

NANOPHASE TECHNOLOGIES CORPORATION
Form S-3/A
April 01, 2004
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As filed with the Securities and Exchange Commission on April 1, 2004

Registration No. 333-112130

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549

AMENDMENT NO. 1
TO
FORM S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

NANOPHASE TECHNOLOGIES CORPORATION

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

36-3687863
(I.R.S. Employer Identification No.)

1319 Marquette Drive

Romeoville, Illinois 60446

(630) 771-6700

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

JOSEPH E. CROSS, CHIEF EXECUTIVE OFFICER

NANOPHASE TECHNOLOGIES CORPORATION

1319 Marquette Drive

Romeoville, Illinois 60446

(630) 771-6700

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

Copies to:

JOHN L. EISEL, ESQ.

DONALD E. FIGLIULO, ESQ.

GEOFFREY C. COCKRELL, ESQ.

Wildman, Harrold, Allen & Dixon LLP

225 West Wacker Drive

Chicago, Illinois 60606-1229

(312) 201-2000

(312) 201-2555 (fax)

Approximate date of commencement of proposed sale to the public: From time to time after the effective date of this registration statement.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box. "

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If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, 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, please 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(c) 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 delivery of the prospectus is expected to be made pursuant to Rule 434, please check the following box.

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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 WHICH 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.

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THE INFORMATION IN THIS PROSPECTUS IS NOT COMPLETE AND MAY BE CHANGED. WE MAY NOT SELL THESE SECURITIES UNTIL THE REGISTRATION STATEMENT FILED WITH THE SECURITIES AND EXCHANGE COMMISSION IS EFFECTIVE. THE PROSPECTUS IS NOT AN OFFER TO SELL THESE SECURITIES AND IT IS NOT SOLICITING AN OFFER TO BUY THESE SECURITIES IN ANY STATE WHERE THE OFFER OR SALE IS NOT PERMITTED.

Subject to Completion, dated April 1, 2004

PROSPECTUS

\$15,000,000

NANOPHASE TECHNOLOGIES CORPORATION

DEBT SECURITIES

COMMON STOCK

WARRANTS

We may offer from time to time the following in one or more series, with an aggregate principal amount of up to a maximum of \$15,000,000, at prices and on terms to be determined at the time of offering:

debt securities, which may consist of debentures, notes or other types of debt

shares of common stock

warrants to purchase debt securities or common stock

When we offer securities pursuant to this prospectus, we will deliver to you this prospectus as well as a prospectus supplement setting forth the specific terms of the securities being offered. We urge you to read carefully this prospectus and the accompanying prospectus supplement before you make your investment decision.

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Our common stock is traded on the NASDAQ National Market under the symbol `NANX` . Any common stock sold pursuant to a prospectus supplement will be listed on such exchange, subject to official notice of issuance. On March 31, 2004, the closing price of the common stock, as reported on the NASDAQ National Market, was \$9.92 per share.

We will sell these securities directly to our stockholders or to purchasers or through agents on our behalf or through underwriters or dealers as designated from time to time. If any agents or underwriters are involved in the sale of any of these securities, the applicable prospectus supplement will provide the names of the agents or underwriters and any applicable fees, commissions or discounts.

INVESTING IN OUR SECURITIES INVOLVES A HIGH DEGREE OF RISK. SEE RISK FACTORS BEGINNING ON PAGE 4 OF THIS PROSPECTUS.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR DETERMINED IF THIS PROSPECTUS IS TRUTHFUL OR COMPLETE. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

The date of this prospectus is _____, 2004.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement filed by us with the Securities and Exchange Commission, or Commission, utilizing a shelf registration process. Under this shelf process, we may, from time to time, sell any combination of securities described in this prospectus in one or more offerings up to a total amount of \$15,000,000. This prospectus provides you with a general description of the securities we may offer. Each time we sell securities, we will provide a prospectus supplement that will contain specific information about the terms of that offering. The prospectus supplement may also add, update or change information contained in this prospectus. You should read both this prospectus and any applicable prospectus supplement together with additional information described below under the heading **Where You Can Find More Information**. As used in this prospectus, company, we, our and us refer to Nanophase Technologies Corporation, except where the context otherwise requires or as otherwise indicated.

We have not authorized any dealer, salesman or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus and the accompanying supplement to this prospectus. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus or the accompanying prospectus supplement as if we had authorized it. This prospectus and the accompanying supplement to this prospectus do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they relate, nor do this prospectus and the accompanying supplement to this prospectus constitute an offer to sell or the solicitation of an offer to buy securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. You should not assume that the information contained in this prospectus and the supplement to this prospectus is correct on any date after their respective dates, even though this prospectus or a supplement is delivered or securities are sold on a later date.

WHERE YOU CAN FIND MORE INFORMATION ABOUT US

We file annual, quarterly and special reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's web site at <http://www.sec.gov>. You may also read and copy any document we file at the SEC's public reference room at room 1024, 450 Fifth Street, N.W., Washington, D.C. Please call the SEC at 1-800-732-0330 for further information on the public reference room.

The SEC allows us to incorporate by reference the information we file with them, which means that we can disclose important information to you by referring you to these documents. The information incorporated by reference is an important part of this prospectus, and information that we file later with the SEC will automatically update and supersede this information. We incorporate by reference the documents listed below (and any amendments thereto) and any future filings made with the SEC under Section 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934 until the offering under this registration statement is completed or withdrawn:

Annual Report on Form 10-K for the fiscal year ended December 31, 2003 filed March 30, 2004; and

The description of our common stock contained in our registration statement on Form 8-A, including any amendments or reports filed to update such information.

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The information incorporated by reference into this prospectus is an important part of this prospectus. Any statement contained in an incorporated document shall be deemed to be modified or superseded for purposes of the registration statement or this prospectus to the extent that a statement contained herein or in any other subsequently filed incorporated documents or in an accompanying prospectus supplement modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as modified or superseded, to constitute a part of this prospectus.

To obtain a copy of these filings at no cost, you may telephone us at 630-771-6700 or write us at Investor Relations Department, Nanophase Technologies Corporation, 1319 Marquette Drive, Romeoville, Illinois 60446. Unless otherwise requested, exhibits to an incorporated document will not be provided unless the exhibit is specifically incorporated by reference into this prospectus.

In addition, we make available free of charge through our website at <http://www.nanophase.com> our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and all amendments to those reports as soon as reasonably practicable after such material is electronically filed with or furnished to the SEC. Other than the information expressly incorporated by reference into this prospectus, information on, or accessible through, our website is not a part of this prospectus, any prospectus supplement or the registration statement of which this prospectus is a part.

References in this prospectus and any prospectus supplement to our common stock include the associated preferred stock purchase rights under our 1998 Rights Agreement, as amended.

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PROSPECTUS SUMMARY

The following summary is qualified in its entirety by reference to, and should be read in conjunction with, the more detailed information appearing elsewhere in this prospectus or incorporated by reference herein. Investors should also carefully consider the information set forth under **Risk Factors** beginning on page 4.

We are a nanomaterials (also referred to as nanocrystalline materials or nanoparticles) developer and commercial manufacturer. We employ patented, patent-pending, and proprietary technology to create nanomaterials, typically in the range of 5-100 nanometers, which may be singular or multi-element oxides, including rare earth materials. We apply our technologies to modify the nanoparticle and nanoparticle surface to manipulate electrical, mechanical, optical, and other properties, while precisely controlling the particle size and other physical parameters. We also use our technologies to create materials, not normally found naturally, that offer special performance attributes.

Since 2001, we have created an integrated platform of nanomaterial technologies that are designed to deliver an engineered nanomaterial solution for a particular target market or specific customer application. Our technologies consist of two distinct nanoparticle or nanomaterial manufacturing processes (physical vapor synthesis (PVS) and NanoA synthesis), nanoparticle surface treatment(s) technologies, and dispersion technologies. We have the ability to deliver various nanomaterials at commercial quantities. Our products are available as nanoparticles, surface-treated nanoparticles, and stable nanoparticle dispersions in aqueous or organic media, providing customers with nanomaterials in readily usable forms. The diverse markets we currently serve include personal care, sunscreens, abrasion-resistant applications, environmental catalysts, antimicrobial products, and a variety of polishing applications, including semiconductors, hard disk drives and optics. New markets and applications also are being developed. Our customers include multinational corporations and Fortune 500 companies.

We reduce the cycle time for innovation by working with certain customers to jointly develop nanoengineered solutions for particular market needs or specific customer applications. We have complete capability from application development and laboratory samples through pilot quantities and volume production. We have extensive research and development facilities and application laboratories, as well as manufacturing capacity based in two locations in the Chicago area. This capability allows us to develop and supply nanomaterials in quantities ranging from grams to metric tons. Our business model is based on strategic partnerships, typically with companies who currently occupy a targeted market channel(s), and supplying nanomaterials to individual customer-specific needs.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

We want to provide investors with more meaningful and useful information. As a result, this prospectus contains and incorporates by reference certain forward-looking statements , as defined in Section 21E of the Securities Exchange Act of 1934, as amended. These statements reflect our current expectations of the future results of its operations, performance and achievements. Forward-looking statements are covered under the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. We have tried, wherever possible, to identify these statements by using words such as anticipates , believes , estimates , expects , plans , intends and similar expressions. These statements reflect our current and are based on information now available to us. Accordingly, these statements are subject to certain risks, uncertainties and contingencies that could cause our actual results, performance or achievements in 2004 and beyond to differ materially from those expressed in, or implied by, such statements. These risks, uncertainties and factors include, without limitation: a decision by a customer to cancel a purchase order or supply agreement in light of our dependence on a limited number of key customers; uncertain demand for, and acceptance of, our nanocrystalline materials; our manufacturing capacity and product mix flexibility in light of customer demand; our limited marketing experience; changes in development and distribution relationships; the impact of competitive products and technologies; our dependence on patents and protection of proprietary information; the resolution of litigation in which we may become involved; and other risks set forth under the caption **Risk Factors** below. You should not place undue reliance on any forward-looking statements. Except as required by federal securities laws, we undertake no obligation to update or revise these forward-looking statements to reflect new events or uncertainties.

