NANOMETRICS INC
Form S-4/A
June 12, 2006
Table of Contents

As Filed with the Securities and Exchange Commission on June 9, 2006

Reg. No. 333-133033

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

AMENDMENT NO. 2

TO

FORM S-4

REGISTRATION STATEMENT

Under

The Securities Act of 1933

NANOMETRICS INCORPORATED

(Exact name of registrant as specified in its charter)

California	**3829**	**94-2276314**
(State or other jurisdiction of incorporation or organization)	**(Primary Standard Industrial Classification Code Number)**	**(I.R.S. Employer Identification Number)**

1550 Buckeye Drive

Milpitas, California 95035

(408) 435-9600

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

Douglas J. McCutcheon

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)

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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, as amended, described herein.

If the securities being registered on this form are being 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. ¨

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.

Table of Contents

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

June 9, 2006

JOINT PROXY STATEMENT/PROSPECTUS

MERGER PROPOSED YOUR VOTE IS VERY IMPORTANT

The boards of directors of Nanometrics Incorporated and Accent Optical Technologies, Inc. have unanimously approved the merger of Alloy Merger Corporation, a wholly owned subsidiary of Nanometrics, with and into Accent Optical pursuant to the terms and conditions of an agreement and plan of merger and reorganization, dated as of January 25, 2006, by and among Nanometrics, Alloy Merger Corporation, Accent Optical and Sanford S. Wadler, as Stockholder Agent, as amended. The maximum number of shares that Nanometrics would issue in connection with the merger and reserve for issuance upon the exercise of assumed options is approximately 5,212,286 shares of common stock, assuming that the average closing price of Nanometrics common stock for the 10 trading days ending the two consecutive trading days prior to the consummation of the merger is $15.63, which would result in the Accent Optical stockholders holding approximately 27% of the fully diluted shares of Nanometrics common stock immediately after the merger, and Nanometrics shareholders holding approximately 73% of the fully diluted shares of Nanometrics common stock immediately after the merger. The actual number of Nanometrics shares to be issued in the merger depends on several factors. See the sections of the attached joint proxy statement/prospectus captioned *Summary Overview of Merger Agreement and Related Agreements Merger Consideration* beginning on page 12 and *The Merger Agreement Treatment of Securities* beginning on page 86 for a description of how the final number of shares will be determined. Nanometrics common stock trades on the Nasdaq National Market under the symbol NANO.

Nanometrics and Accent Optical cannot complete the merger unless Nanometrics shareholders approve the issuance of shares of Nanometrics common stock in the merger and Accent Optical stockholders approve and adopt the merger agreement, as amended, and the merger and approve certain other matters described in the joint proxy statement/prospectus including the escrow agreement and the appointment of a stockholder agent. These matters, among others, are included in the proposals to be voted on at the special meetings of the Nanometrics shareholders and Accent Optical stockholders, to be held on [ ], 2006, as more fully described in this joint proxy statement/prospectus, which also includes more information about Nanometrics, Accent Optical and the merger. **You are encouraged to carefully read this joint proxy statement/prospectus in its entirety, including the section entitled *Risk Factors* beginning on page 30 before voting on the matters set forth in the attached joint proxy statement/prospectus.**

The Nanometrics board of directors unanimously recommends that Nanometrics shareholders vote FOR Nanometrics proposal to approve the issuance of shares of Nanometrics common stock in the merger.

The Accent Optical board of directors unanimously recommends that the Accent Optical stockholders vote FOR Accent Optical s proposal to approve and adopt the merger agreement, as amended, and approve the merger, as well as the other matters set forth in the joint proxy statement/prospectus for their consideration.

Your vote is very important. Whether or not you plan to attend your 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,

John D. Heaton	Bruce C. Rhine
President and Chief Executive Officer	Chairman and Chief Executive Officer
Nanometrics Incorporated	Accent Optical Technologies, Inc.

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 [ ], 2006, and is being mailed to shareholders of Nanometrics and stockholders of Accent Optical on or about [ ] [ ], 2006.

Table of Contents

ADDITIONAL INFORMATION

This joint proxy statement/prospectus incorporates by reference important business and financial information about Nanometrics from documents that are not included in or delivered with this joint proxy statement/prospectus but which Nanometrics has previously filed with the Securities and Exchange Commission (the SEC). 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 166.

You can obtain any of the documents incorporated by reference into this joint proxy statement/prospectus from Nanometrics at *www.nanometrics.com/investors* or from the SEC, through its website at *www.sec.gov*. Documents incorporated by reference are available from Nanometrics and Accent Optical without charge, excluding any exhibits to those documents. Nanometrics shareholders and Accent Optical stockholders may request a copy of such documents by contacting either Nanometrics or Accent Optical, as appropriate, at:

Nanometrics Incorporated	Accent Optical Technologies, Inc.
1550 Buckeye Drive	1320 SE Armour Drive, Suite B2
Milpitas, California 95035	Bend, Oregon 97702
Attn: Investor Relations	Attn: Chief Executive Officer

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 Nanometrics at (408) 435-9600 or, Nanometrics proxy solicitors, The Altman Group, at (800) 884-4969 or (201) 806-7300.

We are not incorporating the contents of the websites of the SEC, Nanometrics, Accent Optical 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 special meetings, Nanometrics or Accent Optical, as applicable, must receive your request no later than [ ], 2006, five business days before the special meetings.

Table of Contents

NANOMETRICS INCORPORATED

NOTICE OF SPECIAL MEETING OF SHAREHOLDERS

TO THE SHAREHOLDERS OF NANOMETRICS INCORPORATED:

NOTICE IS HEREBY GIVEN that the special meeting of shareholders of Nanometrics Incorporated, a California corporation (Nanometrics), will be held on [ ], 2006 at 10:00 a.m., local time, at the principal offices of Nanometrics located at 1550 Buckeye Drive, Milpitas, California 95035. At the special meeting, Nanometrics shareholders will consider and vote upon the following:

1. The issuance of shares of Nanometrics common stock in connection with the merger of Alloy Merger Corporation, a wholly owned subsidiary of Nanometrics, with and into Accent Optical Technologies, Inc. pursuant to an Agreement and Plan of Merger and Reorganization, dated as of January 25, 2006, by and among Nanometrics, Alloy Merger Corporation, Accent Optical Technologies, Inc., and Sanford S. Wadler, as Stockholder Agent, as amended; and

2. Such other business as may properly come before the special 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 special meeting of shareholders.

Only Nanometrics shareholders of record at the close of business on May 24, 2006 are entitled to notice of and to vote at the special meeting and any postponements or adjournments thereof.

All Nanometrics shareholders are cordially invited to attend the special meeting in person. However, to ensure representation at the special 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 special meeting may vote in person even if such shareholder previously returned a proxy card for the special meeting.

BY ORDER OF THE BOARD OF DIRECTORS,

Vincent J. Coates
Chairman of the Board of Directors and Secretary

Milpitas, California

[ ], 2006

A FORM OF PROXY IS ENCLOSED. TO ASSURE THAT YOUR SHARES WILL BE VOTED AT THE MEETING, PLEASE COMPLETE AND SIGN THE ENCLOSED PROXY AND RETURN IT PROMPTLY IN THE ACCOMPANYING ENVELOPE. THE GIVING OF A PROXY WILL NOT AFFECT YOUR RIGHT TO VOTE IN PERSON IF YOU ATTEND THE MEETING. THE PROXY WHEN PROPERLY EXECUTED WILL BE VOTED IN THE MANNER DIRECTED BY THE SHAREHOLDER ON THE PROXY. IF NO CHOICE IS SPECIFIED, THE PROXY WILL BE VOTED FOR PROPOSAL 1, AND AS THE PROXYHOLDER(S) DETERMINE IN THEIR DISCRETION ON ANY OTHER ISSUES THAT COME BEFORE THE MEETING.

Table of Contents

ACCENT OPTICAL TECHNOLOGIES, INC.

NOTICE OF SPECIAL MEETING OF STOCKHOLDERS

TO BE HELD , 2006

NOTICE IS HEREBY GIVEN that a Special Meeting of the Stockholders of Accent Optical Technologies, Inc., a Delaware corporation (Accent Optical), will be held on , 2006, at the principal offices of Accent Optical located at 1320 SE Armour Drive, Suite B2, Bend, Oregon 97702, at 9:00 a.m., local time, to:

1. Approve and adopt the Agreement and Plan of Merger and Reorganization, dated as of January 25, 2006, by and among Nanometrics Incorporated (Nanometrics), Alloy Merger Corporation, a wholly owned subsidiary of Nanometrics, Accent Optical Technologies, Inc., and Sanford S. Wadler, as Stockholder Agent, as amended; approve the merger of Alloy Merger Corporation with and into Accent Optical; approve the appointment of Mr. Wadler as Stockholder Agent; and approve the escrow agreement entered into in connection with the merger;

2. Approve payments to certain executive officers of Accent Optical in connection with the merger, in amounts set forth and as more fully described in the joint proxy statement/prospectus accompanying this notice of special meeting; and

3. Transact such other business as may properly come before the meeting or any adjournment or adjournments thereof.

Only stockholders of record at the close of business on , 2006, will be entitled to notice of and to vote at the Special Meeting of Stockholders or any adjournments thereof.

BY ORDER OF THE BOARD OF DIRECTORS

Bruce C. Rhine
Chairman

, 2006

A FORM OF PROXY IS ENCLOSED. TO ASSURE THAT YOUR SHARES WILL BE VOTED AT THE MEETING, PLEASE COMPLETE AND SIGN THE ENCLOSED PROXY AND RETURN IT PROMPTLY IN THE ACCOMPANYING ENVELOPE. THE GIVING OF A PROXY WILL NOT AFFECT YOUR RIGHT TO VOTE IN PERSON IF YOU ATTEND THE MEETING. THE PROXY WHEN PROPERLY EXECUTED WILL BE VOTED IN THE MANNER DIRECTED BY THE STOCKHOLDER ON THE PROXY. IF NO CHOICE IS SPECIFIED, THE PROXY WILL BE VOTED FOR PROPOSALS 1 AND 2, AND AS THE PROXYHOLDER(S) DETERMINE IN THEIR DISCRETION ON ANY OTHER ISSUES THAT COME BEFORE THE MEETING.

Table of Contents

TABLE OF CONTENTS

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

QUESTIONS AND ANSWERS ABOUT THE MERGER

The following are some questions that shareholders of Nanometrics Incorporated and stockholders of Accent Optical Technologies, Inc. may have regarding the matters being considered at the special meeting of the Nanometrics shareholders and the special meeting of the Accent Optical stockholders, as well as brief answers to those questions. Nanometrics and Accent Optical urge you to read the remainder of this joint proxy statement/prospectus carefully and in its entirety because the information below does not provide all of the information that might be important to you.

Q: What are the material terms of the proposed transaction? (See page 86)

A: The respective boards of directors of Nanometrics and Accent Optical have unanimously approved the merger of a wholly owned subsidiary of Nanometrics, Alloy Merger Corporation, with and into Accent Optical in accordance with the terms and conditions of an agreement and plan of merger and reorganization, dated as of January 25, 2006, between Nanometrics, Accent Optical, Alloy Merger Corporation and Sanford S. Wadler as Stockholder Agent, as amended. A summary term sheet describing the material terms of the proposed transaction follows.

Summary of Terms

Nanometrics wholly-owned subsidiary, Alloy Merger Corporation, will merge with and into Accent Optical resulting in Accent Optical becoming a wholly owned subsidiary of Nanometrics.

Nanometrics will issue approximately 4,900,000 shares of its common stock to the holders of Accent Optical capital stock and the holders of certain Accent Optical stock options.

Nanometrics will also issue (or reserve for issuance) an additional number of shares of its common stock equal to the quotient of (i) the aggregate exercise price of all Accent Optical stock options that are assumed pursuant to the merger agreement (other than options issued on or after January 23, 2006), divided by (ii) the average closing price of Nanometrics common stock for the ten trading days ending two days prior to the closing of the merger, which price is referred to herein as the Average Closing Price. See page 88 for more information regarding the treatment of Accent Optical stock options in the merger.

Nanometrics will assume all Accent Optical stock options that are in-the-money or that were granted on or after January 23, 2006.

Current Nanometrics shareholders and Accent Optical stockholders are expected to hold 73% and 27%, respectively, of the combined company following the merger. See page 87 for more information regarding the expected composition of the stockholders of the combined company following the merger.

Accent Optical has agreed to indemnify Nanometrics for losses suffered by Nanometrics as a result of breaches by Accent Optical of its representations and warranties in the merger agreement. See page 102 for more information regarding Accent Optical s indemnification obligations.

Nanometrics will withhold approximately 490,000 of the shares of its common stock to be distributed to the Accent Optical stockholders at the closing and will place such shares in an escrow account to compensate Nanometrics if it is entitled to indemnification under the merger agreement. Based on the average closing price of Nanometrics common stock for the ten trading days ended on June 6, 2006, which was $10.84, the 490,000 shares of Nanometrics common stock are valued at $5,311,600. See page 102 for more information regarding the escrow arrangement.

The Chief Executive Officer of Accent Optical, who is also one of its directors, has accepted an offer to join Nanometrics as an executive officer and director following the merger.

Table of Contents

Certain other executive officers of Accent Optical may receive severance payments in connection with the proposed transaction.

Certain stockholders of Accent Optical, who hold more than the requisite majorities of each class of Accent Optical capital stock needed to approve the merger, entered into voting agreements concurrently with the execution of the merger agreement, and agreed to vote their shares in favor of the merger.

Q: How many shares of Nanometrics common stock will be issued and reserved for issuance in the merger?

A: There are three components of the consideration that will be issued to Accent Optical stockholders and optionees in the merger: (i) the base consideration of 4,900,000 of Nanometrics common stock including shares reserved for in-the-money options issued prior to January 23, 2006; (ii) an additional number of shares of Nanometrics common stock with an aggregate value equal to the aggregate exercise price of all Accent Optical stock options assumed in the merger, which shares are referred to as the Option Adjustment Amount; and (iii) a number of shares of Nanometrics common stock that will be reserved for issuance upon exercise of certain Accent Optical stock options granted on or after January 23, 2006.

The Option Adjustment Amount and the number of shares of Nanometrics common stock required to be reserved for issuance upon exercise of stock options are each a function of the Average Closing Price. For example, if the Average Closing Price is $15.63, then the Option Adjustment Amount and the number of shares of Nanometrics common stock reserved for issuance upon exercise of Accent Optical stock options granted on or after January 23, 2006, will be 148,738 and 163,548, respectively. At such price, the aggregate number of shares of Nanometrics common stock to be issued and reserved for issuance in connection with the merger will be at its maximum, 5,212,286.

If the Average Closing Price is higher than $15.63, then the Option Adjustment Amount will consist of fewer shares of Nanometrics common stock. For example, at an Average Closing Price of $16.00, the Option Adjustment Amount and the number of shares of Nanometrics common stock reserved for issuance upon exercise of Accent Optical stock options granted after January 23, 2006, will be 145,298 and 164,540, respectively. At such price, the number of shares of Nanometrics common stock to be issued and reserved for issuance in connection with the merger will be 5,209,838.

If the Average Closing Price is less than 15.63, then fewer Accent Optical shares will be assumed in the merger resulting in a lower Option Adjustment Amount and, consequently, fewer Nanometrics shares be issued and reserved for issuance in the merger. For example, at an Average Closing Price of $15.00, the Option Adjustment Amount and the number of shares of Nanometrics common stock reserved for issuance upon exercise of Accent Optical stock options granted after January 23, 2006, will be 73,362 and 161,568, respectively. At such price, the aggregate number of shares of Nanometrics common stock to be issued and reserved for issuance in connection with the merger will be 5,134,930.

The average closing price for Nanometrics common stock during the ten trading days ending on June 6, 2006 was $10.84, which, if it were the Average Closing Price, would result in an Option Adjustment Amount and number of shares of Nanometrics common stock reserved for issuance upon exercise of Accent Optical stock options granted after January 23, 2006 of 95,630 and 142,652, respectively. At such price, the aggregate number of shares of Nanometrics common stock to be issued and reserved for issuance in connection with the merger will be 5,138,282.

Table of Contents

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

A: Nanometrics and Accent Optical cannot complete the merger unless the shareholders of Nanometrics approve the issuance of shares of Nanometrics common stock in the merger and the stockholders of Accent Optical adopt and approve the merger agreement, as amended, and approve the merger, as well as the escrow agreement and the appointment of the stockholder agent as set forth in the Accent Optical Notice of Special Meeting. In addition, Accent Optical is seeking stockholder approval for certain payments to its executive officers in connection with the merger.

The Nanometrics board of directors is soliciting the proxy of its shareholders to vote FOR Nanometrics proposal to approve the issuance of shares of Nanometrics common stock in the merger. The Accent Optical board of directors is soliciting the proxy of its stockholders to vote FOR Accent Optical s proposal to adopt and approve the merger agreement, as amended, and approve the merger, as well as the other matters set forth in the Accent Optical Notice of Special Meeting.

Members of Accent Optical s board of directors, officers and other investors holding 87% of Accent Optical s Common Stock and Preferred Stock, 89% of Accent Optical s Series A Preferred Stock, 65% of Accent Optical s Convertible Preferred Stock and 88% of Accent Optical s Common Stock have entered into voting agreements that obligate them to vote their shares to approve and adopt the merger agreement, as amended, approve the merger, approve the appointment of the stockholder agent and approve the escrow agreement. Nanometrics has waived the provisions of the voting agreements relating to the approval certain payments to Accent Optical s executive officers in connection with the merger. Accordingly, Accent Optical s stockholders are free to vote for or against the approval of such payments.

The board of directors of Accent Optical has also unanimously approved payments to certain executive officers, Bruce C. Rhine, its Chief Executive Officer, Bruce Crawford, its President and Chief Operating Officer and Reid Langrill, its Chief Financial Officer in connection with the merger. Because these payments could be deemed parachute payments under Section 280G of the Internal Revenue Code of 1986, as amended, (the Internal Revenue Code), which would result in adverse tax consequences to Accent Optical and the executives, Messrs. Rhine, Crawford and Langrill have agreed to waive their respective rights to these payments unless Accent Optical obtains the requisite stockholder approval to avoid the adverse tax consequences. Holders of more than 75% of Accent Optical Common Stock and Accent Optical Convertible Preferred Stock, voting together as a single class on an as-converted basis, not including shares owned or constructively owned by executive officers receiving payments in connection with the merger, must approve such payments in order to avoid the adverse tax consequences. Accordingly, Accent Optical is soliciting the proxy of its stockholders to vote FOR the proposal to approve the payments to these executive officers.

This joint proxy statement/prospectus describes Nanometrics, Accent Optical and the merger so that you may make an informed decision with respect to the matters under consideration. A copy of the merger agreement and the amendment thereto dated June 9, 2006 is attached to this joint proxy statement as Annex A.

Q: Why are Nanometrics and Accent Optical proposing to merge? (See page 60)

A: Nanometrics and Accent Optical believe that by combining their product lines and technologies, they can generate improved long-term operating and financial results, improving their competitive position in the industry. The boards of directors of Nanometrics and Accent Optical also believe that the merger of Nanometrics and Accent Optical will create one of the largest independent metrology companies in the semiconductor industry and allow the combined company to expand its market position in each of its primary stand-alone metrology segments after the merger. The merger is expected to create a strong platform for the combined company to deliver metrology systems to both new and existing customers. The Nanometrics and Accent Optical boards of directors believe that the merger will create an opportunity for the holders of both companies capital stock to participate in the growth of the combined company after the merger.

Q: What are the risks of the merger?

A: The 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 Accent Optical;
- the anticipated benefits and synergies of the merger may not be realized;
- the trading price of Nanometrics common stock may decline if the cost benefits of the merger are not realized; and
- customers, distributors, resellers or others may delay or defer decisions concerning Nanometrics and/or Accent Optical during the pendency, or as a result, of the merger.

You are encouraged to read this joint proxy statement/prospectus carefully, including the section entitled Risk Factors beginning on page 30, for a discussion of risks associated with the merger, the combined company and the businesses of each of Nanometrics and Accent Optical.

Q: What will Accent Optical stockholders receive in the merger? (See page 86)

A: Accent Optical has three classes of capital stock outstanding. Each class of Accent Optical capital stock will receive a portion of the total merger consideration, which will consist solely of a specified number of shares of Nanometrics common stock and cash in lieu of fractional shares, if any. Each class of Accent Optical capital stock will be converted into Nanometrics common stock at a different exchange ratio in the merger.

Issuance of the merger consideration will be made to holders of Accent Optical Series A Preferred Stock and Convertible Preferred Stock (collectively, the Accent Optical Preferred Stock) on a *pari passu* basis. If the value of the shares of Nanometrics common stock issuable in the merger is insufficient to provide $1,000 of Nanometrics common stock for each share of Accent Optical Series A Preferred Stock and $1.13 of Nanometrics common stock for each share of Accent Optical Convertible Preferred Stock, then the available merger consideration will be prorated, and holders of Accent Optical Common Stock and options will receive no consideration in the merger.

Q: Will Accent Optical s stockholders receive the full amount of their preferences and accrued dividends as set forth on Accent Optical s certificate of incorporation? (See page 86)

A: No. The holders of Series A Preferred Stock will receive Nanometrics common stock valued at $1,000 for each shares of Series A Preferred Stock, which is the amount that such stockholders originally paid for their Series A Preferred Stock. The holders of Series A Preferred Stock will forego the 13.5% cumulative dividend that Accent Optical has been accruing since 2000 (which dividends totaled approximately $1,027 per share as of December 31, 2005).

The holders of Convertible Preferred Stock will receive Nanometrics common stock valued at $1.13 for each share of Convertible Preferred Stock, which is approximately 55% of the $2.05 liquidation preference on such shares. In addition, the holders of Convertible Preferred Stock will forego the 8% cumulative dividend that Accent Optical has been accruing since such shares were issued (which dividends totaled approximately $0.83 per share as of December 31, 2005).

Table of Contents

Similarly, Bio-Rad Laboratories, Inc. (Bio-Rad), in addition to its rights as a holder of Accent Optical Common Stock, had a contractual right to receive a $13 million change of control payment from Accent Optical as a result of the change of control contemplated by the merger agreement. The provision governing this change of control payment is contained in the agreement between Bio-Rad and Accent Optical pursuant to which Accent Optical purchased the assets of the former Semiconductor Measurements Division of Bio-Rad (the Bio-Rad SMD). Bio-Rad has agreed that, if the merger is consummated, it will forego all but $2.5 million of the change of control payment to which it otherwise would have been entitled.

The allocation of the consideration was structured so that the merger would provide benefit to all Accent Optical stockholders, and to provide incentive for the holders of Accent Optical Common Stock to approve the merger. If the merger and merger agreement, as amended, are approved by the necessary vote of the Accent Optical stockholders, the allocation of the merger consideration set forth in the merger agreement will supersede the rights of stockholders to the preferences and accrued dividends described in Accent Optical s certificate of incorporation.

Q: What is the escrow and how does it work?

A: Upon completion of the merger, Nanometrics will withhold approximately 490,000 shares of Nanometrics common stock from the shares to be distributed to the Accent Optical stockholders at closing of the merger and deposit those shares into an escrow account. The size of escrow was arrived at after negotiations between Accent Optical and Nanometrics and was determined as a percentage of the overall transaction size. These escrowed shares will be available to compensate Nanometrics if it is entitled to indemnification under the merger agreement, as amended. Additionally, upon closing of the merger, Nanometrics will have an immediate claim on the escrow account for a number of shares equal to the Accent Optical transaction costs that exceed $4.2 million, which excess is currently anticipated to be approximately $950,000, divided by the Average Closing Price. Any portion of the remaining escrowed amount that, within 12 months following the completion of the merger, has not been withdrawn or earmarked to satisfy a claim for loss by Nanometrics, will be distributed to the Accent Optical stockholders promptly (but in no event more than 20 days), after expiration of the 12-month escrow period. The value of the escrowed shares will fluctuate with the market price of Nanometrics common stock. Based upon the Average Closing Price on June 6, 2006, the value of the shares in escrow would be equal to $5,311,600.

Q: What will holders of options to purchase Accent Optical Common Stock receive in the merger? (See page 88)

A: At the closing of the merger, Nanometrics will assume each outstanding option to acquire shares of Accent Optical Common Stock that is in-the-money or that was granted on or after January 23, 2006, regardless of whether such option is in-the-money. An option will be in-the-money if the per share exercise price for the option is less than the value of Nanometrics common stock that the holder of one share of Accent Optical Common Stock would be entitled to receive in the merger.

Each assumed option will be converted into an option to purchase the number of Nanometrics shares that would have been issuable in exchange for the number of Accent Optical shares subject to the assumed option, had such shares been outstanding at the closing of the merger. The exercise price of such assumed options will be adjusted such that the aggregate exercise price for the option remains constant.

Q: Do the Accent Optical stockholders have obligations relating to Accent Optical s transaction expenses? (See page 99)

A: The merger agreement, as amended, provides that Accent Optical stockholders will indemnify Nanometrics with respect to any transaction expenses of Accent Optical in excess of $4.2 million. Transaction expenses are broadly defined within the merger agreement to include the $2.5 million fee owed to Bio-Rad, as well as fees owed to Accent Optical s investment banker, lawyers and accountants. Accent Optical currently estimates its transaction expenses at $5.15 million. Accordingly, upon closing of the merger, Nanometrics would have an immediate claim on the escrow in the amount of approximately $950,000.

Q: What are the United States federal income tax consequences of the merger? (See page 80)

A: Nanometrics and Accent Optical each expect the merger to qualify as a reorganization pursuant to Section 368(a) of the Internal Revenue Code for U.S. federal income tax purposes. Assuming that the merger so qualifies, Accent Optical stockholders will not recognize gain or loss for United States federal income tax purposes as a result of the merger, other than gain or loss attributable to cash received by Accent Optical stockholders instead of fractional shares.

Q: When do Nanometrics and Accent Optical expect to complete the merger? (See page 95)

A: Nanometrics and Accent Optical are working to complete the merger as quickly as possible. Nanometrics and Accent Optical currently expect to complete the merger in the third quarter of 2006. Nanometrics and Accent Optical cannot predict the exact timing of the completion of the merger.

Q: What vote is required by Nanometrics shareholders to proceed with the merger? (See page 48)

A: Under the applicable rules of the Nasdaq Stock Market, Nanometrics cannot complete the merger unless the issuance of shares of Nanometrics common stock in the 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 special meeting. Members of Nanometrics board of directors and officers holding approximately 30.9% of Nanometrics outstanding common stock as of January 25, 2006 have entered into voting agreements, which obligate them to approve the share issuance.

Q: How does the Nanometrics board of directors recommend that the Nanometrics shareholders vote on the share issuance? (See page 64)

A: The Nanometrics board of directors unanimously recommends that its shareholders vote FOR Nanometrics proposal to approve the issuance of shares of Nanometrics common stock in the merger.

