

NANOPHASE TECHNOLOGIES CORPORATION

Form 424B3

June 14, 2012

Table of Contents

Filed Pursuant to Rule 424(b)(3)
Registration No. 333-181486

PROSPECTUS

Subscription Rights to Purchase up to 7,250,000 Shares

of Common Stock of Nanophase Technologies Corporation at \$0.33 per Full Share

We are distributing, at no charge, to holders of our common stock non-transferable subscription rights to purchase up to 7,250,000 shares of our common stock. You will receive one subscription right for each share of common stock owned at 5:00 p.m., New York City time, on June 13, 2012.

Each subscription right will entitle you to purchase 0.342 shares of our common stock at a subscription price of \$0.33 per full share, which we refer to as the basic subscription privilege. The per share price was determined by our board of directors after a review of recent closing sales and volume weighted average prices of our common stock and a number of other factors. If you fully exercise your basic subscription privilege and other stockholders do not fully exercise their basic subscription privileges, you may also exercise an over-subscription right to purchase additional shares of common stock that remain unsubscribed at the expiration of the rights offering, subject to the availability and pro rata allocation of shares among persons exercising this over-subscription right and limited to four times the number of shares you purchased under the basic subscription privilege. If all the rights were exercised, the total purchase price of the shares offered in this rights offering would be approximately \$2.4 million.

The subscription rights will expire if they are not exercised by 5:00 p.m., New York City time, on July 20, 2012, unless we extend the rights offering period. We have the option to extend the rights offering and the period for exercising your subscription rights for a period not to exceed 30 days, although we do not presently intend to do so. You should carefully consider whether to exercise your subscription rights prior to the expiration of the rights offering. All exercises of subscription rights are irrevocable, even if the rights offering is extended by our board of directors. However, if we amend the rights offering to allow for an extension of the rights offering for a period of more than 30 days or make a fundamental change to the terms set forth in this prospectus, you may cancel your subscription and receive a refund of any money you have advanced.

Our board of directors is making no recommendation regarding your exercise of the subscription rights. The subscription rights may not be sold, transferred or assigned and will not be listed for trading on any stock exchange or market, specifically including the OTCQB marketplace and the OTC Bulletin Board.

Our board of directors may cancel the rights offering at any time prior to the expiration of the rights offering for any reason. In the event the rights offering is cancelled, all subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

The shares of common stock are being offered directly by us without the services of an underwriter or selling agent.

Shares of our common stock are traded on the OTCQB marketplace under the symbol NANX. On June 12, 2012, the closing sales price for our common stock was \$0.35 per share. The shares of common stock issued in the rights offering will also trade on the OTCQB marketplace under the same symbol.

The exercise of your subscription rights for shares of our common stock involves risks. See Risk Factors beginning on page 6 of this prospectus as well as the other information relating to risks in any documents we incorporate by reference into this prospectus to read about important factors you should consider before exercising your subscription rights.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is June 13, 2012

Table of Contents

TABLE OF CONTENTS

	Page
<u>QUESTIONS AND ANSWERS RELATING TO THE RIGHTS OFFERING</u>	ii
<u>PROSPECTUS SUMMARY</u>	1
<u>RISK FACTORS</u>	6
<u>CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS</u>	17
<u>USE OF PROCEEDS</u>	18
<u>CAPITALIZATION</u>	18
<u>DILUTION</u>	19
<u>THE RIGHTS OFFERING</u>	19
<u>MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES</u>	28
<u>MARKET INFORMATION</u>	31
<u>DIVIDEND HISTORY</u>	32
<u>DESCRIPTION OF CAPITAL STOCK</u>	32
<u>DESCRIPTION OF SUBSCRIPTION RIGHTS</u>	36
<u>PLAN OF DISTRIBUTION</u>	38
<u>LEGAL MATTERS</u>	38
<u>EXPERTS</u>	38
<u>INCORPORATION BY REFERENCE</u>	38
<u>AVAILABLE INFORMATION</u>	39
<u>DISCLOSURE OF COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITIES</u>	39

As permitted under the rules of the Securities and Exchange Commission, or the SEC, this prospectus incorporates important business information about Nanophase Technologies Corporation that is contained in documents that we file with the SEC, but that are not included in or delivered with this prospectus. You may obtain copies of these documents, without charge, from the website maintained by the SEC at www.sec.gov, as well as other sources. See **Available Information** in this prospectus.

You should rely only on the information contained in or incorporated by reference into this prospectus. We have not authorized anyone to provide you with additional or different information from that contained in or incorporated by reference into this prospectus. You should assume that the information contained in or incorporated by reference into this prospectus is accurate only as of any date on the front cover of this prospectus or the date of the document incorporated by reference, as applicable, regardless of the time of delivery of this prospectus or any exercise of the subscription rights. Our business, financial condition, results of operations and prospects may have changed since those dates. We are not making an offer of these securities in any state or other jurisdiction where the offer is not permitted.

As used in this prospectus, Nanophase, the Company, we, us and our refer to Nanophase Technologies Corporation unless stated otherwise or the context requires otherwise.

Table of Contents

QUESTIONS AND ANSWERS RELATING TO THE RIGHTS OFFERING

What is the rights offering?

We are distributing to holders of our common stock, at no charge, non-transferable subscription rights to purchase shares of our common stock. You will receive one subscription right for each share of common stock you owned as of 5:00 p.m., New York City time, on June 13, 2012, the record date. The subscription rights will be evidenced by rights certificates. Each subscription right will entitle the holder to a basic subscription privilege and an over-subscription privilege.

What is the basic subscription privilege?

The basic subscription privilege of each subscription right gives our stockholders the opportunity to purchase for each share of common stock owned as of the record date 0.342 shares of our common stock at a subscription price of \$0.33 per full share. We have granted to you, as a stockholder of record as of 5:00 p.m., New York City time, on the record date, one subscription right for each share of our common stock you owned at that time. For example, if you owned 100 shares of our common stock as of 5:00 p.m., New York City time, on the record date, you would receive 100 subscription rights and would have the right to purchase 34.2 shares of common stock (rounded down to 34 shares, with the total subscription payment being adjusted accordingly, as discussed below) at \$0.33 per full share with your basic subscription privilege. You may exercise the basic subscription privilege of any number of your subscription rights, or you may choose not to exercise any subscription rights.

If you hold your shares in the name of a broker, custodian bank, dealer or other nominee who uses the services of the Depository Trust Company, or DTC, DTC will issue one subscription right to the nominee for each share of our common stock you own at the record date. The basic subscription privilege of each subscription right can then be used to purchase 0.342 shares of common stock at \$0.33 per full share. As in the example above, if you owned 100 shares of our common stock on the record date, you would receive 100 subscription rights and would have the right to purchase 34.2 shares of common stock (rounded down to 34 shares, with the total subscription payment being adjusted accordingly, as discussed below) at \$0.33 per full share with your basic subscription privilege.

Fractional shares of our common stock resulting from the exercise of the basic subscription privilege will be eliminated by rounding down to the nearest whole share, with the total subscription payment being adjusted accordingly. Any excess subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

What is the over-subscription privilege?

We do not expect all of our stockholders to exercise all of their basic subscription privileges. The over-subscription privilege provides stockholders that exercise all of their basic subscription privileges the opportunity to purchase the shares that are not purchased by other stockholders. If you fully exercise your basic subscription privilege and other stockholders do not fully exercise their basic subscription privileges, you may also exercise an over-subscription right to purchase additional shares of common stock that remain unsubscribed at the expiration of the rights offering, subject to the availability and pro rata allocation of shares among persons exercising this over-subscription right, and limited to four times the number of shares purchased by that stockholder under the basic subscription privilege. To the extent the number of the unsubscribed shares is not sufficient to satisfy all of the properly exercised over-subscription rights requests, then the available shares will be prorated among those who properly exercised over-subscription rights based on the number of shares each rights holder subscribed for under the basic subscription privilege. If this pro rata allocation results in any stockholder receiving a greater number of common shares than the stockholder subscribed for pursuant to the exercise of the over-subscription privilege, then such stockholder will be allocated only that number of shares for which the stockholder oversubscribed, and the remaining common shares will be allocated among all other

Table of Contents

stockholders exercising the over-subscription privilege on the same pro rata basis described above. The proration process will be repeated until all shares have been allocated or all over-subscription exercises have been fulfilled, whichever occurs earlier.

In order to properly exercise your over-subscription privilege, you must deliver the subscription payment related to your over-subscription privilege prior to the expiration of the rights offering. Because we will not know the total number of unsubscribed shares prior to the expiration of the rights offering, if you wish to maximize the number of shares you purchase pursuant to your over-subscription privilege, you will need to deliver payment in an amount equal to the aggregate subscription price for the maximum number of shares of our common stock available to you, assuming that no stockholder other than you has purchased any shares of our common stock pursuant to their basic subscription privilege and over-subscription privilege. See [The Rights Offering](#) [The Subscription Rights](#) [Over-Subscription Privilege](#).

Fractional shares of our common stock resulting from the exercise of the over-subscription privilege will be eliminated by rounding down to the nearest whole share, with the total subscription payment being adjusted accordingly. Any excess subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

Are there any limits on the number of shares I may purchase in the rights offering or own as a result of the rights offering?

Yes. Any purchases in the rights offering are inherently limited by the terms as described, including the total number of shares being issued as a limitation of the over-subscription privilege, as well as the over-subscription privilege limit of four times the number of shares purchased by that stockholder under the basic subscription privilege.

Why is the Company conducting the rights offering?

We are conducting the rights offering to raise capital in a cost-effective manner that allows all stockholders to participate. We intend to use the net proceeds for general corporate purposes. It is a condition under the supply agreement with our largest customer, BASF Corporation ([BASF](#)) that we maintain at least \$2.0 million in cash or cash equivalents at the end of each quarterly reporting period. If successful, we believe that the rights offering will enhance our ability to maintain the minimum amount of liquidity required in this supply agreement.

How was the \$0.33 per full share subscription price determined?

In determining the subscription price, our board of directors considered recent closing sales and volume weighted average prices of our common stock and a number of other factors, including: the likely cost of capital from other sources, the price at which our stockholders might be willing to participate in the rights offering, our need for liquidity and the desire to provide an opportunity to our stockholders to participate in the rights offering on a pro rata basis. In conjunction with its review of these factors, our board of directors also reviewed a range of discounts to market value represented by the subscription prices in various prior rights offerings of public companies. The subscription price was established at a price of \$0.33 per full share. The subscription price is not necessarily related to our book value, net worth or any other established criteria of value and may or may not be considered the fair value of our common stock to be offered in the rights offering. We cannot give any assurance that our common stock will trade at or above the subscription price in any given time period.

Am I required to exercise all of the subscription rights I receive in the rights offering?

No. You may exercise any number of your subscription rights, or you may choose not to exercise any subscription rights. However, if you choose not to exercise your subscription rights in full, the relative percentage of our common stock that you own will decrease, and your voting and other rights will be diluted, to the extent shares are purchased by other stockholders in the rights offering. In addition, if you do not exercise your basic subscription privilege in full, you will not be entitled to participate in the over-subscription privilege.

Table of Contents

How soon must I act to exercise my subscription rights?

The subscription rights may be exercised at any time beginning on the date of this prospectus and prior to the expiration of the rights offering, which is on July 20, 2012, at 5:00 p.m., New York City time. If you elect to exercise any rights, the subscription agent must actually receive all required documents and payments from you prior to the expiration of the rights offering. Although we have the option of extending the expiration of the rights offering for a period not to exceed 30 days, we currently do not intend to do so.

May I transfer my subscription rights?

No. You may not sell or transfer your subscription rights to anyone.

Are we requiring a minimum subscription to complete the rights offering?

No.

Are there any conditions to completing the rights offering?