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RISK FACTORS

Investing in our securities involves a high degree of risk. Before making an investment decision, you should carefully consider the following risks and the risks, if any, set forth in the supplement which accompanies this prospectus and in our periodic reports on Form 10-K and Form 10-Q which have been or will be filed with the SEC and are incorporated by reference into this prospectus. The trading price of our common stock could decline due to any of these risks, and you could lose all or part of your investment. You also should refer to the other information appearing elsewhere in this prospectus and the prospectus supplement, or incorporated by reference into this prospectus.

We have a limited operating history and may not be able to address difficulties encountered by early stage companies in new and rapidly evolving markets.

We have only a limited operating history. We were formed in November 1989 and began our commercial nanocrystalline materials operations in January 1997. We have not yet generated a significant amount of revenue from our nanocrystalline materials operations. Because of our limited operating history and the early stage of development of our rapidly evolving market, we have limited insight into trends that may emerge and adversely affect our business and cannot be certain that our business strategy will be successful or that it will successfully address these risks. In addition, our efforts to address any of these risks may distract personnel or divert resources from other more important initiatives, such as attracting and retaining customers and responding to competitive market conditions.

We have a history of losses that may continue in the future.

We have incurred net losses in each year since our inception with net losses of \$5.74 million in 2001, \$5.16 million in 2002 and \$5.83 million in 2003. As of December 31, 2003, we had an accumulated deficit of approximately \$45.74 million and presently expect to continue to incur losses on an annual basis through at least the end of 2004. We believe that our business depends, among other things, on our ability to significantly increase revenue. If revenue fails to grow at anticipated rates or if operating expenses increase without a commensurate increase in revenue, or if we fail to adjust operating expense levels accordingly, then the imbalance between revenue and operating expenses will negatively impact our cash balances and our ability to achieve profitability in future periods.

We depend on a small number of customers for a high percentage of our sales, and the loss of orders from a significant customer could cause a decline in revenue and/or increases in the level of losses incurred.

Sales to our customers are executed pursuant to purchase orders and annual supply contracts; however, customers can cease doing business with us at any time with limited advance notice. We expect a significant portion of our future sales to remain concentrated within a limited number of strategic customers. We may not be able to retain our strategic customers, such customers may cancel or reschedule orders, or in the event of canceled orders, such orders may not be replaced by other sales or by sales that are on as favorable terms. In addition, sales to any particular customer may fluctuate significantly from quarter to quarter, which could affect our ability to achieve anticipated revenues on a quarterly basis.

Sales to BASF Corporation (BASF), Rohm and Haas Electronic Materials (formerly known as Rodel) and C.I. Kasei, a division of Itochu Corporation, accounted for approximately 94% of total revenue for the year ended December 31, 2003, and sales to the same three customers accounted for approximately 81% of total revenue in 2002. For the years ended December 31, 2003 and 2002, BASF accounted for 61% and 73% of our total revenue, respectively. If we were to lose, or receive significantly decreased orders from, any of these three customers, then our

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results of operations would be materially harmed. While our agreements with our three largest customers are long-term agreements, they may be terminated by the customer with reasonable notice and do not provide any guarantees that these customers will continue to buy our products. In addition, while our agreements with our three largest customers contain minimum order requirements, the only repercussion under the agreement for missing the minimum order requirement is that we would be freed from the exclusivity obligations under these contracts.

We have been consistently expanding both our marketing and business development efforts and our production efficiency in order to address the issues of our dependence upon a limited amount of customers, enhancement of gross profit and operating cash flows, and the achievement of profitability. We currently have customers that may grow to the point where they generate significant

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revenues and margins as relationships expand. Given the special nature of our products, and the fact that markets for them are not yet fully developed, it is difficult to accurately predict when additional large customers will materialize. On a going forward basis, our margins, as a percentage of revenue, will be dependent upon revenue mix, revenue volume, and our ability to continue to cut costs. The extent of the growth in revenue volume, and the related gross profit that this revenue generates, will be the main drivers in generating positive operating cash flows and, ultimately, net income.

Any downturn in the markets served by us would harm our business.

A majority of our products are incorporated into products such as sunscreens, polishing slurries, personal care, and to a lesser extent abrasion-resistant coatings for flooring, and catalytic converters. These markets have from time to time experienced cyclical, depressed business conditions, often in connection with, or in anticipation of, a decline in general economic conditions. These industry downturns have resulted in reduced product demand and declining average selling prices. Our business would be harmed by any future downturns in the markets that we serve.

Our products often have long adoption cycles, which could make it difficult to achieve market acceptance and makes it difficult to forecast revenues.

Due to their often novel characteristics and the unfamiliarity with them that exists in the marketplace, our nanocrystalline materials often exhibit longer adoption cycles than existing materials technologies. Our nanomaterials have to receive appropriate attention within any potential customer's organization, then they must be tested to prove a performance advantage over existing materials, typically on a systems-cost basis. Once we have proven initial commercial viability, pilot scale production runs must be completed by the customer, followed by further testing. Once production-level commercial viability is established, then our nanomaterials can be introduced, often to a downstream marketplace that needs to be familiarized with them. If we are unable to convince our potential customers of the performance advantages and economic value of our nanocrystalline materials over existing and competing materials and technologies, we will be unable to generate significant sales. Our long adoption cycle makes it difficult to predict when sales will occur.

We depend on collaborative development relationships with our customers and do not have a substantial direct sales force. If we are unable to initiate or sustain such collaborative relationships, then we may be unable to independently develop, manufacture or market our current and future nanocrystalline materials or applications.

We have established, and will continue to pursue, collaborative relationships with many of our customers and do not have a substantial direct sales force. Through these relationships, we seek to develop new applications for our nanocrystalline materials and share development and manufacturing resources. We also seek to coordinate the development, manufacture and marketing of our nanocrystalline products. Future success will depend, in part, on our continued relationships with these customers and our ability to enter into similar collaborative relationships with other customers. Our customers may not continue in these collaborative development relationships, may not devote sufficient resources to the development or sale of our materials or may enter into collaborative development relationships with our competitors. Additionally, these customers may require a share of control of these collaborative programs. Some of our agreements with these customers limit our ability to license our technology to others and/or limit our ability to engage in certain product development or marketing activities. These relationships can usually be terminated unilaterally by customers. If we are unable to initiate or sustain such collaborative relationships, then we may be unable to independently develop, manufacture or market our current and future nanocrystalline materials or applications.

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In addition, the development agreements with some of our larger customer contain provisions that require us to license our intellectual property to these customers on disadvantaged terms and/or transfer equipment to these customers in the event that we materially breach these agreements or fail to meet satisfy certain financial covenants. For example, see Risk Factors We may need to raise additional capital in the future.

If a catastrophe strikes either of our manufacturing facilities or if we were to lose our lease for either facility due to non-renewal or other unforeseen events, we may be unable to manufacture our materials to meet customers demands.

Our manufacturing facilities are located in Romeoville and Burr Ridge, Illinois. These facilities and some of our manufacturing and testing equipment would be difficult to replace in a timely manner. Therefore, any material disruption at one of our facilities due

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to a natural or man-made disaster or a loss of lease due to non-renewal or other unforeseen events could have a material adverse effect on our ability to manufacture products to meet customers' demands. While we maintain customary property and business interruption insurance, this insurance may not adequately compensate us for all losses that we may incur.

If we are unable to expand our production capabilities to meet unexpected demand, we may be unable to manage our growth and our business would suffer.

Our success will depend, in part, on our ability to manufacture nanocrystalline materials in significant quantities, with consistent quality and in an efficient and timely manner. We expect to continue to expand our current facilities or obtain additional facilities in the future in order to respond to unexpected demand for existing materials or for new materials that we do not currently make in quantity. Such unplanned demand, if it resulted in rapid expansion, could create a situation where growth could become difficult to manage, which could cause us to lose potential revenue.

Protection of our intellectual property is limited and uncertain.

Our intellectual property is important to our business. We seek to protect our intellectual property through patent, trademark, trade secret protection and confidentiality or license agreements with our employees, customers, suppliers and others. Our means of protecting our intellectual property rights in the United States or abroad may not be adequate and others, including our competitors, may use our proprietary technology without our consent. We may not receive the necessary patent protection for any applications pending with the U.S. Patent and Trademark Office and any of the patents that we currently own or license may not be sufficient to keep competitors from using our materials or processes. In addition, patents that we currently own or license may not be held valid if subsequently challenged by others and others may claim rights in the patents and other proprietary technology that we own or license. Additionally, others may have already developed or may subsequently develop similar products or technologies without violating any of our proprietary rights. If we fail to obtain patent protection or preserve our trade secrets, we may be unable to effectively compete against others offering similar products and services. In addition, if we fail to operate without infringing the proprietary rights of others or lose any license to technology that we currently have or will acquire in the future, we may be unable to continue making the products that we currently make.

Moreover, at times, attempts may be made to challenge the prior issuance of our patents. For example, we have received a petition to request a re-examination proceeding filed by an unidentified party in the U.S. Patent and Trademark Office, or USPTO, with respect to one patent relating to one of our nanoparticle manufacturing processes. If a re-examination is granted, we may not be successful in maintaining the scope of the claims of this patent during re-examination. If our patent claims are narrowed substantially by the USPTO, the patent coverage afforded our nanoparticle manufacturing process could be impaired, which could impede the extent of our legal protection of the invention that is subject to this patent and potentially harm our business and operating results.

Furthermore, litigation may be necessary to enforce our intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others, or to defend against claims of infringement or invalidity. Such litigation could result in substantial costs and diversion of resources and could harm our business, operating results and financial condition. In addition, if others assert that our technology infringes their intellectual property rights, resolving the dispute could divert our management team and financial resources.

In the future, we may license certain of our intellectual property, such as trademarks or copyrighted material, to third parties. While we would attempt to ensure that any licensees maintain the quality and value of our brand, these licenses might diminish this quality and value.

We may be subject to claims that one or more of the business methods used by us infringe upon patents held by others. The defense of any claims of infringement made against us by third parties could involve significant legal costs and require our management to divert time and other resources from our business operations. Either of these consequences of an infringement claim could have a material adverse effect on our operating results. If we are unsuccessful in defending any claims of infringement, we may be forced to obtain licenses or pay royalties to continue to use our technology. We may not be able to obtain any necessary licenses on commercially reasonable terms or at all. If we fail to obtain necessary licenses or other rights, or if these licenses are costly, our operating results may suffer either from reductions in revenue through our inability to serve clients or from increases in costs to license third-party technology.