Q: Did the Nanometrics board of directors obtain a fairness opinion in connection with its determination to proceed with the merger? (See page 65)

A: Yes. On January 25, 2006, Cowen & Co., LLC, (formerly SG Cowen & Co., LLC) (Cowen) financial advisor to Nanometrics, provided to the Nanometrics board of directors its opinion, that, as of the date of such opinion, the consideration provided for in the merger agreement was fair, from a financial point of view, to Nanometrics. The full text of the Cowen opinion is attached to this joint proxy statement/prospectus as Annex C. Nanometrics encourages its shareholders 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. The Cowen opinion is directed to the Nanometrics board of directors and addresses only the fairness from a financial point of view of the consideration provided for in the merger agreement as of the date of the opinion. Nanometrics paid Cowen a fee upon the delivery of the Cowen fairness opinion.

Q: What vote is required by Accent Optical stockholders to proceed with the merger? (See page 52)

A: Holders of a majority of the outstanding shares of Accent Optical Common Stock and Convertible Preferred Stock, voting together on an as-converted basis, must approve the merger agreement, as amended, and

Table of Contents

the merger. In addition, a majority of each of the Accent Optical Series A Preferred Stock, the Accent Optical Convertible Preferred Stock and the Accent Optical Common Stock, voting as separate classes, must approve the merger.

Members of Accent Optical s board of directors, officers and other investors holding 87% of Accent Optical s Common Stock and Preferred Stock, 89% of Accent Optical s Series A Preferred Stock, 65% of Accent Optical s Convertible Preferred Stock and 88% of Accent Optical s Common Stock have entered into voting agreements that obligate them to vote their shares to approve and adopt the merger agreement, as amended, approve the merger, approve the appointment of the stockholder agent and approve the escrow agreement.

Q: How does the Accent Optical board of directors recommend that the Accent Optical stockholders vote on the matters set forth in the Accent Optical Notice of Special Meeting? (See page 51)

A: The Accent Optical board of directors unanimously recommends that the Accent Optical stockholders vote FOR Accent Optical s proposal to adopt and approve the merger agreement, as amended, approve the merger, approve the appointment of Mr. Wadler as Stockholder Agent, approve the escrow agreement and FOR Accent Optical s proposal to approve payments to certain executive officers.

Q: Did the Accent Optical board of directors obtain a fairness opinion in connection with its determination to proceed with the merger? (See page 70)

A: Yes. On January 24, 2006, Merrill Lynch, Pierce, Fenner & Smith Incorporated (Merrill Lynch), financial advisor to Accent Optical, provided to the Accent Optical board of directors its opinion, that, as of such date and based upon the assumptions made, matters considered and limits of such review, the aggregate consideration provided for in the merger agreement was fair, from a financial point of view, to the holders of Accent Optical capital stock. The full text of the Merrill Lynch opinion is attached to this joint proxy statement/prospectus as Annex D. Accent Optical encourages its stockholders 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. The Merrill Lynch opinion is addressed to the Accent Optical board of directors and addresses only the fairness, from a financial point of view, of the aggregate consideration provided for in the merger agreement as of January 24, 2006. Accent Optical will pay Merrill Lynch a customary fee for the Merrill Lynch fairness opinion upon the closing of the merger.

Q: Do any of the directors and executive officers of Accent Optical have any special interests in the merger? (See page 76)

A: Yes. In considering the recommendation of the board of directors of Accent Optical with respect to the adoption and approval of the merger agreement, as amended, approval of the merger and the other matters described in the Notice of Special Meeting of Accent Optical Stockholders, the stockholders of Accent Optical should be aware that members of the Accent Optical board of directors and Accent Optical executive officers have interests in the merger that may be different than, or in addition to, the interests of the Accent Optical stockholders generally. These interests include:

- the appointment of Bruce C. Rhine, a director and the current Chief Executive Officer of Accent Optical, as a director and Chief Strategy Officer of Nanometrics following the merger, for which he will receive a base salary of $250,000 per year, standard Nanometrics employee benefits and paid vacation;

- an agreement between Accent Optical and Reid Langrill, its Chief Financial Officer, which provides for Mr. Langrill s continued employment at his regular salary with Accent Optical or its successors through the completion of the merger and up to 30 days thereafter; receipt of a severance payment, upon his termination, equal to the greater of either $185,000 or the difference between $500,000 and the value of Mr. Langrill s options that are in-the-money as of the completion of the merger, subject to withholding;

and, following Mr. Langrill s termination as Chief Financial Officer of Accent Optical, for Mr. Langrill to provide consulting services to Nanometrics through March 15, 2007, subject to earlier termination, at a rate of $105 per hour and reimbursement of expenses;

the potential receipt of severance benefits by Bruce Crawford, Accent Optical s President and Chief Operating Officer, if Accent Optical terminates Mr. Crawford s employment without good cause or Mr. Crawford terminates his employment for good reason during the five-year term of his employment agreement, including a lump-sum payment in the amount of his annual salary (currently $213,000), continued group health or other group benefits as allowed under the Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA) for a period of 12 months with a potential gross-up for taxes arising and reimbursement of relocation expenses up to $50,000;

the receipt of option grants in connection with the merger by Accent Optical officers, for an aggregate of 5,522,000 shares of Accent Optical Common Stock, which will be assumed by Nanometrics;

the acceleration of vesting of assumed options of officers and directors if their employment is terminated in connection with the merger (options to purchase 8,281,596 shares of Accent Optical Common Stock held by Accent Optical officers and directors are expected to be assumed, based on the Average Closing Price as of June 6, 2006, of which options to purchase 1,997,723 shares of Accent Optical Common Stock are unvested as of June 6, 2006);

the continued indemnification following the merger of the current Accent Optical directors and officers for acts or omissions occurring prior to the closing of the merger;

the receipt by Bio-Rad, a company affiliated with Accent Optical director David Schwartz, of approximately $12.0 million as repayment of a loan and a contractual fee of $2.5 million (related to the 2000 asset purchase from Bio-Rad to form Accent Optical), each in connection with the closing of the merger; and

the re-allocation of the merger consideration so that holders of Accent Optical Common Stock can receive more of the merger consideration than they originally would have been entitled to, which benefits the directors and officers who hold Accent Optical Common Stock.

The Accent Optical board of directors was aware of these interests and considered them, among other matters, in making its recommendation that Accent Optical stockholders approve the merger agreement, as amended, the merger and the related transactions and certain payment to executive officers.

Q: What vote is required by Accent Optical stockholders to approve the payments to certain Accent Optical executive officers? (See page 161)

A: Accent Optical stockholders are being asked to approve certain payments to executive officers, which will or may be made to such executive officers in connection with the merger, and which might otherwise be deemed excess parachute payments for purposes of Section 280G of the Internal Revenue Code and the Treasury Regulations promulgated thereunder (collectively, Section 280G). These payments consist of severance payments, option grants and the value of options that could be accelerated due to the executive officer s termination in connection with the merger. Excess parachute payments are not deductible as a business expense by a corporation, and subject the recipient of such payments to a 20% excise tax (in addition to applicable federal and state income and employment taxes), unless such payments are approved by more than 75% of the outstanding shares of Accent Optical s Convertible Preferred Stock and Common Stock, voting together as a single class on an as-converted basis, not including shares owned or constructively owned by executive officers whose payments in connection with the merger would otherwise be excess parachute payments.

Table of Contents

Q: What should the shareholders of Nanometrics and the stockholders of Accent Optical do now? (For Nanometrics Shareholders, see page 48; for Accent Optical Stockholders, see page 53)

A: After reading and considering the information contained in this joint proxy statement/prospectus carefully, Nanometrics shareholders and Accent Optical stockholders should then vote their respective shares of capital stock in accordance with the instructions in this joint proxy statement/prospectus.

Nanometrics and Accent Optical encourage their respective shareholders to vote as soon as possible so that there is a quorum present at the special meetings.

Q: How can Nanometrics shareholders vote or submit voting instructions? (See page 48)

A: Holders of record of shares of Nanometrics common stock may vote 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 or may vote in person at the Nanometrics special meeting.

Nanometrics common stock held through a broker, bank or other nominee (*i.e.*, in street name), may be voted by providing the record holder of the shares with instructions on how to vote such shares at the Nanometrics special meeting. The broker, bank or other nominee has delivered a voting instruction card with this joint proxy statement/prospectus that contains instructions on how to direct the record holder of the Nanometrics shares to vote at the Nanometrics special meeting. Shares of Nanometrics common stock held in street name, can only be voted in person by the shareholders thereof by obtaining a legal proxy from the record holder of such shares in order to attend the Nanometrics special meeting.

Regardless of whether a Nanometrics shareholder intends to attend the Nanometrics special meeting in person, the Nanometrics board of directors requests that all shareholders submit a proxy prior to the meeting.

Q: If my shares of Nanometrics common stock are held in street name, will my broker, bank, or nominee vote my shares for me on the merger proposal? (See page 48)

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 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 Nanometrics shareholders change their vote after they have mailed their signed proxy or instruction form? (See page 49)

A: Yes. Record holders of Nanometrics common stock can change their vote at any time before their proxy is voted at the Nanometrics special meeting by:

- delivering to the Nanometrics corporate secretary a signed notice of revocation;
- submitting 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 special meeting; or
- attending the Nanometrics special meeting and voting in person. Attendance alone, however, will not revoke a 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 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 Nanometrics special meeting.

Q: How can Accent Optical stockholders vote or submit voting instructions? (See page 53)

A: Holders of record of shares of Accent Optical capital stock, may vote in person or by proxy at the Accent Optical special meeting. Accent Optical stockholders electing to vote by proxy must complete, sign, date and return the enclosed proxy card for the special meeting and returning it in the enclosed pre-paid envelope. Regardless of whether an Accent Optical stockholder intends to attend the Accent Optical special meeting, the Accent Optical board of directors requests that all stockholders submit a proxy prior to the meeting.

Q: Can Accent Optical stockholders change their vote after they have mailed their signed proxy? (See page 53)

A: Yes. Record holders of Accent Optical capital stock can change their vote at any time before their proxy is voted at the Accent Optical special meeting by:

- delivering to the Accent Optical corporate secretary a signed notice of revocation;
- submitting to the Accent Optical proxy holders a new, later-dated proxy, which must be signed and delivered to the Accent Optical corporate secretary in advance of the vote at the Accent Optical special meeting; or
- attending the Accent Optical special meeting and voting in person. Attendance alone, however, will not revoke a previously granted proxy.

Q: Should Accent Optical stockholders send in their stock certificates now? (See page 89)

A: No. Accent Optical stockholders should not send in their stock certificates now. They will receive specific instructions from the exchange agent after the merger has been completed on how to exchange their stock certificates.

Q: Will the shareholders of Nanometrics and the stockholders of Accent Optical have dissenters or appraisal rights in connection with the merger? (See page 82)

A: Under applicable law, Nanometrics shareholders will not have dissenters or appraisal rights in connection with the merger.

Accent Optical stockholders are entitled to appraisal rights in connection with the merger under the Delaware General Corporation Law if such stockholders meet certain conditions. Failure to vote against the merger in and of itself will not constitute a waiver of appraisal rights. However, a vote in favor of the merger will constitute a waiver of appraisal rights. Furthermore, a vote against the merger in and of itself will not be deemed to satisfy any notice requirements under state law with respect to appraisal rights. Please see Dissenters or Appraisal Rights in Connection with the Merger, beginning on page 81 and Annex H for more information.

Q: Whom should I call with questions? (See page 167)

A: If Nanometrics shareholders have any questions about the merger or any other matters described in this joint proxy statement/prospectus, or need to obtain additional copies of this joint proxy statement/prospectus or a proxy card for the Nanometrics special meeting, they should contact:

Nanometrics Incorporated

1550 Buckeye Drive

Milpitas, California 95035

Attention: Investor Relations

Tel: (408) 435-9600

Fax: (408) 232-5910

Table of Contents

If Accent Optical stockholders have any questions about the merger or any other matters described in this joint proxy statement/prospectus, or need to obtain additional copies of this joint proxy statement/prospectus or a proxy card for the Accent Optical special meeting, they should contact:

Accent Optical Technologies, Inc.

1320 SE Armour Drive, Suite B2

Bend, Oregon 97702

Attention: Chief Executive Officer

Facsimile No.: (541) 318-1966

Telephone No.: (541) 322-2500

If any Nanometrics shareholder or Accent Optical stockholder has any questions about how to submit their proxy, the enclosed proxy cards, or voting instructions, or needs to request additional copies of this joint proxy statement/prospectus, such persons should contact Nanometrics proxy solicitors, The Altman Group, Inc. at 1200 Wall Street West, 3rd Floor, Lyndhurst, NJ 07071, or call them at (800) 884-4969.

Table of Contents

SUMMARY

The following is a summary of information contained in this joint proxy statement/prospectus. This summary may not contain all of the information that may be important to you. You are encouraged to read the entire joint proxy statement/prospectus carefully. In addition, you are encouraged to read the information incorporated by reference into this joint proxy statement/prospectus, which includes important business and financial information about Nanometrics that has been filed with the SEC. 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 167.

The Companies

Nanometrics Incorporated (See page 117)

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 and integrated circuits. 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.

Alloy Merger Corporation

Alloy Merger Corporation is an acquisition subsidiary that Nanometrics formed solely to effect the merger. Alloy Merger Corporation has not conducted any other business.

Accent Optical Technologies, Inc. (See page 119)

1320 SE Armour Drive, Suite B2

Bend, Oregon 97702

(541) 322-2500

Accent Optical designs, manufactures, sells and services a broad suite of process control and metrology systems used by manufacturers of semiconductor wafers and compound and silicon semiconductor devices for the advanced computing, communications and consumer electronics markets. Its systems measure optical, electrical and material properties, including the structural composition of compound and silicon semiconductor devices and wafers, the amount of impurities or contaminants in semiconductor devices, electron mobility and the wavelength and intensity of light emitted by light emitting diodes (LEDs) and laser diodes. Its systems also measure the degree of alignment and dimensions of semiconductor device features. Customers use Accent Optical s process control and metrology systems to lower their costs by enhancing their manufacturing efficiency and increasing their production yields, and to improve their product performance and quality. Accent Optical sells its systems globally to leading semiconductor device and wafer manufacturers.

Table of Contents

Overview of Merger Agreement and Related Agreements

The Merger Agreement (See page 86)

On January 25, 2006, Nanometrics, Alloy Merger Corporation, Accent Optical and, solely with respect to Article IX, Sanford S. Wadler entered into the merger agreement. On June 9, 2006, the parties entered into an amendment to the merger agreement for the purpose of extending the date by which the merger is required to be completed before either Nanometrics or Accent Optical can terminate the agreement and to provide for Nanometrics to fund an additional $1,611,238 in working capital loans to Accent Optical to satisfy an interest payment due to Bio-Rad on July 9, 2006. Pursuant to the terms and subject to the conditions set forth in the merger agreement, as amended, Alloy Merger Corporation will merge with and into Accent Optical, and Accent Optical will continue as the surviving corporation in the merger as a wholly owned subsidiary of Nanometrics. The merger agreement and the amendment are attached to this joint proxy statement/prospectus as Annex A. You are encouraged to read the merger agreement, as amended, carefully and in its entirety because it is the legal document that governs the merger.

Merger Consideration (See page 86)

Upon completion of the merger, shares of outstanding Accent Optical capital stock and in-the-money options to acquire Accent Optical Common Stock (as well as all Accent Optical stock options granted on or after January 23, 2006 regardless of their exercise price) will be converted into the right to receive Nanometrics common stock and options to acquire Nanometrics common stock. The total number of shares of Nanometrics common stock that will be issued in the merger will be: (i) 4,900,000, plus (ii) a number of shares equal to the aggregate exercise price of the outstanding in-the-money Accent Optical stock options prior to closing (other than options granted after January 23, 2006), divided by the Average Closing Price, plus (iii) shares of Nanometrics common stock issuable upon exercise of the Accent Optical stock options granted on or after January 23, 2006 (at the same conversion ratio as the Accent Optical in-the-money options). Of the total shares issued to Accent Optical stockholders at closing, Nanometrics will deposit approximately 490,000 shares of common stock into an escrow account that will be available to compensate Nanometrics if it is entitled to indemnification under the merger agreement. Based upon the Average Closing Price of Nanometrics common stock as of June 6, 2006, the value of the 490,000 escrow shares is $5,311,600. Upon closing, Nanometrics will have an immediate claim on the escrow for a number of shares equal to (x) the Accent Optical transaction costs that exceed $4.2 million, which excess is currently estimated to be approximately $950,000, divided by (y) the Average Closing Price.

The maximum number of shares of common stock Nanometrics would issue and reserve for issuance upon the exercise of assumed options is approximately 5,212,286 shares, assuming that the Average Closing Price is equal to $15.63, which would result in the Accent Optical stockholders holding approximately 27% of the fully diluted shares of Nanometrics common stock immediately after the merger, and the Nanometrics shareholders holding approximately 73% of the fully diluted shares of Nanometrics common stock immediately after the merger. For comparison purposes, the Average Closing Price for the 10 trading days ending on June 6, 2006 was $10.84 per share, which would have resulted in the issuance, or reservation for issuance upon the exercise of assumed options, of approximately 5,138,282 shares of Nanometrics common stock had the merger closed two days following June 6, 2006.

Nanometrics will not issue fractional shares of its common stock in the merger. As a result, each Accent Optical stockholder will receive cash in lieu of any fractional share of Nanometrics common stock the stockholder would otherwise be entitled to receive in the merger.

Table of Contents

Allocation of Merger Consideration among Accent Optical Stockholders *(See page 86)*

Accent Optical has three classes of capital stock outstanding. Each class of Accent Optical capital stock will receive a portion of the total merger consideration, which will consist solely of a specified number of shares of Nanometrics common stock and cash in lieu of fractional shares, if any. Each class of Accent Optical capital stock will be converted into Nanometrics common stock at a different exchange ratio in the merger. The following table shows the calculation of the per share exchange ratios for each class of Accent Optical capital stock subject to the escrow:

Class	Per Share Exchange Ratio	Estimate if Average Closing Price is $10.84	Estimated Value Per Share
Series A Preferred	$1,000.00 / Average Closing Price	92.250923	$ 1,000.00
Convertible Preferred Stock	$1.13 / Average Closing Price	0.1042	$ 1.13
Common Stock	((4,900,000 shares (as adjusted for additional shares issued for in-the-money options) minus shares issued to Accent Optical Series A Preferred Stock minus shares issued to Accent Optical Convertible Preferred Stock)) divided by (total outstanding Accent Optical Common Stock plus in-the-money options (other than options issued on or after January 23, 2006))	0.02233	$ 0.2421

The amounts receivable by the holders of Accent Optical Series A Preferred Stock and Convertible Preferred Stock are less than the preferences and accrued dividends payable to such holders under Accent Optical s certificate of incorporation. The allocation of consideration was structured so that the merger would provide benefit to all Accent Optical stockholders and to provide incentive for the holders of Accent Optical Common Stock to approve the merger.

Because the final exchange ratios are based on the Average Closing Price for the ten days ending two days prior to closing, they cannot be determined until immediately prior to the closing date of the merger.

Issuance of the merger consideration will be made to holders of Accent Optical Series A Preferred Stock and Convertible Preferred Stock (collectively, the Accent Optical Preferred Stock) on a *pari passu* basis. If the value of the shares of Nanometrics common stock issuable in the merger is insufficient to provide $1,000 of Nanometrics common stock for each share of Series A Preferred Stock and $1.13 of Nanometrics common stock for each share of Convertible Preferred Stock, then the available merger consideration will be prorated, and holders of Accent Optical Common Stock and options will receive no consideration in the merger.

The following table shows the approximate dollar value that will be received for one share of Accent Optical Common Stock, one share of Series A Preferred Stock and one share of Convertible Preferred Stock based on varying average closing prices for Nanometrics stock. The amounts shown take into account the reduction in the purchase price resulting from the amount that Accent Optical transaction expenses exceed the limit provided for in the merger agreement of $4.2 million. Transaction expenses are currently expected to be approximately $5.15 million resulting in an immediate claim against the escrow of $950,000.

Average Closing Price	Value Received for One Share of Accent Optical Common Stock	Value Received for One Share of Accent Optical Series A Preferred Stock	Value Received for One Share of Accent Optical Convertible Preferred Stock
$ 3.00	$ 0.000	$ 753.629	$ 0.851
$ 5.00	$ 0.037	$ 1,000.000	$ 1.130
$ 7.00	$ 0.105	$ 1,000.000	$ 1.130
$ 9.00	$ 0.174	$ 1,000.000	$ 1.130
$11.00	$ 0.241	$ 1,000.000	$ 1.130
$13.00	$ 0.307	$ 1,000.000	$ 1.130
$15.00	$ 0.373	$ 1,000.000	$ 1.130
$17.00	$ 0.438	$ 1,000.000	$ 1.130
$19.00	$ 0.503	$ 1,000.000	$ 1.130

Treatment of Accent Optical Stock Options (See page 88)

At the closing of the merger, Nanometrics will assume each outstanding option to acquire shares of Accent Optical Common Stock that is in-the-money or that was granted on or after January 23, 2006, regardless of whether such option is in-the-money. An option will be in-the-money if the per share exercise price for the option is less than the value of Nanometrics common stock that the holder of one share of Accent Optical Common Stock would be entitled to receive in the merger.

Each assumed option will be converted into an option to purchase the number of Nanometrics shares that would have been issuable in exchange for the number of Accent Optical shares subject to the assumed option, had such shares been outstanding at the closing of the merger. The exercise price of such assumed options will be adjusted such that the aggregate exercise price for the option remains constant.

In addition, if the employment or service relationship of the holder of any assumed options or Accent Optical Common Stock that is subject to vesting is terminated within six months following the completion of the merger, other than by Accent Optical or its successor for cause or by the holder without good reason, the vesting of the options or shares held by such holder will accelerate in full. Each assumed option will be subject to all other terms and conditions set forth in the applicable documents evidencing the option immediately prior to the closing of the merger.

As of June 6, 2006, options to purchase approximately 13,259,343 shares of Accent Optical Common Stock were outstanding and either in-the-money (based upon the Average Closing Price, had the merger closed two days following June 6, 2006), or granted on or after January 23, 2006.

Nanometrics has agreed to file, within 15 business days after completion of the merger, a registration statement on Form S-8 with the SEC covering shares of Nanometrics common stock issuable in connection with the assumed options. As a result, all shares of Nanometrics common stock issuable upon exercise of assumed options will be freely transferable as long as the registration statement remains effective.

Table of Contents

All Accent Optical options that are not in-the-money (and which were not granted on or after January 23, 2006) will be out-of-the-money at the closing of the merger and will terminate if not exercised prior to the closing. The options that are not assumed by Nanometrics will vest in full as of the closing date of the merger in full, pursuant to the terms of the Accent Optical stock incentive plan, immediately prior to their termination. As of June 6, 2006, options to purchase approximately 3,268,874 shares of Accent Optical Common Stock were outstanding and out-of-the-money (based upon the Average Closing Price, had the merger closed two days following June 6, 2006). If the Average Closing Price is equal to or greater than $15.63, then all outstanding stock options of Accent Optical will be assumed in the merger.

Non-Solicitation Restrictions (See page 93)

The merger agreement, as amended, contains detailed provisions that prohibit Accent Optical and its subsidiaries, as well as its 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.

Conditions to Completion of Merger (See page 96)

Under the terms of the merger agreement, as amended, Nanometrics and Accent Optical are not required to complete the merger until the following conditions have been satisfied:

- the registration statement filed with the Securities and Exchange Commission (the SEC) with respect to the shares of Nanometrics common stock to be issued in connection with the merger has been declared effective by the SEC;
- the Nanometrics shareholders have approved the issuance of shares of Nanometrics common stock in the merger, and the Accent Optical stockholders have approved the merger agreement, as amended, and the merger as well as certain other items included in the Notice of the Accent Optical Special Meeting of Stockholders including the escrow agreement and appointment of the stockholder agent;
- any applicable waiting periods have expired or the parties have received all clearances, consents and approvals necessary for completion of the merger under United States and foreign antitrust laws;
- the absence of any legal restraints or prohibitions preventing the completion of the merger;
- the authorization for listing on the Nasdaq National Market of the shares of Nanometrics common stock to be issued in the merger;
- the delivery to each party of tax opinions of legal counsel to the effect that the 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, as amended, are 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;
- each party has performed or complied in all material respects with all agreements and covenants contained in the merger agreement at the completion of the 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 Accent Optical may waive the conditions to the performance of its respective obligations under the merger agreement, as amended, and complete the merger even though one or more of these conditions has not been met.

Termination Rights and Fees (See page 98)

Under circumstances specified in the merger agreement, as amended, either Nanometrics or Accent Optical may terminate the merger agreement, as amended, subject to the limitations set forth in the merger agreement, if:

- the Boards of Directors of both Nanometrics and Accent Optical mutually consent in writing;
- the merger is not completed by July 31, 2006;
- a non-appealable final order of a court or other action of any governmental authority has the effect of permanently prohibiting completion of the merger;
- the required approval of the shareholders of Nanometrics and the stockholders of Accent Optical has not been obtained at their respective special meetings; or
- the other party breaches its representations, warranties or covenants in the merger agreement, as amended, such that its conditions to completion of the merger regarding representations, warranties or covenants would not be satisfied.

If the merger is not completed under because the Nanometrics shareholders have not approved the issuance of Nanometrics common stock or the Accent Optical stockholders have not approved the matters set forth in the Notice of Special Meeting of Accent Optical Stockholders, then Nanometrics or Accent Optical, respectively, will be required to pay the other $5 million, plus expenses.

Accounting Treatment of the Merger (See page 82)

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

Voting Agreements

Nanometrics Voting Agreements (See page 99)

Each of the directors and officers of Nanometrics has entered into a voting agreement with Accent Optical, agreeing to vote all of his respective shares of Nanometrics common stock, including shares of Nanometrics common stock acquired after the date of the voting agreements, in favor of the Nanometrics proposal related to the merger, including approval of the merger agreement, as amended, and any action required to further the merger.

Each of these shareholders has also granted to Accent Optical an irrevocable proxy to vote the shares of Nanometrics common stock subject to the voting agreements in accordance with its terms. The voting agreements and irrevocable proxies terminate upon the earlier of the termination of the merger agreement, as amended, or the effective time of the merger.

At the close of business on January 25, 2006, the parties to the Nanometrics voting agreements and their affiliates owned and were entitled to vote 4,024,815 shares of Nanometrics common stock, collectively representing approximately 30.9% of the shares of Nanometrics common stock outstanding on that date. As of the record date for the Nanometrics special meeting, the parties to the Nanometrics voting agreement and their affiliates owned and were entitled to vote 4,046,141 shares of Nanometrics common stock, collectively representing approximately 31% of the shares of Nanometrics common stock outstanding on that date.