No.

Can our board of directors extend, cancel or amend the rights offering?

Yes. We have the option to extend the rights offering and the period for exercising your subscription rights for a period not to exceed 30 days, although we do not presently intend to do so. If we elect to extend the expiration of the rights offering, we will issue a press release announcing such extension no later than 9:00 a.m., New York City time, on the next business day after the most recently announced expiration of the rights offering. We will extend the duration of the rights offering as required by applicable law or regulation and may choose to extend it if we decide to give investors more time to exercise their subscription rights in this rights offering. If we elect to extend the rights offering for a period of more than 30 days, then holders who have subscribed for rights may cancel their subscriptions and receive a refund of all money advanced.

Our board of directors may cancel the rights offering at any time prior to the expiration of the rights offering for any reason. In the event that the rights offering is cancelled, we will issue a press release notifying stockholders of the cancellation and all subscription payments received by the subscription agent will be returned, without interest or penalty, as soon as practicable.

Our board of directors also reserves the right to amend or modify the terms of the rights offering. If we should make any fundamental changes to the terms set forth in this prospectus, we will file a post-effective amendment to the registration statement in which this prospectus is included, offer potential purchasers who have subscribed for rights the opportunity to cancel such subscriptions and issue a refund of any money advanced by such stockholder and recirculate an updated prospectus after the post-effective amendment is declared effective with the SEC. In addition, upon such event, we may extend the expiration date of this rights offering to allow holders of rights ample time to make new investment decisions and for us to recirculate updated documentation. Promptly following any such occurrence, we will issue a press release announcing any changes with respect to this rights offering and the new expiration date. The terms of the rights offering cannot be modified or amended after the expiration date of the rights offering. Although we do not presently intend to do so, we may choose to amend or modify the terms of the rights offering for any reason, including, without limitation, in order to increase participation in the rights offering. Such amendments or modifications may include a change in the subscription price although no such change is presently contemplated.

Has the board of directors made a recommendation to our stockholders regarding the rights offering?

The board of directors does not make any recommendation to stockholders regarding the exercise of rights under the rights offering. You should make an independent investment decision about whether or not to exercise

Table of Contents

your rights. Stockholders who exercise subscription rights risk investment loss on new money invested. We cannot assure you that the market price for our common stock will remain above the subscription price or that anyone purchasing shares at the subscription price will be able to sell those shares in the future at the same price or a higher price. If you do not exercise your rights, you will lose any value represented by your rights and your percentage ownership interest in us will be diluted. Please see **Risk Factors** for a discussion of some of the risks involved in investing in our common stock.

What will happen if I choose not to exercise my subscription rights?

If you do not exercise any subscription rights, the number of shares of our common stock you own will not change; however, due to the fact that shares will be purchased by other stockholders in the rights offering, your percentage ownership after the completion of the rights offering will be diluted.

How do I exercise my subscription rights? What forms and payment are required to purchase the shares of our common stock?

If you wish to participate in the rights offering, you must take the following steps:

deliver payment to the subscription agent using the methods outlined in this prospectus before 5:00 p.m., New York City time, on July 20, 2012; and

deliver a properly completed rights certificate to the subscription agent before 5:00 p.m., New York City time, on July 20, 2012. If you send a payment that is insufficient to purchase the number of shares you requested, or if the number of shares you requested is not specified in the forms, the payment received will be applied to exercise your subscription rights to the full extent possible based on the amount of the payment received, subject to the elimination of fractional shares.

When will I receive my new shares?

If you purchase shares of our common stock through the rights offering, you will receive your new shares as soon as practicable after the closing of the rights offering.

After I send in my payment and rights certificate, may I cancel my exercise of subscription rights?

No. All exercises of subscription rights are irrevocable, even if you later learn information that you consider to be unfavorable to the exercise of your subscription rights and even if the rights offering is extended by our board of directors. However, if we amend the rights offering to allow for an extension of the rights offering for a period of more than 30 days or make a fundamental change to the terms set forth in this prospectus, you may cancel your subscription and receive a refund of any money you have advanced. You should not exercise your subscription rights unless you are certain that you wish to purchase additional shares of our common stock at a subscription price of \$0.33 per full share.

What should I do if I want to participate in the rights offering but my shares are held in the name of my broker, dealer, custodian bank or other nominee?

If you hold your shares of our common stock in the name of a broker, dealer, custodian bank or other nominee, then your broker, dealer, custodian bank or other nominee is the record holder of the shares you own. The record holder must exercise the subscription rights on your behalf for the shares of our common stock you wish to purchase.

Table of Contents

If you wish to participate in the rights offering and purchase shares of our common stock, please promptly contact the record holder of your shares. We will ask your broker, dealer, custodian bank or other nominee to notify you of the rights offering. You should complete and return to your record holder the form entitled "Beneficial Owner Election." You should receive this form from your record holder with the other rights offering materials.

How many shares of our common stock will be outstanding after the rights offering?

As of June 12, 2012, we had 21,208,162 shares of our common stock issued and outstanding and options to purchase 1,466,200 shares of our common stock outstanding. We expect to issue a maximum of 7,250,000 shares of our common stock in this rights offering through the exercise of subscription rights. Assuming no options are exercised prior to the expiration of the rights offering, we anticipate that we will have 28,458,162 shares of our common stock outstanding immediately after completion of the rights offering.

How much money will the Company receive from the rights offering?

Assuming all the shares of common stock offered are sold, the gross proceeds from the rights offering will be approximately \$2.4 million. Please see "Use of Proceeds."

Are there risks in exercising my subscription rights?

Yes. The exercise of your subscription rights involves risks. Exercising your subscription rights involves the purchase of additional shares of our common stock and should be considered as carefully as you would consider any other equity investment. Among other things, you should carefully consider the risks described under the headings "Risk Factors" in this prospectus.

May stockholders in all states participate in the rights offering?

Although we intend to distribute the rights to all stockholders, we reserve the right in some states to require stockholders, if they wish to participate, to state and agree upon exercise of their respective rights that they are acquiring the shares for investment purposes only, and that they have no present intention to resell or transfer any shares acquired. Our securities are not being offered in any jurisdiction where the offer is not permitted under applicable local laws.

If the rights offering is not completed, will my subscription payment be refunded to me?

Yes. The subscription agent will hold all funds it receives in a segregated bank account until completion of the rights offering. If the rights offering is not completed, all subscription payments received by the subscription agent will be returned, without interest, as soon as practicable. If you own shares in "street name," it may take longer for you to receive payment because the subscription agent will return payments through the record holder of the shares.

Will the subscription rights be listed on a stock exchange or national market?

The subscription rights may not be sold, transferred or assigned and will not be listed or quoted for trading on any stock exchange or market, including the OTCQB marketplace or OTC Bulletin Board.

How do I exercise my subscription rights if I live outside the United States?

We will not mail this prospectus or the rights certificates to stockholders whose addresses are outside the United States or who have an army post office or foreign post office address. The subscription agent will hold the rights certificates for their account. To exercise subscription rights, our foreign stockholders must notify the subscription agent and timely follow the procedures described in "The Rights Offering" Foreign Stockholders.

Table of Contents

What fees or charges apply if I purchase shares of our common stock?

We are not charging any fee or sales commission to issue subscription rights to you or to issue shares to you if you exercise your subscription rights. If you exercise your subscription rights through the record holder of your shares, you are responsible for paying any fees your record holder may charge you.

What are the U.S. federal income tax consequences of exercising subscription rights?

For U.S. federal income tax purposes, you generally should not recognize income or loss in connection with the receipt or exercise of subscription rights unless the rights offering is part of a disproportionate distribution within the meaning of applicable tax rules (in which case you may recognize taxable income upon receipt of the subscription rights). We believe that the rights offering should not be part of a disproportionate distribution but certain aspects of that determination are unclear. This position is not binding on the Internal Revenue Service (the IRS) or the courts, however. You are urged to consult your own tax advisor as to your particular tax consequences resulting from the receipt and exercise of subscription rights and the receipt, ownership and disposition of our common stock. For further information, please see Material U.S. Federal Income Tax Consequences.

To whom should I send my forms and payment?

If your shares are held in the name of a broker, dealer or other nominee, then you should send your subscription documents, rights certificate and subscription payment to that record holder. If you are the record holder, then you should send your subscription documents, rights certificate and subscription payment by hand delivery, first class mail or overnight courier service to:

Broadridge Corporate Issuer Solutions, Inc.

1981 Marcus Avenue

Suite 100

Lake Success, NY 11042

Attention: Subscription Department

You are solely responsible for completing delivery to the subscription agent of your subscription documents, rights certificate and payment. We urge you to allow sufficient time for delivery of your subscription materials to the subscription agent.

Whom should I contact if I have other questions?

If you have other questions or need assistance, please contact Broadridge Corporate Issuer Solutions, Inc. at (800) 733-1121.

Summary Financial Information

The selected consolidated financial data presented below should be read in conjunction with our consolidated financial statements and the notes to the consolidated financial statements and Management's Discussion and Analysis of Financial Condition and Results of Operations included in our Quarterly Report on Form 10-Q for the three months ended March 31, 2012, and our Annual Report on Form 10-K for the year ended December 31, 2011, which are incorporated herein by reference.

Our total revenue and net loss for the periods indicated were as follows:

	Quarter Ended March 31, 2012	Year Ended December 31, 2011
Total revenue	\$ 2,409,338	\$ 9,650,787

Net loss	\$ (774,122)	\$ (3,363,537)
----------	--------------	----------------

- vii -

Table of Contents

PROSPECTUS SUMMARY

*This summary highlights information contained in or incorporated by reference into this prospectus. This summary may not contain all of the information that you should consider before deciding whether or not you should exercise your subscription rights. You should carefully read this prospectus, including the documents incorporated by reference, which are described under the heading *Incorporation by Reference* in this prospectus.*

The Company

Nanophase Technologies Corporation is a nanomaterials and applications developer and commercial manufacturer with an integrated family of nanomaterial technologies. Nanophase produces engineered nanomaterial for use in a variety of diverse existing and developing markets: personal care including sunscreens, architectural coatings, industrial coating ingredients, abrasion-resistant additives, plastics additives, medical diagnostics, architectural window cleaning and restoration, and a variety of polishing applications, including semiconductors and optics. We target markets in which we feel practical solutions may be found using nanoengineered products. We work closely with current and potential customers in these target markets to identify their material and performance requirements and market our materials to various end-use applications manufacturers. Recently developed technologies have made certain new products possible and opened potential new markets.

Nanophase has created a leading commercial approach to the application of its integrated nanomaterials technologies designed to deliver an optimal engineered nanomaterial solution for a target market or specific customer application. With respect to the products it makes, Nanophase has complete capability from application development and laboratory samples through pilot production and, finally, commercial production. Nanophase has development and application laboratories and manufacturing capacity in two locations in the Chicago area. The Company's manufacturing is based on Lean Six Sigma discipline and is certified to ISO 9001, American National Standard, Quality Management System Requirements; ISO 14001, American National Standard, Environmental Management System Requirements; and is compliant with current Good Manufacturing Practices for products under U.S. Food and Drug Administration regulation.

We have undergone a strategic shift toward penetrating key markets via interactive applications development with end-use customers in these markets. We believe this strategy leverages the applications development expertise we have cultivated over the last several years and best positions us to build direct sales to end-use customers, in addition to translating these advantages through our market partners.

The Company was incorporated in Illinois on November 25, 1989, and became a Delaware corporation on November 12, 1997. The Company's common stock trades on the OTCQB marketplace under the symbol NANX. Our principal office is located at 1319 Marquette Drive, Romeoville, Illinois 60446, and the telephone number at that address is (630) 771-6708. Our website address is www.nanophase.com. Except for those SEC filings incorporated by reference in this prospectus, none of the information contained on, or that may be accessed through, our website is a prospectus or constitutes part of, or is otherwise incorporated into, this prospectus.