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Our industry is experiencing rapid changes in technology. If we are unable to keep pace with these changes, our business will not grow.

Rapid changes have occurred, and are likely to continue to occur, in the development of advanced materials and processes. Our success will depend, in large part, upon our ability to keep pace with advanced materials technologies, industry standards and market trends and to develop and introduce new and improved products on a timely basis. We expect to commit substantial resources to develop our technologies and product applications and, in the future, to expand our commercial manufacturing capacity as volume grows. Our development efforts may be rendered obsolete by the research efforts and technological advances of others and other advanced materials may prove more advantageous than those we produce.

Our market is highly competitive, and if we are unable to compete effectively, then our business will not grow.

The advanced materials industry is new, rapidly evolving and intensely competitive, and we expect competition to intensify in the future. The market for materials having the characteristics and potential uses of our nanocrystalline materials is the subject of intensive research and development efforts by both governmental entities and private enterprises around the world. We believe that the level of competition will increase further as more product applications with significant commercial potential are developed. The nanocrystalline product applications that we are developing will compete directly with products incorporating both conventional and advanced materials and technologies. While we are not currently aware of the existence of commercially available competitive products with the same attributes as those we offer, other companies may develop and introduce new or competitive products. Our competitors may succeed in developing or marketing materials, technologies and better or less expensive products than the ones we offer. In addition, many of our potential competitors have substantially greater financial and technical resources, and greater manufacturing and marketing capabilities than we do. If we fail to improve our current and potential nanocrystalline product applications at an acceptable price, or otherwise compete with producers of conventional materials, we will lose market share and revenue to our competitors.

We may need to raise additional capital in the future. If we are unable to obtain adequate funds, we may be required to delay, scale-back or eliminate some of our manufacturing and marketing operations or we may need to obtain funds through arrangements on less favorable terms or we may be required to transfer equipment to our largest customer.

We expect to expend significant resources on research, development and product testing, and in expanding current capacity or capability for new business. In addition, we may incur significant costs in preparing, filing, prosecuting, maintaining and enforcing our patents and other proprietary rights. If necessary, we may seek funding through public or private financing and through contracts with government or other companies. Additional financing may not be available on acceptable terms or at all. If we are unable to obtain adequate funds, we may be required to delay, scale-back or eliminate some of our manufacturing and marketing operations or we may need to obtain funds through arrangements on less favorable terms. If we obtain funding on unfavorable terms, we may be required to relinquish rights to some of our intellectual property.

To raise additional funds in the future, we would likely sell our equity or debt securities or enter into loan agreements. To the extent that we issue debt securities or enter into loan agreements, we may become subject to financial, operational and other covenants that we must observe. In the event that we were to breach any of these covenants, then the amounts due under such loans or debt securities could become immediately payable by us, which could significantly harm us. To the extent that we sell additional shares of our equity securities, you may face economic dilution if the future equity securities are sold at a lower price than your purchase price in this offering, and, to the extent that you do not participate in such future offerings, you would also face dilution of your percentage ownership of us.

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We currently have a supply agreement with BASF that contains provisions which could potentially result in a mandatory transfer of technology and sale of production equipment to BASF providing capacity sufficient to meet BASF's production needs. The transfer and related sale would be triggered only in the event that one of the following occurs:

our earnings for a twelve month period ending with our most recently published quarterly financial statements are less than zero and our cash, cash equivalents and investments are less than \$2,000,000,

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any lender accelerates any debt in excess of \$10,000,000, or

we become insolvent as defined in the supply agreement.

In the event of a triggering event where we are required to sell to BASF production equipment providing capacity sufficient to meet BASF's production needs, the equipment would be sold at 115% of the equipment's net book value.

We believe that we have complied with all contractual requirements and that we have not had a triggering event. We further believe that, even without the additional proceeds from any offering relating to this prospectus, the proceeds of the May 29, 2002 and September 8, 2003 private placements, in addition to the proceeds from the equity investment by Altana Chemie AG (Altana) on March 23, 2004, should provide sufficient cash balances to avoid the first triggering event referenced above for the foreseeable future. Further, we expect, although such events are not guaranteed, to receive at least some portion of an additional \$15 million of proceeds from this offering and to receive an additional \$2,000,000 in possible equity capital relating to the future exercise of warrants relating to the September 2003 fundraising. If a triggering event were to occur and BASF elected to proceed with the transfer and related sale mentioned above, we would lose both significant revenue and the ability to generate significant revenue to replace that which was lost in the near term. Replacement of necessary equipment that would be purchased and removed by BASF pursuant to this triggering event could take six months to a year. Any additional capital outlays required to rebuild capacity would probably be greater than the proceeds from the purchase of the assets pursuant to our agreement with BASF. This shortfall might put us in a position where it would be difficult to secure additional funding given what would then be an already tenuous cash position. Such an event would also result in the loss of many of our key staff and line employees due to economic realities. We believe that our employees are a critical component of our success and would be difficult to quickly replace and train. Given the occurrence of such an event, we might not be able to hire and retrain skilled employees given the stigma relating to such an event and its impact on us. We might elect to effectively reduce our size and staffing to a point where we could remain a going concern in the near term.

We depend on key personnel, and their unplanned departure could harm our business.

Our success will depend, in large part, upon our ability to attract and retain highly qualified research and development, management, manufacturing, marketing and sales personnel on favorable terms. Due to the specialized nature of our business, we may have difficulty locating, hiring and retaining qualified personnel on favorable terms. If we were to lose the services of any of our key executive officers or other key personnel, or if we are unable to attract and retain other skilled and experienced personnel on acceptable terms in the future, then our business, results of operations and financial condition would be materially harmed. In addition, we do not currently have key-man life insurance policies covering all of our executive officers or key employees, nor do we presently have any plans to purchase such policies.

We face potential product liability risks which could result in significant costs that exceed our insurance coverage, damage our reputation and harm our business.

We may be subject to product liability claims in the event that any of our nanocrystalline product applications are alleged to be defective or cause harmful effects. Because our nanocrystalline materials are used in other companies' products, to the extent our customers become subject to suits relating to their products, such as medical implants and cosmetic and skin-care products, these claims may also be asserted against us. We may incur significant costs including payment of significant damages, in defending or settling product liability claims. We currently maintain insurance coverage in the amount of \$10 million for product liability claims, which may prove not to be sufficient. Even if a suit is without merit and regardless of the outcome, claims can divert management time and attention, injure our reputation and adversely affect demand for our nanocrystalline materials.

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We are subject to governmental regulations. The costs of compliance and liability for noncompliance with governmental regulations could have a material adverse effect on our business, results of operations and financial condition.

Current and future laws and regulations may require us to make substantial expenditures for preventive or remedial action. Our operations, business or assets may be materially and adversely affected by governmental interpretation and enforcement of current or future environmental, health and safety laws and regulations. In addition, our coating operations pose a risk of accidental contamination or injury. The damages in the event of an accident or the costs to prevent or remediate a related event could exceed our resources or otherwise have a material adverse effect on our business, results of operations and financial condition.

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In addition, both of our facilities and all of our operations are subject to the plant and laboratory safety requirements of various occupational safety and health laws. We believe we have complied in all material respects with regard to governmental regulations applicable to us. However, we may have to incur significant costs in defending or settling future claims of alleged violations of governmental regulations and these regulations may materially restrict or impede our operations in the future. In addition, our efforts to comply with or contest any regulatory actions may distract personnel or divert resources from other more important initiatives.

The manufacture and use of certain products that contain our nanocrystalline materials are subject to intense governmental regulation, including regulations promulgated by the U.S. Food and Drug Administration, the U.S. Environmental Protection Agency, and the U.S. Occupational Safety and Health Administration. As a result, we are required to adhere to the requirements of the regulations of governmental authorities in the United States and other countries. These regulations could increase our cost of doing business and may render some potential markets prohibitively expensive.

We have implemented anti-takeover provisions which could discourage or prevent a takeover, even if an acquisition could be beneficial to our stockholders.

In October 1998, we entered into a Rights Agreement, commonly referred to as a poison pill. The provisions of this agreement and some of the provisions of our certificate of incorporation, our bylaws and Delaware law could, together or separately:

discourage potential acquisition proposals;

delay or prevent a change in control; and

limit the price that investors might be willing to pay in the future for shares of our common stock.

In particular, our board of directors is authorized to issue up to 24,088 shares of preferred stock (less any outstanding shares of preferred stock) with rights and privileges that might be senior to our common stock, without the consent of the holders of the common stock, including up to 2,500 shares of Series A Junior Participating Preferred Stock issuable under the 1998 Rights Agreement.

In addition, Section 203 of the Delaware General Corporations Law and the terms of our stock option plans may discourage, delay or prevent a change in control of our company.

Future sales of our common stock by existing stockholders could negatively affect the market price of our stock and make it more difficult for us to sell stock in the future.

Sales of our common stock in the public market, or the perception that such sales could occur, could result in a decline in the market price of our common stock and make it more difficult for us to complete future equity financings. A substantial number of shares of our common stock and shares of common stock subject to outstanding warrants and options may be resold pursuant to currently effective registration statements. As of March 26, 2004, in addition to the shares to be sold in this offering, there are:

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15,662,532 shares of common stock that have been issued in registered offerings, upon the exercise of options under our equity incentive plan or in private placements and are freely tradable in the public markets,

1,397,404 shares of common stock that may be issued on the exercise of stock options outstanding and exercisable under our equity incentive plan;

453,001 shares of common stock (together with a warrant to purchase a like number of shares) that were issued pursuant to our September 8, 2003 private placement and may be registered for resale pursuant the terms of the Registration Rights Agreement executed in connection with this private placement; and

1,256,281 shares of common stock that were issued pursuant to our March 23, 2004 private placement and may be registered for resale after March 23, 2006 pursuant the terms of the Registration Rights Agreement executed in connection with this private placement.

We cannot estimate the number of shares of common stock that may actually be resold in the public market because this will depend on the market price for our common stock, the individual circumstances of the sellers, and other factors. If stockholders sell

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large portions of their holdings in a relatively short time, for liquidity or other reasons, the market price of our common stock could decline significantly.