The voting agreements prohibit the signing shareholders from selling or disposing of any shares or options of Nanometrics common stock beneficially owned by the signing shareholders, unless the transferee agrees to be bound by the terms and conditions of the voting agreement. A form of the Nanometrics voting agreement is attached to this joint proxy statement/prospectus as Annex B-1.

17

Table of Contents

Accent Optical Voting Agreements (See page 100)

Certain Accent Optical directors, officers and their affiliated entities and certain other affiliates of Accent Optical have entered into a voting agreement with Nanometrics and Alloy Merger Corporation, agreeing to vote all of their respective shares of Accent Optical capital stock, including shares of Accent Optical capital stock acquired after the date of the voting agreements, in favor of the Accent Optical merger-related proposals including the adoption and approval of the merger agreement, as amended. Some of the voting agreements included certain conditions on the holder s obligation to vote the holder s shares related to the terms of the merger agreement, as amended.

Each of these stockholders has also granted to Nanometrics an irrevocable proxy to vote the shares of Accent Optical capital stock subject to the voting agreements in accordance with its terms. The voting agreements and irrevocable proxies terminate upon the earlier of the termination of the merger agreement, as amended, the closing of the merger or 12 months after the date of the agreement. The voting agreements originally contained the agreement of each of these stockholders to vote the holder s shares in favor of the approval of certain payments to Accent Optical executive officers pursuant to Section 280G of the Internal Revenue Code. Nanometrics and Alloy Merger Corporation subsequently waived this requirement.

At the close of business on January 25, 2006, and as of the record date for the Accent Optical special meeting, , these stockholders and their affiliates beneficially owned and were entitled to vote 124,193,172 shares of Accent Optical Common Stock, collectively representing approximately 87.9% of the shares of Accent Optical Common Stock outstanding on that date; 8,396.77 shares of Accent Optical Series A Preferred Stock, collectively representing approximately 88.9% of the shares of Accent Optical Series A Preferred Stock outstanding on that date; and 5,036,584 shares of Accent Optical Convertible Preferred Stock, collectively representing approximately 64.7% of the shares of Accent Optical Convertible Preferred Stock outstanding on that date.

The voting agreements prohibit the signing stockholders from selling or disposing of any shares or options of Accent Optical capital stock beneficially owned by the signing stockholders without the prior written consent of Nanometrics. A form of the Accent Optical voting agreement is attached to this joint proxy statement/prospectus as Annex B-2.

Escrow Agreement *(See page 102)*

Pursuant to the merger agreement, as amended, approximately 490,000 shares of Nanometrics common stock deliverable as consideration in the merger will be withheld and deposited with U.S. Stock Transfer Corporation to hold in an escrow fund in order to secure Accent Optical s and its former stockholders performance of indemnification obligations under Article IX of the merger agreement, as amended.

Upon closing, Nanometrics will have an immediate claim on the escrow for a number of shares equal to the Accent Optical transaction costs that exceed $4.2 million, which excess is currently anticipated to be approximately $950,000, divided by the Average Closing Price. Based on the Average Closing Price for the ten trading days ending on June 6, 2006, $10.84, the value of the shares to be placed in escrow would be $5,311,600.

In connection with the execution of the merger agreement, Nanometrics, Alloy Merger Corporation, Sanford S. Wadler, as Stockholder Agent, and U.S. Stock Transfer, as Depositary Agent, entered into an escrow agreement setting forth additional terms and conditions relating to the operation of the escrow fund and the indemnification claim procedures. The full text of the escrow agreement is attached as Annex F.

Table of Contents

Employment and Severance Agreements

Employment Agreement (See page 102)

Bruce C. Rhine, Accent Optical s Chairman and Chief Executive Officer, has entered into an employment agreement with Nanometrics, pursuant to which Mr. Rhine will become the Chief Strategy Officer of Nanometrics following the merger. He will receive a base salary of $250,000, standard Nanometrics employee benefits and paid vacation. In connection with his employment, Mr. Rhine has agreed to certain non-competition and non-solicitation provisions, described under *Agreements Related to the Merger Employment Agreement.*

Executive Officer Retention and Severance Arrangements (See page 77)

Reid Langrill. In connection with the merger, Accent Optical entered into an agreement with Reid Langrill, its Chief Financial Officer, which provides for Mr. Langrill s continued employment with Accent Optical or its successors through the completion of the merger and up to 30 days thereafter. During his period of employment, he will continue to earn his regular salary. Upon his termination, he will receive a severance payment equal to the greater of either $185,000 or the difference between $500,000 and the value of Mr. Langrill s options that are in-the-money as of the completion of the merger, subject to withholding. Following his termination, Mr. Langrill has agreed to provide consulting services to Nanometrics through March 31, 2007, subject to earlier termination, for an hourly rate and reimbursement of expenses.

Bruce Crawford. Accent Optical entered into an employment agreement with Bruce Crawford, upon commencement of his role as President and Chief Operating Officer, which provides for certain severance benefits if Accent Optical terminates Mr. Crawford s employment without good cause or Mr. Crawford terminates his employment for good reason during the five-year term of the agreement. Upon such termination, Mr. Crawford is entitled to receive a lump-sump payment of his annual salary (currently $213,000), continued group health or other group benefits as allowed under the Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA) for a period of 12 months (with a potential gross-up for taxes arising from the provision of such benefits) and reimbursement of relocation expenses up to $50,000. See *The Merger Interests of Accent Optical Directors and Executive Officers in the Merger Executive Officer Retention and Severance Arrangements.*

Proposal Two Payments to Executives *(See page 161)*

The merger will constitute a change in the ownership or effective control of Accent Optical for purposes of Section 280G. Pursuant to Section 280G, payments of compensation made to a disqualified individual that are contingent on a change in the ownership or effective control of a corporation and that exceed a threshold amount applicable to that particular disqualified individual may be characterized as excess parachute payments. Excess parachute payments are not deductible as a business expense by a corporation, and subject the recipient of such payments to a 20% excise tax (in addition to applicable federal and state income and employment taxes), unless such payments are approved by the requisite approval of the stockholders of the corporation.

Accent Optical has determined that Bruce C. Rhine, its Chairman and Chief Executive Officer, Bruce Crawford, its President and Chief Operating Officer, and Reid Langrill, its Chief Financial Officer, may be treated as disqualified individuals for purposes of Section 280G and that a portion of the potential parachute payments may be treated as excess parachute payments. The board of directors of Accent Optical has unanimously approved the potential excess parachute payments to Messrs. Rhine, Crawford and Langrill. These payments consist of severance payments, option grants and the value of options that could be accelerated due to the executive officer s termination in connection with the merger. All holders of shares of outstanding capital stock of Accent Optical as of [ ], 2006 (other than shares held directly or indirectly by Messrs. Rhine, Crawford and Langrill) are being asked to approve the potential parachute payments. Messrs. Rhine, Crawford and Langrill have agreed to waive that portion of their respective potential parachute payments in excess of the threshold that would cause such payments to be characterized as excess parachute payments in the event shareholder approval is not obtained. If approval is obtained by a vote of the Accent Optical stockholders holding more than 75% of the voting power of all outstanding capital stock of Accent Optical entitled to vote, then Messrs. Rhine, Crawford and Langrill will each be entitled to receive the full amount of their respective potential parachute payments estimated to be $415,000, $382,000 and $395,000, respectively, at an average closing price of Nanometrics common stock of $10.84. At an average closing price of Nanometrics common stock of $10.84, only Mr. Langrill would have potential parachute payments exceeding the threshold and if shareholder approval is obtained, Mr. Langrill will be entitled to receive approximately $49,000 which he would otherwise have forfeited in the absence of shareholder approval. No Accent Optical stockholder is obligated to vote in any manner with respect to the potential parachute payments, thus, approval of the potential parachute payments is not assured.

Opinion of Nanometrics Financial Advisor *(See page 65)*

Cowen delivered its opinion to the board of directors of Nanometrics that, as of January 25, 2006, the consideration to be paid in the merger was fair, from a financial point of view, to Nanometrics.

The full text of the Cowen opinion is attached hereto as Annex C. You are urged to read the opinion carefully in its entirety.

Opinion of Accent s Optical Financial Advisor *(See page 70)*

Merrill Lynch delivered its opinion to the board of directors of Accent Optical that, as of January 24, 2006, the aggregate consideration to be paid in the merger was fair, from a financial point of view, to the holders of Accent Optical capital stock.

The full text of the Merrill Lynch opinion is attached hereto as Annex D. You are urged to read the opinion carefully in its entirety.

Interests of Certain Directors, Officers and Affiliates of Accent Optical *(See page 76)*

Members of the Accent Optical board of directors and Accent Optical executive officers have interests in the merger that may be different than, or in addition to, the interests of Accent Optical stockholders generally. These interests include:

- the appointment of Bruce C. Rhine, a director and the current Chief Executive Officer of Accent Optical, as a director and Chief Strategy Officer of Nanometrics following the merger, for which he will receive a base salary of $250,000 per year, standard Nanometrics employee benefits and paid vacation;

- an agreement between Accent Optical and Reid Langrill, its Chief Financial Officer, which provides for Mr. Langrill s continued employment at his regular salary with Accent Optical or its successors through the completion of the merger and up to 30 days thereafter; receipt of a severance payment, upon his termination, equal to the greater of either $185,000 or the difference between $500,000 and the value of Mr. Langrill s options that are in-the-money as of the completion of the merger, subject to withholding; and, following Mr. Langrill s termination as Chief Financial Officer of Accent Optical, for Mr. Langrill to provide consulting services to Nanometrics through March 15, 2007, subject to earlier termination, at a rate of $105 per hour and reimbursement of expenses;

- the potential receipt of severance benefits by Bruce Crawford, Accent Optical s President and Chief Operating Officer, if Accent Optical terminates Mr. Crawford s employment without good cause or Mr. Crawford terminates his employment for good reason during the five-year term of his employment agreement, including a lump-sum payment in the amount of his annual salary (currently $213,000),

Table of Contents

continued group health or other group benefits as allowed under the Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA) for a period of 12 months with a potential gross-up for taxes arising and reimbursement of relocation expenses up to $50,000;

the receipt of option grants in connection with the merger by Accent Optical officers, for an aggregate of 5,522,000 shares of Accent Optical Common Stock, which will be assumed by Nanometrics;

the acceleration of vesting of assumed options of officers and directors if their employment is terminated in connection with the merger (options to purchase 8,281,596 shares of Accent Optical Common Stock held by Accent Optical officers and directors are expected to be assumed, based on the Average Closing Price as of June 6, 2006, of which options to purchase 1,997,723 shares of Accent Optical Common Stock are unvested as of June 6, 2006);

the continued indemnification following the merger of the current Accent Optical directors and officers for acts or omissions occurring prior to the closing of the merger;

the receipt by Bio-Rad, a company affiliated with Accent Optical director David Schwartz, of approximately $12.0 million as repayment of a loan and a contractual fee of $2.5 million (related to the 2000 asset purchase from Bio-Rad to form Accent Optical), each in connection with the closing of the merger; and

the re-allocation of the merger consideration so that holders of Accent Optical Common Stock can receive more of the merger consideration than they originally would have been entitled to, which benefits the directors and officers who hold Accent Optical Common Stock.

The Accent Optical board of directors was aware of these interests and considered them, among other matters, in making its recommendation that Accent Optical stockholders approve the merger agreement, as amended, the merger and the related transactions and certain payments to executive officers.

Material U.S. Federal Income Tax Consequences of the Merger

Nanometrics and Accent Optical each expect the merger to qualify as a reorganization pursuant to Section 368(a) of the Internal Revenue Code for U.S. federal income tax purposes. Assuming that the merger so qualifies, Accent Optical stockholders will not recognize gain or loss for United States federal income tax purposes as a result of the merger, other than gain or loss attributable to cash received by Accent Optical stockholders instead of fractional shares. It is a condition to the merger that each of Nanometrics and Accent Optical receive a legal opinion to the effect that the merger will constitute a reorganization within the meaning of Section 368(a) of the Internal Revenue Code. The tax consequences of the merger to Accent Optical stockholders may vary depending upon each such stockholder s situation. Each Accent Optical stockholder is urged to consult its own tax advisors with respect to the tax consequences of the merger. Please see *Material United States Federal Income Tax Consequences of the Merger*, beginning on page 80 for more information.

Ability to Sell Nanometrics Common Stock

Listing of Nanometrics Common Stock (See page 84)

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

Restrictions on Sales of Certain Shares of Nanometrics Common Stock Received in the Merger (See page 85)

The Nanometrics common shares that Accent Optical stockholders receive in the merger will be freely transferable, except that shares received by persons who are deemed to be affiliates of Accent Optical under SEC rules and regulations will be subject to certain resale restrictions.

21

Table of Contents

In addition, certain Accent Optical stockholders have executed shareholder agreements imposing restrictions on their disposition of shares of Nanometrics common stock received in connection with the merger. These restrictions continue for a period of 24 months following the merger for some of these stockholders or a period of 12 months following the merger for others.

Regulatory Approval *(See page 82)*

The merger is not subject to review by the Department of Justice and the FTC under the HSR Act. However, the Department of Justice, the FTC, or other United States or foreign governmental authorities could challenge or seek to block the merger under the antitrust laws, at any time, even after completion of the merger. Moreover, 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 merger, either before or after it is completed.

Appraisal Rights *(See page 82)*

Nanometrics shareholders are not entitled to appraisal rights in connection with the merger. Accent Optical stockholders have the right under Delaware law to dissent from the adoption and approval of the merger agreement, as amended, to exercise appraisal rights and to receive payment in cash for the fair value of their shares of Accent Optical stock, determined in accordance with Delaware law.

Comparison of Shareholder Rights *(See page 147)*

Accent Optical stockholders receiving shares of Nanometrics common stock in the merger will have different rights once they become Nanometrics shareholders. These differences are described in detail under the heading *Comparison of Rights of Holders* on page 147.

Table of Contents

Summary Selected Historical Financial Data

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

Nanometrics

Nanometrics has derived the following historical information from its audited consolidated financial statements as of December 31, 2005, January 1, 2005, January 3, 2004, December 28, 2002 and December 29, 2001 and for each of the fiscal years then ended and from its unaudited consolidated financial statements as of April 1, 2006 and for each of the three month periods ended April 1, 2006 and April 2, 2005. 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.

	Three Months Ended		Year Ended				
	April 1, 2006	April 2, 2005	December 31, 2005	January 1, 2005	January 3, 2004 [(2)]	December 28, 2002	December 29, 2001 [(1)]
	(in thousands, except per share amounts)						
Consolidated Statement of Operations Data:							
Net revenues:							
Products	$ 15,972	$ 21,010	$ 61,012	$ 62,147	$ 34,592	$ 28,669	$ 42,653
Service	2,996	2,340	9,531	7,784	7,010	6,054	4,931
Total net revenues	18,968	23,350	70,543	69,931	41,602	34,723	47,584
Costs and expenses:							
Cost of products	7,909	9,732	29,173	27,812	17,691	13,237	17,949
Cost of service	2,534	2,573	10,695	8,404	6,620	5,765	5,406
Research and development	2,528	3,179	12,533	12,827	13,399	13,765	10,760
Selling	3,102	3,143	10,945	11,748	11,496	10,862	9,523
General and administrative	4,550	1,998	11,882	5,137	4,689	5,104	4,177
Merger termination fee			(8,300)				
Asset impairment			2,232			1,077	
Total costs and expenses	20,623	20,625	69,160	65,928	53,895	49,810	47,815
Income (loss) from operations	(1,655)	2,725	1,383	4,003	(12,293)	(15,087)	(231)
Interest income	332	130	998	276	397	583	2,576
Interest expense	(13)	(18)	(73)	(110)	(96)	(94)	(86)
Other, net	35	(270)	(579)	(44)	385	100	(517)
Total other income (expense), net	354	(158)	346	122	686	589	1,973
Income (loss) before provision (benefit) for income taxes	(1,301)	2,567	1,729	4,125	(11,607)	(14,498)	1,742
Provision (benefit) for income taxes	21	83	218	426	5,860(3)	(6,230)	782
Net income (loss) [(1)]	$ (1,322)	$ 2,484	$ 1,511	$ 3,699	$ (17,467)	$ (8,268)	$ 960
Net income (loss) per share:							
Basic	$ (0.10)	$ 0.20	$ 0.12	$ 0.30	$ (1.45)	$ (0.70)	$ 0.08
Diluted	$ (0.10)	$ 0.18	$ 0.11	$ 0.28	$ (1.45)	$ (0.70)	$ 0.08
Shares used in per share computation:							
Basic	13,018	12,575	12,760	12,320	12,043	11,878	11,691
Diluted	13,018	13,455	13,471	13,364	12,043	11,878	12,161

(1) Nanometrics adopted Statement of Financial Accounting Standards No. 142, *Goodwill and Other Intangible Assets* (SFAS 142), effective January 1, 2002. Included in the net income for the year ended December 29, 2001 was $68 for amortization of goodwill, net of tax.
(2) The fiscal year ended January 3, 2004 included 53 weeks, whereas the other periods presented include 52 weeks.
(3) The income tax provision for the fiscal year ended January 3, 2004 includes a charge of $6,020 to record a valuation allowance against deferred income tax assets.

Table of Contents

	As of					
	April 1, 2006	December 31, 2005	January 1, 2005	January 3, 2004	December 28, 2002	December 29, 2001
Balance Sheet Data:						
Cash, cash equivalents and short term investments	$ 33,915	$ 45,394	$ 33,868	$ 29,892	$ 36,866	$ 47,227
Working capital	70,046	76,731	68,588	59,587	74,776	80,171
Total assets	138,048	136,300	133,769	121,740	134,688	142,355
Long-term liabilities including current portion	1,951	1,796	4,164	4,350	4,761	3,942
Total shareholders equity	120,362	120,343	116,829	108,441	124,106	129,845

Accent Optical

Accent Optical has derived the following historical information from its audited consolidated financial statements as of December 31, 2005, 2004, 2003, 2002 and 2001 and for each of the fiscal years then ended and from its unaudited consolidated financial statements as of April 1, 2006 and for each of the three month periods ended April 1, 2006 and April 2, 2005. The information is only a summary and should be read in conjunction with Accent Optical s consolidated financial statements and accompanying notes and management s discussion and analysis of results of operations and financial condition included in this joint proxy statement/prospectus.

	Three Months Ended		Year Ended December 31,				
	April 1, 2006	April 2, 2005	2005	2004	2003	2002	2001
			(in thousands, except per share amounts)				
Consolidated Statement of Operations Data:							
Total revenues							
Product	$ 8,210	$ 10,872	$ 33,911	$ 33,512	$ 28,078	$ 30,402	$ 63,409
Services	1,855	1,694	7,963	8,529	9,477	7,774	6,583
Total revenues	10,065	12,566	41,874	42,041	37,555	38,176	69,992
Cost of revenues:							
Product	3,688	5,738	16,742	15,885	14,103	16,219	26,696
Services	1,251	1,206	5,453	5,282	4,698	4,057	4,599
Total cost of revenues	4,939	6,944	22,195	21,167	18,801	20,276	31,295
Gross profit	5,126	5,622	19,679	20,874	18,754	17,900	38,697
Research and development	1,918	2,199	8,233	7,341	7,035	6,217	7,509
Selling, general and administrative	3,876	3,545	14,052	15,091	15,672	15,579	23,665
Restructuring costs		5	16	40	126	274	145
Failed initial public offering costs				991			
Amortization of acquired intangibles and goodwill[1]	27	159	453	637	555	1,676	3,050
Impairment of acquired intangibles					156	2,500	3,951
Total operating expenses	5,821	5,908	22,754	24,100	23,544	26,246	38,320
Income (loss) from operations	(695)	(286)	(3,075)	(3,226)	(4,790)	(8,346)	377
Interest expense	(449)	(450)	(1,839)	(1,887)	(1,676)	(1,414)	(1,347)
Other income (expense)	(237)	(23)	(211)	418	(732)	(423)	(738)
Total other expense, net	(686)	(473)	(2,050)	(1,469)	(2,408)	(1,837)	(2,085)
Loss before provision (benefit) for income taxes	(1,381)	(759)	(5,125)	(4,695)	(7,198)	(10,183)	(1,708)
Provision (benefit) for income taxes	12	27	124	93	(166)	(894)	2,696
Net loss	(1,393)	(786)	(5,249)	(4,788)	(7,032)	(9,289)	(4,404)
Cumulative dividends on preferred stock	(904)	(875)	(3,549)	(3,378)	(3,022)	(2,880)	(2,684)

Accretion of beneficial conversion feature				(864)			
Net loss attributable to common stockholders	$ (2,297)	$ (1,661)	$ (8,798)	$ (9,030)	$ (10,054)	$ (12,169)	$ (7,088)
Net loss per share:							
Basic	$ (0.02)	$ (0.01)	$ (0.06)	$ (0.07)	$ (0.08)	$ (0.10)	$ (0.06)
Diluted	$ (0.02)	$ (0.01)	$ (0.06)	$ (0.07)	$ (0.08)	$ (0.10)	$ (0.06)
Weighted average common shares:							
Basic	141,176	141,163	140,928	131,433	126,219	120,289	116,774
Diluted	141,176	141,163	140,928	131,433	126,219	120,289	116,774

Table of Contents

[1] Amortization of goodwill is included in 2001. With the adoption of Statement of Financial Accounting Standards No. 142, *Goodwill and Other Intangible Assets*, effective January 1, 2002, goodwill is no longer amortized.

	April 1,	As of December 31,				
	2006	2005	2004	2003	2002	2001
Balance Sheet Data:						
Cash, cash equivalents and short-term investments	$ 3,239	$ 3,589	$ 5,120	$ 5,508	$ 11,239	$ 17,273
Working capital	9,723	10,097	15,547	16,641	20,026	24,329
Total assets	30,243	27,731	34,830	33,629	40,837	56,692
Long-term debt, less current portion	11,772	11,772	13,440	14,272	14,736	15,512
Accumulated deficit	(31,759)	(30,366)	(25,117)	(20,329)	(13,297)	(4,008)
Total stockholders equity	1,960	2,600	8,096	7,474	13,237	21,354

25

Table of Contents

Selected Unaudited Pro Forma Condensed Combined Financial Data

The following selected pro forma condensed combined financial data for the year ended December 31, 2005 and for the three months ended April 1, 2006 gives effect to Nanometrics acquisition of Accent Optical as if it had occurred on January 2, 2005, the beginning of Nanometrics fiscal year ended December 31, 2005. The selected pro forma condensed combined financial data as of April 1, 2006 gives effect to the Accent Optical merger as if it had occurred on April 1, 2006. The pro forma combined statements of operations for the year ended December 31, 2005 and the three months ended April 1, 2006 also give effect to Nanometrics acquisition of Soluris, Inc. as if it had occurred on January 2, 2005. The pro forma adjustments are based upon available information and assumptions that Nanometrics believes are reasonable. The selected pro forma condensed combined financial data are presented for illustrative purposes only. The companies may have performed differently had they always been combined. Stockholders 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 the combined company would experience after the 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 be indicative of the consolidated results of operations or financial condition of Nanometrics that would have been reported had the 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 merger, which cannot be made prior to the completion of the 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 Accent Optical that exist as of the date of the completion of the merger, the final number of shares issued associated with the aggregate merger consideration and stock options assumed. 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 document.

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 this joint proxy statement/prospectus as described under *Unaudited Pro Forma Condensed Combined Financial Statements* beginning on page 104, and (ii) should be read in conjunction with the consolidated financial statements of Nanometrics and Accent Optical and other information filed by Nanometrics with the SEC and incorporated by reference into this joint proxy statement/prospectus (in thousands, except per share amounts) .

	Three Months Ended April 1, 2006	Year Ended December 31, 2005
Income Statement Data:		
Net revenues	$ 30,148	$ 121,090
Loss from operations	$ (3,172)	$ (5,775)
Net loss	$ (3,585)	$ (7,818)
Net loss per share		
Basic	$ (0.21)	$ (0.46)
Diluted	$ (0.21)	$ (0.46)

Table of Contents

	Three Months Ended April 1, 2006	Year Ended December 31, 2005
		As of April 1, 2006
Balance Sheet Data:		
Working capital		$ 63,223
Total assets		$ 237,928
Total long-term debt, including current portion		$ 15,677
Stockholders equity		$ 187,301

Comparative Per Share Information

The following tables set forth historical per share information of Nanometrics, adjusted to give pro forma effect to the purchase of Soluris as if that transaction had occurred on January 2, 2005, and historical per share information of Accent Optical and unaudited pro forma condensed combined per share information after giving effect to the Accent Optical merger and the Soluris acquisition under the purchase method of accounting, based on an average price per share, for the period beginning two trading days before and ending two trading days after the merger was announced, of Nanometrics common stock of $13.87. The unaudited pro forma combined financial data are not necessarily indicative of the financial position had the merger occurred on April 1, 2006, or operating results that would have been achieved had the merger been in effect as of January 2, 2005 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 this joint proxy statement/prospectus as described under *Unaudited Pro Forma Condensed Combined Financial Statements* beginning on page 104. The historical per share information is derived from the audited financial statements as of and for the year ended December 31, 2005 for Nanometrics and Accent Optical and from the unaudited financial statements for the three months ended April 1, 2006 for Nanometrics and Accent Optical.

	Pro Forma Nanometrics	Historical Accent Optical	Pro Forma Combined (2)	Pro Forma Equivalent of One Accent Optical Common Share (3)
Net loss per common share:				
Year ended December 31, 2005				
Basic	$ (0.04)	$ (0.06)	$ (0.46)	$ (0.01)
Diluted	$ (0.04)	$ (0.06)	$ (0.46)	$ (0.01)
Net loss per common share:				
Three months ended April 1, 2006				
Basic	$ (0.15)	$ (0.02)	$ (0.21)	$ (0.00)
Diluted	$ (0.15)	$ (0.02)	$ (0.21)	$ (0.00)
Weighted average shares used to compute net loss per common share (in thousands):				
Year ended December 31, 2005				
Basic	12,760	140,928	17,067	
Diluted	12,760	140,928	17,067	
Three months ended April 1, 2006				
Basic	13,018	141,176	17,325	

Diluted	13,018	141,176	17,325	
Book value per common share:				
April 1, 2006	$ 9.23	$ (0.29)[(1)]	$ 10.54	$ 0.26
April 1, 2006 shares used in computing (in thousands):				
Book value	13,033	141,374	17,769	

27

(1) The historical Accent Optical book value per share was calculated by dividing total stockholders equity as of April 1, 2006, less liquidation preferences of $42,542,297 to the Series A Preferred shareholders and the Convertible Preferred shareholders, by total common shares outstanding.
(2) The combined pro forma data includes the effect of the merger on the basis as described in the notes to the unaudited pro forma combined financial information included elsewhere in this document.
(3) The Pro Forma Equivalent of One Accent Optical Common Share amount was determined by dividing the pro forma Nanometrics and Accent Optical combined company net loss and total stockholders equity by the equivalent Accent Optical common shares outstanding. Equivalent Accent Optical common shares outstanding was determined by dividing the total shares outstanding of the pro forma combined company by the ratio of Nanometrics shares issued to Accent Optical common stockholders to total Nanometrics pro forma shares outstanding after closing.