The Rights Offering

*The following summary describes the principal terms of the rights offering, but is not intended to be complete. See the information under the heading *The Rights Offering* in this prospectus for a more detailed description of the terms and conditions of the rights offering.*

Securities Offered

We are distributing, at no charge, to holders of our common stock non-transferable subscription rights to purchase up to 7,250,000 shares of our common stock. You will receive one subscription right for each share of common stock owned at 5:00 p.m., New York City time, on June 13, 2012.

Table of Contents

Basic Subscription Privilege	The basic subscription privilege of each subscription right will entitle you to purchase 0.342 shares of our common stock at a subscription price of \$0.33 per full share.
Over-Subscription Privilege	If you fully exercise your basic subscription privilege and other stockholders do not fully exercise their basic subscription privileges, you may also exercise an over-subscription right to purchase additional shares of common stock that remain unsubscribed at the expiration of the rights offering, subject to the availability and pro rata allocation of shares among persons exercising this over-subscription right. To the extent the number of the unsubscribed shares is not sufficient to satisfy all of the properly exercised over-subscription rights requests, then the available shares will be prorated among those who properly exercised over-subscription rights based on the number of shares each rights holder subscribed for under the basic subscription privilege. If this pro rata allocation results in any stockholder receiving a greater number of common shares than the stockholder subscribed for pursuant to the exercise of the over-subscription privilege, then such stockholder will be allocated only that number of shares for which the stockholder oversubscribed, and the remaining common shares will be allocated among all other stockholders exercising the over-subscription privilege on the same pro rata basis described above. The proration process will be repeated until all shares have been allocated or all over-subscription exercises have been fulfilled, whichever occurs earlier.
Limitation on the Purchase of Shares	Any stockholder may exercise basic subscription and over-subscription privileges to the extent that any such exercise is the result of rights as described herein and that the total number of shares sold by the Company does not exceed 7,250,000. Additionally, over-subscription rights are restricted to the number of shares available in this offering and not purchased by stockholders in their basic subscription right, and further limited to four times the number of shares a stockholder purchases under its fully exercised basic subscription right.
Record Date	5:00 p.m., New York City time, on June 13, 2012.
Expiration of the Rights Offering	5:00 p.m., New York City time, on July 20, 2012.
Subscription Price	\$0.33 per full share, payable in cash. To be effective, any payment related to the exercise of a right must clear prior to the expiration of the rights offering.
Use of Proceeds	We intend to use the net proceeds for general corporate purposes, including enhancing our ability to maintain the minimum amount of liquidity required in the supply agreement with our largest customer.
Non-Transferability of Rights	The subscription rights may not be sold, transferred or assigned and will not be listed for trading on any stock exchange or market, including the OTCQB marketplace or the OTC Bulletin Board.

Table of Contents

No Board Recommendation	Our board of directors is making no recommendation regarding your exercise of the subscription rights. You are urged to make your decision based on your own assessment of our business and the rights offering. Please see Risk Factors for a discussion of some of the risks involved in investing in our common stock.
No Revocation	All exercises of subscription rights are irrevocable, even if you later learn information that you consider to be unfavorable to the exercise of your subscription rights and even if the rights offering is extended by our board of directors. However, if we amend the rights offering to allow for an extension of the rights offering for a period of more than 30 days or make a fundamental change to the terms set forth in this prospectus, you may cancel your subscription and receive a refund of any money you have advanced. You should not exercise your subscription rights unless you are certain that you wish to purchase additional shares of our common stock at a subscription price of \$0.33 per full share.
U.S. Federal Income Tax Considerations	For U.S. federal income tax purposes, you generally should not recognize income or loss in connection with the receipt or exercise of subscription rights unless the rights offering is part of a disproportionate distribution within the meaning of applicable tax rules (in which case you may recognize taxable income upon receipt of the subscription rights). We believe that the rights offering should not be part of a disproportionate distribution, but certain aspects of that determination are unclear. This position is not binding on the IRS or the courts, however. You are urged to consult your own tax advisor as to your particular tax consequences resulting from the receipt and exercise of subscription rights and the receipt, ownership and disposition of our common stock. For further information, please see Material U.S. Federal Income Tax Consequences.
Extension, Cancellation and Amendment	<p>We have the option to extend the rights offering and the period for exercising your subscription rights for a period not to exceed 30 days, although we do not presently intend to do so. If we elect to extend the expiration of the rights offering, we will issue a press release announcing such extension no later than 9:00 a.m., New York City time, on the next business day after the most recently announced expiration of the rights offering. We will extend the duration of the rights offering as required by applicable law or regulation and may choose to extend it if we decide to give investors more time to exercise their subscription rights in this rights offering. If we elect to extend the rights offering for a period of more than 30 days, then holders who have subscribed for rights may cancel their subscriptions and receive a refund of all money advanced.</p> <p>Our board of directors may cancel the rights offering at any time prior to the expiration of the rights offering for any reason. In the event that the rights offering is cancelled, we will issue a press release notifying stockholders of the cancellation and all subscription payments received by the subscription agent will be returned, without interest or penalty, as soon as practicable.</p>

Table of Contents

Our board of directors also reserves the right to amend or modify the terms of the rights offering. If we should make any fundamental changes to the terms set forth in this prospectus, we will file a post-effective amendment to the registration statement in which this prospectus is included, offer potential purchasers who have subscribed for rights the opportunity to cancel such subscriptions and issue a refund of any money advanced by such stockholder and recirculate an updated prospectus after the post-effective amendment is declared effective with the SEC. In addition, upon such event, we may extend the expiration date of this rights offering to allow holders of rights ample time to make new investment decisions and for us to recirculate updated documentation. Promptly following any such occurrence, we will issue a press release announcing any changes with respect to this rights offering and the new expiration date. The terms of the rights offering cannot be modified or amended after the expiration date of the rights offering. Although we do not presently intend to do so, we may choose to amend or modify the terms of the rights offering for any reason, including, without limitation, in order to increase participation in the rights offering. Such amendments or modifications may include a change in the subscription price although no such change is presently contemplated.

Procedures for Exercising Rights

To exercise your subscription rights, you must complete the rights certificate and deliver it to the subscription agent, Broadridge Corporate Issuer Solutions, Inc., together with full payment for all the subscription rights you elect to exercise under the basic subscription privilege and over-subscription privilege. You may deliver the documents and payments by mail or commercial carrier. If regular mail is used for this purpose, we recommend using registered mail, properly insured, with return receipt requested.

Subscription Agent and Information Agent

Broadridge Corporate Issuer Solutions, Inc.

Shares Outstanding Before the Rights Offering

21,208,162 shares of our common stock were outstanding as of June 12, 2012.

Shares Outstanding After Completion of the Rights Offering

We expect to issue a maximum of 7,250,000 shares of our common stock in this rights offering. Assuming no options are exercised prior to the expiration of the rights offering, we anticipate that we will have 28,458,162 shares of our common stock outstanding immediately after completion of the rights offering.

Fees and Expenses

We will pay the fees and expenses related to the rights offering.

OTCQB Marketplace Trading Symbol

Shares of our common stock are traded on the OTCQB marketplace under the symbol NANX.

Table of Contents

Questions

If you have any questions about the rights offering, including questions about subscription procedures and requests for additional copies of this prospectus or other documents, please contact Broadridge Corporate Issuer Solutions, Inc. at (800) 733-1121.

Risk Factors

Before you invest in the rights offering, you should be aware that there are risks associated with your investment, including the risks described in the section entitled "Risk Factors" beginning on page 6 of this prospectus. You should carefully read and consider these risk factors together with all of the other information included in or incorporated by reference into this prospectus before you decide to exercise your subscription rights to purchase shares of our common stock.

- 5 -

Table of Contents

RISK FACTORS

An investment in our common stock involves a high degree of risk. You should carefully consider the risks described below, together with the other information included or incorporated by reference in this prospectus before making a decision to invest in our common stock. If any of these risks actually occur, our business, results of operations and financial condition could suffer. In that case, the market price of our common stock could decline, and you may lose all or part of your investment.

Risks Related to Our Business

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 \$4.1 million in 2010, \$3.4 million in 2011, and \$774,122 in the first three months of 2012. As of March 31, 2012, we had an accumulated deficit of \$86.6 million and expect to incur a loss on an annual basis through at least the end of 2012. 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 few major 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 long-term supply contracts; however, customers can cease doing business with us at any time with limited advance notice. It is possible that a significant portion of our future sales may 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 our three largest customers accounted for 54%, 21% and 7%, respectively, of our total revenue in 2011, and 70%, 10% and 5%, respectively, in the first three months of 2012.

We plan to expand 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. 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. Going forward, our margins, as a percentage of revenue, will be dependent upon revenue mix, revenue volume, raw materials pricing, 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 product markets served by us would harm our business.

A majority of our products are incorporated into products such as sunscreens, architectural coatings, polishing slurries, personal care, and to a lesser extent, medical diagnostics, abrasion-resistant coatings and other products. 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 often result in reduced product demand and declining average selling prices. Our business would be harmed by a continuation of the existing downturn and/or any future downturns in the markets that we serve.

Table of Contents

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 nanomaterials may require longer adoption cycles than existing materials technologies, to the point that adoption cycles are typically one to five years. 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 demonstrate to our potential customers the performance advantages and economic value of our nanomaterials 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 frequently depend on collaborative development relationships with our customers. We also have relationships with distributor entities in certain market areas (such as personal care including sunscreens) and geographic areas where our limited direct sales force would not be effective. If we are unable to initiate or sustain such collaborative relationships or if the terms of our relationships with distributors in these market and geographic areas limit the distribution of our products, or if our strategic partners are unable to distribute our products efficiently, then we may be unable to successfully develop, manufacture or market our current and future nanomaterials or applications.

We have established, and will continue to pursue, strategic relationships with many of our customers and do not have a substantial direct sales force or an established distribution network (other than distribution arrangements for research samples). Through these relationships, we seek to develop new applications for our nanomaterials and share development and manufacturing resources. We also seek to coordinate the development, manufacture and marketing of our nanomaterials products, particularly as a result of our selling additives that must be integrated into complete formulations by the customer. Future success will depend, in part, on our continued relationships with these customers and our ability to enter into similar strategic 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 strategic development relationships with our competitors. These customers may also require a share of control of these collaborative programs. While less prevalent than in the past, 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 with others. These relationships generally can be terminated unilaterally by customers.

If we are unable to initiate or sustain such collaborative relationships or if the terms of these relationships materially limit our access to distribution channels for our products, then we may be unable to successfully develop, manufacture or market our current and future nanomaterials or applications.

If commodity metal prices increase at such a rate that we are unable to recover lost margins on a timely basis or that our products became uncompetitive in their current marketplaces, our financial and liquidity position and results of operations would be substantially harmed.

Many of our significant raw materials come from commodity metal markets that may be subject to rapid price increases. While we generally are able to pass a significant portion of commodity price-related increases on to our customers, it is possible that, given our limited customer base and the limited control we have over it, commodity metal prices could increase at such a rate that could hinder our ability to recover lost margins from our customers. It is also possible that such drastic cost increases could render some of our materials uncompetitive in their current marketplaces when considered relative to other materials on a cost benefit basis. If either of these potential results occurred, our financial and liquidity position and results of operations would be substantially harmed.

Table of Contents

Beginning in 2010, the availability of one of the materials we use, cerium oxide, a rare earth material, was constrained by a change in Chinese export policy, causing a dramatic increase in material cost. New sources of materials, a lack of further restrictions, and other factors have reduced the availability and cost issues substantially from their 2011 peak, but the cost of this material remains significantly higher than it was during the first half of 2010. While cerium oxide continues to be used for many applications, and polishing applications in our case, customers are more inclined to look for alternative solutions today as they consider the supply (including cost) risk of this material. Failure of customers to either adopt solutions utilizing cerium oxide or continue to use solutions containing cerium oxide could harm one of our business areas, and thus negatively impact our financial and liquidity position and results of operations.