Bradford T. Whitmore has significant influence on all matters requiring stockholder approval because he beneficially owns a large percentage of our common stock, and he may vote the common stock in ways with which our other stockholders disagree.

As of March 30, 2004, Bradford T. Whitmore, together with his affiliates, Grace Brothers, Ltd. and Grace Investments, Ltd., beneficially owned approximately 25% of the outstanding shares of our common stock. As a result, he has significant influence on matters submitted to our stockholders for approval, including proposals regarding:

any merger, consolidation or sale of all or substantially all of our assets;

the election of members of our board of directors; and

any amendment to our certificate of incorporation.

The ownership position of Mr. Whitmore could delay, deter or prevent a change of control or adversely affect the price that investors might be willing to pay in the future for shares of our common stock. Mr. Whitmore's interests may be significantly different from the interests of our other stockholders and he may vote the common stock he beneficially owns in ways with which our other stockholders disagree. Investors should also note that R. Janet Whitmore, one of our directors, is the sister of Mr. Whitmore.

We have been involved in litigation. If we are involved in similar litigation in the future, the expense of defending such litigation and the potential costs of judgments against us and the costs of maintaining insurance coverage could have a material adverse effect on our financial performance.

We have been involved in three securities class action lawsuits, one of which was a consolidation of several related lawsuits. While all of these lawsuits have been settled and dismissed with all settlements funded by our directors and officers liability insurance, we may be the target of additional securities lawsuits in the future. If we are involved in similar litigation in the future, the expense of defending such litigation, the potential costs of judgments against us, the costs of maintaining insurance coverage and the diversion of management's attention could have a material adverse effect on our financial performance.

Our stock price is volatile.

The stock markets in general, and the stock prices of technology-based companies in particular, have experienced extreme volatility that often has been unrelated to the operating performance of any specific public company. The market price of our common stock has fluctuated in the past and is likely to fluctuate in the future as well. Our future financial performance and stock price may be subject to significant volatility, particularly on a quarterly basis. Shortfalls in our revenues in any given period relative to the levels expected by investors could immediately, significantly and adversely affect the trading price of our common stock.

Dilutive Effect of Private Placements.

On May 29, 2002 we sold 1,370,000 shares of our common stock to selected accredited investors at a purchase price of \$5.00 per share. On May 29, 2002 the closing sale price of our common stock, as reported on NASDAQ, was \$5.15 per share. On September 8, 2003 we sold 453,001 shares of our common stock to Grace Brothers, Ltd. at a purchase price of \$4.415 per share together with a warrant to purchase a like number of shares of common stock during the next twelve months also at a price of \$4.415 per share. The share price for the common stock was determined based on the fifteen-day market closing average for our stock ending September 5, 2003. On September 8, 2003 the closing sale price of our common stock as reported on NASDAQ, was \$5.50 per share. On March 23, 2004 we sold 1,256,281 shares of our common stock to Altana at a purchase price of \$7.96 per share. On March 23, 2004 the closing sale price of our common stock, as reported on NASDAQ, was \$8.26 per share. Each of these issuances of stock at below the then-current market price had a dilutive effect on existing common stockholders.

We have never paid dividends.

We currently intend to retain earnings, if any, to support our growth strategy. We do not anticipate paying dividends on our stock in the foreseeable future.

Table of Contents**USE OF PROCEEDS**

Unless otherwise specified in the prospectus supplement, we intend to use the net proceeds from the sale of the securities offered by this prospectus and any accompanying prospectus supplement for general corporate purposes, which might include working capital, increase in technology development, increase in business development, capital expenditures, the repayment of indebtedness, the repurchase of shares of our equity securities and acquisitions. Pending use for these purposes, we expect to invest proceeds from the sale of the securities in short-term marketable securities. The precise amount and timing of sales of any securities will be dependent on market conditions and the availability and cost of other funds to us.

DILUTION

If the securities offered hereby are common stock, the prospectus supplement will include a dilution table setting forth any increase in net tangible book value to existing stockholders and any dilution to new investors based on the proposed number of shares of common stock to be offered and the assumed public offering price at the time of such offering.

RATIO OF EARNINGS TO FIXED CHARGES

| | Years Ended December 31, | | | | |
|--|--------------------------|------|------|------|------|
| | 1999 | 2000 | 2001 | 2002 | 2003 |
| Ratio of Earnings to Fixed Charges(1)(2) | | | | | |

- (1) In computing the ratio of earnings to fixed charges, (a) earnings have been computed as loss before provision for income taxes excluding fixed charges and (b) fixed charges consist of interest expense and the estimated interest portion of rent expense.
- (2) For the years ended December 31, 1999, 2000, 2001, 2002 and 2003, earnings were insufficient to cover fixed charges for those periods by \$5,117,067, \$4,518,327, \$5,710,243, \$5,086,563 and \$5,797,650, respectively.

DESCRIPTION OF DEBT SECURITIES

This prospectus describes the general terms and provisions of our debt securities. When we offer to sell a particular series of debt securities, we will describe the specific terms of the series in a supplement to this prospectus. Accordingly, for a description of the terms of any series of debt securities, you must refer to both the prospectus supplement relating to that series and the description of the debt securities in this prospectus. To the extent the information contained in the prospectus supplement differs from this summary description, you should rely on the information in the prospectus supplement.

The debt securities offered hereby will be issued under an indenture between us and the trustee named therein. The indenture will be subject to, and governed by, the Trust Indenture Act of 1939, as amended. A copy of the form of indenture has been filed in the registration statement of which this prospectus is a part. The following description of certain provisions of the form of indenture does not purport to be complete and is subject to, and is qualified in its entirety by reference to, all the provisions of the indenture to be filed in an amendment to the registration statement of which this prospectus is a part or filed in a Current Report on Form 8-K and incorporated by reference in the registration statement of which this prospectus is a part.

General

The terms of each series of debt securities will be established by or pursuant to a resolution of our board of directors and detailed or determined in the manner provided in an officers' certificate or by a supplemental indenture. The particular terms of each series of debt securities will be described in a prospectus supplement relating to the series, including any pricing supplement.

We will be able to issue an unlimited amount of debt securities under the indenture that may be in one or more series with the same or various maturities, at par, at a premium, or at a discount. We will set forth in a prospectus supplement, including any pricing supplement, relating to any series of debt securities being offered, the initial offering price, the aggregate principal amount and the following terms of the debt securities:

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We will provide in a prospectus supplement, including any pricing supplement, relating to any series of debt securities being offered, the aggregate principal amount and the following terms of the debt securities:

the title of the debt securities;

the aggregate principal amount of the debt securities and any limit on the aggregate principal amount of the debt securities;

whether we will issue the debt securities at a discount and the portion of the principal amount of the debt securities payable upon declaration of acceleration of the maturity of the securities or upon redemption, if other than the principal amount, and the rate at which the original issue discount will accrue;

the date on which we will pay the principal on the debt securities;

the rate, which may be fixed or variable, or the method used to determine the rate at which the debt securities will bear interest;

the date from which interest will accrue, the date on which interest will be payable and any regular record date for the interest payable on any interest payment date;

the place where we will pay, or the method of payment of, principal, premium and interest on the debt securities and where holders may surrender the debt securities for conversion, registration of transfer or exchange;

any obligation we have to redeem or purchase the debt securities under any sinking fund or similar provisions or at the option of a holder of debt securities;

our right to redeem the debt securities and the date on which, the price at which and the terms and conditions upon which we may redeem the debt securities;

the denominations in which we will issue the debt securities, if other than denominations of \$1,000 and any multiples of \$1,000;

provisions, if any, for the defeasance or discharge of our obligations relating to the debt securities;

whether we will issue the debt securities in registered or bearer form;

the currency in which we will pay principal, premium and interest on the debt securities;

if we will pay principal, premium or interest on the debt securities in one or more currencies other than those in which the debt securities are denominated, the manner in which we will determine the exchange rate on the payments;

the manner in which we will determine the amounts of payment of principal, premium or interest on the debt securities if these amounts may be determined by reference to an index based on a currency other than that in which the debt securities are denominated or designated or by reference to a commodity, commodity index, stock exchange index or financial index;

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any addition to, or change or deletion of, any events of default or covenants in the indenture;

a discussion of any material or special United States federal income tax considerations applicable to the debt securities;

any depositaries, trustees, interest rate calculation agents, exchange rate calculation agents or other agents relating to the debt securities other than those originally appointed;

whether we will issue the debt securities in the form of global securities and whether we will issue the global securities in temporary or permanent global form;

any rights of the holders of the debt securities to convert the debt securities into other securities or property and the terms and conditions of the conversion;

any subordination provisions relating to the debt securities;

any listing of the debt securities on a securities exchange;

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any provisions relating to any security provided for by the debt securities; and

any other terms of the debt securities that will not be inconsistent with the indenture.

We may issue debt securities at a discount below their stated principal amount. Even if we do not issue the debt securities below their stated principal amount, for United States federal income tax purposes the debt securities may be deemed to have been issued with a discount because of interest payment characteristics. We will describe in a prospectus supplement the United States federal income tax considerations applicable to debt securities issued at a discount or deemed to be issued at a discount. We will also describe in a prospectus supplement the special United States federal income tax considerations or other restrictions or terms applicable to debt securities issuable in bearer form, offered exclusively to foreigners or denominated in a foreign currency.

Denominations, Registration, Transfer and Exchange

Unless we specify otherwise in the prospectus supplement, the debt securities of any series will be issuable only in denominations of \$1,000 and multiples of \$1,000, and will be payable only in U.S. dollars.

We may issue the debt securities in whole or in part in the form of one or more global securities that will be deposited with, or on behalf of, a depository identified in the applicable prospectus supplement. We may issue the global securities in either registered or bearer form and in either temporary or permanent form. We will describe the specific terms of the depository arrangement relating to a series of debt securities in the prospectus supplement.

You may transfer or exchange certificated debt securities at any office we maintain for this purpose in accordance with the terms of the indenture. We will not charge a service fee for any transfer or exchange of certificated debt securities, but we may require payment of a sum sufficient to cover any tax or other governmental charge we are required to pay in connection with a transfer or exchange.

You may effect the transfer of certificated debt securities and the right to receive the principal, premium and interest on certificated debt securities only by surrendering the certificate representing those certificated debt securities and either reissuance by us or the trustee of the certificate to the new holder or the issuance by us or the trustee of a new certificate to the new holder.