The unaudited pro forma condensed combined financial statements have been prepared by Nanometrics and Accent Optical for illustrative purposes only and are not necessarily indicative of the condensed consolidated financial position or results of operations in future periods or the results that actually would have been realized had Nanometrics and Accent Optical been a combined company during the specified periods. The pro forma adjustments are based on the preliminary information available at the time of the preparation of this document. The unaudited pro forma condensed combined financial statements, including the notes thereto, should be read in conjunction with, Nanometrics historical consolidated financial statements included in its Annual Report on Form 10-K for the year ended December 31, 2005 and Quarterly Report on Form 10-Q for the three months ended April 1, 2006, which are incorporated herein by reference, and Accent Optical s historical consolidated financial statements included elsewhere herein.

Comparative Per Share Market Price Data

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

	Per Share of Nanometrics Common Stock	
	High	**Low**
2006		
First Quarter	$ 15.71	$ 10.97
Second Quarter (through June 8, 2006)	14.98	9.71
2005		
First Quarter	$ 16.39	$ 11.07
Second Quarter	13.35	9.81
Third Quarter	12.88	10.85
Fourth Quarter	12.01	9.87
2004		
First Quarter	$ 23.50	$ 13.86
Second Quarter	18.94	10.60
Third Quarter	12.20	7.50
Fourth Quarter	17.72	11.14

Table of Contents

Recent Developments

Acquisition of Soluris, Inc. On March 15, 2006, Nanometrics acquired Soluris, Inc., an overlay metrology company headquartered in Concord, Massachusetts. Total consideration to purchase all the outstanding stock of Soluris was $6.9 million in an all-cash transaction.

Acceleration of Working Capital Loan. Pursuant to the merger agreement, Nanometrics agreed to provide Accent Optical with a working capital loan in the aggregate amount of $2,500,000, payable in two equal installments of $1,250,000 pursuant to a form of unsecured, subordinated, convertible promissory note as more fully described in Section 6.17 of the merger agreement. Nanometrics obligation to provide the working capital loan arises in the event that the merger between Nanometrics and Accent Optical has not yet been consummated as of April 30, 2006 or June 30, 2006 and the merger agreement has not been terminated prior to such date.

Accent Optical is entitled to make demand for payment of the first installment of the working capital loan on or after April 30, 2006 and is also entitled to make an additional demand for payment for the second installment of the working capital loan on or after June 30, 2006. On February 23, 2006, Nanometrics Board of Directors unanimously approved the acceleration of the initial loan date to February 24, 2006. Accordingly, Nanometrics received Accent Optical s demand for payment of a portion of the first installment of the working capital loan on March 10, 2006 and Nanometrics and Accent Optical executed the Note with an outstanding principal amount of $1,250,000. Nanometrics accelerated a portion of the loan, in the amount of $750,000, and disbursed such amount to Accent Optical on March 13, 2006. Subsequent to April 1, 2006, Nanometrics advanced an additional $1,750,000 to Accent Optical.

Sales Representative Agreements. On March 13, 2006, Nanometrics and Accent Optical entered into a sales representative agreement whereby Nanometrics agreed to provide Accent Optical with the ability to act as a sales representative for Accent Optical to sell Nanometrics products in Europe in advance of the closing of the merger.

Amendment to Merger Agreement. On June 9, 2006, Nanometrics and Accent Optical entered into an amendment to the merger agreement for the purpose of extending the date by which the merger is required to be completed before either Nanometrics or Accent Optical can terminate the merger agreement and to provide for Nanometrics to fund an additional $1,611,238 in working capital loans to Accent Optical to satisfy an interest payment due to Bio-Rad on July 9, 2006.

Table of Contents

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, Accent Optical and/or the combined company following the merger could be seriously harmed if any of these risks were to materialize. Nanometrics operates in a market environment that is difficult to predict and that involves significant risks, many of which are beyond Nanometrics control. The trading price of shares of Nanometrics common stock may also decline due to the occurrence or perceived impact of any of these risks.

Risks Relating to the Merger

Nanometrics common stock received by Accent Optical stockholders in the merger will fluctuate in value.

Nanometrics will issue and reserve for issuance upon exercise of assumed stock options a maximum of approximately 5,212,286 shares of its common stock in connection with the merger. Because the market price of Nanometrics common stock may fluctuate, the value of the per share merger consideration and the number of shares to be received by the holders of Accent Optical Common Stock and assumed options will depend upon the market price of Nanometrics common stock at the time of the closing of the merger. Holders of Accent Optical Preferred Stock have a right to receive a fixed dollar value of merger consideration per share. Because the value of the Nanometrics common stock will be determined using the Average Closing Price, which will not be known until two days prior to the closing, the number of Nanometrics shares required to pay holders of Accent Optical Preferred Stock could exhaust the available shares. If such event occurred, the holders of Accent Optical Common Stock will receive no Nanometrics shares and holders of Accent Optical Preferred Stock will divide the available Nanometrics shares in proportion to the fixed preference amounts to which they were entitled.

In addition, because the Average Closing Price will not be known until two days prior to the closing, you may not know what the per share merger consideration would be if you hold Accent Optical Common Stock or assumed options when you vote on the matters set forth in this joint proxy statement/prospectus.

Accent Optical stockholders may not receive the consideration to be held in the escrow account, and even if they do receive the shares, the value of the escrowed shares may decline.

Upon completion of the merger, Nanometrics will deposit into an escrow account approximately 490,000 shares of Nanometrics common stock, to be withheld from the shares issued at closing to holders of outstanding shares of Accent Optical capital stock, which shares will be available for a one year period to compensate Nanometrics if it is entitled to indemnification for losses due to breaches of Accent Optical s representations and warranties or other matters specified in the merger agreement, as amended. In the event shares of Nanometrics common stock are withdrawn from the escrow to satisfy a claim, the number of shares will be determined on the basis of the fair market value of the shares at the time the claim is made. As a result, if the market price for Nanometrics common stock falls between closing and the filing of a claim, the former Accent Optical stockholders may be required to forego more shares to satisfy the claim. If the total amount of claims paid or pending at the first anniversary of the closing of the merger exceeds the market value of the escrowed shares, the former Accent Optical stockholders may not receive any of the escrowed shares.

The market value of the Nanometrics common stock deposited in the escrow account may fluctuate or decrease between the time of such deposit and the time at which any escrowed amount is distributed to the Accent Optical equity holders. Accent Optical equity holders will not be compensated for fluctuations in value of the Nanometrics stock.

Some of the directors and executive officers of Accent Optical have interests and arrangements that may have affected their decisions to support or approve the merger.

The interests of some of the directors and executive officers of Accent Optical in the merger and their participation in arrangements that are different from, or are in addition to, those of Accent Optical stockholders generally, may have affected their decision to support or approve the merger.

Table of Contents

As a result, some of the directors and executive officers of Accent Optical may be more likely to recommend the 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 Merger Interests of Accent Optical Directors and Executive Officers in the Merger* beginning on page 76.

Nanometrics and Accent Optical expect to incur significant costs in connection with the merger.

Nanometrics and Accent Optical estimate that they will incur direct transaction costs of $6.7 million in connection with the merger. Certain of Nanometrics costs will be capitalized. Nanometrics will have an immediate claim against the escrow for the portion of Accent Optical s costs that exceeds $4.2 million. Accent Optical currently estimates this claim at $950,000. Nanometrics and Accent Optical believe that the combined company will also incur charges to operations, but cannot reasonably estimate those costs at this time, in the quarter in which the merger is completed to reflect the costs of integrating the two companies. There can be no assurance that the combined company will not incur additional material charges in subsequent quarters to reflect additional costs associated with the merger.

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

If the merger is not completed, the trading price of Nanometrics common stock may decline to the extent that the current market prices reflect an assumption that the merger will be completed. In addition, Nanometrics and Accent Optical 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 alone, or that uncertainty exists surrounding the future direction of the product and service offerings and strategy of the companies on a stand alone basis.

Nanometrics and Accent Optical will be required to pay significant costs incurred in connection with the merger, including legal, accounting and a portion of the financial advisory fees, regardless of whether the merger is completed.

In that regard, Nanometrics has agreed to make a working capital loan to Accent Optical in two disbursements of $1.25 million each, the first on or after April 30, 2006 and the second on or after June 30, 2006. However, Nanometrics and Accent Optical have agreed to accelerate a portion of the disbursements. In connection with their agreement, Nanometrics issued a $750,000 loan to Accent Optical on March 13, 2006 and another in the amount of $1,750,000 after the end of the first quarter. Additionally, Nanometrics has agreed to provide an additional $1,611,238 loan to Accent Optical to satisfy an interest payment that Accent Optical must make to Bio-Rad on July 9, 2006.

In the event the merger is not completed, the working capital loans may continue as a debt obligation of Accent Optical or may be converted to Accent Optical Common Stock if certain events occur. In the event that the merger does not occur, Nanometrics may not receive repayment of the loans in a timely manner, if at all.

If either Nanometrics or Accent Optical fails to obtain shareholder approval of the matters set forth in this joint proxy statement/prospectus, it may be required to pay the other party a termination fee equal to $5 million, plus any applicable costs, expenses and interest pursuant to the merger agreement, as amended.

Nanometrics and Accent Optical must continue to retain and motivate executives and key employees and recruit new employees, and failure to do so could seriously harm the combined company.

In order to be successful, each of Nanometrics and Accent Optical must continue to retain and motivate executives and other key employees and recruit new employees before the merger is completed. Employees of Nanometrics or Accent Optical may experience uncertainty about their future roles until or after strategies with regard to Nanometrics after the merger are announced or executed. These potential distractions related to the merger 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 strategic corporate goals. Any failure by Nanometrics or Accent Optical to retain and motivate executives and key employees during the period prior to the completion of the merger could seriously harm their respective businesses or the business of the combined company after the closing of the merger.

The combined company will need to retain and motivate key executives and employees after the merger in order to be successful. Uncertainty during the integration period after closing will pose retention challenges for the combined company after the closing. Failure to address these challenges could result in undesirable attrition, which would likely harm the combined company s business.

The announcement of the merger may cause customers, distributors, resellers and others to delay or defer decisions concerning purchases from Nanometrics and Accent Optical, which may harm their or the combined company s results of operations.

Because the merger is subject to several closing conditions, uncertainty exists regarding whether and when the merger will be completed. In addition, customers, distributors, resellers and others may be uncertain about the combined company s plans for each of Nanometrics and Accent Optical s products. This uncertainty may cause customers, distributors, resellers and others to delay or defer purchasing decisions, or elect to switch to other suppliers, which could negatively affect the businesses and results of operations of Nanometrics, Accent Optical or the combined company. Prospective customers might also be reluctant to purchase the combined company s products after the merger due to uncertainty about the direction of its products and its willingness to support and service existing products. Customers, distributors, resellers and others may also seek to change existing agreements with Nanometrics or Accent Optical as a result of the merger. These and other actions by customers, distributors, resellers and others could negatively affect the businesses and results of operations of Nanometrics and/or Accent Optical.

Provisions of the merger agreement, as amended, may discourage other companies from entering into a merger or other business combination with Accent Optical that might otherwise benefit its stockholders.

The merger agreement, as amended, prohibits Accent Optical and its affiliates from soliciting or encouraging any discussions regarding a proposal to enter into a merger or business combination with a party other than Nanometrics and requires Accent Optical to seek the approval of the matters set forth in this joint proxy statement/prospectus from its stockholders. In addition, officers, directors and certain stockholders of Accent Optical and their respective affiliates have entered into voting agreements with Nanometrics pursuant to which those persons have agreed to vote their shares of Accent Optical capital stock in favor of the matters set forth in this joint proxy statement/prospectus. As a result of these provisions, a third party may be discouraged from making a proposal to acquire Accent Optical on terms that its stockholders may consider more favorable unless the merger agreement, as amended, between Accent Optical and Nanometrics is first terminated, or at all.

The merger may be completed even though Nanometrics or Accent Optical suffers a material adverse change.

In general, either party can refuse to complete the merger if the other party suffers from a material adverse change between January 25, 2006, the date of the signing of the merger agreement, and the closing of the merger. However, certain types of changes would not prevent the merger from going forward, even if the change would have a material adverse effect on Nanometrics or Accent Optical including:

- changes in the market price or trading volume of Nanometrics common stock;
- changes, circumstances or conditions affecting the economy as a whole or the industries in which Nanometrics and Accent Optical operate if those changes, circumstances or conditions do not disproportionately affect either or both parties;
- any effects resulting primarily from the pendency of the merger or restrictions imposed thereby;

Table of Contents

- any litigation by Accent Optical stockholders or Nanometrics shareholders relating to the merger; and

- the impact of Nanometrics restatements of past financial statements as described in its Current Report on Form 8-K dated October 25, 2005, as amended.

Governmental authorities could seek to block or challenge the merger.

The merger is exempt from the pre-merger notification filing requirements of the Hart-Scott-Rodino Act. However, even after completion of the merger, governmental authorities could seek to block or challenge the 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 merger, before or after it is completed. Nanometrics and Accent Optical may not prevail in such action, and significant legal fees and costs may be incurred even if they are ultimately successful.

Challenges involved in integrating Accent Optical s operations may negatively impact Nanometrics efforts to remediate and improve its financial and managerial control and reporting systems and processes, including with respect to its internal control over financial reporting.

The combined company s ability to successfully offer its products and implement its business plan in a rapidly evolving market will require an effective planning and management process. The combined company 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.

Accent Optical has not been required to prepare a report on the effectiveness of its internal controls over financial reporting because it is not subject to the registration requirements of the Securities Exchange Act of 1934, as amended. Nanometrics did prepare such a report, which noted a material weakness in internal controls relating to its Japanese operations.

The merger will require significant integration efforts by management and, as such, may distract management or otherwise interfere with implementation of the Nanometrics remediation plan. Additionally, unanticipated factors may hinder the effectiveness or delay the integration of Nanometrics and Accent Optical s control systems and as such, there can be no assurances regarding the combined company s ability to remediate the material weakness in our internal controls over financial reporting. Unless the combined company is able to evolve its current capabilities with respect to control systems and procedures, its ability to file reports with the SEC in a timely manner may be adversely affected.

Accent Optical will need to obtain consents to the assignment of certain agreements it has with third parties as a result of the merger and if it cannot obtain these consents, Accent Optical and/or Nanometrics may lose the benefits of these relationships.

Accent Optical is currently attempting to obtain third-party consents for some agreements requiring consent upon a change of control. If Accent Optical is unable to do so, it may be forced to renegotiate these agreements or enter into new agreements with these various third parties. The agreements requiring consent include certain sales representative and distributor agreements, customer agreements, real property leases and license agreements. There can be no assurance that Accent Optical will be able to renegotiate or to negotiate new agreements on favorable terms, or at all.

Risks Related to the Combined Company after the Merger

Although Nanometrics and Accent Optical expect the merger to result in benefits to the combined company, those benefits may not be realized because of integration difficulties or other challenges.

Nanometrics and Accent Optical each have global operations that will need to be integrated successfully in order for Nanometrics to realize the benefits anticipated from the merger. Realizing these benefits will require

Table of Contents

the meshing of technology, operations and personnel of Nanometrics and Accent Optical into a single organization. Nanometrics and Accent Optical expect the integration to be a complex, time-consuming and expensive process that, even with proper planning and implementation, could cause significant disruption. The challenges that the combined company may face include, but are not limited to, the following:

- consolidating operations, including rationalizing corporate information technology and administrative infrastructures;
- coordinating sales and marketing efforts between the two companies;
- overcoming any perceived adverse changes in business focus, including customers concerns that the merger will result in erosion of customer service standards or business focus;
- coordinating and harmonizing research and development activities to accelerate introduction of new products and technologies with reduced cost;
- preserving customer, distribution, reseller, manufacturing, supplier, marketing and other important relationships of Nanometrics and Accent Optical and resolving any potential conflicts that may arise;
- retaining key employees and maintaining employee morale;
- addressing differences in the business cultures of Nanometrics and Accent Optical;
- coordinating and combining operations, relationships and facilities outside of the United States, which may be subject to additional constraints imposed by geographic distance, local laws and regulations; and
- creating a consolidated internal control over financial reporting structure so that the combined company and its independent auditors can report on the effectiveness of its internal controls over financial reporting.

Nanometrics may not successfully integrate the operations of Accent Optical in a timely manner, or at all. In addition, the combined company may not realize the anticipated benefits and synergies of the merger to the extent or when anticipated.

Even if the integration of Nanometrics and Accent Optical s operations, products and personnel is successful, it may place a significant burden on the combined company s management resources. The diversion of management attention and any difficulties encountered in the transition and integration process could harm Nanometrics business, financial condition and operating results.

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

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

Table of Contents

If the combined company fails to successfully develop and introduce new products and services after the merger, it will not be able to compete effectively and its ability to generate revenues will suffer.

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

As the combined company introduces new or enhanced products or integrates Accent Optical s or other new technology into its products, it will face risks relating to such transitions including, among other things, disruption in customers ordering patterns, excessive levels of older product inventories, insufficient 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. The combined company s failure to manage the transition to newer products or the integration of newer technology into its products could adversely affect its business operating results and financial results.

If the combined company is unable to compete successfully against existing and future competitors on the basis of product offerings or price, the combined company could experience an erosion of market share and/or be required to reduce prices, which could result in reduced gross margins.

Nanometrics and Accent Optical s operating results are subject to fluctuations and are inherently unpredictable; if the combined company fails to meet the expectations of securities analysts or investors, the combined company s stock price may decline significantly.

Nanometrics and Accent Optical s operating results are difficult to predict and vary significantly from period to period. As a result, Nanometrics and Accent Optical believe that quarter-to-quarter comparisons of their respective operating results are not necessarily a good indication of what their or the combined company s future performance will be. In addition, future operating results may fluctuate significantly due to several factors, many of which are outside of its control and may not meet the management s expectations or those of securities analysts or investors. If this occurs, the price of the common stock will likely decrease. Factors that may cause fluctuations in the combined company s 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 and microelectronic industries;
- changes in customer preferences for the combined company s products and services;
- competitive pricing pressures and new product introductions by the combined company s competitors;
- inability or failure to respond to changing technology within the semiconductor and microelectronic industries;
- seasonality of demand for the combined company s products and services;
- variations in product costs or the mix of products sold;

the expected high selling prices of the combined company s products which typically results in a long sales cycle and variations in the length of sales cycles;

product quality issues;

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 products and services;
- excess inventory or insufficient inventory to meet demand; or
- litigation.

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 Nanometrics.

The combined company will be dependent on its suppliers, some of which will likely be the sole source for certain components and elements of its technology, and the combined company s 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.

The combined company s 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 may not always be available or may be cost prohibitive. If suppliers were unable or unwilling to meet the combined company s needs for sole source components and if the combined company is unable to obtain an alternative source or if the price for an alternative source is prohibitive, the combined company s ability to maintain timely and cost-effective production of its products would be seriously harmed.

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

The combined company is expected to be dependent on 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. Nanometrics has no long-term supply contracts with such manufacturers and if the combined company 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, the combined company s ability to ship products to its customers could be delayed which could adversely affect its business and financial results.

A limited number of Nanometrics and Accent Optical s customers will continue to comprise a significant portion of the combined company s revenues and any decrease in revenue from these customers could have an adverse effect on the combined company.

Even though the combined company s customer base is expected to increase as a result of the merger, a large portion of the combined company s net revenues will likely continue to depend on sales to a limited number of customers. During 2005, sales to its top 10 customers accounted for 74.2% of Nanometrics net revenues. During 2005, sales to Accent Optical s 10 largest customers accounted for 49.3% of its net revenues. Any downturn in the business of these customers or potential new customers could significantly decrease sales to those customers which, in turn, could adversely affect the combined company s net revenues and results of operations.

The cyclicality of the semiconductor industry may adversely impact the combined company s operating results.

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,

Table of Contents

characterized by diminished product demand, accelerated erosion of prices and excess production capacity. The industry also periodically experiences increased demand and production capacity constraints. Because the combined company s revenues will be dependent upon capital equipment spending by semiconductor manufacturers to increase their capacity or transition to a new process geometry, the combined company s operating results may vary significantly as a result of general conditions in the semiconductor industry.

Nanometrics and Accent Optical s products are highly technical and if they contain undetected errors, the combined company s business could be adversely affected.

Nanometrics and Accent Optical s products are highly technical and complex. Technically complex products such as those of Nanometrics and Accent Optical may contain undetected errors or defects, some of which may only be discovered after a product has been installed and used by customers. Any errors discovered in the products offered by the combined company 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 the combined company s reputation, business and results of operations.

Third parties have claimed and may claim in the future that Nanometrics, Accent Optical or the combined company have infringed or are infringing their intellectual property which claims may result in the combined company incurring significant litigation or licensing expenses or being prevented from selling certain of its products if the claims are successful.

In the normal course of business, Nanometrics and Accent Optical have each 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. Also, in August 2005, Nanometrics was served with a complaint by KLA-Tencor Corporation alleging that certain of our products infringe two of KLA s patents, Patent No. 6,483,580 and Patent No. 6,590,656. In January 2006, KLA added Patent No. 6,611,330 to their claim. In March 2006, the court granted Nanometrics motion to stay the proceedings pending a re-examination of the KLA patents by the U.S. Patent and Trademark Office.

Upon receipt of a claim or becoming aware of potentially relevant patents or other intellectual property rights, the combined company 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, Accent Optical and/or the combined company or their customers are infringing or contributing to the infringement of their intellectual property rights, and the combined company may be found to infringe or contribute to the infringement of those intellectual property rights and require a license to use those rights. Nanometrics, Accent Optical and/or the combined company may be unaware of intellectual property rights of others that may cover some of their respective technology, products and services.

Any litigation regarding patents or other intellectual property could be costly and time consuming and could divert the attention of management and key personnel from the combined company s 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 recently due to the current uncertainty of the law and the increasing competition and overlap of product functionality in the markets served by Nanometrics and Accent Optical. Claims of intellectual property infringement might also require Nanometrics, Accent Optical and/or the combined company to enter into costly royalty or license agreements or to indemnify its customers. However, the combined company may not be able to obtain royalty or license agreements on terms acceptable to it or at all. The combined company also may be subject to significant damages or injunctions against development and sale of its products.

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

The success of the combined company will depend in large part on its proprietary technology and other intellectual property rights. Nanometrics and Accent Optical each rely on a combination of patents, copyrights, trademarks and trade secrets, confidentiality provisions and licensing arrangements to establish and protect their proprietary rights. If the combined company fails to protect or to enforce its intellectual property rights successfully, the combined company s competitive position could suffer, which could harm its operating results.

Nanometrics and Accent Optical s pending patent and trademark applications for registration may not be allowed, or third parties 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 the combined company or may be held invalid and unenforceable against third parties.

The combined company may be required to spend significant resources to monitor and police its intellectual property rights. Effective policing of the unauthorized use of the combined company s products or intellectual property is difficult and litigation may be necessary in the future to enforce its intellectual property rights. Intellectual property litigation is expensive and time-consuming, regardless of the merits of any claim, and could divert the attention of the combined company s management from operating the business. The combined company 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 the combined company s technology or develop competing technologies.

Despite the efforts of Nanometrics and Accent Optical 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 the combined company will be successful in asserting its intellectual property claims. Attempts may be made to copy or reverse engineer aspects of Nanometrics and/or Accent Optical s products or to obtain and use information that is regarded as proprietary. Accordingly, there can be no assurance that the combined company will be able to protect its proprietary rights against unauthorized third-party copying or use. Infringement by others of such proprietary rights could materially harm the combined company s business.

Nanometrics and Accent Optical have international presences 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 the combined company s intellectual property.

Nanometrics and Accent Optical have both targeted countries with large populations and propensities for adopting new technologies as a part of their business plans. However, some of these 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 countries in which the combined company does business. As a result, the combined company may not be able to effectively prevent competitors in these regions from infringing its intellectual property rights, which would reduce the combined company s ability to compete in those regions and could negatively impact its business.

Nanometrics and Accent Optical are subject to litigation claims as part of their operations, and the combined company 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 expects that the combined company (consistent with their experience) will occasionally receive general claims related to the conduct of their business and the performance

Table of Contents

of their products and services, as well as other litigation claims. Any litigation regarding these claims could be costly and time-consuming and could divert the attention of the combined company s management and key personnel from its business operations. The complexity of the technology involved and the uncertainty of litigation increase these risks. The combined company also may be subject to significant damages or equitable remedies regarding the development and sale of its products and the operation of its business.

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

Nanometrics currently conducts significant sales and customer support operations directly and indirectly through its facilities, distributors and resellers outside of the United States. Accent Optical also maintains a substantial portion of its business and operations outside of the United States, with its primary manufacturing facility located in York, England. Both companies depend on the operations of contract manufacturers and suppliers that are located outside of the United States. During 2005, sales outside of the United States accounted for 66.7% of Nanometrics net revenues and 71.8% of Accent Optical s net revenues. Accordingly, the combined company s 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 employment, environmental and other local laws applicable to the combined company s operations in foreign jurisdictions;
- potentially negative consequences from changes in tax laws in the foreign jurisdiction or with respect to the tax treaty between the jurisdiction and the United States;
- difficulty in managing widespread operations; and
- difficulty in managing a geographically dispersed workforce.

Any or all of these factors could have a material adverse impact on the combined company s revenue, expenses and financial condition following completion of the merger.

Future acquisitions or investments that the combined company may make could disrupt its business and harm its financial condition and may dilute the ownership of Accent Optical stockholders.

Each of Nanometrics and Accent Optical has made, and the combined company may continue to make, acquisitions in order to enhance its business. For example, on March 15, 2006, Nanometrics announced that it had purchased Soluris. 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 the combined company has no or limited prior experience and potential loss of key employees. There can be no assurance that the combined company will be able to successfully integrate any businesses, products, technologies or personnel of Soluris or any other company that it might acquire in the future. The integration of businesses that each of Nanometrics and Accent Optical has acquired has been, and will continue to be, a complex, time-consuming and expensive process. Additionally, if the combined company 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

Table of Contents

condition may be adversely affected. In the event of any such investments or acquisitions, the combined company could issue stock that would dilute its then current shareholders percentage ownership, incur debt, assume liabilities, incur amortization expenses related to purchases of intangible assets, or incur large write-offs.