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 (USPTO) 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 or maintain 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. 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. Such litigation might occur with parties that have substantially greater resources, and thus more capability to engage and continue litigation. In addition, if others assert that our technology infringes their intellectual property rights, resolving the dispute could divert our management team and financial resources.

Due to the expanding length of time required in order to obtain a patent, and the inherent ongoing risks of the protections truly provided by any patent, we made a decision during 2008 that we could no longer place a value on these intangible assets. In the future, we may license certain of our intellectual property, such as trademarks, 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.

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 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 property insurance, this insurance may not adequately compensate us for all losses that we may incur in the event of a material interruption in our business.

Table of Contents

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 nanomaterials in significant quantities, with consistent quality and in an efficient and timely manner. We expect to be able to expand our current facilities or obtain additional facilities in the future, and outsource production aspects as necessary, available and appropriate, 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.

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.

The markets we serve are 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 nanomaterials 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 nanomaterials 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 nanomaterials 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 sell key production 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 governmental entities 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.

Table of Contents

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, our stockholders may face economic dilution and dilution of their percentage of ownership.

We currently have a supply agreement with BASF that contains provisions which could potentially result in a mandatory license of technology and/or sale of production equipment to BASF, providing capacity sufficient to meet BASF's production needs. Under our supply agreement with BASF, a triggering event also would occur:

if 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 certain investments are less than \$2,000,000, or

upon the acceleration of any debt maturity having a principal amount of more than \$10,000,000, or if 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 the greater of 30% of the original book value of such equipment, and any associated upgrades to it, or 115% of the equipment's net book value.

If we were determined to have materially breached certain other provisions of our supply agreement with BASF, we similarly could be subject to a triggering event that potentially could result in a mandatory license of technology and/or sale of certain production equipment to the customer.

We believe that the net proceeds from the rights offering together with our current cash balances and other assets that might be monetized if and as needed will be sufficient to avoid the first triggering event under the BASF supply agreement for the foreseeable future, and because we are debt-free, the second triggering event is not currently applicable to us.

If a triggering event were to occur and BASF elected to proceed with the license 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 the customer pursuant to this triggering event could take in excess of 12 months. 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 potential 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 likely 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. Upon 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, or if we are unable to implement a succession plan to prepare qualified individuals to assume key roles upon any loss of our key personnel, then our business, results of operations and financial condition could be materially harmed.

Table of Contents

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 nanomaterials product applications are alleged to be defective or cause harmful effects to humans or physical environments. Because our nanomaterials are used in other companies' products, to the extent our customers become subject to suits relating to their products, such as cosmetic, skin-care, architectural coatings and personal-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. Although we maintain insurance for product liability claims, our coverage may not prove 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 nanomaterials.

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 and dispersion 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 both the amount of our liability insurance and our resources or otherwise have a material adverse effect on our business, results of operations and financial condition.

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 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 important initiatives.

The manufacture and use of certain products that contain our nanomaterials are subject to extensive 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. In addition, new rules or regulations could impose restrictions or prohibitions on certain materials being marketed with or incorporated into certain applications, which could limit our ability to sell our nanomaterials in the marketplace.

Risks Related to the Rights Offering

The market price of our common stock is volatile and may decline before or after the subscription rights expire.

The market price of our common stock could be subject to wide fluctuations in response to numerous factors, some of which are beyond our control. These factors include, among other things, actual or anticipated variations in our costs of doing business, operating results and cash flow, the nature and content of our earnings releases and our competitors' earnings releases, shortfalls in our revenues in any given period relative to the levels expected by investors, customers, competitors or markets, changes in financial estimates by securities analysts or investors, business conditions in our markets and the general state of the securities markets and the market for similar stocks, changes in capital markets that affect the perceived availability of capital to companies.

Table of Contents

in our industry, governmental legislation or regulation, as well as general economic and market conditions, such as continued downturns in our economy and recessions.

We cannot assure you that the market price of our common stock will not decline after you elect to exercise your subscription rights. If that occurs, you may have committed to buy shares of our common stock in the rights offering at a price greater than the prevailing market price, and could have an immediate unrealized loss. Moreover, we cannot assure you that following the exercise of your subscription rights you will be able to sell your common stock at a price equal to or greater than the subscription price. Until shares are delivered upon expiration of the rights offering, you will not be able to sell the shares of our common stock that you purchase in the rights offering. Certificates representing shares of our common stock purchased will be delivered as soon as practicable after expiration of the rights offering. We will not pay you interest on funds delivered to the subscription agent pursuant to the exercise of subscription rights.

If you do not fully exercise your subscription rights, your ownership interest will be diluted.

The rights offering will result in our issuance of up to 7,250,000 additional shares of our common stock. If you choose not to fully exercise your subscription rights prior to the expiration of the rights offering, your relative ownership interest in us will be diluted to the extent shares are purchased by other stockholders in the rights offering.

The subscription rights are not transferable and there is no market for the subscription rights.

You may not sell, transfer or assign your subscription rights. The subscription rights are only transferable by operation of law. Because the subscription rights are non-transferable, there is no market or other means for you to directly realize any value associated with the subscription rights. You must exercise the subscription rights and acquire additional shares of our common stock to realize any value that may be embedded in the subscription rights.

The subscription price determined for the rights offering is not an indication of the fair value of our common stock.

In determining the subscription price for the rights offering, our board of directors considered recent closing sales and volume weighted average prices for our common stock and a number of other factors, including: the likely cost of capital from other sources, the price at which our stockholders might be willing to participate in the rights offering, our need for liquidity and the desire to provide an opportunity to our stockholders to participate in the rights offering on a pro rata basis. In conjunction with its review of these factors, our board of directors also reviewed a range of discounts to market value represented by the subscription prices in various prior rights offerings of public companies. The subscription price was established at a price of \$0.33 per full share. The subscription price is not necessarily related to our book value, net worth or any other established criteria of value and may or may not be considered the fair value of our common stock to be offered in the rights offering. We cannot give you any assurance that our common stock will trade at or above the subscription price in any given time period. After the date of this prospectus, our common stock may trade at prices above or below the subscription price.

Because our management will have broad discretion over the use of the gross proceeds from the rights offering, you may not agree with how we use the proceeds, and we may not invest the proceeds successfully.

We are conducting the rights offering to provide additional liquidity to support the existing business, including the need to maintain a minimum liquidity under the supply agreement with our largest customer, BASF. We may also use the proceeds for general corporate purposes, including marketing initiatives intended to increase future sales volumes. In addition, market factors may require our management to allocate portions of the proceeds for other purposes. Accordingly, you will be relying on the judgment of our management with regard to the use of the proceeds from the rights offering, and you will not have the opportunity, as part of your investment

Table of Contents

decision, to assess whether the proceeds are being used appropriately. It is possible that the proceeds will be invested in a way that does not yield a favorable, or any, return for the Company.

We may cancel the rights offering at any time prior to the expiration of the rights offering, and neither we nor the subscription agent will have any obligation to you except to return your exercise payments.

We may, in our sole discretion, decide not to continue with the rights offering or cancel the rights offering prior to the expiration of the rights offering. If the rights offering is cancelled, we will issue a press release notifying stockholders of the cancellation and all subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

We may amend or modify the terms of the rights offering at any time prior to the expiration of the rights offering in our sole discretion.

Our board of directors reserves the right to amend or modify the terms of the rights offering in its sole discretion. Although we do not presently intend to do so, we may choose to amend or modify the terms of the rights offering for any reason, including, without limitation, in order to increase participation in the rights offering. Such amendments or modifications may include a change in the subscription price although no such change is presently contemplated. If we should make any fundamental changes to the terms set forth in this prospectus, we will file a post-effective amendment to the registration statement in which this prospectus is included, offer potential purchasers who have subscribed for rights the opportunity to cancel such subscriptions and issue a refund of any money advanced by such stockholder and recirculate an updated prospectus after the post-effective amendment is declared effective with the SEC. In addition, upon such event, we may extend the expiration date of this rights offering to allow holders of rights ample time to make new investment decisions and for us to recirculate updated documentation. Promptly following any such occurrence, we will issue a press release announcing any changes with respect to this rights offering and the new expiration date. The terms of the rights offering cannot be modified or amended after the expiration date of the rights offering.

The rights offering does not have a minimum amount of proceeds and there can be no assurance that stockholders will choose to exercise their subscription rights, which means that if you exercise your rights you may be investing in a company that continues to desire additional capital.

There can be no assurance that any stockholders will exercise their subscription rights. There is no minimum amount of proceeds required to complete the rights offering. In addition, all exercises of subscription rights are irrevocable, even if you later learn information that you consider to be unfavorable to the exercise of your subscription rights and even if the rights offering is extended by our board of directors. However, if we amend the rights offering to allow for an extension of the rights offering for a period of more than 30 days or make a fundamental change to the terms set forth in this prospectus, you may cancel your subscription and receive a refund of any money you have advanced. If you exercise the basic subscription privilege or the over-subscription privilege, but we do not raise the desired amount of capital in this rights offering, you may be investing in a company that continues to desire additional capital.

You may not revoke your subscription exercise, even if the rights offering is extended by our board of directors, and you could be committed to buying shares above the prevailing market price.

Once you exercise your subscription rights, you may not revoke the exercise of such rights. If our board of directors decides to exercise its option to extend the rights offering, you still may not revoke the exercise of your subscription rights. However, if we amend the rights offering to allow for an extension of the rights offering for a period of more than 30 days or make a fundamental change to the terms set forth in this prospectus, you may cancel your subscription and receive a refund of any money you have advanced. The public trading market price of our common stock may decline before the subscription rights expire. If you exercise your subscription rights and, afterwards, the public trading market price of our common stock decreases below the subscription price, you

Table of Contents

will have committed to buying shares of our common stock at a price above the prevailing market price. Our common stock is traded on the OTCQB marketplace under the symbol NANX, and the last reported sales price of our common stock on June 12, 2012 was \$0.35 per share. Following the exercise of your rights, you may be unable to sell your shares of our common stock at a price equal to or greater than the subscription price you paid for such shares, and you may lose all or part of your investment in our common stock.

If you do not act promptly and follow the subscription instructions, your exercise of subscription rights will be rejected.

Stockholders that desire to purchase shares in the rights offering must act promptly to ensure that all required forms and payments are actually received by the subscription agent prior to the expiration of the rights offering. If you are a beneficial owner of shares, you must act promptly to ensure that your broker, dealer, custodian bank or other nominee acts for you and that all required forms and payments are actually received by the subscription agent prior to the expiration of the rights offering. We are not responsible if your broker, custodian or nominee fails to ensure that all required forms and payments are actually received by the subscription agent prior to the expiration of the rights offering. If you fail to complete and sign the required subscription forms, send an incorrect payment amount or otherwise fail to follow the subscription procedures that apply to your exercise in the rights offering prior to the expiration of the rights offering, the subscription agent will reject your subscription or accept it only to the extent of the payment received. Neither we nor our subscription agent undertakes to contact you concerning an incomplete or incorrect subscription form or payment, nor are we under any obligation to correct such forms or payment. We have the sole discretion to determine whether a subscription exercise properly complies with the subscription procedures.

The tax treatment of the rights offering is somewhat uncertain and it may be treated as a taxable event to our stockholders.

