processing applications that could be immediately incorporated by August Technology in its advanced macro inspection product offerings;

August Technology's DMSVision Software, which provides high performance information handling and analysis capability, has the potential to enhance Nanometrics' thin film metrology products and enable August Nanometrics to gain a competitive advantage in the thin film metrology markets;

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there will be cost savings by consolidating certain general and administrative functions and eliminating redundant expenses, including the expenses of maintaining two separate public companies; and

the combination of the two companies will create more growth opportunities for both companies, provide significant economies of scale and create greater resources to enable the combined company to compete more effectively with competitors having greater resources than August Technology alone.

August Technology's board of directors consulted with August Technology's senior management and its legal and financial advisors in reaching the decision to approve the August merger. Among the factors considered by August Technology's board of directors in its deliberations were the following:

the financial condition, results of operations, cash flow, business and prospects of August Technology and Nanometrics, before and after giving effect to the August merger;

the common stock of August Nanometrics will issue in the August merger in light of current financial market conditions, comparable merger transactions, comparable public inspection and metrology stock valuations, historical market prices and other information with respect to August Technology common stock and Nanometrics common stock, and the financial performance and condition, business operations and long-term prospects of each company;

the prices paid in comparable transactions involving other metrology companies, as well as the trading performance of the stock of comparable companies in the industry;

the provisions that require Nanometrics to pay August Technology a termination fee of \$8.3 million, plus expenses, if the merger agreement is terminated for specified reasons;

the fairness to August Technology and its shareholders of the terms of the merger agreement and related agreements; and

the financial analysis and presentation of Needham & Company, as well as the opinion of Needham & Company delivered to the August Technology board of directors that, as of January 20, 2005 and based upon and subject to the assumptions and other matters described in the opinion, the exchange ratio pursuant to the merger agreement was fair to the holders of August Technology common stock from a financial point of view.

August Technology's board of directors also identified and considered a number of uncertainties and risks in its deliberations concerning the August merger, including the following:

the risk that the potential benefits sought in the August merger may not be fully realized, if at all;

the possibility that the August merger might not be completed and that in certain circumstances, August Technology might be required to pay Nanometrics a termination fee of \$8.3 million, plus expenses;

the risk that efforts to integrate the two companies will disrupt August Nanometrics' operations;

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the effect of the public announcement of the August merger on Nanometrics' and August Technology's stock prices;

the restrictions on the conduct of August Technology's business during the period between the signing of the merger agreement and the completion of the August merger;

the substantial charges to be incurred in connection with the August merger, including the costs of integrating the businesses of Nanometrics and August Technology and the transaction expenses arising from the August merger;

the risk of management and employee disruption as a result of the August merger, including the risk that key personnel may choose not to remain employed with August Nanometrics; and

other applicable risks associated with the businesses of August Technology and Nanometrics described in this joint proxy statement/prospectus.

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Recommendation of the August Technology Board of Directors Regarding the August Merger

After careful consideration at a meeting of the August Technology board of directors held on January 20, 2005, the August Technology board of directors determined that the August merger is advisable, and in the best interests of August Technology and its shareholders, and unanimously approved the merger agreement and the transactions contemplated by the merger agreement.

The August Technology board of directors unanimously recommends that the August Technology shareholders vote FOR August Technology's proposal to approve the merger agreement and the August merger.

Opinion of August Technology's Financial Advisor Regarding the August Merger

August Technology retained Needham & Company to act as its financial advisor in connection with the proposed August merger and to render an opinion as to the fairness, from a financial point of view, of the exchange ratio pursuant to the merger agreement to the holders of August Technology common stock. The exchange ratio was determined through arm's length negotiations between August Technology and Nanometrics and not by Needham & Company.

On January 20, 2005, Needham & Company delivered to the August Technology board of directors its written opinion that, as of that date and based upon and subject to the assumptions and other matters described in the written opinion, the exchange ratio pursuant to the merger agreement was fair to the holders of August Technology common stock from a financial point of view. **The Needham & Company opinion is addressed to the August Technology board of directors, is directed only to the financial terms of the merger agreement and does not constitute a recommendation to any August Technology shareholder as to how that shareholder should vote on, or take any other action relating to, the August merger.**

The complete text of the Needham & Company opinion, which sets forth the assumptions made, matters considered, limitations on and scope of the review undertaken by Needham & Company, is attached to this joint proxy statement/prospectus as Annex D. The summary of the Needham & Company opinion set forth in this joint proxy statement/prospectus is qualified in its entirety by reference to the Needham & Company opinion. **August Technology shareholders should read the Needham & Company opinion carefully and in its entirety for a description of the procedures followed, the factors considered, and the assumptions made by Needham & Company.**

In arriving at its opinion, Needham & Company, among other things:

reviewed a draft of the merger agreement dated January 20, 2005;

reviewed certain publicly available information concerning August Technology and Nanometrics and certain other relevant financial and operating data of August Technology and Nanometrics furnished to Needham & Company by August Technology and Nanometrics;

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reviewed the historical stock prices and trading volumes of the common stock of Nanometrics and August Technology;

held discussions with members of management of Nanometrics and August Technology concerning their current and future business prospects and joint prospects for the combined companies, including the potential cost savings and other synergies that may be achieved by August Nanometrics;

reviewed certain research analyst projections with respect to Nanometrics and held discussions with members of Nanometrics concerning those projections;

reviewed certain financial forecasts with respect to August Technology and Nanometrics prepared by the respective managements of August Technology and Nanometrics and held discussions with members of such management concerning those forecasts;

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compared certain publicly available financial data of companies whose securities are traded in the public markets and that Needham & Company deemed relevant to similar data for August Technology;

reviewed the financial terms of certain other business combinations that Needham & Company deemed generally relevant; and

performed and/or considered such other studies, analyses, inquiries and investigations as Needham & Company deemed appropriate.