Risks Related to Nanometrics Business

Cyclicality in the semiconductor industry has led to substantial fluctuations in demand for Nanometrics systems, and this cyclicality may, from time to time, continue to cause these fluctuations.

Nanometrics operating results have varied significantly from period to period due to the cyclical nature of the semiconductor industry. 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. Should this trend reverse and the downturn resume, the 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.

Revenues from customers in Asian markets represented approximately 65.5%, 68.8% and 72.7% of Nanometrics total net revenues in 2005, 2004 and 2003, respectively. Countries in the Asia Pacific region, including Japan, South Korea and Taiwan, each of which accounted for a significant portion of Nanometrics business in Asia, experienced general economic weaknesses in 2002 and 2003, which adversely affected Nanometrics revenues at that time. It is anticipated that Nanometrics will continue to rely upon customers in Asia for a majority of its revenues and any future weaknesses or instabilities in the economies of countries in Asia may continue to have a material adverse effect on Nanometrics results of operations and financial condition.

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

Nanometrics believes that sales of integrated metrology systems will continue to be an important source of its revenues. Sales of Nanometrics integrated metrology systems depend upon the ability of Applied Materials, Inc. 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, its business could suffer. If Nanometrics were to lose Applied Materials as a customer for any reason, its ability to realize sales from integrated metrology systems would be significantly diminished, which would harm its business.

Nanometrics largest customers account for a substantial portion of its revenue, and its revenue would materially decline if one or more of these customers were to purchase significantly fewer of Nanometrics 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 this trend is expected to continue. There are only a limited number of large companies operating in the semiconductor industry. Accordingly, Nanometrics expects that it will continue to depend on a small number of large customers for a significant portion of its revenues for the foreseeable future. If any of Nanometrics key customers were to purchase significantly fewer systems, or if a large order were delayed or cancelled, Nanometrics revenues could significantly decline. In 2005, sales to Applied Materials accounted for 20.6% and sales to Samsung Electronics Co. Ltd. accounted for 15.9% of Nanometrics total net revenues, respectively. In 2004, sales to Applied Materials accounted for 21.4% and sales to Samsung accounted for 14.7% of Nanometrics total net revenues, respectively. In 2003, sales to Applied Materials accounted for 15.4% and sales to Hynix Semiconductor, Inc. accounted for 12.0% of Nanometrics total net revenues, respectively.

The success of Nanometrics product development efforts depends on Nanometrics 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 it 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 current and potential competitors have significantly greater resources than it does, and increased competition could impair sales of Nanometrics products.

Nanometrics operates in the highly competitive semiconductor industry and faces competition from a number of companies, many of which have greater financial, engineering, manufacturing, marketing and customer support resources than Nanometrics does. 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 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 industry 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 internal quality specifications, Nanometrics typically will 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 customers as a result of internal processes, or for any other reason, its 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 internal quality specifications. Any significant delays stemming from the failure of Nanometrics products to meet or exceed internal quality specifications, or for any other reasons, would delay shipments. Shipment delays could harm Nanometrics business and reputation in the industry.

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

Notwithstanding its internal quality specifications, Nanometrics systems have sometimes contained errors, defects and bugs when introduced. If Nanometrics delivers systems with errors, defects or bugs, its credibility and the market acceptance and sales of its systems would be harmed. Further, if Nanometrics systems contain

Table of Contents

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.

Relatively small fluctuations in the sales volume of Nanometrics systems may cause its operating results to vary significantly each quarter.

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, integrated metrology systems range in price from approximately $80,000 to $400,000 per system and tabletop metrology systems range in price from approximately $50,000 to $200,000 per system. Accordingly, a small change in the number or mix of systems that Nanometrics sells could cause significant changes in its operating results.

Nanometrics depends on orders that are received and shipped in the same quarter, and therefore its 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, it is sometimes difficult for Nanometrics to attract customers from its competitors even if the Nanometrics metrology systems are superior to those of its competitors.

Once a semiconductor 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.

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

Nanometrics produces all of its systems in its manufacturing facilities located in Milpitas, California and, to a lesser extent, through its 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 its manufacturing facilities, such as those resulting from a severe fire or earthquake, could seriously harm Nanometrics ability to satisfy its customer order deadlines. A significant portion of Nanometrics operations are located in Japan, Taiwan and South Korea, which may be subject to regional political and economic instability.

Table of Contents

Nanometrics customers may cease purchasing its systems at any time.

Nanometrics typically does not have long-term purchase commitments from its customers or a substantial noncancelable backlog. Therefore, generally:

- Nanometrics customers are not obligated to purchase a specified number of its systems and can cancel purchase orders or return systems prior to payment;
- Nanometrics customers are free to purchase systems from its competitors;
- Nanometrics is exposed to competitive price pressure on each order; and
- Nanometrics customers are not required to make minimum purchases.

As a result, Nanometrics sales and revenues over the long term will depend on its ability to provide its customers with the best systems and service. Depending on customers needs and competitive conditions in the marketplace, anticipated system orders may not materialize, and orders that do materialize may be cancelled or delayed. The lack of long-term purchase commitments from customers and a substantial noncancelable backlog may impede the Nanometrics ability to allocate its capacity efficiently and forecast its future revenues. In addition, because Nanometrics expense levels will be based in part on its expectations of future revenues, it may be unable to adjust costs in a timely manner to offset revenue shortfalls.

Risks Related to Accent Optical s Business

Accent Optical has experienced net losses during its limited history operating as an independent company.

From the inception of Accent Optical s business on April 6, 2000 through December 31, 2005, Accent Optical incurred cumulative net losses of $30.4 million. While Accent Optical achieved net income in the period starting on the date of inception and ending December 31, 2000, it has subsequently incurred net losses each year and may continue to do so in the future. Further, to support its worldwide customer base, Accent Optical maintains significant operations around the world. Accent Optical s revenues may not be sufficient to cover the costs of sustaining these operations.

The factors that have most significantly affected Accent Optical s business in the past are the demand for semiconductor devices and the rate of capital spending by semiconductor device and wafer manufacturers, both of which adversely affected Accent Optical s operating results during a cyclical industry downturn in 2002 and 2003. Accent Optical s operating results have also been negatively affected by order patterns and competitive conditions, including, for example, a significant competitive loss at Accent Optical s then largest customer, Intel Corporation in 2002. Accent Optical expects these factors to continue to be among the most important factors affecting its operating results in the future.

Accent Optical s business plan is premised in part on growth in the market for lattice engineering metrology systems and its business will not be successful if this market does not develop as expected.

Accent Optical s business plan is premised in part on growth in the demand for advanced semiconductor devices such as compound semiconductors, high brightness LEDs (HBLEDs) and strained silicon devices and the adoption of technologies for manufacturing these devices that are compatible with its metrology systems. If the market for these advanced semiconductor devices fails to grow as expected or if the manufacturers if these advanced semiconductor devices adopt manufacturing technologies for which Accent Optical s metrology systems are not well suited, the demand Accent Optical anticipates for its lattice engineering metrology systems will not materialize.

Accent Optical s systems have long development cycles, and it may encounter numerous obstacles to successful commercialization.

As the semiconductor industry is characterized by rapid change, emerging standards and the introduction of new technologies, Accent Optical expects to spend a significant amount of time and resources to develop new

43

systems and upgrades for its existing systems. In light of the long product development cycles inherent in Accent Optical s industry, it will make these expenditures well in advance of any revenues from the sale of new systems and upgrades. Accent Optical s ability to commercially introduce and successfully market any new system or upgrade is subject to a variety of challenges including problems associated with transitioning development prototypes to production, design defects and other challenges that could increase Accent Optical s costs and prevent or delay introduction of these systems or upgrades to the marketplace. If it is unable to introduce new systems or upgrades on a timely basis, or if it is unable to recover the research and development costs associated with such systems, Accent Optical s operating results and financial condition would be harmed.

The high cost of switching system vendors in Accent Optical s markets makes it difficult for us to win customers from its competitors even if its systems are superior.

Once a vendor s system has been installed in a production line application, a semiconductor device manufacturer must often make costly technical modifications, retrain personnel and suffer production downtime in order to switch to another vendor s system. To avoid these costs, semiconductor device manufacturers generally rely upon the system from the incumbent vendor and, to the extent possible, subsequent generations of the same vendor s system, for the life of the application. Accordingly, unless Accent Optical s systems offer performance or cost advantages that substantially outweigh the expense of switching to Accent Optical s systems, it will be difficult for us to achieve significant sales to a potential customer after it has selected another vendor s system.

The markets in which Accent Optical participates are intensely competitive, and if it is unable to compete effectively, its business would be harmed.

Accent Optical competes in the emerging market for lattice engineering metrology systems and the more mature market for photolithography process control and metrology systems. The market for lattice engineering metrology systems is highly fragmented. Competition typically consists of privately held companies or divisions of large, established companies such as Spectris plc and Thermo Electron Corporation. Accent Optical expects intense competition in this market to continue. Accent Optical s market share and operating results can fluctuate dramatically as a result of the introduction of new, competitive systems and the ability of competitors to secure patent and other intellectual property rights.

The market for photolithography process control and metrology systems is highly competitive with numerous large, established companies. Accent Optical s most significant competitors in this market are Hitachi, Ltd., KLA-Tencor Corporation, Nikon Instruments Inc., Therma-Wave, Inc. and Timbre Technologies, Inc., a subsidiary of Tokyo Electron Limited (TEL). These companies have substantially superior distribution capabilities and larger research and development budgets than Accent Optical does and greater ability to offer bundled and integrated product offerings to customers. In addition, significant competition for Accent Optical s critical dimension systems has emerged from manufacturers of traditional reflectometers and ellipsometers, such as Rudolph Technologies, that have extended their technology by using new algorithms that enable their tools to perform critical dimension measurements.

Many of Accent Optical s existing and potential competitors in both the lattice engineering metrology and photolithography process control and metrology markets have greater name recognition, larger customer bases, more established customer relationships and greater financial, technical, manufacturing, marketing and other resources than Accent Optical does. As a result, they may be able to respond more quickly to new or emerging technologies and to changes in customer requirements, to devote greater resources to the development, promotion, sale and support of their products and to reduce prices to increase market share. They may also be able to drive industry standards or influence standard-setting bodies in order to limit Accent Optical s access to or exclude us from markets. If the research and development efforts of Accent Optical s competitors are more effective than Accent Optical s own, some or all of Accent Optical s systems and technologies may become non-competitive or obsolete. Potential customers may also decide for risk management reasons to purchase

Table of Contents

products from Accent Optical s larger competitors who have greater financial resources than it does. Moreover, there has been significant merger and acquisition activity among Accent Optical s existing and potential competitors. These combinations may provide Accent Optical s existing and potential competitors with an advantage over Accent Optical by enabling them to expand their product offerings and service capabilities to meet a broader range of customer needs.

Sales of Accent Optical s photolithography process control and metrology systems are subject to decline if the market adopts the competitive integrated metrology.

A significant portion of Accent Optical s revenues are derived from the sale of stand-alone overlay and critical dimension systems that are used to detect and diagnose problems in the photolithography process. Semiconductor device manufacturers may demand integration of these metrology systems with other semiconductor processing equipment to lower their costs. To provide integrated systems, Accent Optical would need to establish relationships with a small number of original equipment manufacturers (OEMs), that control a large portion of the semiconductor processing systems markets. Some of these OEMs are Accent Optical s competitors or may choose to work with its competitors to Accent Optical s exclusion. Furthermore, Accent Optical may not be able to timely or cost-effectively adapt its systems to be competitive in the market for integrated metrology tools. If Accent Optical is unable to compete effectively with integrated metrology systems, or if it is unable to establish relationships with OEMs on commercially satisfactory terms, its sales, operating results and financial condition would be harmed.

Sales to manufacturers of HBLEDs may be negatively impacted by lawsuits and intellectual property disputes.

Accent Optical s future success will depend in part on growth in the worldwide market for semiconductor devices such as HBLEDs. The HBLED market consists of a few large manufacturers, several of whom have asserted infringement of intellectual property rights against each other. This litigation, if it continues, may constrain market acceptance of HBLED products. Further, a resolution that requires manufacturers to pay royalties to intellectual property holders or that similarly increases costs for manufacturers, may result in investment decisions or pricing that delays or prevents market acceptance. Accent Optical supplies lattice engineering metrology systems to the manufacturers of HBLEDs and, to the extent that the sales growth of their products is limited, it would reduce the demand for Accent Optical s systems.

Accent Optical manufactures most of its systems at a single facility, and its results of operations would be harmed if manufacturing disruptions cause it to not meet customer requirements.

Accent Optical manufactures most of its systems in York, United Kingdom. Accent Optical s manufacturing operations could be disrupted as a result of a number of events, including power outages, fire, or other natural or man-made catastrophes. As part of its restructuring efforts in 2003, Accent Optical closed its operations in Randolph, Massachusetts, Waterloo, Canada and Albuquerque, New Mexico. The Randolph facility was primarily responsible for Accent Optical s fourier transform infrared scatterometers (FTIR) product line including engineering, product marketing, final test and qualification. Accent Optical has transferred all production, testing and qualification procedures to its primary manufacturing facility in York. The Waterloo facility was responsible for engineering, product marketing, final test and manufacturing of Accent Optical s Vektor and PLM 100 systems. Accent Optical has transferred all such activities to its facilities in the United Kingdom. The Albuquerque facility was responsible for engineering, product marketing, final test and qualification of Accent Optical s critical dimension scatterometers (CDS) product line, all of which have been transferred to its York and Bend, Oregon facilities. Accent Optical may experience difficulties meeting delivery deadlines and quality expectations during the transition period.

Table of Contents

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. These forward-looking statements are based on Nanometrics 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 negat words or expressions of similar meaning, 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 are necessarily estimates reflecting the best judgment of the respective management of Nanometrics and Accent Optical 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 Nanometrics shareholders and Accent Optical s stockholders, to satisfy the closing conditions in the merger agreement, as amended, and to otherwise complete the merger in a timely manner;
- the ability to timely and cost-effectively integrate the geographically dispersed operations of Nanometrics and Accent Optical;
- the ability to realize the synergies and other perceived advantages resulting from the merger;
- the ability to retain key personnel both before and after the merger;
- the extent and timing of market acceptance of new products;
- the ability of Nanometrics and Accent Optical 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 currency exchange rates and interest rates;
- litigation outcomes and judicial actions, including costs of existing litigation matters;
- the ability of Nanometrics and Accent Optical to continue to increase customer loyalty and maintain existing distributor, subcontractor and supplier relationships;
- environmental restrictions, soil and water conditions, weather and other hazards, site access matters, environmental restrictions and building permit issues;

- the ability of Nanometrics to successfully complete any future acquisitions and integrate any acquired businesses;

- acts of war or terrorist incidents; and

- the effects of 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 Accent Optical 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, other than as required by law.

Table of Contents

THE NANOMETRICS SPECIAL 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 special 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 special meeting.

Date, Time, and Place

The Nanometrics special meeting will be held on [ ], 2006 at 10:00 a.m., local time, at its corporate offices located at 1550 Buckeye Drive, Milpitas, California 95035. These proxy solicitation materials were mailed on or about [ ], 2006 to all shareholders entitled to vote at the special meeting.

Purpose; Other Matters

The Nanometrics special meeting is being held to consider and vote upon a proposal to approve the issuance of shares of Nanometrics common stock in connection with the merger of Alloy Merger Corporation with and into Accent Optical, pursuant to the merger agreement, as amended.

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

Except as described below, the vote of a Nanometrics shareholder on one proposal has no bearing on any other matter that may come before the Nanometrics special 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 special meeting or any adjournments or postponements thereof. If you vote AGAINST the proposal, the proxy holders will not be authorized to vote for any adjournments or postponements of the special meeting, including for the purpose of soliciting additional proxies, unless you so indicate by marking the appropriate box on the proxy card for the special meeting.

Recommendation of the Nanometrics Board of Directors

After careful consideration, the Nanometrics board of directors determined that the merger is advisable, and is fair to and in the best interests of Nanometrics and its shareholders, and unanimously approved the merger agreement, as amended, and the transactions contemplated thereby, including the issuance of Nanometrics common stock as merger consideration.

The Nanometrics board of directors unanimously recommends that you vote FOR the proposal to approve the issuance of shares of Nanometrics common stock in connection with the merger.

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 special meeting, May 24, 2006, are entitled to notice of and to vote at the special meeting. As of the Nanometrics record date, there were 13,095,332 shares of Nanometrics common stock outstanding and entitled to vote at the special meeting, held by approximately 140 holders of record. Each record holder of Nanometrics

Table of Contents

common stock on the Nanometrics record date is entitled to one vote for each share of Nanometrics common stock held of record as of the Nanometrics record date with respect to the proposal.

A list of Nanometrics shareholders will be available for review at the Nanometrics special meeting and at the executive offices of Nanometrics during regular business hours for a period of 10 days before the Nanometrics special meeting.

Admission to the Special Meeting

Only Nanometrics shareholders, their designated proxies and guests of Nanometrics may attend the Nanometrics special meeting. If you plan to attend the Nanometrics special meeting and wish to vote 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 Nanometrics special meeting, you must bring to the special meeting a legal proxy from the record holder of your shares authorizing you to attend and vote at the Nanometrics special meeting.

Quorum and Vote Required

A quorum of shareholders is necessary to hold a valid special meeting of Nanometrics shareholders. In order to have a quorum for the transaction of business at the Nanometrics special meeting, a majority of shares of Nanometrics common stock issued and outstanding and entitled to vote on the record date must be present in person or by proxy. Shares that are voted FOR, AGAINST or ABSTAIN a matter are treated as being present at the special meeting for purposes of establishing a quorum.

Approval of the issuance of shares of Nanometrics common stock in the 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 special meeting.

Voting Agreements

All of the Nanometrics directors and executive officers have entered into voting agreements with Accent Optical pursuant to which they have agreed to vote their shares of Nanometrics common stock in favor of the proposal to approve the issuance of shares of Nanometrics common stock in the merger.

At the close of business on January 25, 2006, the date of the merger agreement, directors and executive officers of Nanometrics and their affiliates beneficially owned or were entitled to vote 4,024,815 shares of Nanometrics common stock, collectively representing approximately 30.9% of the shares of Nanometrics common stock outstanding on that date.

As of the record date for the Nanometrics special meeting, directors and executive officers of Nanometrics and their affiliates owned beneficially or were entitled to vote 4,046,147 shares of Nanometrics common stock, collectively representing approximately 31% 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 special meeting and voting their shares in person or by completing, signing and dating their respective proxy cards for the special meeting and mailing them in the postage pre-paid envelope enclosed for that purpose. Nanometrics shareholders holding shares of Nanometrics common stock in street name may vote by mail by completing, signing and dating the voting instruction forms for the Nanometrics special meeting

48

provided by their brokers, banks, or other nominee and returning their voting instruction forms as directed therein. Even if you plan to attend the Nanometrics special meeting, Nanometrics recommends that you vote by proxy prior to the special meeting. You can always change your vote as described below.

Voting by Proxy

All properly executed proxies that are received prior to the Nanometrics special meeting and 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 Nanometrics to vote your shares, your shares will be voted FOR the proposal to approve the issuance of shares of Nanometrics common stock in connection with the merger.

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 materials 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 special meeting by:

- delivering to the Nanometrics corporate secretary a signed notice of revocation;
- providing to the Nanometrics proxy holders a new, later-dated proxy in advance of the vote at the special meeting; or
- attending the Nanometrics special meeting and voting in person.

Your attendance alone 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 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 Nanometrics special 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 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 the following manner:

- Broker non-votes are shares held by a broker or other nominee that are represented at the special 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 the proposal to issue shares of Nanometrics common stock, abstentions will be counted towards a quorum, but will not be counted for any purpose in determining whether the proposal is approved.

Table of Contents

Proxy Solicitation

Nanometrics is soliciting proxies for the Nanometrics special meeting from Nanometrics shareholders. Nanometrics will bear the entire cost of soliciting proxies from Nanometrics shareholders, and Accent Optical has agreed to bear all expenses incurred in connection with its solicitation of proxies from its stockholders including, in each case, expenses incurred in the filing with the SEC 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 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 will also use The Altman Group to solicit proxies from Nanometrics shareholders, either personally or by telephone, internet, telegram, facsimile or special delivery letter. Nanometrics has agreed to pay The Altman Group a fee of $5,000 plus expenses for its services in connection with the solicitation.

Please do not send in any Nanometrics 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 shares 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. Nanometrics does not currently intend to seek a postponement or adjournment of the Nanometrics special meeting.

Assistance

If you need assistance in completing your proxy card or have questions regarding the Nanometrics special meeting, please contact Nanometrics Investor Relations at (408) 435-9600 or write to Nanometrics Incorporated, 1550 Buckeye Drive, Milpitas, California 95035, Attn: Investor Relations. You may also contact our proxy solicitors, The Altman Group, Inc., 1200 Wall Street West, 3rd Floor, Lyndhurst, NJ 07071, or call them at (800) 884-4969.

Table of Contents

THE ACCENT OPTICAL SPECIAL MEETING

General

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

Date, Time, and Place

The Accent Optical special meeting will be held on [   ], 2006 at 9:00 a.m., local time, at 1320 SE Armour Drive, Suite B2, Bend Oregon 97702. These proxy solicitation materials were mailed on or about [   ], 2006 to all stockholders entitled to vote at the special meeting.

Purpose; Other Matters

The Accent Optical Special Meeting is being held to consider and vote upon the following proposals in connection with the merger of Alloy Merger Corporation with and into Accent Optical pursuant to the merger agreement, as amended, to:

(i) Approve and adopt the merger agreement, as amended, approve the merger and the related transactions, approve the appointment of Sanford S. Wadler as Stockholder Agent and approve the escrow agreement; and

(ii) Approve payments to certain executive officers in connection with the merger.

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

Except as described below, the vote of an Accent Optical stockholder on one proposal has no bearing on any other matter that may come before the Accent Optical special 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 special meeting or any adjournments or postponements thereof. If you vote AGAINST the proposal, the proxy holders will not be authorized to vote for any adjournments or postponements of the special meeting, including for the purpose of soliciting additional proxies, unless you so indicate by marking the appropriate box on the proxy card for the special meeting.

Recommendation of the Accent Optical Board of Directors

After careful consideration, the Accent Optical board of directors has approved and adopted the merger agreement, as amended, approved the merger and related transactions, approved the appointment of Mr. Wadler as Stockholder Agent, adopted and approved the escrow agreement and approved payments to certain executive officers in connection with the merger and has unanimously determined that the merger agreement, as amended, the merger and related transactions, the appointment of Mr. Wadler as Stockholder Agent, the escrow agreement and payments to certain executive officers in connection with the merger are fair to, and in the best interests of, Accent Optical and its stockholders. Accordingly, the board of directors unanimously recommends to the Accent Optical stockholders that they vote FOR the approval and adoption of the merger agreement, as amended,

Table of Contents

approval of the merger and related transactions, the approval of the appointment of Mr. Wadler as Stockholder Agent and the approval of the escrow agreement. The Accent Optical board of directors also recommends to the Accent Optical stockholders being asked to approve payments to certain executive officers in connection with the merger that they vote FOR the approval of such payments.

Record Date; Outstanding Shares; Voting Rights

Only holders of record of Accent Optical shares at the close of business on the Accent Optical record date for the special meeting, [ ], are entitled to notice of and to vote at the special meeting. As of the Accent Optical record date, there were 141,439,274 shares of Accent Optical Common Stock, 9,444.8334 shares of Accent Optical Series A Preferred Stock, and 7,787,804 shares of Accent Optical Convertible Preferred Stock outstanding. Each record holder of Accent Optical capital stock on the Accent Optical record date is entitled to one vote for each share of Accent Optical capital stock held of record as of the Accent Optical record date, on an as converted to common stock basis, with respect to the proposals. A list of Accent Optical stockholders will be available for review at the Accent Optical special meeting and at the executive offices of Accent Optical during regular business hours for a period of 10 days before the Accent Optical special meeting.

Admission to the Special Meeting

Only Accent Optical stockholders, their designated proxies and guests of Accent Optical may attend the Accent Optical special meeting. If you plan to attend the Accent Optical special meeting and wish to vote in person, you will be given a ballot at the special meeting.

Quorum and Vote Required

A quorum of stockholders is necessary to hold a valid special meeting of Accent Optical stockholders. In order to have a quorum for the transaction of business at the Accent Optical special meeting, a majority of each class and series of shares of Accent Optical capital stock issued and outstanding and entitled to vote on the record date must be present in person or by proxy. Shares that are voted FOR, AGAINST or ABSTAIN a matter are treated as being present at the special meeting for purposes of establishing a quorum.

The vote required to approve and adopt the merger agreement, as amended, approve the merger and the related transactions, approve the appointment of Sanford S. Wadler as Stockholder Agent and approve the escrow agreement is the following:

(i) the affirmative vote of the holders of the majority of the outstanding shares of Accent Optical Convertible Preferred Stock and Accent Optical Common Stock, voting together as a single class on an as-converted basis;

(ii) the affirmative vote of the holders of a majority of the outstanding shares of Accent Optical Series A Preferred Stock;

(iii) the affirmative vote of the holders of a majority of the outstanding shares of Accent Optical Convertible Preferred Stock; and

(iv) the affirmative vote of the holders of a majority of the outstanding shares of Accent Optical Common Stock.

The vote required to approve the payments to certain executive officers in connection with the merger is the affirmative vote of the holders of at least 75% of the outstanding shares of Accent Optical Preferred Stock and Accent Optical Common Stock, voting together as a single class on an as-converted basis, not including the shares owned or constructively owned by the executive officers receiving such payments.

Table of Contents

Voting Agreements

Each of Peter M. and Lindsay M. Joost, Trustees, U/T/A dated April 11, 2002, JFI II, LP, Rhine 2000 Children s Trust, Jeffrey J. Rosen, Joseph Dox, Rajeev Mundhe, Gregory A. Kaiser, Kaiser Family Trust U/A dated June 20, 2000, Bruce Crawford, Reid Langrill, Bruce C. Rhine and Martha H. Rhine, JTWROS, Bruce Charles Rhine and Martha Hawn Rhine Family Trust U/T/A dated February 6, 2002, MCP Global Corporation Ltd., RS Coinvestment, LLC and Bio-Rad entered into a voting agreement with Nanometrics and Alloy Merger Corporation, agreeing to vote all of the stockholder s shares of Accent Optical capital stock, including shares of Accent Optical capital stock acquired after the date of the voting agreements, in favor of the adoption and approval of the merger agreement, as amended, the approval of the merger and the related transactions, the approval of the appointment of Sanford S. Wadler as Stockholder Agent and the approval of the escrow agreement. The voting agreements originally contained the agreement of each of these stockholders to vote his, her or its shares in favor of the approval of payments to certain Accent Optical executive officers pursuant to Section 280G of the Internal Revenue Code. Nanometrics and Alloy Merger Corporation subsequently waived this requirement in order to provide all Accent Optical stockholders the ability to exercise their voting rights with respect to the executive officer payments independently.