We are not required to:

register, transfer or exchange debt securities of any series during a period beginning at the opening of 15 business days before the day we transmit a notice of redemption of debt securities of the series selected for redemption and ending at the close of business on the day of the transmission; or

to register, transfer or exchange any debt security so selected for redemption in whole or in part, except the unredeemed portion of any debt security being redeemed in part.

Covenants

We will describe in the prospectus supplement any restrictive covenants applicable to an issue of debt securities.

Consolidation, Merger or Sale of Assets

Unless we have pre-existing contractual obligations, we may not consolidate or merge with or into, or sell, assign, convey or transfer our properties and assets substantially in their entirety to another corporation, person or entity unless:

in the case of a consolidation or merger, (1) we are the surviving corporation, or (2) the successor corporation is an entity organized and validly existing under the laws of the United States, any state of the United States or the District of Columbia and expressly assumes our obligations under the debt securities and the indenture; and

immediately after giving effect to the transaction, no event of default exists.

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Notwithstanding the foregoing, any subsidiary of ours may consolidate with, merge into or transfer all or part of its properties and assets to us.

Events of Default

Each of the following is an event of default relating to a series of debt securities:

default in the payment of any interest upon any debt security of that series when it becomes due and payable, and continuance of that default for a period of 30 days;

default in the payment of principal of or premium on any debt security of that series when due and payable;

default in the deposit of any sinking fund payment, when and as due relating to any debt security of that series;

default in the performance or breach by us of any other covenant or warranty in the indenture, other than a covenant or warranty that has been included in the indenture solely for the benefit of a series of debt securities other than that series, which default continues uncured for a period of 60 days after we receive written notice from the trustee or we and the trustee receive written notice from the holders of at least 25% in principal amount of the outstanding debt securities of that series as provided in the indenture;

the acceleration of the maturity date of any of our indebtedness, other than non-recourse indebtedness, at any one time, in an amount exceeding the greater of (1) \$10 million or (2) 5% of our consolidated net tangible assets, if the acceleration is not cancelled within 30 days;

events of bankruptcy, insolvency or reorganization; and

any other event of default provided relating to debt securities of that series that is described in the applicable prospectus supplement accompanying this prospectus.

Non-recourse indebtedness means indebtedness for which the terms provide that the lender's claim for repayment of the indebtedness is limited solely to a claim against the property that secures the indebtedness.

Consolidated net tangible assets means the total amount of assets, including investments in joint ventures, of a company and its subsidiaries, if any, less applicable depreciation, amortization and other valuation reserves after deducting:

all current liabilities, excluding (1) the current portion of long-term indebtedness, (2) intercompany liabilities and (3) any liabilities that are by their terms renewable or extendible at the option of the obligor to a time more than 12 months from the time as of which the amount is being computed; and

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all goodwill, trade names, trademarks, patents, unamortized debt discount and any other similar intangibles, all as provided on the most recent consolidated balance sheet of the company and computed in accordance with generally accepted accounting principles.

If an event of default relating to outstanding debt securities of any series occurs and is continuing, then the trustee or the holders of at least 25% in principal amount of outstanding debt securities of that series may declare, in a written notice, the principal amount, or specified amount, plus accrued and unpaid interest and premium, if payable on all debt securities of that series to be immediately due and payable. At any time after a declaration of acceleration relating to debt securities of any series has been made, the holders of a majority in principal amount of the outstanding debt securities of that series may rescind and cancel the acceleration if:

the holders act before the trustee has obtained a judgment or decree for payment of the money due;

we have paid or deposited with the trustee a sum sufficient to pay overdue interest and overdue principal other than the accelerated interest and principal; and

we have cured or the holders have waived all events of default, other than the non-payment of accelerated principal and interest relating to debt securities of that series, as provided in the indenture.

We refer you to the prospectus supplement relating to any series of debt securities that are discount securities for the particular provisions relating to acceleration of a portion of the principal amount of the discount securities upon the occurrence of an event of default.

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The trustee has no obligation to exercise any of its rights or powers under the indenture at the request of any holder of outstanding debt securities, unless the trustee receives indemnity satisfactory to it against any loss, liability or expense. Subject to rights of the trustee, the holders of a majority in principal amount of the outstanding debt securities of any series will have the right to direct the time, method and place of conducting any proceeding for any remedy available to the trustee or exercising any trust or power conferred on the trustee relating to the debt securities of that series.

No holder of any debt security of any series will have any right to institute any judicial or other proceeding relating to the indenture or for the appointment of a receiver or trustee, or for any remedy under the indenture, unless:

that holder has previously given the trustee written notice of a continuing event of default relating to debt securities of that series; and

the holders of at least 25% in principal amount of outstanding debt securities of that series have made a written request, and offered reasonable indemnity, to the trustee to institute the proceeding as trustee, and the trustee has not received from the holders of a majority in principal amount of the outstanding debt securities of that series a direction inconsistent with that request and has failed to institute the proceeding within 60 days.

The holder of any debt security will have an absolute and unconditional right to receive payment of the principal, premium and any interest on that debt security on or after the due dates expressed in that debt security and to institute suit for the enforcement of payment.

Within 120 days after the end of our fiscal year we will furnish to the trustee a statement as to compliance with the indenture. The trustee may withhold notice to the holders of debt securities of any series of any default or event of default, except in payment on any debt securities of that series, relating to debt securities of that series if it in good faith determines that withholding notice is in the interest of the holders of those debt securities.

Modification and Waiver

We may modify the indenture, without prior notice to or consent of any holders, for any of the following purposes:

to evidence the succession of another corporation to our rights and the assumption by the successor of our covenants and obligations in the indenture and the debt securities;

to add to the covenants for the benefit of the holders of the debt securities or to surrender any right or power conferred upon us in the indenture;

to add any events of default;

to add or change any provision of the indenture to permit or facilitate the issuance of debt securities of any series in bearer form, to permit bearer securities to be issued in exchange for registered securities, to permit bearer securities to be issued in exchange

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for bearer securities of other denominations or to permit the issuance of debt securities of any series in uncertificated form, provided that the action will not adversely affect the interests of the holders of debt securities or coupons in any material respect;

to change or eliminate any provision of the indenture, provided that the change or elimination will become effective only when there is no outstanding debt security issued under the indenture or coupon of any series created prior to the modification which is entitled to the benefit of the provision and as to which the modification would apply;

to secure the debt securities or to provide that any of our obligations under the debt securities or the indenture will be guaranteed and the terms and conditions for the release or substitution of the security or guarantee;

to supplement any provisions of the indenture to permit or facilitate the defeasance and discharge of any series of debt securities, provided that the action will not adversely affect the interests of the holders of the debt securities or coupons in any material respect;

to establish the form or terms of debt securities and coupons as permitted by the indenture;

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to evidence and provide for a successor or other trustee relating to one or more series of debt securities and to add or change any provision of the indenture to provide for or facilitate the administration of the trusts by more than one trustee; or

to cure any ambiguity, to correct or supplement any provision of the indenture that may be defective or inconsistent with any other provision of the indenture, to eliminate any conflict between the terms of the indenture and the debt securities and the Trust Indenture Act or to make any other provisions which will not be inconsistent with any provision of the indenture; provided, however, that these other provisions will not adversely affect the interest of the holders of outstanding debt securities or coupons in any material respect.

We may modify and amend the indenture with the written consent of at least a majority in principal amount of the outstanding debt securities of each series affected by the modifications or amendments. However, these modifications may not, without the consent of the holder of each outstanding debt security of each series affected:

change the stated maturity of any debt security or coupon;

reduce the principal amount of any payment to be made on any debt security or coupon;

reduce the rate of interest or extend the time for payment of interest or premium payable upon redemption of any debt security;

change the coin or currency in which any debt security or any premium or interest is payable;

reduce the amount of the principal of a discount security that would be due and payable upon a declaration of acceleration of the maturity;

impair the right to institute suit for the enforcement of any payment on or after the due date of the payment;

alter any redemption provisions in a manner adverse to the holders of the debt securities;

reduce the percentage in principal amount of the outstanding debt securities;

adversely affect the right of any holder to convert any debt security;

modify any of the waiver provisions, except to increase any required percentage or to provide that other provisions of the indenture cannot be modified or waived without the consent of the holder of each affected outstanding debt security; or

modify any provision described in the applicable prospectus supplement as requiring the consent of each affected holder of debt securities.

A modification that changes or eliminates any covenant or other provision of the indenture relating to one or more particular series of debt securities and coupons, or that modifies the rights of the holder of debt securities and coupons of that series, will be deemed not to affect the rights of the holders of debt securities and coupons of any other series.

The holders of at least a majority in principal amount of the outstanding debt securities of any series, by notice to the trustee, may on behalf of the holders of all debt securities of that series waive any default and its consequences under the indenture, except:

a continuing default in the payment of interest on, premium or the principal amount of any debt security held by a non-consenting holder; or

a default of a covenant or provision that cannot be modified or amended without the consent of the holder of each outstanding debt security of each series affected.

Defeasance of Debt Securities and Covenants in Circumstances

Legal Defeasance. We may be discharged from any and all obligations relating to the debt securities of any series except for obligations:

to pay additional amounts, if any, upon the occurrence of specified tax, assessment or government charge events relating to payments on the debt securities;

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to register the transfer or exchange of debt securities;

to replace stolen, lost or mutilated debt securities;

to maintain paying agencies; and

to hold money in payment for trust.

We will be discharged upon our deposit with the trustee, in trust, of money or government obligations that will provide money in an amount sufficient, in the opinion of a nationally recognized firm of independent public accountants, to pay and discharge each installment of principal, premium and interest on and any mandatory sinking fund payments relating to the debt securities of that series on the stated maturity of those payments.

We may be discharged only if we have delivered to the trustee an opinion of counsel stating that we have received from, or there has been published by, the United States Internal Revenue Service a ruling or, since the date of execution of the indenture, there has been a change in the applicable United States federal income tax law, in either case to the effect that the holders of the debt securities of that series will not recognize income, gain or loss for United States federal income tax purposes as a result of the deposit, defeasance and discharge.