If the rights offering is deemed to be part of a disproportionate distribution under section 305 of the Internal Revenue Code of 1986, as amended (the Code), our stockholders may recognize taxable income for U.S. federal income tax purposes in connection with the receipt of subscription rights in the rights offering depending on our current and accumulated earnings and profits and our stockholders' tax basis in our common stock. A disproportionate distribution is a distribution or a series of distributions, including deemed distributions, that has the effect of the receipt of cash or other property by some stockholders or holders of debt instruments convertible into stock and an increase in the proportionate interest of other stockholders in a company's assets or earnings and profits. It is unclear whether the fact that we have outstanding options and certain other equity-based awards could cause the receipt of subscription rights to be part of a disproportionate distribution. Please see Material U.S. Federal Income Tax Consequences for further information on the treatment of the rights offering.

The rights offering could impair or limit our net operating loss carryforwards.

As of March 31, 2012, we had net operating loss (NOL) carryforwards of approximately \$79 million for U.S. federal income tax purposes. Under the Code, an ownership change with respect to a corporation can significantly limit the amount of pre-ownership change NOLs and certain other tax assets that the corporation may utilize after the ownership change to offset future taxable income, possibly reducing the amount of cash available to the corporation in the future. An ownership change generally should occur if the aggregate stock ownership of holders of at least 5% of our stock increases by more than 50 percentage points over the preceding three-year period. The purchase of shares of our common stock pursuant to the rights offering may trigger an ownership change with respect to our stock.

The rights offering may cause the price of our common stock to decrease.

The announcement of the rights offering and its terms, including the subscription price, together with the number of shares of common stock we could issue if the rights offering is completed, may result in an immediate

Table of Contents

decrease in the trading price of our common stock. This decrease may continue after the completion of the rights offering. If that occurs, your purchase of shares of our common stock in the rights offering may be at a price greater than the prevailing trading price. Further, if a substantial number of subscription rights are exercised and the holders of the shares received upon exercise of those subscription rights choose to sell some or all of those shares, the resulting sales could depress the market price of our common stock.

Risks Related to Our Common Stock

Bradford T. Whitmore and his affiliates have significant influence on all matters requiring stockholder approval because they beneficially own a large percentage of our common stock, their beneficial ownership may increase unless all other stockholders exercise their basic subscription privilege, and they may vote any additional shares of common stock they acquire in the offering in ways with which other stockholders disagree.

As of June 5, 2012, Bradford T. Whitmore, together with his affiliates, Grace Brothers, Ltd. and Grace Investments, Ltd., beneficially owned approximately 25.8% of the outstanding shares of our common stock. If all of our stockholders do not exercise their subscription rights in full, and Mr. Whitmore and his affiliates purchase additional shares in the offering, the beneficial ownership of Mr. Whitmore and his affiliates would increase along with their 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 current or increased ownership position of Mr. Whitmore and his affiliates 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. The interests of Mr. Whitmore and his affiliates may significantly differ from the interests of our other stockholders and they may vote the common stock they beneficially own 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 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.

Sales, or the availability for sale, of substantial amounts of our common stock could adversely affect the value of our common stock.

No prediction can be made as to the effect, if any, that future sales of our common stock, or the availability of our common stock for future sales, will have on the market price of our common stock. Sales of substantial amounts of our common stock in the public market and the availability of shares for future sale could adversely affect the prevailing market price of our common stock. This in turn could impair our future ability to raise capital through an offering of our equity securities.

There may be future sales or other dilution of our equity, which may adversely affect the market price of our common stock.

We are not restricted from issuing additional shares of common stock, including any securities that are convertible into or exchangeable for, or that represent the right to receive, common stock. The market price of our common stock could decline as a result of sales of our common stock made after this offering or the perception that such sales could occur.

Table of Contents

Provisions in our certificate of incorporation, our by-laws, and Delaware law could make it more difficult for a third party to acquire us, discourage a takeover, and adversely affect existing stockholders.

Our certificate of incorporation, our by-laws and the Delaware General Corporation Law (the "DGCL") contain provisions that may have the effect of making more difficult, delaying or deterring attempts by others to obtain control of our Company, even when these attempts may be in the best interests of stockholders. These include provisions on our maintaining a classified Board of Directors and limiting the stockholders powers to remove directors or take action by written consent instead of at a stockholders meeting. Our certificate of incorporation also authorizes our Board of Directors, without stockholder approval, to issue one or more series of preferred stock, which could have voting and conversion rights that adversely affect or dilute the voting power of the holders of common stock. The DGCL also imposes conditions on certain business combination transactions with interested stockholders.

These provisions and others that could be adopted in the future could deter unsolicited takeovers or delay or prevent changes in our control or management, including transactions in which stockholders might otherwise receive a premium for their shares over then current market prices. These provisions may also limit the ability of stockholders to approve transactions that they may deem to be in their best interests.

Table of Contents

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements, within the meaning of the Federal securities laws, that involve substantial risks and uncertainties. Any statements contained herein that are not statements of historical fact may be deemed to be forward-looking statements. Without limiting the foregoing, the words outlook, believes, plans, intends, expects, goals, potential, continues, may, should, approximately, predicts, estimates, anticipates and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these words. You should read statements that contain these words carefully because they discuss our plans, strategies, prospects and expectations concerning our business, operating results, financial condition and other similar matters. We believe that it is important to communicate our future expectations to our investors. There will be events in the future, however, that we are not able to predict accurately or control. The factors listed under Risk Factors in this prospectus and in any documents incorporated by reference into this prospectus as well as any cautionary language in this prospectus, provide examples of risks, uncertainties and events that may cause our actual results to differ materially from the expectations we describe in our forward-looking statements. Such risks and uncertainties include, among other things, risks and uncertainties related to:

our ability to become profitable despite the losses we have incurred since our incorporation;

our dependence on our principal customers and the terms of our supply agreement with BASF which could trigger a requirement to transfer technology and/or equipment to that customer;

our potential inability to obtain working capital when needed on acceptable terms or at all;

our ability to obtain materials at costs we can pass through to our customers, including Rare Earth elements, specifically cerium oxide;

uncertain demand for, and acceptance of, our nanocrystalline materials;

our limited 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;

our ability to maintain an appropriate electronic trading venue;

the impact of any potential new governmental regulations that could be difficult to respond to or costly to comply with;

general industry and market conditions and growth rates; and

other factors, including those discussed in **Risk Factors** in this prospectus.

Before you invest in our securities, you should be aware that the occurrence of the events described above and elsewhere in this prospectus under the heading **Risk Factors**, and in the information contained in documents incorporated by reference into this prospectus could have a material adverse effect on our business, results of operations and financial position. Any forward-looking statement made by us in this prospectus speaks only as of the date on which we make it. Factors or events that could cause our actual results to differ will emerge from time to time, and it is not possible for us to predict all of them. We undertake no obligation to update or revise publicly any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law. All forward-looking statements should be evaluated with the understanding of their inherent uncertainty. You are advised to consult any further disclosures we make on

Table of Contents

related subjects in the reports we file with the SEC pursuant to Sections 13(a), 13(c), 14, or 15(d) of the Securities Exchange Act of 1934, as amended (Exchange Act).

USE OF PROCEEDS

Assuming all the shares of common stock offered are sold, the gross proceeds from the rights offering will be approximately \$2.4 million. However, it is impossible to predict how many shares of common stock will be subscribed for in this rights offering and, therefore, the proceeds that will actually be received by the Company. We intend to use the net proceeds for general corporate purposes. If successful, we believe the rights offering will enhance our ability to maintain the minimum liquidity required in the supply agreement with our largest customer.

CAPITALIZATION

The following table sets forth our cash and cash equivalents and our capitalization as of March 31, 2012 on an actual basis and on an as adjusted basis to give effect to this rights offering, assuming proceeds from the rights offering of \$2,392,500, less the estimated offering expenses of \$180,000. However, it is impossible to predict how many shares of common stock will be subscribed for in this rights offering and, therefore, the proceeds that will actually be received by the Company. You should read this table together with the information under the heading

Management's Discussion and Analysis of Results of Operations and Financial Condition, in the Company's Form 10-Q for the three months ended March 31, 2012.

	As of March 31, 2012	
	Actual	As Adjusted
Cash and cash equivalents	\$ 2,315,306	\$ 4,527,806
Total debt	\$ 0	\$ 0
Stockholders' equity:		
Preferred stock \$.01 par value; 24,088 shares authorized, no shares issued and outstanding as of March 31, 2012		
Common stock \$.01 par value; 35,000,000 shares authorized, 21,208,162 shares issued and outstanding as of March 31, 2012; 28,458,162, as adjusted	\$ 212,082	\$ 284,582
Additional paid-in capital	\$ 93,153,507	\$ 95,293,507
Accumulated deficit	\$ (86,581,325)	\$ (86,581,325)
Total stockholders' equity	\$ 6,784,264	8,996,764
Total capitalization	\$ 6,784,264	\$ 8,996,764

Table of Contents**DILUTION**

Purchasers of our common stock in the rights offering will experience an immediate dilution of the net tangible book value of the shares purchased. At April 30, 2012, we had a net tangible book value of approximately \$6.8 million, or \$0.32 per share of our common stock. After giving effect to the sale of the maximum 7,250,000 shares of our common stock in the rights offering and after deducting transaction and offering expenses, the pro forma net tangible book value at April 30, 2012 attributable to common stockholders would have been \$9.0 million, or \$0.32 per share of our common stock. This amount represents an immediate dilution to purchasers in the rights offering of \$0.01 per share. The following table illustrates this per share dilution.

Subscription Price		\$ 0.33
Net tangible book value per share at April 30, 2012, before the rights offering	\$ 0.32	
Net increase in pro forma tangible book value per share attributable to the rights offering	\$ 0.00	
Pro forma net tangible book value per share after giving effect to the rights offering		\$ 0.32
Dilution in pro forma net tangible book value per share to purchasers		\$ 0.01

THE RIGHTS OFFERING

Please read the following information concerning the subscription rights in conjunction with the statements under Description of Subscription Rights in this prospectus, which the following information supplements.

The Subscription Rights

We are distributing to the record holders of our common stock as of the record date non-transferable subscription rights to purchase shares of our common stock. The subscription price of \$0.33 per full share was determined by our board of directors after a review of recent closing sales and volume weighted average prices of our common stock and a number of other factors. The subscription rights will entitle the holders of our common stock to purchase approximately an aggregate of 7,250,000 shares of our common stock for an aggregate purchase price of approximately \$2.4 million.

Each holder of record of our common stock will receive one subscription right for each share of our common stock owned by such holder as of 5:00 p.m., New York City time, on the record date. Each subscription right will entitle the holder to a basic subscription privilege and an over-subscription privilege.

Basic Subscription Privilege

With your basic subscription privilege, you may purchase 0.342 shares of our common stock per subscription right, upon delivery of the required documents and payment of the subscription price of \$0.33 per full share, prior to the expiration of the rights offering. You may exercise all or a portion of your basic subscription privilege. However, if you exercise less than your full basic subscription privilege you will not be entitled to purchase shares pursuant to your over-subscription privilege.

Fractional shares of our common stock resulting from the exercise of the basic subscription privilege will be eliminated by rounding down to the nearest whole share, with the total subscription payment being adjusted accordingly. Any excess subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

We will deliver certificates representing shares of our common stock purchased with the basic subscription privilege as soon as practicable after the rights offering has expired.

Over-Subscription Privilege

If you fully exercise your basic subscription privilege and other stockholders do not fully exercise their basic subscription privileges, you may also exercise an over-subscription right to purchase additional shares of

Table of Contents

common stock that remain unsubscribed at the expiration of the rights offering, subject to the availability and pro rata allocation of shares among persons exercising this over-subscription right. To the extent the number of the unsubscribed shares is not sufficient to satisfy all of the properly exercised over-subscription rights requests, then the available shares will be prorated among those who properly exercised over-subscription rights based on the number of shares each rights holder subscribed for under the basic subscription privilege. If this pro rata allocation results in any stockholder receiving a greater number of common shares than the stockholder subscribed for pursuant to the exercise of the over-subscription privilege, then such stockholder will be allocated only that number of shares for which the stockholder oversubscribed, and the remaining common shares will be allocated among all other stockholders exercising the over-subscription privilege on the same pro rata basis described above. The proration process will be repeated until all shares have been allocated or all over-subscription exercises have been fulfilled, whichever occurs earlier.