At the close of business on January 25, 2006, the date of the merger agreement, and [ ], the record date for the Accent Optical special meeting, these stockholders and their affiliates beneficially owned and were entitled to vote 124,193,172 shares of Accent Optical Common Stock, collectively representing approximately 87.9% of the shares of Accent Optical Common Stock outstanding on that date; 8,396.77 shares of Accent Optical Series A Preferred Stock, collectively representing approximately 88.9% of the shares of Accent Optical Series A Preferred Stock outstanding on that date; and 5,036,584 shares of Accent Optical Convertible Preferred Stock, collectively representing approximately 64.7% of the shares of Accent Optical Convertible Preferred Stock outstanding on that date.

Voting

General

Accent Optical stockholders of record as of the Accent Optical record date may vote their shares by attending the Accent Optical special meeting and voting their shares in person or by completing, signing and dating their respective proxies for the special meeting and mailing them in the postage pre-paid envelope enclosed for that purpose. Even if you plan to attend the Accent Optical special meeting, Accent Optical recommends that you vote by proxy prior to the special meeting. You can always change your vote as described below.

Voting by Proxy

All properly executed proxies that are received prior to the Accent Optical special meeting and 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 Accent Optical to vote your shares, your shares will be voted FOR the proposals.

You may receive more than one proxy depending on how you hold your shares of Accent Optical capital stock. Generally, you need to sign and return all of your proxies to vote all of your shares.

Changing Your Vote

If you are the record holder of your shares of Accent Optical capital stock, you can change your vote at any time before your proxy is voted at the Accent Optical special meeting by:

- delivering to the Accent Optical corporate secretary a signed notice of revocation;
- providing to the Accent Optical proxy holders a new, later-dated proxy in advance of the vote at the special meeting; or

attending the Accent Optical special meeting and voting in person.
Your attendance alone will not revoke your previously granted proxy.

Abstentions

An abstention occurs when a stockholder physically attends a meeting but refrains from voting, or when a stockholder marks their proxy ABSTAIN. Abstentions will be included in determining the number of shares present and voting at the Accent Optical special meeting for the purpose of determining the presence of a quorum. A stockholder who attends the Accent Optical meeting in person but abstains from voting, or who marks their proxy ABSTAIN will be, in effect, voting against the proposals.

Proxy Solicitation

Accent Optical is soliciting proxies for the Accent Optical special meeting from Accent Optical stockholders. Accent Optical will bear the entire cost of soliciting proxies from Accent Optical stockholders, and Nanometrics has agreed to bear all expenses incurred in connection with its solicitation of proxies from its shareholders including, in each case, expenses incurred in the filing with the SEC 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 materials.

Do not send in any stock certificates with your proxy cards. The exchange agent for the merger will mail transmittal forms with instructions for the surrender of stock certificates representing Accent Optical shares to former Accent Optical stockholders as soon as practicable after the completion of the merger.

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 shares 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. Accent Optical does not currently intend to seek a postponement or adjournment of the Accent Optical special meeting.

Assistance

If you need assistance in completing your proxies or have questions regarding the Accent Optical special meeting, please contact Accent Optical s Chief Executive Officer at (541) 322-2500 or write to Accent Optical Technologies, Inc., 1320 SE Armour Drive, Suite B2, Bend, Oregon 97702, Attn: Chief Executive Officer.

Table of Contents

PROPOSAL ONE THE MERGER

Background of the Merger

In their ongoing evaluations of their respective businesses, the Nanometrics and Accent Optical boards of directors have, in the past, periodically considered various strategic opportunities to enhance their respective brands and build shareholder value. Nanometrics had, from time to time over the past several years, begun preliminary discussions with various parties, including Accent Optical, with respect to potential strategic transactions.

As a result of the abandonment of its plans for an initial public offering of common stock in 2004, Accent Optical s board of directors increasingly focused on selling all or a part of its business to improve its ability to fund its operations and growth. In March 2005, Accent Optical retained Merrill Lynch as a financial advisor in connection with consideration of such transactions. With Merrill Lynch s assistance, Accent Optical continued to contact potential purchasers in order to discuss the sale of all or a part of the Accent Optical business.

In July 2005, John D. Heaton, the President and Chief Executive Officer of Nanometrics, met with Bruce C. Rhine, Chairman and Chief Executive Officer of Accent Optical, at a trade show in San Francisco, California. During the meeting, Messrs. Heaton and Rhine discussed the potential for Nanometrics to purchase Accent Optical s overlay metrology business.

As a result of this meeting, Messrs. Heaton and Rhine continued periodic discussions regarding the potential asset purchase.

Beginning in September 2005, Mr. Heaton, along with Douglas J. McCutcheon, Nanometrics Chief Financial Officer, and a representative of Headgate Partners LLC, a consulting firm representing Nanometrics, had several teleconferences with Mr. Rhine, other representatives of Accent Optical and Merrill Lynch about a potential asset purchase.

On October 4, 2005, Messrs. Heaton and McCutcheon had a telephone conference with Mr. Rhine and Reid Langrill, Accent Optical s Chief Financial Officer, during which those present discussed a broader strategic transaction between the parties that could include a purchase of additional assets or a merger of the two companies.

Thereafter, on October 13, 2005, Messrs. McCutcheon and Langrill had a telephone discussion regarding the financial performance and finance organization of the respective companies. They also discussed potential synergies that could result from the proposed strategic transaction.

On October 17, 2005, Messrs. Heaton and McCutcheon discussed the terms of a proposed strategic transaction with Mr. Rhine and a representative of Merrill Lynch. The transaction contemplated was an all-stock acquisition of Accent Optical by Nanometrics.

On October 18, 2005, a representative of Merrill Lynch called Mr. McCutcheon to discuss further the proposed strategic transaction. Subsequently, during a call on October 21, 2005, Accent Optical proposed modifications to the nonbinding preliminary proposal made on October 17, 2005 by Messrs. Heaton and McCutcheon.

On October 25, 2005, Messrs. Heaton and McCutcheon spoke by telephone with Mr. Rhine and a representative of Merrill Lynch. During that call, the representatives of Nanometrics indicated that Nanometrics was unwilling to accept the changes proposed by Accent Optical on October 21, 2005. Mr. Heaton subsequently confirmed the discussion in an e-mail to Mr. Rhine.

On October 28, 2005, Messrs. Heaton and McCutcheon and a representative of Headgate Partners had a telephone conference with Mr. Rhine and representatives of Merrill Lynch. During the conference, the

Table of Contents

Nanometrics representatives discussed a revised nonbinding proposal by Nanometrics to acquire Accent Optical. Subsequently, via e-mail on October 31, 2005, Mr. Heaton confirmed terms of the nonbinding proposal to Mr. Rhine.

On November 3, 2005, Messrs. Heaton and McCutcheon and a representative of Headgate Partners had another call with Mr. Rhine to review in greater detail the terms and conditions of the nonbinding proposal. During a November 4, 2005 conference call with representatives of Nanometrics, Accent Optical, Headgate Partners and Merrill Lynch presented certain proposed revisions to Nanometrics proposal. Later that day, Mr. Heaton indicated via e-mail to Mr. Rhine that Nanometrics was not amenable to the proposed revisions and suggested that Nanometrics and Accent Optical discontinue discussions.

On November 5, 2005, Mr. Rhine and Mr. Heaton spoke by telephone and Mr. Rhine reinforced Accent Optical s interest in pursuing a business combination transaction with Nanometrics. In that meeting, Messrs. Heaton and Rhine preliminarily agreed to negotiate the acquisition of Accent Optical by Nanometrics pursuant to the November 3, 2005 nonbinding proposal.

On November 14, 2005, Mr. Rhine traveled to Nanometrics headquarters in Milpitas, California to meet with Messrs. Heaton and McCutcheon and Vincent Coates, Chairman of the Nanometrics board of directors. During the meetings, the parties agreed to begin drafting a confidentiality agreement and preliminary term sheet to guide future discussions and the negotiation of a definitive agreement.

On November 18, 2005, representatives of Wilson Sonsini Goodrich & Rosati, Professional Corporation (WSGR), Nanometrics legal counsel, sent drafts of a non-binding preliminary term sheet and confidentiality agreement to representatives of Perkins Coie LLP, Accent Optical s legal counsel. Representatives of WSGR and Perkins Coie continued to negotiate the confidentiality agreement and non-binding term sheet from November 18, 2005, to November 29, 2005.

On November 29, 2005, Mr. Rhine and Mr. Heaton discussed the substantive open issues on the preliminary term sheet and confidentiality agreement and scheduled a trip for Mr. Heaton to visit the Accent Optical facilities in Bend, Oregon.

On November 30, 2005, the Nanometrics board of directors had a regularly scheduled meeting. Also present were Mr. McCutcheon and representatives of WSGR. In addition to the regularly scheduled agenda items, Mr. Heaton reviewed the status of discussions regarding the proposed acquisition of Accent Optical by Nanometrics. Mr. Heaton also reviewed anticipated strategic and operational benefits of a transaction with Accent Optical. During the meeting, the Nanometrics board of directors authorized management to continue negotiations with Accent Optical and to enter into the non-binding term sheet and confidentiality agreement with such revisions as would be approved by Messrs. Heaton and McCutcheon and legal counsel.

On December 2, 2005, Mr. Heaton met with Messrs. Rhine and Langrill at Accent Optical s headquarters in Bend, Oregon to discuss Accent Optical s business and intellectual property. On December 3, 2005, Messrs. Heaton and Rhine discussed by telephone the remaining unresolved issues on the non-binding term sheet and confidentiality agreement.

On December 5, 2005, the Accent Optical board of directors met to consider the proposed acquisition as well as the preliminary non-binding term sheet and confidentiality agreement. Also present at the meeting were Mr. Langrill and representatives of Merrill Lynch and Perkins Coie. Mr. Rhine presented the proposal from Nanometrics, including the proposed exclusivity period through January 10, 2006. After discussion, the Accent Optical authorized Mr. Rhine to enter into the non-binding term sheet and confidentiality agreement on substantially the terms presented.

Table of Contents

On December 5, 2005, Nanometrics and Accent Optical executed the confidentiality agreement and non-binding term sheet. The confidentiality agreement provided for an exclusive negotiating period through January 10, 2006.

On December 6, 2005, representatives of WSGR and Perkins Coie discussed the protocol for due diligence meetings and the exchange of materials. From December 6, 2005 through December 9, 2005, Nanometrics management met with several investment banks to discuss potentially retaining them.

From December 11, 2005 to December 14, 2005, Mr. Heaton, Quentin Wright, Nanometrics Chief Accounting Officer, Paul Bacchi, Executive Director of Nanometrics, and a representative of Cowen visited Accent Optical s facilities in York, England with Mr. Rhine and Bruce Crawford, President and Chief Operating Officer of Accent Optical, to perform due diligence on the Accent Optical facilities and operations.

On December 12, 2005, a representative of WSGR circulated a draft of the definitive merger agreement to Messrs. Rhine and Langrill and representatives of Merrill Lynch and Perkins Coie.

From December 14, 2005 to January 25, 2006, representatives of WSGR and Taylor Wessing LLP, English counsel to Nanometrics, conducted legal due diligence review of Accent Optical at Accent Optical s headquarters in Bend, Oregon and at the offices of WSGR and Taylor Wessing. Representatives of Perkins Coie and Merrill Lynch conducted legal or business due diligence of Nanometrics at the offices of WSGR and the representatives own offices and provided assistance to Accent Optical in its production of documents during the same period.

On December 15, 2005, Mr. McCutcheon and representatives of Cowen met for financial and business due diligence with Messrs. Rhine and Langrill and representatives of Merrill Lynch at Accent Optical s headquarters in Bend, Oregon.

On December 16, 2005, the Nanometrics board of directors held a special meeting at the headquarters of Nanometrics in Milpitas, California. Also present at the meeting were Mr. McCutcheon, a representative of Headgate Partners and representatives of WSGR. Mr. Heaton summarized the status of discussions and due diligence with Accent Optical. A representative of WSGR provided a summary of the legal due diligence review to date. After discussion of various financial advisor candidates, the Nanometrics board of directors formally authorized Messrs. Heaton and McCutcheon to retain Cowen.

On December 21, 2005, Messrs. Heaton, McCutcheon and Rhine and representatives of Perkins Coie and WSGR met at the offices of WSGR in Palo Alto, California to negotiate the terms of the merger agreement and a proposed working capital loan to Accent Optical. In addition, those present discussed the impact of the proposed consideration on the liquidation preferences set forth in Accent Optical s certificate of incorporation, as well as certain change of control payments due to Bio-Rad pursuant to the terms of the July 31, 2000 agreement under which Accent Optical purchased the intellectual property and other assets of Bio-Rad s Semiconductor Measurements Division. On December 24, 2005, a representative of WSGR circulated a revised version of the merger agreement reflecting the discussions at the December 21, 2005 meeting.

On December 22, 2005, the Nanometrics board of directors held a special meeting at Nanometrics headquarters in Milpitas, California. Also present at the meeting were Mr. McCutcheon, a representative of Headgate Partners and representatives of Cowen and WSGR. Mr. Heaton updated the board of directors regarding the status of his discussions with Accent Optical. A representative of WSGR provided a summary of the discussions on the merger agreement. Finally, representatives of Cowen then discussed their preliminary financial analysis of the proposed merger and Nanometrics and Accent Optical s historical financial performance.

On December 29, 2005, representatives of WSGR circulated drafts of the form of promissory note, escrow agreement, and employment agreement to Perkins Coie for review.

Table of Contents

On December 30, 2005, Messrs. Rhine and Heaton spoke on the telephone regarding the allocation of the proposed consideration in an acquisition of Nanometrics and, as an alternative, the sale of Accent Optical s overlay metrology business to Nanometrics.

From January 2, 2006 to January 6, 2006, Messrs. Heaton and Rhine spoke several times regarding the proposed asset sale term sheet. On January 4, 2006, Mr. Heaton circulated a draft of a non-binding asset sale term sheet to Mr. Rhine. Mr. Heaton circulated a revised version to Mr. Rhine on January 6, 2006, as well as an amendment to the confidentiality agreement, extending the exclusivity period until January 14, 2006.

On January 6, 2005, Mr. Rhine contacted Mr. Heaton to discuss the concerns of Accent Optical s board of directors and management that the impact of the Bio-Rad change of control payment and preference amounts due to holders of Accent Optical Preferred Stock would result in an unsatisfactory outcome in which holders of Accent Optical Common Stock would not approve the merger as they would receive almost no consideration in the merger.

On January 9, 2006, Accent Optical and Bio-Rad reached a tentative agreement to restructure and reduce the change of control payment conditioned upon the acceptance of concessions by Accent Optical s preferred stockholders.

On January 10, 2006, the Accent Optical board of directors met. Representatives of Perkins Coie were present at the invitation of the board. Mr. Rhine provided the board with an update of the merger negotiations and ongoing efforts to structure the proposed sale in a manner that would benefit all of Accent Optical s stockholders by seeking to obtain concessions from its preferred stockholders and from Bio-Rad with respect to its right to a change of control payment, in order to provide some consideration for its common stockholders. Mr. Rhine also indicated that management was analyzing an alternative proposal to sell only its overlay and scatterometry business to Nanometrics, and that more time was needed to determine whether the alternative transaction was more favorable for Accent Optical and its stockholders. The board authorized management to complete the analysis and to extend the exclusivity period with Nanometrics.

On January 10, 2006, Accent Optical and Nanometrics executed an amended confidential agreement, which extended the exclusivity period until January 14, 2006.

On January 12, 2006, Accent Optical and RS Coinvestment Fund, LLC, the holder of the largest number of shares of Accent Optical Convertible Preferred Stock, reached an agreement pursuant to which RS Coinvestment agreed to restructure its liquidation preference and to vote in favor of the allocation of consideration with respect to the proposed merger.

Also on January 12, 2006, the Nanometrics board of directors held a special meeting. Also present were Mr. McCutcheon, a representative of Headgate Partners and representatives of Cowen and WSGR. At the meeting, Mr. Heaton provided a summary of his recent discussions with Mr. Rhine. The board of directors approved a revised asset sale term sheet presented to them at the meeting and authorized management to move forward with the transaction described therein in the event that Accent Optical was unwilling or unable to agree to be acquired.

On January 13, 2006, Messrs. Heaton and Rhine executed an amendment to the confidentiality agreement extending the exclusivity period to January 21, 2006.

On January 18, 2006, the Accent Optical board of directors met. Mr. Rhine presented management s analysis of the competing proposals to sell either the entire company, or just the overlay and scatterometry businesses, to Nanometrics. The Board authorized management to continue negotiation of the merger as well as the existing preferences and to further extend the exclusivity period if needed. Mr. Rhine and representatives of Bio-Rad and certain holders of Accent Optical s Preferred Stock reached an agreement to restructure the Bio-Rad change of control payment and the liquidation preferences of the Preferred Stock in connection with an acquisition, as contemplated by the December 5, 2005 non-binding term sheet.

At that time, Mr. Rhine contacted Mr. Heaton to discuss the accommodation reached and Accent Optical s desire to pursue the merger described in the December 5, 2005 non-binding term sheet rather than the sale of the overlay metrology business. Messrs. Heaton and Rhine agreed to proceed on that basis.

On January 19, 2006, Mr. Langrill and representatives of Merrill Lynch had a call with Mr. McCutcheon to discuss Nanometrics financial outlook.

From January 19 to January 25, 2006, the parties worked on finalizing the definitive merger agreement and the ancillary agreements, including the form of working capital note, employment agreements and the form of escrow agreement. During that same period, Accent Optical was in communication with some of its largest stockholders with respect to the allocation of consideration and to obtain voting agreements. During this period, Messrs. McCutcheon and Langrill had several discussions regarding employment and severance arrangements for the Accent Optical senior executives.

On January 20, 2006, Messrs. Heaton and Rhine discussed certain changes to the merger agreement, including a proposal regarding placing additional limitations on stockholder indemnification obligations under the merger agreement.

On January 21, 2006, Messrs. Heaton, McCutcheon, Rhine and Langrill and representatives of Perkins Coie and WSGR had a call to discuss the status of various agreements, a proposed schedule to signing and any material, open diligence items.

On January 23, 2006, Mr. Langrill discussed a proposal with Mr. McCutcheon, which proposal was subsequently confirmed through a series of e-mails, regarding the treatment of stock options held by Accent Optical employees whose employment was terminated within six months following the closing of the merger and the treatment of the Accent Optical senior executive team.

On January 23, 2006, Mr. McCutcheon advised Mr. Langrill that Nanometrics would accept the proposed acceleration of Accent Optical options held by employees terminated with the six month period following the merger, provided that such employees had not resigned or been terminated for cause.

On January 23, 2006, Mr. McCutcheon discussed the proposed treatment of the Accent Optical senior executives with Mr. Langrill. Mr. McCutcheon advised Mr. Langrill that the proposed employment arrangements relating to the Accent Optical senior executives including the severance provisions and retention options were acceptable to Nanometrics.

On January 24, 2006, the Accent Optical board of directors met. A representative from Perkins Coie reviewed with the board of directors the legal principles applicable to the proposed sale, including the board s fiduciary duties and authority in considering the proposed merger. The representative from Perkins Coie reviewed the terms of the draft merger agreement and related agreements, and the results of Accent Optical s due diligence investigation of Nanometrics. Representatives from Merrill Lynch made a presentation and delivered its oral fairness opinion to the board of directors, later confirmed in writing, that, as of January 24, 2006, based upon the assumptions made, matters considered and limits of such review, the aggregate consideration was fair, from a financial point of view, to holders of Accent Optical capital stock. See *The Merger Opinion of Accent Optical s Financial Advisor* beginning on page 70. Following lengthy board discussions, the board of directors determined that additional time was needed to fully evaluate the merger agreement and related documents.

On January 25, 2006, the Accent Optical board of directors met. Representatives of Merrill Lynch and Perkins Coie were also present. The board of directors reviewed and discussed the process that had been employed to market the company to potential buyers and the strategic and tactical reasons for the merger. After further discussion and extensive deliberation, the board of directors determined that the merger is in the best

Table of Contents

interests of Accent Optical, approved the merger, the merger agreement and the transactions contemplated by the merger agreement, determined to submit the merger and merger agreement to the Accent Optical s stockholders for approval with the board of director s recommendation that they be so approved, and authorized Accent Optical s management to execute and deliver the merger agreement and related agreements.

Thereafter, also on January 25, 2006, the Nanometrics board of directors held a special meeting. Also present were Mr. McCutcheon, a representative of Headgate Partners and representatives of Cowen and WSGR. The Cowen representatives summarized the terms of the proposed merger and the related financial analyses. The WSGR representatives reviewed the draft merger agreement and related agreements, as well as the findings of the legal diligence review by WSGR and Taylor Wessing. The WSGR representatives also reviewed with the Nanometrics board of directors the legal principles applicable to the proposed acquisition, including the board s fiduciary duties and authority in considering the proposed merger and the share issuance by Nanometrics. Following the presentations and discussions, Cowen delivered its oral opinion to the board of directors, later confirmed in writing that, as of January 25, 2006 and based upon and subject to the factors and assumptions set forth in its written opinion, the merger consideration to be issued pursuant to the merger agreement was fair from a financial point of view to Nanometrics. See *The Merger Opinion of Nanometrics Financial Advisor* beginning on page 65. The board of directors discussed the prior negotiations with Accent Optical and again reviewed the strategic rationale for the merger. After further discussion and extensive deliberation, the Nanometrics board of directors approved and declared the merger, the merger agreement and the transactions contemplated by the merger agreement advisable, determined that it was in the best interests of Nanometrics and its shareholders that the company enter into the merger agreement and consummate the merger on the terms and conditions set forth in the merger agreement, resolved to recommend that the Nanometrics shareholders approve the issuance of Nanometrics common stock in the merger, approved the ancillary agreements, and authorized execution of the merger agreement and the ancillary agreements.

On the evening of January 25, 2006, the parties executed the merger agreement and issued a press release announcing the execution of the merger agreement.

On March 31, 2006, the board of directors of Accent Optical acted by written consent to unanimously recommend to the Accent Optical stockholders to vote for the proposal to approve the payments to certain executive officers in connection with the merger.

On June 9, 2006, Nanometrics, Alloy Merger Corporation, Accent Optical and Sanford S. Wadler, as stockholder agent, entered into an amendment to the merger agreement for the purpose of extending the date by which the merger agreement for the purpose of extending the date by which the merger is required to be completed before either Nanometrics or Accent Optical can terminate the merger agreement and providing for Nanometrics to fund an additional $1,611,238 in working capital loans to Accent Optical in order to satisfy an interest payment due to Bio-Rad on July 9, 2006.

Joint Reasons of Nanometrics and Accent Optical for the Merger

The Nanometrics and Accent Optical boards of directors have consulted with senior management as well as their respective legal counsel and financial advisors, and considered a number of factors in their analysis of the merger agreement and the proposed merger, including but not limited to:

- Combining Accent Optical with Nanometrics is expected to create one of the largest independent metrology companies, which would provide an opportunity for increased sales to and support of current Nanometrics and Accent Optical customers by offering a broader product line.

- The combined company would have the technical resources of both Nanometrics and Accent Optical, which will enable the combined company to avoid relying on limited technology platforms in developing its products.

- The combined company would have a greater product portfolio available to its customers.

- Due to the limited overlap of the customer base of Nanometrics and Accent Optical, the combined company is expected to have a much larger customer base.

60

Table of Contents

The combined company would have greater opportunities for marketing its products due to the creation of worldwide sales and service channels, the expansion of the companies dedicated sales teams and a higher profile with customers.

The combined company s sales channels are expected to provide a more effective geographic distribution for its products, which would benefit the combined company by increasing market penetration of such products. In particular, Nanometrics strength in Japan and Accent Optical s strength in Europe would provide the combined company with greater potential sales opportunities.

The shareholders of Nanometrics and the stockholders of Accent Optical will have the opportunity to participate in the potential for growth of the combined company after the merger.

The experience, financial resources, development expertise, size and breadth of product offerings of the combined company 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 the combined company to provide more effective support and broader geographical coverage to its customers and make it more attractive to new customers.

The combined company may enjoy other economies of scale such as combined administrative functions and efficiencies in manufacturing.

Combining Accent Optical with Nanometrics would provide additional depth and experience to the combined company s management team.

The Nanometrics and Accent Optical boards of directors also considered the following additional factors in its deliberations:

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

information concerning the recent and past stock price performance of Nanometrics common stock;

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;

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

the number of shares issuable as consideration, which provide a level of certainty as to the aggregate number of shares of Nanometrics common stock to be issued to Accent Optical stockholders and optionees and the percentage of the total shares of Nanometrics common stock that current Accent Optical stockholders and optionees will own after the merger; and

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

Nanometrics Reasons for the Merger

The Nanometrics board of directors considered a number of factors in its analysis of the merger agreement and the proposed merger, in addition to those listed above, including but not limited to:

- the shareholders of Nanometrics will have the opportunity to participate in the potential for growth of the combined company after the merger;

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

Table of Contents

the written opinion of Cowen, dated January 25, 2006, 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 merger consideration to be issued by Nanometrics was fair from a financial point of view to Nanometrics;

the provisions that prohibit Accent Optical from soliciting other acquisition offers; and

the provisions that require Accent Optical to pay Nanometrics expenses and a termination fee of $5 million, plus expenses, if the merger agreement is terminated due to Accent Optical s failure to obtain the required stockholder approval.

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

the risk that the potential benefits sought in the merger might not be fully realized;

the possibility that the merger might not be completed, or that completion might be unduly delayed, for reasons beyond Nanometrics control;

the possibility that the merger might not be completed and that, in the event that Nanometrics fails to obtain shareholder approval for the issuance of shares in the proposed merger, Nanometrics would be required to pay Accent Optical a termination fee of $5 million, plus expenses;

the potential dilution of Nanometrics earnings per share as a result of the issuance of the shares in the merger, and the estimated time period for the merger to be accretive to Nanometrics earnings per share;

the risk that efforts to integrate the two companies may disrupt Nanometrics operations;

the effect of the public announcement of the merger on Nanometrics stock prices;

the substantial costs to be incurred in connection with the merger, including the costs of integrating the businesses of Nanometrics and Accent Optical and the transaction expenses arising from the merger;

the risk that, despite Nanometrics efforts and the efforts of Accent Optical after the merger, Nanometrics may lose key Accent Optical personnel;

the risk that the restrictions on the conduct of Nanometrics business during the period between the signing of the merger agreement and the completion of the 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 Merger* beginning on page 30.