In connection with its review and in arriving at its opinion, Needham & Company assumed and relied on the accuracy and completeness of all of the financial and other information reviewed or discussed with it for purposes of rendering its opinion, and Needham & Company neither attempted to verify independently nor assumed responsibility for verifying any of such information. Needham & Company assumed that the financial forecasts for each company provided to Needham & Company by their respective managements and the joint prospects of the combined companies were reasonably prepared on bases reflecting the best currently available estimates and judgments of the managements of August Technology and Nanometrics, at the time of preparation, of the future operating and financial performance of August Technology and Nanometrics and August Nanometrics. Needham & Company relied upon the estimates of August Technology and Nanometrics of the potential cost savings and other synergies, including the amount and timing thereof, that may be achieved as a result of the August merger. Needham & Company also assumed, based upon discussions with management of Nanometrics, that the research analyst projections relating to Nanometrics represent reasonable estimates as to the future performance of Nanometrics. Needham & Company did not assume any responsibility for or make or obtain any independent evaluation, appraisal or physical inspection of the assets or liabilities of August Technology or Nanometrics. Needham & Company's opinion states that it was based on economic, monetary and market conditions existing as of its date. Needham & Company expressed no opinion as to what the value of Nanometrics common stock will be when issued to the shareholders of August Technology pursuant to the August merger or the prices at which August Nanometrics common stock, August Technology common stock or Nanometrics common stock will actually trade at any time. In addition, Needham & Company was not asked to consider, and the Needham & Company opinion does not address, August Technology's underlying business decision to engage in the August merger, or the relative merits of the August merger as compared to other business strategies that might be available to August Technology.

No limitations were imposed by August Technology on Needham & Company with respect to the investigations made or procedures followed by Needham & Company in rendering its opinion.

In preparing its opinion, Needham & Company performed a variety of financial and comparative analyses. The following paragraphs summarize the material financial analyses performed by Needham & Company in arriving at its opinion. Some of the summaries of the financial analyses include information presented in tabular format. The tables are not intended to stand alone, and in order to more fully understand the financial analyses used by Needham & Company, the tables must be read together with the full text of each summary.

Contribution Analysis. Needham & Company reviewed and analyzed the pro forma contribution of each of August Technology and Nanometrics to the pro forma combined third quarter 2004 balance sheet information (as of September 30, 2004 for August Technology, and as of October 2, 2004 for Nanometrics), and the pro forma combined estimated calendar 2004 and calendar 2005 combined operating results. In calculating the pro forma estimated combined operating results, Needham & Company used financial forecasts prepared by August Technology and Nanometrics management and assumed no cost savings or other synergies.

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Needham & Company reviewed, among other things, the pro forma contributions to cash and cash equivalents, working capital, total assets, shareholders' equity, revenue, gross profit, earnings before interest and taxes, or EBIT, and enterprise value. This analysis indicated that August Technology and Nanometrics would have contributed the following:

	Percentage Contribution	
	August Technology	Nanometrics
Pro forma combined cash and equivalents	59.8%	40.2%
Pro forma combined working capital	50.4%	49.6%
Pro forma combined total assets	43.6%	56.4%
Pro forma combined stockholders' equity	42.0%	58.0%
Pro forma combined enterprise value	42.0%	58.0%

This analysis also indicated that August Technology and Nanometrics would contribute the percentages shown in the following table of estimated calendar 2004 through estimated calendar 2005 pro forma combined revenue, gross profit and EBIT.

	Percentage Contribution	
	August Technology	Nanometrics
Revenue:		
2004 estimate	48.7%	51.3%
2005 estimate	48.6%	51.4%
Gross Profit:		
2004 estimate	49.3%	50.7%
2005 estimate	50.4%	49.6%
EBIT:		
2004 estimate	6.8%	93.2%
2005 estimate	30.0%	70.0%

The results of the contribution analysis are not necessarily indicative of the contributions that the respective businesses may have in the future.

Based on the exchange ratio, August Technology shareholders would beneficially own approximately 46.5% of the outstanding shares of common stock of August Nanometrics on a fully diluted basis calculated using the treasury share method.

Selected Company Analysis. Using publicly available information, Needham & Company compared selected historical and projected financial and market data ratios for August Technology and Nanometrics to the corresponding publicly available data and ratios of certain publicly traded companies that Needham & Company deemed relevant. These companies, referred to as the selected companies, consisted of the following:

ADE Corporation;

Applied Materials, Inc.;

FEI Company;

ICOS Vision Systems, Inc.;

KLA-Tencor Corporation;

Nova Measuring Instruments Ltd.;

Rudolph Technologies, Inc.;

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Therma-Wave, Inc.; and

Veeco Instruments Inc.

The table below sets forth information concerning the following multiples for the selected companies and for August Technology and Nanometrics:

Enterprise value as a multiple of LTM revenues;

Enterprise value as a multiple of estimated calendar 2004 revenues;

Enterprise value as a multiple of estimated calendar 2005 revenues;

Enterprise value as a multiple of LTM earnings before interest, taxes and amortization, or EBITDA;

Enterprise value as a multiple of LTM EBIT;

Price as a multiple of LTM earnings per share;