In order to properly exercise your over-subscription privilege, you must deliver the subscription payment related to your over-subscription privilege prior to the expiration of the rights offering. Because we will not know the total number of unsubscribed shares prior to the expiration of the rights offering, if you wish to maximize the number of shares you purchase pursuant to your over-subscription privilege, you will need to deliver payment in an amount equal to the aggregate subscription price for the maximum number of shares of our common stock available to you, assuming that no stockholder other than you has purchased any shares of our common stock pursuant to their basic subscription privilege and over-subscription privilege.

We can provide no assurances that you will actually be entitled to purchase the number of shares issuable upon the exercise of your over-subscription privilege in full at the expiration of the rights offering. We will not be able to satisfy your exercise of the over-subscription privilege if all of our stockholders exercise their basic subscription privileges in full, and we will only honor an over-subscription privilege to the extent sufficient shares of our common stock are available following the exercise of subscription rights under the basic subscription privileges.

If the amount you pay in connection with the exercise of your over-subscription privilege exceeds the subscription price of the number of shares allocated to you, you will be allocated only the number of unsubscribed shares available to you, and any excess subscription payment will be returned to you, without interest, as soon as practicable. If the amount you pay in connection with the exercise of your over-subscription privilege is less than the subscription price of the maximum number of unsubscribed shares available for purchase under your over-subscription privilege, you will be allocated only the number of shares for which you actually paid the subscription price.

Fractional shares of our common stock resulting from the exercise of the over-subscription privilege will be eliminated by rounding down to the nearest whole share, with the total subscription payment being adjusted accordingly. Any excess subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

We will deliver certificates representing shares of our common stock purchased with the over-subscription privilege as soon as practicable after the expiration of the rights offering.

Limitation on the Purchase of Shares

The maximum number of shares available in the over-subscription privilege is limited to four times the number of shares that the stockholder purchases under the basic subscription privilege.

Reasons for the Rights Offering

Our board of directors has approved the rights offering as a cost-effective manner of raising capital that allows all stockholders to participate. The proceeds will enhance our ability to maintain compliance with a

Table of Contents

covenant in a supply agreement with our largest customer, BASF, that requires us to have at least \$2.0 million in cash or cash equivalents at the end of any reporting period. Our board of directors also considered several alternative capital raising methods prior to concluding that the rights offering was appropriate under the circumstances. We are conducting the rights offering to raise capital that we intend to use for general corporate purposes. Although we believe that the rights offering will strengthen our financial condition, our board of directors is making no recommendation regarding your exercise of the subscription rights.

Method of Exercising Subscription Rights

The exercise of subscription rights is irrevocable and may not be cancelled or modified, even if the rights offering is extended by our board of directors. However, if we amend the rights offering to allow for an extension of the rights offering for a period of more than 30 days or make a fundamental change to the terms set forth in this prospectus, you may cancel your subscription and receive a refund of any money you have advanced. You may exercise your subscription rights as follows:

Subscription by Registered Holders

You may exercise your subscription rights by properly completing and executing the rights certificate together with any required signature guarantees and forwarding it, together with your full subscription payment, to the subscription agent at the address set forth below under Subscription Agent and Information Agent, prior to the expiration of the rights offering.

Subscription by DTC Participants

We expect that the exercise of your subscription rights may be made through the facilities of DTC. If your subscription rights are held of record through DTC, you may exercise your subscription rights by instructing DTC, or having your broker instruct DTC, to transfer your subscription rights from your account to the account of the subscription agent, together with certification as to the aggregate number of subscription rights you are exercising and the number of shares of our common stock you are subscribing for under your basic subscription privilege and your over-subscription privilege, if any, and your full subscription payment.

Subscription by Beneficial Owners

If you are a beneficial owner of shares of our common stock that are registered in the name of a broker, custodian bank or other nominee, or if you hold our common stock certificates and would prefer to have an institution conduct the transaction relating to the subscription rights on your behalf, you should instruct your broker, custodian bank or other nominee or institution to exercise your subscription rights and deliver all documents and payment on your behalf prior to 5:00 p.m., New York City time, on July 20, 2012, which is the expiration of the rights offering. Your subscription rights will not be considered exercised unless the subscription agent receives from you, your broker, custodian bank, nominee or institution, as the case may be, all of the required documents and your full subscription payment prior to 5:00 p.m., New York City time, on July 20, 2012.

Payment Method

Your payment of the subscription price must be made in United States dollars for the full number of shares of common stock for which you are subscribing by cashier's or certified check drawn upon a U.S. bank payable to Broadridge Corporate Issuer Solutions, Inc., as Subscription Agent for Nanophase Technologies Corporation (working in conjunction with Broadridge Corporate Issuer Solutions, Inc.) at the address set forth below in Subscription Agent and Information Agent. The subscription agent will not accept non-certified checks or payment by any other means. Payment received after the expiration of the rights offering will not be honored, and the subscription agent will return your payment to you, without interest, as soon as practicable. Your payment will be considered received by the subscription agent only upon receipt by the subscription agent of any cashier's or certified check drawn upon a U.S. bank payable to the subscription agent.

Table of Contents

You should read the instruction letter accompanying the rights certificate carefully and strictly follow it. **DO NOT SEND RIGHTS CERTIFICATES OR PAYMENTS TO US.** We will not consider your subscription received until the subscription agent has received delivery of a properly completed and duly executed rights certificate and payment of the full subscription amount. The risk of delivery of all documents and payments is borne by you or your nominee, not by the subscription agent or us.

The method of delivery of rights certificates and payment of the subscription amount to the subscription agent will be at the risk of the holders of subscription rights. If sent by mail, we recommend that you send those certificates and payments by overnight courier or by registered mail, properly insured, with return receipt requested, and that a sufficient number of days be allowed to ensure delivery to the subscription agent and clearance of payment prior to the expiration of the rights offering.

Unless a rights certificate provides that the shares of our common stock are to be delivered to the record holder of such rights or such certificate is submitted for the account of a bank or a broker, signatures on such rights certificate must be guaranteed by an eligible guarantor institution, as such term is defined in Rule 17Ad-15 of the Exchange Act, subject to any standards and procedures adopted by the subscription agent.

Missing or Incomplete Subscription Information

If you do not indicate the number of subscription rights being exercised, or the subscription agent does not receive the full subscription payment for the number of subscription rights that you indicate are being exercised, then you will be deemed to have exercised the maximum number of subscription rights that may be exercised with the aggregate subscription payment you delivered to the subscription agent. If we do not apply your full subscription payment to your purchase of shares of our common stock, any excess subscription payment received by the subscription agent will be returned, without interest, as soon as practicable.

Expiration Date and Amendments

The subscription period, during which you may exercise your subscription rights, expires at 5:00 p.m., New York City time, on July 20, 2012, which is the expiration of the rights offering. If you do not exercise your subscription rights prior to that time, your subscription rights will expire and will no longer be exercisable. We will not be required to issue shares of our common stock to you if the subscription agent receives your rights certificate or your subscription payment after that time, regardless of when the rights certificate and subscription payment were sent. We may extend the expiration of the rights offering for a period not to exceed 30 days by giving oral or written notice to the subscription agent prior to the expiration of the rights offering, although we do not presently intend to do so. If we elect to extend the expiration of the rights offering, we will issue a press release announcing such extension no later than 9:00 a.m., New York City time, on the next business day after the most recently announced expiration of the rights offering. We will extend the duration of the rights offering as required by applicable law or regulation and may choose to extend it if we decide to give investors more time to exercise their subscription rights in this rights offering. If we elect to extend the rights offering for a period of more than 30 days, then holders who have subscribed for rights may cancel their subscriptions and receive a refund of all money advanced.

Our board of directors also reserves the right to amend or modify the terms of the rights offering. If we should make any fundamental changes to the terms set forth in this prospectus, we will file a post-effective amendment to the registration statement in which this prospectus is included, offer potential purchasers who have subscribed for rights the opportunity to cancel such subscriptions and issue a refund of any money advanced by such stockholder and recirculate an updated prospectus after the post-effective amendment is declared effective with the SEC. In addition, upon such event, we may extend the expiration date of this rights offering to allow holders of rights ample time to make new investment decisions and for us to recirculate updated documentation. Promptly following any such occurrence, we will issue a press release announcing any changes with respect to this rights offering and the new expiration date. The terms of the rights offering cannot be modified or amended

Table of Contents

after the expiration date of the rights offering. Although we do not presently intend to do so, we may choose to amend or modify the terms of the rights offering for any reason, including, without limitation, in order to increase participation in the rights offering. Such amendments or modifications may include a change in the subscription price although no such change is presently contemplated.

Subscription Price

In determining the subscription price, our board of directors considered recent closing sales and volume weighted average prices for our common stock and a number of other factors, including: the likely cost of capital from other sources, the price at which our stockholders might be willing to participate in the rights offering, our need for liquidity and capital and the desire to provide an opportunity to our stockholders to participate in the rights offering on a pro rata basis.

In conjunction with its review of these factors, our board of directors also reviewed a range of discounts to market value represented by the subscription prices in various prior rights offerings of public companies. The subscription price was established at a price of \$0.33 per full share. The subscription price is not necessarily related to our book value, net worth or any other established criteria of value and may or may not be considered the fair value of our common stock to be offered in the rights offering. We cannot assure you that the market price of our common stock will not decline during or after the rights offering. We also cannot assure you that you will be able to sell shares of our common stock purchased during the rights offering at a price equal to or greater than the subscription price. We urge you to obtain a current quote for our common stock before exercising your subscription rights.

Conditions, Withdrawal and Termination

We reserve the right to withdraw the rights offering prior to the expiration of the rights offering for any reason. We may terminate the rights offering, in whole or in part, if at any time before completion of the rights offering there is any judgment, order, decree, injunction, statute, law or regulation entered, enacted, amended or held to be applicable to the rights offering that in the sole judgment of our board of directors would or might make the rights offering or its completion, whether in whole or in part, illegal or otherwise restrict or prohibit completion of the rights offering. We may waive any of these conditions and choose to proceed with the rights offering even if one or more of these events occur. If we terminate, cancel or withdraw the rights offering, in whole or in part, we will issue a press release notifying the stockholders of such event, all affected subscription rights will expire without value, and all excess subscription payments received by the subscription agent will be returned, without interest, as soon as practicable following such termination, cancellation or withdrawal.

Cancellation Rights

Our board of directors may cancel the rights offering at any time prior to the time the rights offering expires for any reason. If we cancel the rights offering, we will issue a press release notifying stockholders of the cancellation and all subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

Subscription Agent and Information Agent

The subscription agent and the information agent for this offering is Broadridge Corporate Issuer Solutions, Inc. The address to which subscription documents, rights certificates and subscription payments should be mailed or delivered by hand delivery, first class mail or overnight courier service is:

Broadridge Corporate Issuer Solutions, Inc.

1981 Marcus Avenue

Suite 100

Lake Success, NY 11042

Attention: Subscription Department

Table of Contents

If you deliver subscription documents or rights certificates in a manner different than that described in this prospectus, then we may not honor the exercise of your subscription rights.

Fees and Expenses

We will pay all fees charged by the subscription agent. You are responsible for paying any other commissions, fees, taxes or other expenses incurred in connection with the exercise of the subscription rights.