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 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 merger and the merger agreement. The decision of each member of the Nanometrics board of directors was based upon his 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 thereby, including the issuance of shares of Nanometrics common stock in the merger and recommended that the Nanometrics shareholders approve the issuance of shares of Nanometrics common stock in the merger.

Table of Contents

Accent Optical s Reasons for the Merger

The board of directors of Accent Optical considered a number of factors in its analysis of the merger agreement and the proposed merger, in addition to those listed above, including but not limited to:

- the recent performance of Accent Optical s business and Accent Optical s cash position;
- the prospects for Accent Optical s growth and profitability as a stand-alone company and the risks related to such growth and profitability;
- the capital requirements to operate Accent Optical s business on a going-forward basis;
- the considerable financial resources available from Nanometrics to help develop the Accent Optical business;
- the terms on which additional funding might be available to Accent Optical and the related dilution that existing stockholders would suffer as a result of obtaining such additional funding;
- the aggregate value of the merger consideration payable to Accent Optical stockholders pursuant to the merger agreement;
- the written opinion of Merrill Lynch, dated January 24, 2006, that, as of that date, and based upon and subject to the assumptions made, matters considered and limits of review, as further described in its opinion, the full text of which is attached to this joint proxy statement/prospectus as Annex D, the aggregate consideration was fair, from a financial point of view, to holders of Accent Optical capital stock;
- the fact that the Accent Optical stockholders would receive Nanometrics common stock in the merger, which provides them the opportunity to participate in the potential growth of the combined company following the merger as shareholders of Nanometrics and the opportunity to hold publicly traded stock;
- the current financial market conditions and historical market prices, volatility and trading information with respect to Nanometrics common stock;
- the fact that the merger is structured such that Accent Optical stockholders would not be immediately taxed on merger consideration consisting of Nanometrics common stock;
- the conditions to completion of the merger, in particular the likelihood of obtaining the necessary regulatory and stockholder approvals;
- the interests that certain executive officers and directors of Accent Optical may have with respect to the merger. See the section of this proxy statement/prospectus entitled *Interests of Accent Optical Directors and Executive Officers in the Merger* beginning on page 76;

- the costs associated with being a public company if Accent Optical pursued its own public offering as a way to access additional capital for its business and liquidity for its stockholders; and

- the other strategic alternatives available to Accent Optical discussed above under *Background of the Merger* beginning on page 55.

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

- the risk that the potential benefits sought in the merger might not be fully realized;

- the possibility that the merger might not be completed, or that completion might be unduly delayed, for reasons beyond Accent Optical s control;

- the possibility that the merger might not be completed and that, if it failed to obtain the required stockholder approval, Accent Optical might be required to pay Nanometrics a termination fee of $5 million, plus expenses;

Table of Contents

the provisions that prohibit Accent Optical from soliciting other acquisition offers;

the substantial costs to be incurred in connection with the merger, including the costs of integrating the businesses of Accent Optical and Nanometrics and the transaction expenses arising from the merger;

the risk that the restrictions on the conduct of Accent Optical s business during the period between the signing of the merger agreement and the completion of the merger may negatively impact Accent Optical s business;

the risk that efforts to integrate the two companies would disrupt Accent Optical s operations;

the risk that Nanometrics may be unable to retain key personnel of the combined company; and

the other risks described in the section of this joint proxy statement/prospectus entitled *Risk Factors Risks Relating to the Merger* beginning on page 30.

It was not practical to, and thus the Accent Optical board of directors did not, quantify, rank or otherwise assign relative weights to the wide variety of factors it considered in evaluating the 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 Accent Optical and its stockholders. This discussion of information and material factors considered by the Accent Optical board of directors is intended to be a summary rather than an exhaustive list. In considering these factors, individual members of the Accent Optical 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 merger, the merger agreement and the related transactions. The decision of each member of the Accent Optical board of directors was based upon his own judgment, in light of all of the information presented, regarding the overall effect of the merger agreement and associated transactions on the Accent Optical stockholders as compared to any potential alternative transactions or courses of action. After considering this information, the members of the Accent Optical board of directors unanimously approved the merger, the merger agreement and the transactions contemplated thereby and recommended that the Accent Optical stockholders approve the proposal to approve and adopt the merger agreement and approve the merger, the appointment of Mr. Wadler as Stockholder Agent and the escrow agreement.

Recommendation of the Nanometrics Board of Directors

The Nanometrics board of directors believes there are substantial benefits to the Nanometrics shareholders that can be obtained as a result of the merger. At a meeting held on January 25, 2006, the Nanometrics board of directors unanimously determined that the merger and the other transactions contemplated by the merger agreement, including the issuance of shares of Nanometrics common stock as consideration in the merger, are advisable and in the best interests of Nanometrics and the Nanometrics shareholders. Thereafter, the Nanometrics board of directors unanimously resolved to recommend that the Nanometrics shareholders approve the issuance of shares of Nanometrics common stock in the merger.

The Nanometrics board of directors unanimously recommends that the Nanometrics shareholders vote FOR Nanometrics proposal to approve the issuance of shares of Nanometrics common stock in the merger.

Table of Contents

Recommendation of the Accent Optical Board of Directors

The Accent Optical board of directors believes there are substantial benefits to the Accent Optical stockholders that can be obtained as a result of the merger. At a meeting held on January 25, 2006, the Accent Optical board of directors unanimously determined that the merger agreement, the merger and the related transactions, including the appointment of Mr. Wadler as Stockholder Agent and the escrow agreement and the payments to certain executive officers, are advisable and in the best interests of Accent Optical and the Accent Optical stockholders. Thereafter, the Accent Optical board of directors unanimously resolved to recommend that the Accent Optical stockholders approve adoption of the merger agreement, the merger, the appointment of Mr. Wadler as Stockholder Agent and the escrow agreement and approve the payments to certain executive officers.

The Accent Optical board of directors unanimously recommends that Accent Optical stockholders vote FOR the proposal to approve and adopt the merger agreement, as amended, and approve the merger, the appointment of Mr. Wadler as Stockholder Agent and the escrow agreement and FOR the proposal to approve the payments to certain executive officers.

Opinion of Nanometrics Financial Advisor

On January 25, 2006, Cowen delivered its opinion to the Nanometrics board of directors that, subject to the various assumptions set forth therein, as of January 25, 2006, the consideration to be paid in the merger was fair, from a financial point of view, to Nanometrics.

The full text of the written opinion of Cowen, dated January 25, 2006, is attached to this joint proxy statement/prospectus as Annex C. Holders of Nanometrics common stock are urged to read the opinion in its entirety for the assumptions made, procedures followed, other matters considered and limits of the review undertaken in connection with the opinion by Cowen. The summary of the written opinion of Cowen set forth herein is qualified in its entirety by reference to the full text of such opinion. Cowen s analyses and opinion were prepared for and addressed to the Nanometrics board of directors and are directed only to the fairness, from a financial point of view, to Nanometrics of the consideration to be paid in the merger, and do not constitute an opinion as to the merits of the merger or a recommendation to any shareholder as to how to vote on the proposed merger. The consideration paid in the merger was determined through negotiations between Nanometrics and Accent Optical and not pursuant to recommendations of Cowen.

In arriving at its opinion, Cowen reviewed and considered such financial and other matters as it deemed relevant, including, among other things:

- a draft of the merger agreement dated January 23, 2006;
- certain publicly available financial and other information for Nanometrics, and certain other relevant financial and operating data furnished to Cowen by Nanometrics;
- certain publicly available financial and other information for Accent Optical, and certain other relevant financial and operating data furnished to Cowen by Accent Optical and Nanometrics;
- certain internal financial analyses, financial forecasts, reports and other information concerning Nanometrics and Accent Optical prepared by the managements of Nanometrics and Accent Optical, respectively, as well as the amounts and timing of the cost savings and related expenses expected to result from the merger furnished to Cowen by Nanometrics;
- First Call estimates and financial projections in Wall Street analyst reports for Nanometrics;
- discussions Cowen had with certain members of the managements of each of Nanometrics and Accent Optical concerning their respective historical and current business operations and financial conditions and the prospects of Nanometrics and Accent Optical, the expected synergies and such other matters Cowen deemed relevant;

certain operating results and the reported price and trading history of the shares of the common stock of Nanometrics compared to the operating results and reported price and trading histories of certain publicly traded companies Cowen deemed relevant;

certain financial terms of the merger as compared to the financial terms of certain selected business combinations Cowen deemed relevant; and

certain anticipated pro forma financial effects of the merger excluding goodwill of the merger on an accretion/dilution basis.

In conducting its review and arriving at its opinion, Cowen, with Nanometrics consent, assumed and relied, without independent investigation, upon the accuracy and completeness of all financial and other information provided to it by Nanometrics and Accent Optical or which was publicly available. Cowen further relied upon the assurance of management of Nanometrics that they were unaware of any facts that would make the information provided to Cowen incomplete or misleading in any respect. In addition, Cowen did not conduct any physical inspection of the properties or facilities of Nanometrics or Accent Optical. Cowen, with Nanometrics consent, assumed that the financial forecasts and synergies provided to Cowen were reasonably prepared by the management of Nanometrics, and reflected the best available estimates and good faith judgments of such management as to the future performance of Nanometrics and the synergies. Management of each of Nanometrics and Accent Optical confirmed to Cowen, and Cowen assumed, with Nanometrics consent, that each of the financial forecasts and synergies, and the First Call estimates and analyst projections utilized in Cowen s analyses with respect to Nanometrics and Accent Optical provided a reasonable basis for its opinion.

Cowen did not make or obtain any independent evaluations, valuations or appraisals of the assets or liabilities of Nanometrics or Accent Optical, nor was Cowen furnished with these materials. Cowen s services to Nanometrics in connection with the merger were limited to rendering an opinion from a financial point of view of the consideration paid in the merger. Cowen s opinion was necessarily based upon economic and market conditions and other circumstances as they existed and could be evaluated by Cowen on the date of its opinion. Cowen assumed that the final form of the merger agreement would be substantially similar to the last draft received by Cowen prior to rendering its opinion. Cowen also assumed that all governmental, regulatory and other consents and approvals contemplated by the merger agreement would be obtained and that, in the course of obtaining any of those consents, no restrictions will be imposed or waivers made that would have an adverse effect on the contemplated benefits of the merger.

Cowen s opinion does not constitute a recommendation to any Nanometrics shareholder or Accent Optical stockholder as to how such person should vote on the matters set forth in this joint proxy statement/ prospectus. Cowen s opinion does not imply any conclusion as to the likely trading range for Nanometrics common stock following consummation of the merger or otherwise, which may vary depending on numerous factors that generally influence the price of securities. Cowen expresses no opinion as to the underlying business reasons that may support the decision of the Nanometrics board to approve, or Nanometrics decision to consummate, the merger.

The following is a summary of the principal financial analyses performed by Cowen to arrive at its opinion. Some of the summaries of financial analyses include information presented in tabular format. In order to fully understand the financial 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 analyses, nor does the order of the analyses described represent the relative importance or weight given to those analyses by Cowen. Considering the data set forth in the tables without considering the full narrative description of the financial analyses, including the methodologies and assumptions underlying the analyses, could create a misleading or incomplete view of the financial analyses. Cowen performed certain procedures, including each of the financial analyses described below, and reviewed with the management of Nanometrics the assumptions on which such analyses were based and other factors, including the historical and projected financial results of Nanometrics and Accent Optical.

Table of Contents

Analysis of Selected Transactions. Cowen reviewed the financial terms, to the extent publicly available, of selected transactions referred to as the Precedent Transactions involving the acquisition of companies in the semiconductor capital equipment industry, which were announced or completed since January 1, 2001. These Precedent Transactions were (listed as acquirer/target):

Brooks Automation Inc. / Helix Technology Corp.

Entegris Inc. / Mykrolis Corp.

Aviza Technology Inc. / Trikon Technologies Inc.

Helix Technology Corp. / ICG Polycold Systems Inc.

Toppan Printing Co. Ltd. /DuPont Photomasks Inc.

Applied Materials Inc. / Metron Technology N.V.

AIXTRON AG/ Genus, Inc.

Novellus Systems Inc. / Peter Wolters AG

GSI Group, Inc. / MicroE Systems Corp.

Credence Systems Corp. / NPTest Holding LLC

Veeco Instruments Inc. / Emcore Corp. MOCVD Business

Partnership led by Francisco Partners Inc. / NPTest Holding Corp.

Investor Group Ltd. / CoorsTek Inc.

Novellus Systems Inc. / SpeedFam-IPEC Inc.

Newport Corp. / Micro Robotics Systems Inc.

MKS Instruments Inc. / ENI Division of Emerson Electric Co.

Brooks Automation Inc. / PRI Automation Inc.

Veeco Instruments Inc. / Applied EPI Inc.

Teradyne Inc. / GenRad Inc.

Credence Systems Corp. / Integrated Measurement Systems Inc.

Brooks Automation Inc. / SEMY Engineering Inc.

Cowen reviewed the market capitalization of common stock plus total debt less cash and equivalents (the Enterprise Value) paid in the Precedent Transactions as a multiple of the last quarter annualized (LQA) revenues, the latest reported twelve month (LTM) revenues and the estimated next twelve month (NTM) revenues, and also examined the multiples of equity value paid in the Precedent Transactions to NTM earnings.

The following table presents, for the periods indicated, the multiples implied by the ratio of Enterprise Value to LTM revenues and NTM revenue, and the ratio of equity value to NTM earnings. The information in the table was based on the closing sale price of Nanometrics stock as reported on the Nasdaq Stock Market on January 24, 2006.

	Precedent Transactions				Multiple Implied by
	1st Quartile	Mean	Median	3rd Quartile	Consideration Paid
Enterprise Value / LTM Revenue	1.3 x	1.8 x	1.9 x	2.3 x	1.9 x
Enterprise Value / NTM Revenue	1.5 x	1.8 x	1.8 x	2.1 x	1.5 x
Equity Value / NTM Earnings	30 x	37 x	37 x	46 x	24 x (a)

(a) Equity Value / NTM Earnings assumes earnings are fully taxed at 36%.

Although the Precedent Transactions were used for comparison purposes, none of those transactions is directly comparable to the merger, and none of the companies in those transactions is directly comparable to Nanometrics or Accent Optical. Accordingly, an analysis of the results of such a comparison is not purely 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 or Accent Optical to which they are being compared.

Analysis of Selected Publicly Traded Companies. To provide contextual data and comparative market information, Cowen compared selected historical operating and financial data and ratios for Accent Optical to the corresponding financial data and ratios of certain other companies (the Selected Companies) whose securities are publicly traded and which Cowen believes have operating, market valuation and trading valuations similar to what might be expected of Accent Optical. These Selected Companies were:

ADE Corporation

FEI Company

KLA-Tencor Corp.

Nanometrics Incorporated

Nova Measuring Instruments Ltd.

Rudolph Technologies, Inc.

Therma-Wave, Inc.

Veeco Instruments Inc.

Zygo Corporation

The data and ratios included the Enterprise Value of the Selected Companies as multiples of LQA revenues, estimated 2005 calendar year revenues and estimated 2006 calendar year revenues. Cowen also examined the ratios of the current share prices of the Selected Companies to estimated 2006 calendar year earnings per share (EPS) (as available from research analyst reports or, if not so available, First Call) for the Selected Companies.

The following table presents, for the periods indicated, the multiples implied by the ratio of Enterprise Value to estimated (E) 2005 calendar year (CY) revenues, and estimated 2006 CY revenues, and the ratio of equity value as reported on the Nasdaq Stock Market to estimates for 2006 CY earnings. The information in the table is based on the closing sale price of Nanometrics stock on January 24, 2006 as reported on the Nasdaq Stock Market.

	Selected Company Multiples				Multiple Implied by
	1st Quartile	Mean	Median	3rd Quartile	Consideration Paid
Enterprise Value / LOA Revenue	1.8 x	2.3 x	2.0 x	2.6 x	2.7 x
Enterprise Value / CY 2005 E Revenue	1.8 x	2.3 x	2.0 x	2.5 x	1.9 x
Enterprise Value / CY 2006 E Revenue	1.6 x	2.1 x	1.7 x	2.3 x	1.5 x
Equity Value / CY 2006 E Earnings	23 x	30 x	24 x	35 x	24 x (a)

(a) Equity Value / NTM Earnings assumes earnings are fully taxed at 36%.

Although none of the Selected Companies is directly comparable to Accent Optical, the companies included were chosen because they are publicly traded companies with operations that for purposes of analysis may be considered similar to certain operations of Accent Optical.

Table of Contents

Contribution Analysis. Cowen analyzed the respective implied contributions of various operating metrics of Nanometrics and Accent Optical to the combined company, based upon the historical and projected financial results of Nanometrics and Accent Optical (based upon Wall Street research analyst estimates for Nanometrics, and the financial forecasts supplied by Accent Optical and revised by management of Nanometrics). The contribution analysis did not reflect any synergies, purchase accounting adjustments or merger related costs resulting from the consummation of the merger.

Relative Contribution	Accent Optical Contribution	Nanometrics Contribution
Revenue		
LTM	35%	65%
LQA	34%	66%
CY 2005E	37%	63%
CY 2006E	42%	58%
Gross Profit		
LTM	36%	64%
LQA	37%	63%
CY 2005E	39%	61%
CY 2006E	44%	56%
Operating Income		
LTM	NM	NM
LQA	NM	NM
CY 2005E	NM	NM
CY 2006E	56%	44%
Net Income		
LTM	NM	NM
LQA	NM	NM
CY 2005E	NM	NM
CY 2006E	46%	54%

Pro Forma Ownership Analysis. Cowen analyzed the pro forma ownership in the combined company by the holders of Accent Optical and noted that holders of Accent Optical capital stock would own approximately 27% of the combined company, based on the Nanometrics closing sales price as reported on the Nasdaq Stock Market on January 24, 2006.

Pro Forma Earnings Analysis. Cowen analyzed the potential effect of the merger on the projected combined income statement of operations of Nanometrics and Accent Optical for the calendar year ending December 31, 2006, and for the period from April 1, 2006 to December 31, 2006. This analysis was based upon publicly available information, estimates prepared by Nanometrics management and selected Wall Street research estimates. For purposes of the analysis, EPS was calculated both on the basis of GAAP and on a cash EPS basis, which added back to GAAP net income amortization of intangible assets and transaction expenses resulting from the merger. In addition, for purposes of the analysis of pro forma 2006 results, Cowen assumed the merger will close on March 31, 2006 and prepared this analysis assuming no synergies and $5.2 million in transaction expenses. Based on these estimates and assumptions, Cowen s analysis showed that the merger would result in accretion for the calendar year ending December 31, 2006, and for the period from April 1, 2006 to December 31, 2006, to Nanometrics cash EPS, and dilution for the calendar year ending December 31, 2006, and for the period from April 1, 2006 to December 31, 2006 to Nanometrics GAAP EPS. The financial forecasts that underlie this analysis are subject to substantial uncertainty and, therefore, actual results may be substantially different.

Table of Contents

Cowen was selected by the Nanometrics board to render an opinion to the Nanometrics board because Cowen is a nationally recognized investment banking firm and because, as part of its investment banking business, Cowen is continually engaged in the valuation of businesses and their securities in connection with mergers and acquisitions, negotiated underwritings, secondary distributions of listed and unlisted securities, private placements and valuations for corporate and other purposes. In addition, in the ordinary course of its business, Cowen and its affiliates trade the equity securities of Nanometrics for their own account and for the accounts of their customers, and, accordingly, may at any time hold a long or short position in such securities. Cowen and its affiliates in the ordinary course of business have from time to time provided, and in the future may continue to provide, commercial and investment banking services to Nanometrics, including serving as a financial advisor on potential acquisitions and as an underwriter on equity offerings, and have received and may in the future receive fees for the rendering of such services.

Pursuant to a letter agreement, Nanometrics engaged Cowen to act as its exclusive financial advisor in connection with the merger, for which it is entitled to receive a transaction fee of $500,000 if the merger is consummated. Nanometrics has also paid a fee to Cowen for rendering its opinion, which fee shall be credited against any transaction fee paid. Additionally, Nanometrics has agreed to reimburse Cowen for its reasonable out of pocket expenses, up to $35,000, including attorneys fees, and has agreed to indemnify Cowen against certain liabilities, including liabilities under the federal securities laws. To date, Nanometrics has paid Cowen an aggregate of $400,000 for services relating to the merger. Other than this amount, Nanometrics has not made any payments to Cowen over the preceding two years.

Opinion of Accent Optical s Financial Advisor

Accent Optical retained Merrill Lynch to act as exclusive financial advisor to Accent Optical in connection with the merger. In connection with that engagement, Accent Optical requested that Merrill Lynch evaluate the fairness of the aggregate consideration, from a financial point of view, to the holders of Accent Optical shares of capital stock. At the meeting of Accent Optical s board of directors on January 24, 2006, Merrill Lynch rendered its oral opinion to the Accent Optical board, and confirmed in writing, that as of January 24, 2006, based upon the assumptions made, matters considered and limits of such review, as set forth in its opinion, the aggregate consideration was fair, from a financial point of view, to the holders of Accent Optical shares of capital stock.

The full text of Merrill Lynch s opinion, which sets forth material information relating to Merrill Lynch s fairness opinion, including the assumptions made, matters considered and qualifications and limitations on the scope of review undertaken by Merrill Lynch, is attached as Annex D and is incorporated into this document by reference in its entirety. This description of Merrill Lynch s opinion is qualified in its entirety by reference to, and should be reviewed together with, the full text of the opinion. You are urged to read the opinion and consider it carefully. Merrill Lynch s opinion is addressed to the Board of Directors of Accent Optical and addresses only the fairness, from a financial point of view, of the aggregate consideration to the holders of Accent Optical shares of capital stock. The opinion does not address the merits of the underlying decision of Accent Optical to engage in the merger and does not constitute a recommendation to any stockholder as to how such stockholder should vote on, or consent to, the proposed merger or any matter related thereto. In addition, Accent Optical has not asked Merrill Lynch to address, and this opinion does not address, the fairness to, or any other consideration of, the holders of any class of securities, creditors or other constituencies of Accent Optical, other than the holders of Accent Optical shares of capital stock on an aggregate basis.

In arriving at its opinion, Merrill Lynch, among other things:

- Reviewed certain publicly available business and financial information relating to Accent Optical and Nanometrics that Merrill Lynch deemed to be relevant;

- Reviewed certain information, including financial forecasts, relating to the business, earnings, cash flow, assets, liabilities and prospects of Accent Optical and Nanometrics furnished to Merrill Lynch by Accent Optical and Nanometrics, respectively, as well as the amount and timing of the cost savings and related expenses and synergies expected to result from the merger (the Expected Synergies) furnished to Merrill Lynch by Accent Optical;

Conducted discussions with members of senior management of Accent Optical and Nanometrics concerning the matters described above, as well as their respective businesses and prospects before and after giving effect to the merger and the Expected Synergies;

Reviewed the valuation multiples for Accent Optical and Nanometrics and compared them with those of certain publicly traded companies that Merrill Lynch deemed to be relevant;

Reviewed the results of operations of Accent Optical and Nanometrics and compared them with those of certain publicly traded companies that Merrill Lynch deemed to be relevant;

Compared the proposed financial terms of the merger with the financial terms of certain other transactions that Merrill Lynch deemed to be relevant;

Participated in certain discussions and negotiations among representatives of Accent Optical, and Nanometrics and its financial advisor;

Reviewed the potential pro forma impact of the merger;

Reviewed the merger agreement; and

Reviewed such other financial studies and analyses and took into account such other matters as Merrill Lynch deemed necessary, including its assessment of general economic, market and monetary conditions.

In preparing its opinion, Merrill Lynch assumed and relied on the accuracy and completeness of all information supplied or otherwise made available to it, discussed with or reviewed by or for it, or publicly available, and Merrill Lynch did not assume any responsibility for independently verifying such information or undertake an independent evaluation or appraisal of any of the assets or liabilities of Accent Optical or Nanometrics, nor was Merrill Lynch furnished with any such evaluation and appraisal, and Merrill Lynch did not evaluate the solvency or fair value of Accent Optical or Nanometrics under any state or federal laws relating to bankruptcy, insolvency or similar matters. In addition, Merrill Lynch did not assume any obligation to conduct any physical inspection of the properties or facilities of Accent Optical or Nanometrics. With respect to the financial forecast information and the Expected Synergies furnished to or discussed with Merrill Lynch by Accent Optical or Nanometrics, Merrill Lynch assumed that they had been reasonably prepared and reflected the best currently available estimates and judgment of Accent Optical s or Nanometrics management as to the expected future financial performance of Accent Optical or Nanometrics, as the case may be, and the Expected Synergies. Merrill Lynch makes no representations as to the actual timing or amount of Expected Synergies, if any, which may result from the merger. Merrill Lynch assumed that the final form of the merger agreement would be substantially similar to the last draft reviewed by it.

Merrill Lynch s opinion was necessarily based upon market, economic and other conditions as they existed and could be evaluated on the date of the opinion, and upon the information made available to Merrill Lynch as of the date of the opinion. For purposes of rendering this opinion, Merrill Lynch assumed that, in all respects material to its analysis, the representations and warranties of Accent Optical, Nanometrics and the merger subsidiary contained in the merger agreement were true and correct, that Accent Optical, Nanometrics and the merger subsidiary will each perform all of the covenants and agreements to be performed by it under the merger agreement, and all conditions and obligations of each of Accent Optical, Nanometrics and the merger subsidiary will be satisfied without waiver. Merrill Lynch also assumed that all governmental, regulatory or other approvals and consents required in connection with the consummation of the merger will be obtained, and that in connection with obtaining such governmental or other approvals and consents, or any amendments, modifications or waivers to any agreements, instruments or orders to which either Accent Optical or Nanometrics is a party or is subject or by which it is bound, no limitations, restrictions or conditions will be imposed that would have a material adverse effect on Accent Optical or Nanometrics or materially reduce the contemplated benefits of the merger to Accent Optical, Nanometrics or the combined company.

Table of Contents

Merrill Lynch has no obligation to update its opinion to take into account events occurring after the date that its opinion was delivered to Accent Optical s board of directors. Circumstances could develop prior to consummation of the merger that, if known at the time Merrill Lynch rendered its opinion, would have altered such opinion. Merrill Lynch has expressed no opinion as to the prices at which shares of Nanometrics common stock will trade following the announcement or consummation of the merger. In addition, as described above, Merrill Lynch s fairness opinion was among several factors taken into consideration by Accent Optical s board of directors in making its determination to approve the merger agreement and the merger. Consequently, Merrill Lynch s analysis described below should not be viewed as determinative of the decision of Accent Optical s board of directors or the Accent Optical management with respect to the fairness of the aggregate consideration, to the holders of Accent Optical shares of capital stock.