Defeasance of Covenants. Upon compliance with specified conditions, we will not be required to comply with some restrictive covenants contained in the indenture and any omission to comply with the obligations will not constitute a default or event of default relating to the debt securities. These conditions include:

depositing with the trustee money or government obligations that, through the payment of interest and principal in accordance with their terms, will provide money in an amount sufficient in the opinion of a nationally recognized firm of independent public accountants to pay principal, premium and interest on and any mandatory sinking fund payments relating to the debt securities of that series on the date those payments are due; and

delivering to the trustee a United States Internal Revenue Service ruling or an opinion of counsel to the effect that the holders of the debt securities of the series will not recognize income, gain or loss for United States federal income tax purposes as a result of the deposit and related covenant defeasance.

Limited Liability of Some Persons

No past, present or future stockholder, incorporator, employee, officer or director of Nanophase or any successor corporation or any of our affiliates will have any personal liability for our obligations under the indenture or the debt securities because of his, her or its status as a stockholder, incorporator, employee, officer or director.

Conversion Rights

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We will describe in the applicable prospectus supplement the terms and conditions, if any, upon which the debt securities are convertible into common stock. Those terms will include:

whether the debt securities are convertible into common stock;

whether such conversion is at the option of us or the investor;

the conversion price, or manner of calculation;

the conversion period;

provisions regarding whether conversion will be at our option or the option of the holders;

the events requiring an adjustment of the conversion price; and

provisions affecting conversion in the event of the redemption of the debt securities.

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Payment and Paying Agents

The indenture will require us to duly and punctually pay the principal, premium and interest on the debt securities as provided in the debt securities and the indenture.

If debt securities of a series are issuable only as registered securities, we will maintain in each place of payment for that series an office or agency where:

holders may present or surrender for payment debt securities of that series;

holders may surrender debt securities of that series for registration of transfer or exchange; and

we may be served with notices and demands regarding the debt securities of that series.

If debt securities of a series are issuable as bearer securities, we will maintain or cause to be maintained:

in Chicago, Illinois, an office or agency (i) where holders may (1) present or surrender for payment any registered securities of that series, (2) surrender for registration or transfer any registered securities of that series, (3) surrender debt securities of that series for exchange or redemption and (4) present or surrender for payment bearer securities of that series and related coupons in the circumstances described in the following paragraph and not otherwise, and (ii) where we may be served with notices and demands regarding the debt securities of that series;

subject to any applicable laws or registration, in a place of payment for that series that is located outside the United States, an office or agency where holders may present and surrender for payment debt securities of that series and related coupons; and

subject to any applicable laws or regulations, in a place of payment for that series located outside the United States, an office or agency where holders may surrender any registered securities of that series for registration of transfer or surrender for exchange or redemption debt securities of that series and where we may receive notices and demands regarding the debt securities of that series.

We will give prompt written notice to the applicable trustee of the locations, and any change in the locations, of offices or agencies. If at any time we fail to maintain any required office or agency or fail to furnish the applicable trustee with the address, holders may make or serve the presentations, surrenders, notices and demands at the corporate trust office of the applicable trustee, except that holders may present and surrender bearer securities of that series and the related coupons for payment at the offices specified in the applicable debt security. We will appoint the applicable trustee as our agent to receive the foregoing presentations, surrenders, notices and demands. However, in the case of bearer securities, we may appoint another agent as may be specified in the applicable prospectus supplement.

We will make no payment of principal, premium or interest on bearer securities at any of our offices or agencies in the United States or by check mailed to any address in the United States or by transfer to an account maintained with a bank located in the United States. However, if the debt securities of a series are denominated and payable in U.S. dollars, we will pay principal and any premium and interest on the debt securities of

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that series, if specified in the applicable prospectus supplement, at the office of our paying agent in Chicago, Illinois, only if payment in U.S. dollars of the full amount of the principal, premium, interest or additional amounts, as the case may be, at all offices or agencies outside the United States maintained for the purpose by us in accordance with the indenture is illegal or effectively precluded by exchange controls or other similar restrictions.

Governing Law

The indenture and the related debt securities will be governed by and construed in accordance with the laws of the State of Delaware.

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DESCRIPTION OF CAPITAL STOCK

General

This prospectus describes the general terms of our capital stock. For a more detailed description of these securities, you should read the applicable provisions of Delaware law and our certificate of incorporation and bylaws. When we offer to sell a particular series of these securities, we will describe the specific terms of the series in a supplement to this prospectus. Accordingly, for a description of the terms of any series of securities, you must refer to both the prospectus supplement relating to that series and the description of the securities described in this prospectus. To the extent the information contained in the prospectus supplement differs from this summary description, you should rely on the information in the prospectus supplement.

Under our certificate of incorporation, the total number of shares of all classes of stock that we have authority to issue is 25,024,088 consisting of 25,000,000 shares of common stock, par value \$0.01 per share, and 24,088 shares of preferred stock, par value \$0.01 per share.

Common Stock

As of March 30, 2004 we had 17,371,814 shares of common stock outstanding. The holders of our common stock are entitled to one vote for each share on all matters voted on by stockholders. The holders of our common stock do not have cumulative voting rights, which means that holders of more than one-half of the shares voting for the election of directors can elect all of the directors then being elected. Subject to the preferences of any of our outstanding preferred stock from time to time outstanding, the holders of our common stock are entitled to a proportional distribution of any dividends that may be declared by the board of directors. In the event of a liquidation or dissolution of Nanophase, the holders of our common stock are entitled to share equally in all assets remaining after payment of liabilities and any payments due to holders of any outstanding shares of our preferred stock from time to time outstanding. The outstanding shares of our common stock are, and the shares offered by this prospectus, when issued, will be, fully paid and nonassessable. The rights, preferences and privileges of holders of our common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any of our outstanding preferred stock.

Preferred Stock

Our board of directors has the authority to issue up to 24,088 shares of preferred stock with rights and privileges that might be senior to our common stock, without the consent of the holders of the common stock, including up to 2,500 shares of Series A Junior Participating Preferred Stock issuable under our shareholder rights plan discussed below. No shares of preferred stock are presently outstanding, and no shares are expected to be issued except in connection with the shareholder rights plan referred to below. The issuance of preferred stock with voting and conversion rights may adversely affect the voting power of the holders of our common stock.

Shareholder Rights Plan

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In October 1998, we declared a dividend of one preferred stock purchase right for each outstanding share of Company common stock on November 10, 1998. Each right entitles the holder, upon the occurrence of certain specified events, to purchase from the Company one ten-thousandth of a share of the Company's Series A Junior Participating Preferred Stock at a purchase price of \$25 per one-ten thousandth of a share. The rights further provide that each right will entitle the holder, upon the occurrence of certain specified events (and without the necessity of purchasing the one ten-thousandth of a share of the Company's Series A Junior Participating Preferred Stock), to purchase from us, common stock having a value of twice the purchase price and, upon the occurrence of certain other specified events, to purchase from another entity into which we are merged or which acquires 50% or more of our assets or earnings power, common stock of such other entity having a value of twice the purchase price. The rights are not presently exercisable. The rights generally become exercisable if a person or group acquires 35% or more of our common stock or commences a tender offer that could result in such person or group owning 35% or more of our common stock. In general, the rights may be redeemed by us at a price of \$0.01 per right. The rights expire on October 28, 2008.

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Anti-takeover Provisions

As a corporation organized under the laws of the State of Delaware, we are subject to Section 203 of the DGCL, which restricts our ability to enter into business combinations with an interested stockholder or a stockholder owning 15% or more of our outstanding voting stock, or that stockholder's affiliates or associates, for a period of three years. These restrictions do not apply if:

prior to becoming an interested stockholder, our board of directors approves either the business combination or the transaction in which the stockholder becomes an interested stockholder;

upon consummation of the transaction in which the stockholder becomes an interested stockholder, the interested stockholder owns at least 85% of our voting stock outstanding at the time the transaction commenced, subject to exceptions; or

on or after the date a stockholder becomes an interested stockholder, the business combination is both approved by our board of directors and authorized at an annual or special meeting of our stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock not owned by the interested stockholder.

Some provisions of our certificate of incorporation and bylaws could also have anti-takeover effects. These provisions, which are described below:

permit the board of directors to increase its own size and fill the resulting vacancies;

provide for a board comprised of three classes of directors with each class serving a staggered three-year term;

authorize the issuance of preferred stock in one or more series; and

prohibit stockholder action by written consent.

These provisions are intended to enhance the likelihood of continuity and stability in the composition of the policies formulated by the board of directors. In addition, these provisions are intended to ensure that the board of directors will have sufficient time to act in what it believes to be in the best interests of Nanophase and its stockholders. These provisions also are designed to reduce our vulnerability to an unsolicited proposal for a takeover of Nanophase that does not contemplate the acquisition of all of our outstanding shares or an unsolicited proposal for the restructuring or sale of all or part of Nanophase. The provisions are also intended to discourage some tactics that may be used in proxy fights.

Classified Board of Directors

The certificate of incorporation provides for the board of directors to be divided into three classes of directors, with each class as nearly equal in number as possible, serving staggered three-year terms. As a result, approximately one-third of the board of directors will be elected each year. The classified board provision will help to assure the continuity and stability of the board of directors and the business strategies and policies of Nanophase as determined by the board of directors. The classified board provision could have the effect of discouraging a third party from

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making a tender offer or attempting to obtain control of Nanophase. In addition, the classified board provision could delay stockholders who do not agree with the policies of the board of directors from removing a majority of the board of directors for two years.

No Stockholder Action by Written Consent; Special Meetings

The certificate of incorporation provides that stockholder action can only be taken at an annual or special meeting of stockholders and prohibits stockholder action by written consent in lieu of a meeting. The certificate of incorporation also provides that special meetings of stockholders may be called only by the board of directors, its chairman, the president or the secretary of Nanophase. Stockholders are not permitted to call a special meeting of stockholders or to require that the board of directors call a special meeting.