No Fractional Shares

We will not issue fractional shares or cash in lieu of fractional shares. Fractional shares of our common stock resulting from the exercise of the basic subscription privileges and the over-subscription privileges will be eliminated by rounding down to the nearest whole share, with the total subscription payment being adjusted accordingly. Any excess subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

Medallion Guarantee May Be Required

Your signature on each rights certificate must be guaranteed by an eligible institution, such as a member firm of a registered national securities exchange or a member of the Financial Industry Regulatory Authority, Inc., or a commercial bank or trust company having an office or correspondent in the United States, subject to standards and procedures adopted by the subscription agent, unless:

your rights certificate provides that shares are to be delivered to you as record holder of those subscription rights; or

you are an eligible institution.

You can obtain a signature guarantee from a financial institution such as a commercial bank, savings and loan association, credit union or broker dealer that participates in one of the Medallion signature guarantee programs. The three Medallion signature guarantee programs are the following:

Securities Transfer Agents Medallion Program (STAMP) whose participants include more than 7,000 U.S. and Canadian financial institutions.

Stock Exchanges Medallion Program (SEMP) whose participants include the regional stock exchange member firms and clearing and trust companies.

New York Stock Exchange Medallion Signature Program (MSP) whose participants include NYSE member firms.

If a financial institution is not a member of a recognized Medallion signature guarantee program, it would not be able to provide signature guarantees. Also, if you are not a customer of a participating financial institution, it is likely the financial institution will not guarantee your signature. Therefore, the best source of a Medallion Guarantee would be a bank, savings and loan association, brokerage firm, or credit union with whom you do business. The participating financial institution will use a Medallion imprint or stamp to guarantee the signature, indicating that the financial institution is a member of a Medallion signature guarantee program and is an acceptable signature guarantor.

Notice to Nominees

If you are a broker, custodian bank or other nominee holder that holds shares of our common stock for the account of others on the record date, you should notify the beneficial owners of the shares for whom you are the nominee of the rights offering as soon as possible to learn their intentions with respect to exercising their subscription rights. You should obtain instructions from the beneficial owner, as set forth in the instructions we

Table of Contents

have provided to you for your distribution to beneficial owners. If the beneficial owner so instructs, you should complete the appropriate rights certificate and submit it to the subscription agent with the proper subscription payment. If you hold shares of our common stock for the account(s) of more than one beneficial owner, you may exercise the number of subscription rights to which all beneficial owners in the aggregate otherwise would have been entitled had they been direct holders of our common stock on the record date, *provided* that you, as a nominee record holder, make a proper showing to the subscription agent by submitting the form entitled Nominee Holder Certification, which is provided with your rights offering materials. If you did not receive this form, you should contact the subscription agent to request a copy.

Beneficial Owners

If you are a beneficial owner of shares of our common stock or will receive your subscription rights through a broker, custodian bank or other nominee, we will ask your broker, custodian bank or other nominee to notify you of the rights offering. If you wish to exercise your subscription rights, you will need to have your broker, custodian bank or other nominee act for you. If you hold certificates of our common stock directly and would prefer to have your broker, custodian bank or other nominee act for you, you should contact your nominee and request it to effect the transactions for you. To indicate your decision with respect to your subscription rights, you should complete and return to your broker, custodian bank or other nominee the form entitled Beneficial Owner Election. You should receive this form from your broker, custodian bank or other nominee with the other rights offering materials. If you wish to obtain a separate rights certificate, you should contact the nominee as soon as possible and request that a separate rights certificate be issued to you. You should contact your broker, custodian bank or other nominee if you do not receive this form, but you believe you are entitled to participate in the rights offering. We are not responsible if you do not receive the form from your broker, custodian bank or nominee or if you receive it without sufficient time to respond.

Transferability of Subscription Rights

The subscription rights granted to you are non-transferable and, therefore, you may not sell, transfer or assign your subscription rights to anyone.

Validity of Subscriptions

We will resolve all questions regarding the validity and form of the exercise of your subscription rights, including time of receipt and eligibility to participate in the rights offering. In resolving all such questions, we will review the relevant facts, consult with our legal advisors and we may request input from the relevant parties. Our determination will be final and binding. Once made, subscriptions and directions are irrevocable, even if you later learn information that you consider to be unfavorable to the exercise of your subscription rights and even if the rights offering is extended by our board of directors, and we will not accept any alternative, conditional or contingent subscriptions or directions. However, if we amend the rights offering to allow for an extension of the rights offering for a period of more than 30 days or make a fundamental change to the terms set forth in this prospectus, you may cancel your subscription and receive a refund of any money you have advanced. We reserve the absolute right to reject any subscriptions or directions not properly submitted or the acceptance of which would be unlawful. You must resolve any irregularities in connection with your subscriptions before the subscription period expires, unless waived by us in our sole discretion. Neither we nor the subscription agent shall be under any duty to notify you or your representative of defects in your subscriptions. A subscription will be considered accepted, subject to our right to withdraw or terminate the rights offering, only when a properly completed and duly executed rights certificate and any other required documents and the full subscription payment have been received by the subscription agent. Our interpretations of the terms and conditions of the rights offering will be final and binding.

Escrow Arrangements; Return of Funds

The subscription agent will hold funds received in payment for shares of our common stock in a segregated account pending completion of the rights offering. The subscription agent will hold this money in escrow until

Table of Contents

the rights offering is completed or is withdrawn and canceled. If the rights offering is canceled for any reason, all subscription payments received by the subscription agent will be returned, without interest, as soon as practicable. In addition, all subscription payments received by the subscription agent will be returned, without interest, as soon as practicable, if subscribers decide to cancel their subscription rights in the event that we extend the rights offering for a period of more than 30 days after the expiration date or if there is a fundamental change to the rights offering.

Stockholder Rights

You will have no rights as a holder of the shares of our common stock you purchase in the rights offering, if any, until certificates representing the shares of our common stock are issued to you. You will have no right to revoke your subscriptions after you deliver your completed rights certificate, the full subscription payment and any other required documents to the subscription agent.

Foreign Stockholders

We will not mail this prospectus or rights certificates to stockholders with addresses that are outside the United States or that have an army post office or foreign post office address. The subscription agent will hold these rights certificates for their account. To exercise subscription rights, our foreign stockholders must notify the subscription agent prior to 11:00 a.m., New York City time, at least three business days prior to the expiration of the rights offering and demonstrate to the satisfaction of the subscription agent that the exercise of such subscription rights does not violate the laws of the jurisdiction of such stockholder.

No Revocation or Change

Once you submit the form of rights certificate to exercise any subscription rights, you are not allowed to revoke or change the exercise or request a refund of monies paid. All exercises of subscription rights are irrevocable, even if you later learn information that you consider to be unfavorable to the exercise of your subscription rights and even if the rights offering is extended by our board of directors. However, if we amend the rights offering to allow for an extension of the rights offering for a period of more than 30 days or make a fundamental change to the terms set forth in this prospectus, you may cancel your subscription and receive a refund of any money you have advanced. You should not exercise your subscription rights unless you are certain that you wish to purchase additional shares of our common stock at the subscription price.

Regulatory Limitation

We will not be required to issue to you shares of our common stock pursuant to the rights offering if, in our opinion, you are required to obtain prior clearance or approval from any state or federal regulatory authorities to own or control such shares and if, at the time the rights offering expires, you have not obtained such clearance or approval.

U.S. Federal Income Tax Treatment of Rights Distribution

We believe that our distribution and any stockholder's receipt and exercise of these subscription rights to purchase shares of our common stock generally should not be taxable to our stockholders for the reasons described below in **Material U.S. Federal Income Tax Consequences**.

No Recommendation to Rights Holders

Our board of directors is making no recommendation regarding your exercise of the subscription rights. You are urged to make your decision based on your own assessment of our business and the rights offering. Please see **Risk Factors** for a discussion of some of the risks involved in investing in our common stock.

Table of Contents

Listing

The subscription rights will not be listed or quoted for trading on any stock exchange or market, nor on the OTCQB marketplace or the OTC Bulletin Board. The shares of our common stock issuable upon exercise of the subscription rights will be available for trading on the OTCQB marketplace under the symbol NANX.

Shares of Our Common Stock Outstanding After the Rights Offering

Assuming no options are exercised prior to the expiration of the rights offering, we expect that there will be 28,458,162 shares of our common stock outstanding immediately after completion of the rights offering.

Other Matters

We are not making the rights offering in any state or other jurisdiction in which it is unlawful to do so, nor are we distributing or accepting any offers to purchase any shares of our common stock from subscription rights holders who are residents of those states or other jurisdictions or who are otherwise prohibited by federal or state laws or regulations from accepting or exercising the subscription rights. We may delay the commencement of the rights offering in those states or other jurisdictions, or change the terms of the rights offering, in whole or in part, in order to comply with the securities laws or other legal requirements of those states or other jurisdictions. Subject to state securities laws and regulations, we also have the discretion to delay allocation and distribution of any shares you may elect to purchase by exercise of your subscription privileges in order to comply with state securities laws. We may decline to make modifications to the terms of the rights offering requested by those states or other jurisdictions, in which case, if you are a resident in those states or jurisdictions or if you are otherwise prohibited by federal or state laws or regulations from accepting or exercising the subscription rights you will not be eligible to participate in the rights offering. However, we are not currently aware of any states or jurisdictions that would preclude participation in the rights offering.

Table of Contents

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES

This section describes the material U.S. federal income tax consequences, as of the date of this prospectus, to U.S. holders (as defined below) of the receipt and exercise (or expiration) of the subscription rights acquired through the rights offering and the receipt, ownership and sale of the common shares received upon exercise of the basic subscription privilege or, if applicable, the over-subscription privilege, and constitutes the opinion of Faegre Baker Daniels LLP insofar as this section relates to U.S. federal income tax law and legal conclusions with respect thereto. In the following discussion, we and our refer to Nanophase Technologies Corporation and not Faegre Baker Daniels LLP.

This section applies to you only if you are a U.S. holder (as defined below), acquire your subscription rights in the rights offering and hold your subscription rights or common shares issued to you upon exercise of the basic subscription privilege or, if applicable, the over-subscription privilege, as capital assets within the meaning of section 1221 of the Code. This section does not apply to you if you are not a U.S. holder or if you are a member of a special class of holders subject to special rules, including, without limitation, financial institutions, regulated investment companies, real estate investment trusts, holders who are dealers in securities or foreign currency, traders in securities that elect to use a mark-to-market method of accounting for securities holdings, tax-exempt organizations, insurance companies, persons liable for alternative minimum tax, holders who hold common stock as part of a hedge, straddle, conversion, constructive sale or other integrated security transaction, holders whose functional currency is not the U.S. dollar, or holders who received our common stock on which the subscription rights are distributed in satisfaction of our indebtedness.

This section is based upon the Code, the Treasury Regulations promulgated thereunder, legislative history, judicial authority and published rulings, any of which may subsequently be changed, possibly retroactively, or interpreted differently by the IRS, so as to result in U.S. federal income tax consequences different from those discussed below. The discussion that follows neither binds nor precludes the IRS from adopting a position contrary to that expressed in this prospectus, and we cannot assure you that such a contrary position could not be asserted successfully by the IRS or adopted by a court if the position was litigated. We have not sought, and will not seek, a ruling from the IRS regarding this rights offering. This section does not address any tax consequences under foreign, state, or local tax laws.

You are a U.S. holder if you are a beneficial owner of subscription rights or common stock and you are:

An individual who is a citizen or resident of the United States, including an alien individual who is a lawful permanent resident of the United States or meets the substantial presence test under section 7701(b) of the Code,

A corporation (or entity treated as a corporation for U.S. federal income tax purposes) created or organized, or treated as created or organized, in or under the laws of the United States, any state thereof or the District of Columbia,

An estate whose income is subject to U.S. federal income tax regardless of its source, or

A trust (a) if a U.S. court can exercise primary supervision over the trust's administration and one or more U.S. persons are authorized to control all substantial decisions of the trust or (b) that has a valid election in effect under applicable Treasury Regulations to be treated as a U.S. person.