At the meeting of Accent Optical s board of directors held on January 24, 2006, Merrill Lynch presented certain financial analyses accompanied by delivery of its written materials in connection with the delivery of its oral opinion at that meeting and its subsequent written opinion. The following is a summary of the material financial analyses performed by Merrill Lynch in arriving at its opinion.

Accent Optical Valuation Analysis

Comparable Public Trading Multiples Analysis. Using publicly available securities research analyst estimates and other information, Merrill Lynch compared selected financial data of Accent Optical with similar data for selected publicly traded companies engaged in businesses that Merrill Lynch judged to be reasonably comparable to those of Accent Optical. These companies were:

- FEI Company
- Veeco Instruments Inc.
- ADE Corporation
- Zygo Corporation
- Rudolph Technologies, Inc.
- Nanometrics Incorporated
- August Technology Corporation
- Therma-Wave, Inc.
- Nova Measuring Instruments Ltd.

Merrill Lynch used publicly available securities research analyst estimates for each of these companies to determine multiples of the enterprise value or equity value of the comparable companies to several estimated financial metrics for the comparable companies. The following table summarizes the derived ranges of multiples and the ranges of enterprise values of Accent Optical implied by such multiples, assuming Accent Optical target and conservative management estimates:

	Multiple Range	Implied Enterprise Value of Accent Optical (in millions)
Target Case CY2005 Estimated Revenue	0.41x 2.12x	$17 - $89
Target Case CY2006 Estimated EBITDA	6.8x 13.6x	$69 - $138
Target Case CY2007 Estimated EBITDA	5.9x 17.0x	$71 - $205
Target Case CY2007 Estimated Net Income	10.7x 22.3x	$80 - $155
Conservative Case CY2005 Estimated Revenue	0.41x 2.12x	$17 - $89
Conservative Case CY2006 Estimated EBITDA	6.8x 13.6x	$13 - $27
Conservative Case CY2007 Estimated EBITDA	5.9x 17.0x	$18 - $53
Conservative Case CY2007 Estimated Net Income	10.7x 22.3x	$23 - $36

Table of Contents

Merrill Lynch observed that the implied multiples being paid for Accent Optical were:

- in the range of the comparable public trading multiples for target case for CY 2005 based on estimated revenue, and target case for CYs 2006 and 2007 based on estimated EBITDA;
- below the range of the comparable public trading multiples for target case for CY 2007 based on estimated net income;
- in the range of the comparable public trading multiples for conservative case for CY 2005 based on estimated revenue; and
- above the range of the comparable public trading multiples for conservative case for CYs 2006 and 2007 based on estimated EBITDA, and conservative case for CY 2007 based on estimated net income.

It should be noted that no company used in the above analysis is identical to Accent Optical. In evaluating companies identified by Merrill Lynch as comparable to Accent Optical, Merrill Lynch made judgments and assumptions with regard to industry performance, general business, economic, market and financial conditions and other matters, many of which are beyond the control of Accent Optical, such as the impact of competition on the business of Accent Optical and the industry generally, industry growth and the absence of any material change in the financial condition and prospects of Accent Optical or the industry or in the financial markets in general. A complete analysis involves complex considerations and judgments concerning differences in financial and operating characteristics of the comparable companies and other factors that could affect the public trading values of such comparable companies to which they are being compared; mathematical analysis is not in itself a meaningful method of using selected company data.

Comparable Transaction Analysis. Using publicly available securities research analyst estimates and other information, Merrill Lynch examined the following transactions that Merrill Lynch deemed to be relevant to determine the multiple of the value of such transactions at the time of announcement to estimates at the time of announcement of the LTM revenues and next CY revenues for the target companies. The precedent transactions that Merrill Lynch considered are:

Acquiror	**Target**
Brooks Automation, Inc.	Helix Technology Corporation
Entegris, Inc.	Mykrolis Corporation
KLA-Tencor Corporation	August Technology Corporation
Rudolph Technologies, Inc.	August Technology Corporation
Nanometrics Incorporated	August Technology Corporation
Toppan Printing Co., Ltd.	DuPont Photomasks, Inc.
Applied Materials, Inc.	Metron Technology N.V.
Amkor Technology, Inc.	Unitive, Inc.
AIXTRON Aktiengesellschaft	Genus, Inc.
Credence Systems Corporation	NPTest, Inc.
Veeco Instruments Inc.	TurboDisc Segment of Emcore Corporation
Francisco Partners / Shah Management	NPTest, Inc.
Investor Group	CoorsTek, Inc.
Novellus Systems, Inc.	SpeedFam-IPEC, Inc.
MKS Instruments, Inc.	ENI Division of Emerson Electric Co.
Brooks Automation, Inc.	PRI Automation, Inc.
Texas Pacific Group	MEMC Electronic Materials, Inc.
Teradyne, Inc.	GenRad, Inc.
Credence Systems Corporation	Integrated Measurement Systems, Inc.

All calculations of multiples paid in the selected transactions were based on public information available at the time of public announcement. Merrill Lynch s analysis did not take into account different market and other

73

Table of Contents

conditions during the period in which the selected transactions occurred. The following table summarizes the derived ranges of multiples and the ranges of enterprise value implied by such multiples, assuming Accent Optical target and conservative management estimates:

	Multiple Range		Implied Enterprise Value of Accent Optical (in millions)	
Target Case LTM Revenue	0.43x	2.70x	$18	$113
Target Case Next CY Estimated EBITDA	3.8x	15.2x	$55	$222
Conservative Case LTM Revenue	0.43x	2.70x	$18	$113
Conservative Case Next CY Estimated EBITDA	3.8x	15.2x	$21	$85

Merrill Lynch observed that the implied multiples being paid for Accent Optical were in the range of multiples paid for selected comparable transactions.

It should be noted that no transaction utilized in the analysis above is identical to the proposed merger. A complete analysis involves complex considerations and judgments concerning differences in financial and operating characteristics of the companies involved in these transactions and other factors that could affect the transaction multiples or premiums paid in such comparable transactions to which the transaction is being compared; mathematical analysis (such as determining the mean or the median) is not in itself a meaningful method of using selected transaction data.

Nanometrics Valuation Analysis

Comparable Public Trading Multiples Analysis. Using publicly available securities research analyst estimates and other information, Merrill Lynch compared selected financial and trading data of Nanometrics with similar data for selected publicly traded companies engaged in businesses that Merrill Lynch judged to be reasonably comparable to those of Nanometrics. These companies were:

- FEI Company
- Veeco Instruments Inc.
- ADE Corporation
- Zygo Corporation
- Rudolph Technologies, Inc.
- August Technology Corporation
- Therma-Wave, Inc.

Nova Measuring Instruments Ltd.

Merrill Lynch used publicly available securities research analyst estimates for each of these companies to determine multiples of the enterprise value or equity value of the comparable companies to several estimated financial metrics for the comparable companies. The following table summarizes the derived ranges of multiples and the ranges of equity values per Nanometrics share implied by such multiples, assuming Nanometrics management estimates for calendar years 2005 and 2006 and estimates derived from discussion with Nanometrics management for calendar year 2007:

	Multiple Range		**Implied Equity Value per Nanometrics Share**	
CY2005 Estimated Revenue	0.41x	3.63x	$5.15	$20.95
CY2006 Estimated Revenue	0.86x	3.10x	$7.95	$20.47
CY2006 Estimated EBITDA	6.8x	13.6x	$7.97	$12.81
CY2007 Estimated EBITDA	5.9x	10.2x	$11.38	$17.39
CY2007 Estimated P/E	10.7x	22.3x	$8.74	$18.21

Table of Contents

Merrill Lynch observed that the multiples for Nanometrics were:

- in the range of the comparable public trading multiples for management case for CY 2005 and 2006 based on estimated revenue, management-derived case for CY 2007 based on estimated EBITDA and management-derived case for CY 2007 based on P/E; and

- above the range of the comparable public trading multiples for management case for CY 2006 based on estimated EBITDA.

It should be noted that no company used in the above analysis is identical to Nanometrics. In evaluating companies identified by Merrill Lynch as comparable to Nanometrics, Merrill Lynch made judgments and assumptions with regard to industry performance, general business, economic, market and financial conditions and other matters, many of which are beyond the control of Nanometrics, such as the impact of competition on the business of Nanometrics and the industry generally, industry growth and the absence of any material change in the financial condition and prospects of Nanometrics or the industry or in the financial markets in general. A complete analysis involves complex considerations and judgments concerning differences in financial and operating characteristics of the comparable companies and other factors that could affect the public trading values of such comparable companies to which they are being compared; mathematical analysis is not in itself a meaningful method of using selected company data.

The summary set forth above does not purport to be a complete description of the analyses performed by Merrill Lynch in arriving at its opinion. The preparation of a fairness opinion is a complex process involving various determinations as to the most appropriate and relevant methods of financial analysis and the application of those methods to the particular circumstances and, therefore, such an opinion is not readily susceptible to partial analysis or summary description. No company, business or transaction used in such analyses as a comparison is identical to Nanometrics or Accent Optical or the merger, nor is an evaluation of such analyses entirely mathematical. In arriving at its opinion, Merrill Lynch did not attribute any particular weight to any analysis or factor considered by it, but rather made qualitative judgments as to the significance and relevance of each analysis and factor. Accordingly, Merrill Lynch believes that its analyses must be considered as a whole and that selecting portions of its analyses and of the factors considered by it, without considering all factors and analyses, would, in the view of Merrill Lynch, create an incomplete and misleading view of the analyses underlying Merrill Lynch s opinion.

Accent Optical retained Merrill Lynch based upon Merrill Lynch s experience and expertise. Merrill Lynch is an internationally recognized investment banking firm with substantial experience in transactions similar to the proposed merger. Merrill Lynch, as part of its investment banking business, is continually engaged in the valuation of businesses and securities in connection with business combinations and acquisitions and for other purposes and has substantial experience in transactions similar to the proposed Nanometrics-Accent Optical transaction.

Under the terms of the engagement letter between Merrill Lynch and Accent Optical, Merrill Lynch provided financial advisory services and the financial fairness opinion in connection with the transaction, and Accent Optical agreed to pay Merrill Lynch a fee of $2 million which is contingent upon consummation of the transaction, plus related expenses up to $50,000. In addition, Accent Optical has agreed to indemnify Merrill Lynch and its affiliates, their respective directors, officers, agents, employees and controlling persons against certain liabilities and expenses, including certain liabilities under the federal securities laws, related to or arising out of Merrill Lynch s engagement. Accent Optical has not made any payments to Merrill Lynch over the past two years for services relating to the merger or otherwise.

In the ordinary course of its business, Merrill Lynch may actively trade in the securities of Nanometrics, for its own account and for the accounts of its customers and, accordingly, may at any time hold a long or short position in such securities.

Table of Contents

Interests of Nanometrics Directors and Executive Officers in the Merger

Nanometrics Board of Directors and Executive Officers after the Merger

Accent Optical and Nanometrics have agreed that all of the current directors of Nanometrics will serve as members of the board of directors of Nanometrics following the completion of the merger. Additionally, Accent Optical and Nanometrics have agreed to take all action necessary to ensure that the current executive officers of Nanometrics will continue to serve as executive officers of Nanometrics following completion of the merger. In addition, Mr. Rhine, a current director of Accent Optical, will join the Nanometrics board of directors following completion of the merger. Mr. Rhine, also the current Chief Executive Officer of Accent Optical, will also become an executive officer of Nanometrics and serve as Chief Strategy Officer after the merger is completed.

Directors and Officers Insurance

Nanometrics does not currently maintain directors and officers insurance for its directors and officers.

Interests of Accent Optical Directors and Executive Officers in the Merger

In considering the recommendation of the Accent Optical board of directors that Accent Optical stockholders approve the merger agreement, as amended, the merger and the related transactions and approve the payments to certain executive officers, you should be aware that members of the Accent Optical board of directors and Accent Optical executive officers have interests in the merger that may be different than, or in addition to, the interests of Accent Optical stockholders generally. These interests include:

- the appointment of Mr. Rhine, a current director and Chief Executive Officer of Accent Optical, as a director of the combined company upon completion of the merger, and the appointment of Mr. Rhine, as an executive officer of the combined company upon completion of the merger;

- the potential receipt of severance payments by certain Accent Optical executive officers, including Mr. Rhine, Reid Langrill, Accent Optical s Chief Financial Officer, and Bruce Crawford, Accent Optical s President and Chief Operating Officer;

- the grant of additional stock options to Accent Optical officers which will be assumed by Nanometrics, including Messrs. Rhine and Crawford, Gregory Kaiser, Accent Optical s Senior Vice President, Business Development, and Steve Hummel, Accent Optical s Chief Technology Officer;

- the acceleration of vesting of assumed options of officers and directors, including Messrs. Rhine, Langrill and Crawford, if their employment or service relationship is terminated in connection with the merger;

- the continued indemnification following the merger of the current Accent Optical directors and officers for acts or omissions occurring prior to the closing of the merger;

- the receipt by Bio-Rad, a company affiliated with Accent Optical director David Schwartz, of approximately $12.0 million as repayment of a loan and a contractual fee of $2.5 million (related to the 2000 Bio-Rad SMD purchase), each in connection with the closing of the merger; and

- the re-allocation of the merger consideration so that holders of Accent Optical Common Stock can receive more of the merger consideration than they originally would have been entitled to, which benefits the directors and officers that hold Accent Optical Common Stock.

The Accent Optical board of directors was aware of these interests and considered them, among other matters, in making its recommendation.

Nanometrics Board of Directors after the Merger

Accent Optical and Nanometrics have agreed that up to three current directors of Accent Optical will join the board of directors of Nanometrics following the completion of the merger. The parties currently expect that

Table of Contents

Mr. Rhine will become a member of the Nanometrics board of directors and that no other appointments of the two other candidates will be made.

Employment Agreement with Nanometrics

Mr. Rhine, Accent Optical s Chairman and Chief Executive Officer, has entered into an employment agreement with Nanometrics, pursuant to which Mr. Rhine will become an executive officer of Nanometrics and serve as its Chief Strategy Officer following the completion of the merger. He will receive a base salary of $250,000 per year, standard Nanometrics employee benefits and paid vacation. In connection with his employment, Mr. Rhine has agreed to certain non-competition and non-solicitation provisions, described under *Agreements Related to the Merger Employment Agreement.*

Executive Officer Retention and Severance Arrangements

Reid Langrill. In connection with the merger, Accent Optical entered into an agreement with Reid Langrill, its Chief Financial Officer, which provides for Mr. Langrill s continued employment with Accent Optical or its successors through the completion of the merger and for up to 30 days thereafter. During his period of employment, he will continue to earn his regular salary. Upon his termination, he will receive a severance payment equal to the greater of either $185,000 or the difference between $500,000 and the value of Mr. Langrill s options that are in-the-money as of the completion of the merger, subject to withholding. As such the value of the severance payment is dependent on the share price of Nanometrics common stock. Based on an Average Closing Price of $13.00, the value of the severance payment would be approximately $327,000. Following his termination, Mr. Langrill has agreed to provide consulting services to Nanometrics through March 15, 2007, subject to earlier termination, at a rate of $105 per hour and reimbursement of expenses. Mr. Langrill will provide consulting services relating to Accent Optical s financial reports, financial statements, corporate matters, tax matters and other related areas in which Mr. Langrill was involved during his employment with Accent Optical as its Chief Financial Officer. Mr. Langrill will not be required to perform more than 80 hours per month of consulting services for the first three months following his termination nor more than 40 hours per month for the fourth month following his termination through March 15, 2007. Assuming that Mr. Langrill s employment with Accent Optical is terminated on July 1, 2006, the maximum amount of compensation that Mr. Langrill could receive for his consulting services (excluding reimbursement of expenses) is $48,300.

For purposes of determining Mr. Langrill s severance payment, the value of the options that are in-the-money as of the completion of the merger will be equal to the fair market value of the shares covered by such options as of the closing (including shares for which the option had previously been exercised) minus the aggregate exercise price of such options.

Bruce Crawford. Accent Optical entered into an employment agreement with Bruce Crawford, upon commencement of his role as President and Chief Operating Officer, which provides for certain severance benefits if Accent Optical terminates Mr. Crawford s employment without good cause or Mr. Crawford terminates his employment for good reason, as defined below, during the five-year term of the agreement. Upon such termination, Mr. Crawford is entitled to receive a lump-sump payment of his annual salary (currently $213,000), continued group health or other group benefits as allowed under COBRA for a period of 12 months (with a potential gross-up for taxes arising from the provision of such benefits) and reimbursement of relocation expenses up to $50,000.

As used in Mr. Crawford s employment agreement with Accent Optical, the term good cause means: (a) willful and repeated failure to comply with the lawful instructions of the board of directors or chief executive officer, (b) willful misconduct in the performance of duties, (c) Mr. Crawford s dishonesty, fraud or willful misconduct with respect to the business or affairs of Accent Optical, or (d) Mr. Crawford s conviction of a felony or conviction of a misdemeanor involving theft, fraud, dishonesty or other acts of moral turpitude. As used in Mr. Crawford s employment agreement with Accent Optical, the term good reason means (1) a material

Table of Contents

reduction in Mr. Crawford s reporting responsibilities not mutually agreed upon, (2) a reduction in Mr. Crawford s salary by more than 15%, (3) demand by Accent Optical that Mr. Crawford relocate more than 50 miles from the Bend, Oregon area, (4) the occurrence of a change of control of Accent Optical; however, Mr. Crawford will remain during the six-month transition period after such change in control upon written request. The term change of control means the acquisition by any person or entity or group of related persons or entities of beneficial ownership of more than 50% of Accent Optical s Common Stock or voting power entitled to vote in an election of directors, subject to exclusions for public offerings and acquisitions of stock by Accent Optical, an employee benefit plan or persons and entities who beneficially owned more than 50% of Accent Optical s stock or voting power prior to the acquisition. In certain circumstances, change of control, as used in the employment agreement, has the same meaning as used in Section 409A of the Internal Revenue Code. Mr. Crawford must provide written notice to Accent Optical of the good reason event, and allow Accent Optical 50 days to cure the conditions. If Accent Optical does not cure the conditions within 50 days, Mr. Crawford must exercise his right to terminate the employment agreement for good reason within 50 days thereafter, or he will have waived the conditions.

Executive Officer Option Grants

In connection with the merger, Accent Optical granted nonqualified options to purchase Accent Optical Common Stock to certain of its executive officers, as set forth below, and to certain key employees. Nanometrics desires to retain the services of these individuals following the consummation of the merger, and the options were granted to provide an additional incentive for these individuals to continue their employment with Accent Optical through the consummation of the merger and with Nanometrics thereafter. The options were granted on January 25, 2006 and have an exercise price of $0.33 per share. The exercise price is equal to the fair market value of Accent Optical Common Stock as of the date of grant, as determined by the merger consideration payable for such shares as of that date. Based on the Average Closing Price as of June 6, 2006, the estimated value of the merger consideration payable for each share of Accent Optical Common Stock underlying the options is $0.2421 per share. The options are subject to vesting with one-third of the options vesting on each of the first, second and third anniversaries of the grant date. Upon consummation of the merger, these nonqualified stock options will be assumed by Nanometrics pursuant to the terms of the merger agreement, as amended. If the employment of the holder of Accent Optical stock options assumed by Nanometrics upon completion of the merger is terminated by Accent Optical or Nanometrics without cause or by the employee for good reason, as defined below, within six months following the completion of the merger, the vesting of such options will accelerate in full.

Executive Officer	Title	Shares Subject to Accent Optical Options Granted in connection with the Merger
Bruce C. Rhine	Chairman and Chief Executive Officer	4,122,000
Bruce Crawford	President and Chief Operating Officer	800,000
Gregory Kaiser	Senior Vice President, Business Development	100,000
Steve Hummel	Chief Technology Officer	250,000
Raj Mundhe	Vice President, Global Sales	250,000

With respect to these option grants, the term good reason means: (a) a change in the holder s status, title, position or responsibilities (including reporting responsibilities) that, in the holder s reasonable judgment, represents a substantial reduction in the status, title, position or responsibilities as in effect immediately prior thereto; the assignment to the holder of any duties or responsibilities that, in the holder s reasonable judgment, are materially inconsistent with such status, title, position or responsibilities; or any removal of the holder from or failure to reappoint or reelect the holder to any of such positions, except in connection with the termination of the holder s employment for cause, as a result of his or her disability or death, or by the holder other than for good reason; (b) a reduction in the holder s annual base salary; or (c) Accent Optical or its successor requiring the holder (without the holder s consent) to be based at any place outside a 50 mile radius of his place of employment prior to the completion of the merger, except for reasonably required travel on business that is not materially greater than such travel requirements prior to the completion of the merger.

With respect to these option grants, the term cause means: a termination of employment or service based upon a finding by Accent Optical, acting in good faith and based on its reasonable belief at the time, that the holder (a) has been negligent in the discharge of his duties to Accent Optical, has refused to perform stated or assigned duties or is incompetent in or (other than by reason of a disability or analogous condition) incapable of performing those duties; (b) has been dishonest or committed or engaged in an act of theft, embezzlement or fraud, a breach of confidentiality, an unauthorized disclosure or use of inside information, customer lists, trade secrets or other confidential information; (c) has breached a fiduciary duty, or willfully and materially violated any other duty, law, rule, regulation or policy of Accent Optical or an affiliate; or has been convicted of, or plead guilty or nolo contendere to, a felony or misdemeanor (other than minor traffic violations or similar offenses); (d) has materially breached any of the provisions of any agreement with Accent Optical or an affiliated entity; (e) has engaged in unfair competition with, or otherwise acted intentionally in a manner injurious to the reputation, business or assets of, Accent Optical or an affiliate; or (f) has improperly induced a vendor or customer to break or terminate any contract with Accent Optical or an affiliate or induced a principal for whom Accent Optical or an affiliate acts as agent to terminate such agency relationship.

Indemnification; Directors and Officers Insurance

In the merger agreement, as amended, Nanometrics agreed that, for a period of six years following completion of the merger, Nanometrics and any of its subsidiaries would honor any indemnification agreements currently in place between Accent Optical and any of its current or former directors and officers. Additionally, Nanometrics agreed that, for a period of six years following completion of the merger, Nanometrics and any of its subsidiaries would cause the certificate of incorporation and bylaws (or any similar organizational documents) of the surviving corporation and its subsidiaries to contain indemnification and exculpation provisions no less favorable than the indemnification and exculpation provisions contained in the Accent Optical certificate of incorporation and bylaws immediately prior to the merger and not amend, repeal or otherwise modify such provisions of the certificate or articles of incorporation or bylaws in any manner.

In addition, for a period of six years from the completion of the merger, Nanometrics and the surviving corporation will cause Accent Optical s existing policy of directors and officers and fiduciary liability insurance to be maintained, subject to certain limitations. Alternatively, Nanometrics is permitted to purchase a six-year tail prepaid policy on Accent Optical s current policy of directors and officers and fiduciary liability insurance and maintain the policy in full force and effect for a period of six years.

Payments to Bio-Rad Corporation

In 2000, Accent Optical purchased the assets of the former Bio-Rad SMD from Bio-Rad, a company affiliated with Accent Optical director David Schwartz. Pursuant to the asset purchase agreement, Accent Optical agreed to pay Bio-Rad $13.0 million upon a change of control of Accent Optical. In connection with the negotiations with Nanometrics related to the merger described in this joint proxy statement/prospectus, Bio-Rad agreed to reduce this change of control payment to $2.5 million, which will be paid to it upon completion of the merger. In addition, Bio-Rad will receive approximately $12.0 million in connection with the closing of the merger as repayment of a loan to Accent Optical.

Stock and Options of Directors and Executive Officers

In addition to the interests of Accent Optical s directors and executive officers described above, which may be different from the interests of an Accent Optical stockholder, each of the directors and executive officers of Accent Optical owns stock and/or options to purchase Accent Optical Common Stock. They will be entitled to the same rights as other Accent Optical stockholders and optionholders with respect to such ownership interests,

Table of Contents

including the right to a portion of the merger consideration, assumption of options and vesting acceleration, as applicable. The allocation of the merger consideration required by the merger agreement, as amended, reflects a reduction of the liquidation preference on Accent Optical s Convertible Preferred Stock and elimination of accrued dividends on both Accent Optical s Series A Preferred Stock and Convertible Preferred Stock. As a result of these concessions, holders of Accent Optical s Common Stock, including directors and executive officers, will receive a greater amount of the merger consideration.

Material United States Federal Income Tax Consequences of the Merger

The following discussion summarizes the material United States federal income tax consequences of the merger that are generally applicable to holders of Accent Optical stock. This discussion is based on the Internal Revenue Code, judicial decisions, and administrative regulations and interpretations in effect as of the date of this proxy statement/prospectus, all of which are subject to change, possibly with retroactive effect. Accordingly, the tax consequences of the merger to the holders of Accent Optical stock could differ from those described below.

This discussion does not address all aspects of United States federal income taxation that may be relevant to holders of Accent Optical stock in light of their particular circumstances, nor does it address the United States federal income tax consequences to holders that are subject to special rules under United States federal income tax law, including:

- dealers in securities or foreign currencies;
- tax-exempt organizations;
- foreign persons;
- financial institutions or insurance companies;
- holders who have a functional currency other than the U.S. dollar;
- holders who own their shares indirectly through partnerships, trusts, or other entities that may be subject to special treatment;
- holders who acquired their Accent Optical stock in connection with stock options or stock purchase plans or other compensatory transactions; and
- holders who hold their shares as a hedge or as part of a straddle, constructive sale, conversion transaction, or other risk management transaction.

In addition, this discussion does not describe the federal income tax consequences of transactions other than those pursuant to the merger or the tax consequences of the merger under foreign, state, or local law or federal estate and gift tax laws.

The obligation of each of Accent Optical and Nanometrics to effect the merger is conditioned upon the receipt of a written opinion, respectively, from each of Perkins Coie, counsel to Accent Optical, and WSGR, counsel to Nanometrics to the effect that, on the basis of statements and representations made by each of Nanometrics, Accent Optical and Alloy Merger Corporation, and subject to the limitations, qualifications and assumptions set forth therein, for United States federal income tax purposes, the merger will constitute a reorganization within the meaning of Section 368(a) of the Internal Revenue Code. If one party s counsel fails to deliver an opinion, this condition shall be satisfied if counsel to the other party delivers an opinion to both parties. These opinions will not be binding on the Internal Revenue Service and will not preclude the Internal Revenue Service from taking a contrary position. Neither Accent Optical nor Nanometrics has requested, nor will request, a ruling from the Internal Revenue Service regarding any of the federal income tax consequences of the merger.

Table of Contents

The discussion set forth below, subject to the limitations and qualifications set forth herein, constitutes the opinion of each of Perkins Coie and WSGR as to the material federal income tax consequences to the Accent Optical stockholders of the exchange of Accent Optical