Number of Directors; Removal; Filling Vacancies

The certificate of incorporation provides that the board of directors will consist of between five and nine members, the exact number to be fixed by resolution adopted by affirmative vote of a majority of the board of directors. The board of directors currently

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consists of seven directors. Further, the certificate of incorporation authorizes the board of directors to fill newly created directorships. Accordingly, this provision could prevent a stockholder from obtaining majority representation on the board of directors by permitting the board of directors to enlarge the size of the board and fill the new directorships with its own nominees. A director so elected by the board of directors holds office until the next election of the class for which the director has been chosen and until his or her successor is elected and qualified. The certificate of incorporation also provides that directors may be removed only for cause and only by the affirmative vote of holders of a majority of the total voting power of all outstanding securities. The effect of these provisions is to preclude a stockholder from removing incumbent directors without cause and simultaneously gaining control of the board of directors by filling the vacancies created by the removal with its own nominees.

Transfer Agent and Registrar

The Transfer Agent and Registrar for our common stock is LaSalle Bank National Association.

DESCRIPTION OF WARRANTS

Description of Warrants

We may issue warrants to purchase debt securities or common stock. We may issue warrants independently or together with any other securities we offer under a prospectus supplement. The warrants may be attached to or separate from the securities. We will issue each series of warrants under a separate warrant agreement that we will enter into with a bank or trust company, as warrant agent. The statements made in this section relating to the warrant agreement are summaries only. These summaries are not complete. When we issue warrants, we will provide the specific terms of the warrants and the applicable warrant agreement in a prospectus supplement. To the extent the information contained in the prospectus supplement differs from this summary description, you should rely on the information in the prospectus supplement. For more detail, we refer you to the applicable warrant agreement itself, which we will file as an exhibit to an amendment to, or incorporate by reference in, the registration statement.

Debt Warrants

We will describe in the applicable prospectus supplement the terms of the debt warrants being offered, the warrant agreement relating to the debt warrants and the debt warrant certificates representing the debt warrants, including:

the title of the debt warrants;

the aggregate number of the debt warrants;

the price or prices at which the debt warrants will be issued;

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the designation, aggregate principal amount and terms of the debt securities purchasable upon exercise of the debt warrants, and the procedures and conditions relating to the exercise of the debt warrants;

the designation and terms of any related debt securities with which the debt warrants are issued, and the number of the debt warrants issued with each security;

the date, if any, on and after which the debt warrants and the related debt securities will be separately transferable;

the principal amount of debt securities purchasable upon exercise of each debt warrant, and the price at which the principal amount of the debt securities may be purchased upon exercise;

the date on which the right to exercise the debt warrants will commence, and the date on which the right will expire;

the maximum or minimum number of the debt warrants which may be exercised at any time;

information with respect to book-entry procedures, if any;

a discussion of the material United States federal income tax considerations applicable to the exercise of the debt warrants; and

any other terms of the debt warrants and terms, procedures and limitations relating to the exercise of the debt warrants.

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Holders may exchange debt warrant certificates for new debt warrant certificates of different denominations, and may exercise debt warrants at the corporate trust office of the warrant agent or any other office indicated in the applicable prospectus supplement. Prior to the exercise of their debt warrants, holders of debt warrants will not have any of the rights of holders of the securities purchasable upon the exercise and will not be entitled to payments of principal, premium or interest on the securities purchasable upon the exercise of debt warrants.

Equity Warrants

We will describe in the applicable prospectus supplement the terms of the common stock warrants being offered, the warrant agreement relating to the common stock warrants and the warrant certificates representing the common stock warrants, including:

the title of the warrants;

the securities for which the warrants are exercisable;

the price or prices at which the warrants will be issued;

if applicable, the number of warrants issued with each share of common stock;

if applicable, the date on and after which the warrants and the related common stock will be separately transferable;

the date on which the right to exercise the warrants will commence, and the date on which the right will expire;

the maximum or minimum number of warrants which may be exercised at any time;

information with respect to book-entry procedures, if any;

a discussion of the material United States federal income tax considerations applicable to exercise of the warrants; and

any other terms of the warrants, including terms, procedures and limitations relating to the exchange and exercise of the warrants.

Unless otherwise provided in the applicable prospectus supplement, holders of equity warrants will not be entitled, by virtue of being such holders, to vote, consent, receive dividends, receive notice as stockholders with respect to any meeting of stockholders for the election of our directors or any other matter, or to exercise any rights whatsoever as stockholders.

Except as provided in the applicable prospectus supplement, the exercise price payable and the number of shares of common stock purchasable upon the exercise of each warrant will be subject to adjustment in certain events, including the issuance of a stock dividend to holders of common stock or a stock split, reverse stock split, combination, subdivision or reclassification of common stock. In lieu of adjusting the number

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of shares of common stock purchasable upon exercise of each warrant, we may elect to adjust the number of warrants. Unless otherwise provided in the applicable prospectus supplement, no adjustments in the number of shares purchasable upon exercise of the warrants will be required until all cumulative adjustments require an adjustment of at least 1% thereof. We may, at our option, reduce the exercise price at any time.

No fractional shares will be issued upon exercise of warrants, but we will pay the cash value of any fractional shares otherwise issuable. Notwithstanding the foregoing, except as otherwise provided in the applicable prospectus supplement, in case of any consolidation, merger, or sale or conveyance of our property as an entirety or substantially as an entirety, the holder of each outstanding warrant will have the right to the kind and amount of shares of stock and other securities and property, including cash, receivable by a holder of the number of shares of common stock into which each warrant was exercisable immediately prior to the particular triggering event.

Exercise of Warrants

Each warrant will entitle the holder of the warrant to purchase for cash at the exercise price provided in the applicable prospectus supplement the principal amount of debt securities or shares of common stock being offered. Holders may exercise warrants at any time up to the close of business on the expiration date provided in the applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants are void.

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Holders may exercise warrants as described in the prospectus supplement relating to the warrants being offered. Upon receipt of payment and the warrant certificate properly completed and duly executed at the corporate trust office of the warrant agent or any other office indicated in the prospectus supplement, we will, as soon as practicable, forward the debt securities or shares of common stock purchasable upon the exercise of the warrant. If less than all of the warrants represented by the warrant certificate are exercised, we will issue a new warrant certificate for the remaining warrants.

PLAN OF DISTRIBUTION

We may offer and sell the securities described in this prospectus:

through agents;

through one or more underwriters or dealers;

through a block trade in which the broker or dealer engaged to handle the block trade will attempt to sell the securities as agent; but may position and resell a portion of the block as principal to facilitate the transaction;

directly to one or more purchasers (through a specific bidding or auction process or otherwise); or

through a combination of any of these methods of sale.

The distribution of the securities described in this prospectus may be effected from time to time in one or more transactions either:

at a fixed price or prices, which may be changed;

at market prices prevailing at the time of sale;

at prices relating to the prevailing market prices; or

at negotiated prices (which may potentially raise the dilutive effect of such issuance).

Offers to purchase the securities may be solicited by agents designated by us from time to time. Any agent involved in the offer or sale of the securities will be named, and any commissions payable by us to the agent will be described, in the applicable prospectus supplement. Unless otherwise indicated in the applicable prospectus supplement, any such agent will be acting on a best efforts basis for the period of its appointment. Any agent may be deemed to be an underwriter, as such term is defined in the Securities Act of 1933, of the securities so offered and sold.

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If we offer and sell securities through an underwriter or underwriters, we will execute an underwriting agreement with the underwriter or underwriters. The names of the specific managing underwriter or underwriters, as well as any other underwriters, and the terms of the transactions, including compensation of the underwriters and dealers, which may be in the form of discounts, concessions or commissions, if any, will be described in the applicable prospectus supplement, which will be used by the underwriters to make resales of the securities. That prospectus supplement and this prospectus will be used by the underwriters to make resales of the securities. If underwriters are used in the sale of any securities in connection with this prospectus, those securities will be acquired by the underwriters for their own account and may be resold from time to time in one or more transactions, including negotiated transactions, at fixed public offering prices or at varying prices determined by the underwriters and us at the time of sale. Securities may be offered to the public either through underwriting syndicates represented by managing underwriters or directly by one or more underwriters. If any underwriter or underwriters are used in the sale of securities, unless otherwise indicated in a related prospectus supplement, the underwriting agreement will provide that the obligations of the underwriters are subject to some conditions precedent and that with respect to a sale of these securities the underwriters will be obligated to purchase all such securities if any are purchased.

We may grant to the underwriters options to purchase additional securities to cover over-allotments, if any, at the public offering price, with additional underwriting commissions or discounts, as may be set forth in a related prospectus supplement. The terms of any over-allotment option will be set forth in the prospectus supplement for those securities.

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If any underwriters are involved in the offer and sale, they will be permitted to engage in transactions that maintain or otherwise affect the price of the securities. These transactions may include over-allotment transactions, purchases to cover short positions created by the underwriter in connection with the offering and the imposition of penalty bids. If an underwriter creates a short position in the securities in connection with the offering, i.e., if it sells more securities than set forth on the cover page of the applicable prospectus supplement, the underwriter may reduce that short position by purchasing the securities in the open market. In general, purchases of a security to reduce a short position could cause the price of the security to be higher than it might be in the absence of such purchases. As noted above, underwriters may also choose to impose penalty bids on other underwriters and/or selling group members. This means that if underwriters purchase securities on the open market to reduce their short position or to stabilize the price of the securities, they may reclaim the amount of the selling concession from those underwriters and/or selling group members who sold such securities as part of the offering.

Neither we nor any underwriter make any representation or prediction as to the direction or magnitude of any effect that the transactions described above may have on the price of the securities. In addition, neither we nor any underwriter make any representation that such underwriter will engage in such transactions or that such transactions, once commenced, will not be discontinued without notice.

If we offer and sell securities through a dealer, we or an underwriter will sell the securities to the dealer, as principal. The dealer may then resell the securities to the public at varying prices to be determined by the dealer at the time of resale. Any such dealer may be deemed to be an underwriter, as such term is defined in the Securities Act of 1933, of the securities so offered and sold. The name of the dealer and the terms of the transactions will be set forth in the applicable prospectus supplement.

We may solicit offers to purchase the securities directly, and we may sell the securities directly to institutional or other investors, who may be deemed an underwriter within the meaning of the Securities Act of 1933 with respect to any resales of those securities. The terms of these sales, including the terms of any bidding or auction process, if utilized, will be described in the applicable prospectus supplement.

We may enter into agreements with agents, underwriters and dealers under which we may agree to indemnify the agents, underwriters and dealers against certain liabilities, including liabilities under the Securities Act of 1933, or to contribute to payments they may be required to make with respect to these liabilities. The terms and conditions of this indemnification or contribution will be described in the applicable prospectus supplement. Some of the agents, underwriters or dealers, or their affiliates may be customers of, engage in transactions with or perform services for us in the ordinary course of business.

We may authorize our respective agents or underwriters to solicit offers to purchase securities at the public offering price under delayed delivery contracts. The terms of these delayed delivery contracts, including when payment for and delivery of the securities sold will be made under the contracts and any conditions to each party's performance set forth in the contracts, will be described in the applicable prospectus supplement. The compensation received by underwriters or agents soliciting purchases of securities under delayed delivery contracts will also be described in the applicable prospectus supplement.

Unless otherwise indicated in the applicable prospectus supplement, each series of offered securities will be a new issue of securities with no established trading market, except for our common stock, which is listed on the NASDAQ National Market. Unless otherwise indicated in the applicable prospectus supplement, we do not expect to list the securities on a securities exchange, except for our common stock, which is listed on the NASDAQ National Market. Underwriters involved in the public offering and sale of these securities may make a market in the securities. They are not obligated to make a market, however, and may discontinue market making activity at any time. We cannot give any assurance as to the liquidity of the trading market for any of these securities. In order to comply with the securities laws of some states, if applicable, the securities offered hereby will be sold in those jurisdictions only through registered or licensed brokers or dealers. In addition, in some states securities may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and complied with.

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LEGAL MATTERS

Wildman, Harrold, Allen & Dixon LLP, Chicago, Illinois is giving an opinion of the validity of the issuance of the securities offered in this prospectus.

EXPERTS

The financial statements appearing in Nanophase Technologies Corporation's 2003 Annual Report on Form 10-K have been audited by McGladrey & Pullen, LLP, independent auditors, as set forth in their report thereon included therein and incorporated herein by reference. Such financial statements are incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

Table of Contents**PART II.****INFORMATION NOT REQUIRED IN PROSPECTUS****Item 14. Other Expenses of Issuance and Distribution**

| | |
|-----------------------------|------------------|
| SEC Registration Fee | \$ 1,213 |
| Accounting Fees and Expense | \$ 10,000 |
| Legal Fees and Expenses | \$ 30,000 |
| Miscellaneous | \$ 0 |
| | <hr/> |
| Total | \$ 41,213 |

All fees and expenses other than the SEC registration fee are estimated. The expenses listed above will be paid by the Company.

Item 15. Indemnification of Officers and Directors

Under Section 145 of the General Corporation Law of the State of Delaware (the "DGCL"), a corporation may indemnify its directors, officers, employees and agents and its former directors, officers, employees and agents and those who serve, at the corporation's request, in such capacities with another enterprise, against expenses (including attorney's fees), as well as judgments, fines and settlements in nonderivative lawsuits, actually and reasonably incurred in connection with the defense of any action, suit or proceeding in which they or any of them were or are made parties or are threatened to be made parties by reason of their serving or having served in such capacity. The DGCL provides, however, that such person must have acted in good faith and in a manner he or she reasonably believed to be in (or not opposed to) the best interests of the corporation and, in the case of a criminal action, such person must have had no reasonable cause to believe his or her conduct was unlawful. In addition, the DGCL does not permit indemnification in an action or suit by or in the right of the corporation, where such person has been adjudged liable to the corporation, unless, and only to the extent that, a court determines that such person fairly and reasonably is entitled to indemnity for costs the court deems proper in light of liability adjudication. Indemnity is mandatory to the extent a claim, issue or matter has been successfully defended.

Our certificate of incorporation provides that to the fullest extent permitted by Delaware law, it shall indemnify and advance indemnification expenses to all of its directors and officers. In addition, the certificate of incorporation provides that to the fullest extent permitted by Delaware law, a director shall not be liable to Nanophase Technologies Corporation or its stockholders for breach of fiduciary duty as a director.

We have entered into indemnification agreements with each director providing for indemnification to the fullest extent permitted by Delaware law.

Item 16. List of Exhibits

(a) Exhibits

- 1* Form of Underwriting or Distribution Agreement.
- 4.1 Specimen stock certificate representing Common Stock, incorporated by reference to Exhibit 4.1 to the Company's Registration Statement on Form S-1 (File No. 333-36937) (the "IPO S-1").
- 4.2 Form of Warrants, incorporated by reference to Exhibit 4.2 to the IPO S-1.
- 4.3 Rights Agreement dated as of October 28, 1998 by and between the Company and LaSalle National Bank, incorporated by reference to Exhibit 1 to the Company's Registration Statement on Form 8-A, filed October 28, 1998.
- 4.4 Certificate of Designation of Series A Junior Participating Preferred Stock incorporated by reference to Exhibit 4.4 to the Company's Annual Report on Form 10-K for the year ended December 31, 1998 (the "1998 10-K").
- 4.5 Amendment to Rights Agreement dated August 1, 2001 between the Company and LaSalle National Association, as Rights Agent, incorporated by reference to Exhibit 4.5 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2001.

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|-------|---|
| 4.6 | 2001 Nanophase Technologies Corporation Equity Compensation Plan, incorporated by reference to Exhibit 4.3 to the Company's Registration Statement on Form S-8 (File No. 333-74170) filed October 29, 2001. |
| 4.7 | Second Amendment to Rights Agreement dated May 24, 2002 between the Company and LaSalle National Association, as Rights Agent, incorporated by reference to Exhibit 4.7 to the Company's Registration Statement on Form S-3 (File No. 333-90326) filed June 12, 2002. |
| 4.8 | Third Amendment to Rights Agreement dated September 5, 2003 between the Company and LaSalle National Association, as Rights Agent, incorporated by reference to Exhibit 99.1 to the Company's Form 8-K filed September 10, 2003. |
| 4.9 | Subscription Agreement dated September 8, 2003 between the Company and Grace Brothers, Ltd., incorporated by reference to Exhibit 99.2 to the Company's Current Report on Form 8-K filed September 10, 2003. |
| 4.10 | Stock Purchase Agreement dated March 23, 2004 between the Company and Altana Chemie AG, incorporated by reference to Exhibit 4.10 to the Company's Annual Report on Form 10-K for the year ended December 31, 2003 (the 2003 10-K). |
| 4.11 | Registration Rights Agreement dated March 23, 2004 between the Company and Altana Chemie AG, incorporated by reference to Exhibit 4.11 to the 2003 10-K. |
| 4.12 | Form of Indenture. |
| 4.13* | Form of Note. |
| 4.14* | Form of Common Stock Warrant Agreement, including Common Stock Warrant Certificate. |
| 4.15* | Form of Debt Warrant Agreement, including Common Debt Warrant Certificate. |
| 5 | Opinion of Wildman, Harrold, Allen & Dixon LLP |
| 12 | Statement of Computation of Ratios of Earnings to Fixed Charges |
| 23.1 | Consent of McGladrey & Pullen, LLP |
| 23.2 | Consent of Wildman, Harrold, Allen & Dixon LLP (included in Exhibit 5) |
| 24 | Power of Attorney (previously included on signature page) |

* To be filed, if necessary, subsequent to the effectiveness of this registration statement by an amendment to the registration statement or incorporated by reference pursuant to a Current Report on Form 8-K in connection with the offering of securities registered hereunder.

(b) Financial Statement Schedule

None

Item 17. Undertakings

The undersigned Registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement: (i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933; (ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20% change in the maximum aggregate offering price set forth in the Calculation of Registration Fee table in the effective registration statement; (iii) To include any material information with respect to the distribution not previously disclosed in the registration statement or any material change to such information in the registration statement; provided, however, that paragraphs (a)(1)(i) and (a)(1)(ii) of this section do not apply if the registration statement is on Form S-3 or Form S-8, and the information required to be included in a post-effective amendment by those paragraphs is conformed in periodic reports filed by the Registrant pursuant to Section 13 or Section 15(d) of the 1934 Act that are incorporated by reference in the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof; and

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(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

The undersigned Registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

The undersigned Registrant undertakes that: (1) for purposes of determining any liability under the Securities Act of 1933, the information omitted from the form of prospectus filed as part of the registration statement in reliance upon Rule 430A and contained in the form of prospectus filed by the Registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of the registration statement as of the time it was declared effective; and (2) for the purpose of determining any liability under the Securities Act of 1933, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Registrant pursuant to the Registration Certificate of Incorporation, Bylaws, indemnification agreements or otherwise, the Registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by Registrant of expenses incurred or paid by a director, officer or controlling person of Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

The undersigned Registrant hereby undertakes to file an application for the purpose of determining the eligibility of the trustee to act under subsection (a) of section 310 of the Trust Indenture Act (Act) in accordance with the rules and regulations prescribed by the Commission under section 305(b)2 of the Act.

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SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, Nanophase Technologies Corporation certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized in Romeoville, Illinois as of April 1, 2004.

NANOPHASE TECHNOLOGIES CORPORATION

/s/ JOSEPH E. CROSS

Joseph E. Cross,

President and Chief Executive Officer

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities indicated as of April 1, 2004.

| <u>Signature</u> | <u>Title</u> |
|----------------------------|--|
| <u>/s/ JOSEPH E. CROSS</u> | President and Chief Executive Officer |
| Joseph E. Cross | |
| <u>/s/ JESS JANKOWSKI</u> | Acting Chief Financial Officer, Vice President and Corporate Controller (Principal Accounting and Financial Officer) |
| Jess Jankowski | |
| * | Chairman of the Board |
| <u>Donald Perkins</u> | |
| * | Director |
| <u>James Henderson</u> | |
| * | Director |
| <u>James McClung</u> | |
| * | Director |
| <u>Jerry Pearlman</u> | |
| * | Director |

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Richard Siegel

*

Director

R. Janet Whitmore

* /s/ JESS JANKOWSKI

Jess Jankowski

Attorney-in-fact

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EXHIBIT INDEX

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| 4.12 | Form of Indenture. |
| 5 | Opinion of Wildman, Harrold, Allen & Dixon LLP |
| 12 | Statement of Computation of Ratios of Earnings to Fixed Charges |
| 23.1 | Consent of McGladrey & Pullen, LLP |
| 23.2 | Consent of Wildman, Harrold, Allen & Dixon LLP (included in Exhibit 5) |
| 24 | Power of Attorney (previously included on signature page) |

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