If a partnership (including any entity treated as a partnership for U.S. federal income tax purposes) receives the subscription rights or holds the common stock received upon exercise of the subscription rights, the tax treatment of a partner in such partnership generally will depend upon the status of the partner and the activities of the partnership. Such a partner or partnership is urged to consult its own tax advisor as to the U.S. federal income tax consequences of receiving and exercising the subscription rights and acquiring, holding or disposing of our common shares.

Table of Contents

EACH HOLDER OF OUR COMMON STOCK IS URGED TO CONSULT ITS OWN TAX ADVISOR REGARDING THE SPECIFIC FEDERAL, STATE, LOCAL AND FOREIGN INCOME AND OTHER TAX CONSIDERATIONS OF THE RECEIPT AND EXERCISE OF SUBSCRIPTION RIGHTS AND THE RECEIPT, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK.

Receipt, Exercise and Expiration of the Subscription Rights; Tax Basis and Holding Period of Shares Received upon Exercise of the Subscription Rights

Receipt of the Subscription Rights

You should not recognize taxable income for U.S. federal income tax purposes in connection with the receipt of subscription rights in the rights offering if the rights offering is not part of a disproportionate distribution within the meaning of section 305 of the Code. A disproportionate distribution is a distribution or a series of distributions, including deemed distributions, that has the effect of the receipt of cash or other property by some stockholders or holders of debt instruments convertible into stock and an increase in the proportionate interest of other stockholders in a company's assets or earnings and profits. During the last 36 months, our common stock has been our sole outstanding class of stock, we have not made any distributions of cash or other property on such stock, and we have not had any convertible debt outstanding. Nor do we currently intend to issue another class of stock or convertible debt or, as stated below, pay any dividends on our common stock. However, the fact that we have outstanding options and certain other equity-based awards could cause, under certain circumstances that cannot currently be predicted, the receipt of subscription rights pursuant to the rights offering to be part of a disproportionate distribution. We intend to take the position that the outstanding options and other equity-based awards do not cause the subscription rights issued pursuant to the rights offering to be part of a disproportionate distribution. For a discussion of the U.S. federal income tax consequences to you if the rights offering were to be considered part of a disproportionate distribution, see *Consequences if the Rights Offering Is Considered Part of a Disproportionate Distribution* below.

Tax Basis in the Subscription Rights

If the fair market value of the subscription rights you receive is less than 15% of the fair market value of your common stock on the date you receive your subscription rights, your subscription rights will be allocated a zero tax basis for U.S. federal income tax purposes, unless you elect to allocate tax basis between your existing common stock and your subscription rights in proportion to the relative fair market values of the existing common stock and your subscription rights determined on the date of receipt of your subscription rights. If you choose to allocate tax basis between your existing common stock and your subscription rights, you must make this election on a statement included with your tax return for the taxable year in which you receive your subscription rights. Such an election is irrevocable.

If the fair market value of your subscription rights is 15% or more of the fair market value of your existing common stock on the date you receive your subscription rights, then you must allocate your tax basis in your existing common stock between your existing common stock and your subscription rights in proportion to the relative fair market values determined on the date you receive your subscription rights. The fair market value of the subscription rights on the date the subscription rights will be distributed is uncertain, and we have not obtained, and do not intend to obtain, an appraisal of the fair market value of the subscription rights on that date. In determining the fair market value of the subscription rights, you should consider all relevant facts and circumstances, including any difference between the subscription price of the subscription rights and the trading price of our common stock on the date that the subscription rights are distributed, the length of the period during which the subscription rights may be exercised and the fact that the subscription rights are non-transferable.

Exercise and Expiration of the Subscription Rights

You will not recognize any gain or loss upon the exercise of subscription rights received in the rights offering, and the tax basis of the shares of our common stock acquired through exercise of the subscription rights

Table of Contents

will equal the sum of the subscription price for the shares and your tax basis, if any, in the subscription rights. The holding period for the shares of our common stock acquired through exercise of the subscription rights will begin on the date the subscription rights are exercised.

If you allow subscription rights received in the rights offering to expire, you generally will not recognize any gain or loss upon the expiration of the subscription rights. If you have tax basis in the subscription rights and you allow the subscription rights to expire, the tax basis of our common stock owned by you with respect to which such subscription rights were distributed will be restored to the tax basis of such common stock immediately before the receipt of the subscription rights in the rights offering.

Consequences if the Rights Offering Is Considered Part of a Disproportionate Distribution

If the rights offering is part of a disproportionate distribution, the distribution of subscription rights would be taxable to you as a dividend to the extent that the fair market value of the subscription rights you receive is allocable to our current and accumulated earnings and profits for the taxable year in which the subscription rights are distributed. We cannot determine prior to the consummation of the rights offering the extent to which we will have sufficient current and accumulated earnings and profits to cause any distribution to be treated as a dividend. Dividends received by corporate holders of our common stock are taxable at ordinary corporate tax rates subject to any applicable dividends-received deduction. Dividends received by noncorporate holders of our common stock in taxable years beginning before January 1, 2013 are taxed under current law at the holder's capital gain tax rate (a maximum rate of 15%), provided that the holder meets applicable holding period and other requirements. Any distributions in excess of our current and accumulated earnings and profits will be treated as a tax-free return of basis, and any further distributions in excess of your tax basis in our common stock will be treated as gain from the sale or exchange of our common stock. Regardless of whether the distribution of subscription rights is treated as a dividend, as a tax-free return of basis or as gain from the sale or exchange of our common stock, your tax basis in the subscription rights you receive will be their fair market value.

If the receipt of subscription rights is taxable to you as described in the previous paragraph and you allow subscription rights received in the rights offering to expire, you should recognize a short-term capital loss equal to your tax basis in the expired subscription rights. Your ability to use any capital loss is subject to certain limitations. You will not recognize any gain or loss upon the exercise of the subscription rights, and the tax basis of the shares of our common stock acquired through exercise of the subscription rights will equal the sum of the subscription price for the shares and your tax basis in the subscription rights. The holding period for the shares of our common stock acquired through the exercise of the subscription rights will begin on the date the subscription rights are exercised.

Sale of Shares of Our Common Stock and Receipt of Distributions on Shares of Our Common Stock

You will recognize capital gain or loss upon the sale of our common stock acquired through the exercise of subscription rights in an amount equal to the difference between the amount realized and your tax basis in our common stock. The capital gain or loss will be long-term if your holding period in the shares is more than one year. Long-term capital gains recognized by individuals are taxable under current law at a maximum rate of 15%. Under current law, long-term capital gains recognized by individuals will be taxable at a maximum rate of 20% for taxable years beginning after December 31, 2012. Long-term capital gains recognized by corporations are taxable at ordinary corporate tax rates. If you have held your shares of our common stock for one year or less, your capital gain or loss will be short-term. Short-term capital gains are taxed at a maximum rate equal to the maximum rate applicable to ordinary income. Your ability to use any capital loss is subject to certain limitations.

Distributions, if any, on shares of our common stock acquired through the exercise of subscription rights will be taxable to you as a dividend to the extent that the cash and fair market value of property is allocable to our current and accumulated earnings and profits for the taxable year in which the distribution is made. Dividends received by corporate holders of our common stock are taxable at ordinary corporate tax rates subject

Table of Contents

to any applicable dividends-received deduction. Dividends received by noncorporate holders of our common stock in taxable years beginning before January 1, 2013 are taxed under current law at the holder's capital gain tax rate (a maximum rate of 15%), provided that the holder meets applicable holding period and other requirements. Under current law, dividends received by noncorporate holders of our common stock in taxable years beginning after December 31, 2012 will be taxed as ordinary income. Any distributions in excess of our current and accumulated earnings and profits will be treated as a tax-free return of basis, and any further distributions in excess of your tax basis in our common stock will be treated as gain from the sale or exchange of such common stock. Your tax basis in any property you receive as a distribution on shares of our common stock will be the property's fair market value (regardless of whether the distribution is treated as a dividend, as a tax-free return of basis or as gain from the sale or exchange of our common stock).

Information Reporting and Backup Withholding

You may be subject to information reporting and/or backup withholding with respect to dividend payments on or the gross proceeds from the disposition of our common stock acquired through the exercise of subscription rights. Backup withholding may apply under certain circumstances if you (1) fail to furnish your social security or other taxpayer identification number ("TIN"), (2) furnish an incorrect TIN, (3) fail to report interest or dividends properly, or (4) fail to provide a certified statement, signed under penalty of perjury, that the TIN provided is correct, that you are not subject to backup withholding and that you are a U.S. person. Any amount withheld from a payment under the backup withholding rules is allowable as a credit against (and may entitle you to a refund with respect to) your U.S. federal income tax liability, provided that the required information is furnished to the IRS. Certain persons are exempt from backup withholding, including corporations and financial institutions. You are urged to consult your own tax advisor as to your qualification for exemption from backup withholding and the procedure for obtaining such exemption.

Tax Consequences to the Company

As of March 31, 2012, we had NOL carryforwards of approximately \$79 million for U.S. federal income tax purposes. An ownership change generally would produce an annual limitation on the utilization of our pre-ownership change NOLs and certain other tax assets if the aggregate stock ownership of holders of at least 5% of our stock increases by more than 50 percentage points over the preceding three-year period. The amount of annual limitation generally is equal to the value of our stock immediately prior to the ownership change multiplied by the adjusted federal long-term tax-exempt rate. The purchase of shares of our common stock pursuant to the rights offering may trigger an ownership change with respect to our stock.

MARKET INFORMATION

Our common stock trades on the OTCQB marketplace under the trading symbol NANX. On June 12, 2012, there were 120 record holders of our common stock. This number does not include the number of persons or entities that hold stock in nominee or street name through various brokerage firms, banks and other nominees. On June 12, 2012, the last closing sales price reported on the OTCQB marketplace for our common stock was \$0.35 per share.

Table of Contents

The following table sets forth the high and low sale prices of our common stock on Nasdaq (through March 20, 2012) and the OTCQB marketplace since that date:

	Price Range	
	High	Low
Fiscal 2010		
First Quarter	\$ 2.16	\$ 0.75
Second Quarter	\$ 2.18	\$ 1.03
Third Quarter	\$ 1.60	\$ 0.97
Fourth Quarter	\$ 1.73	\$ 0.98
Fiscal 2011		
First Quarter	\$ 1.76	\$ 1.16
Second Quarter	\$ 1.45	\$ 1.16
Third Quarter	\$ 1.24	\$ 0.60
Fourth Quarter	\$ 0.80	\$ 0.38
Fiscal 2012		
First Quarter	\$ 0.77	\$ 0.15
Second Quarter (through June 12, 2012)	\$ 0.60	\$ 0.26

DIVIDEND HISTORY

We have never declared or paid any cash dividends on our common stock and do not currently anticipate paying any cash dividends or other distributions on our common stock in the foreseeable future. We intend instead to retain any future earnings for reinvestment in our business. Any future determination to pay cash dividends will be at the discretion of our Board of Directors and will be dependent upon our financial condition, results of operations, capital requirements and such other factors deemed relevant by the Board of Directors.

DESCRIPTION OF CAPITAL STOCK

The following is a summary of the material terms of our capital stock. This summary does not purport to be exhaustive and is qualified in its entirety by reference to our certificate of incorporation, as amended, and by-laws and to the applicable provisions of the DGCL. Copies of our certificate of incorporation, as amended, and by-laws have been filed with the SEC.

General

Our authorized capital stock consists of 35,024,088 shares. The authorized capital stock is divided into 24,088 shares of preferred stock, par value \$.01 per share, and 35,000,000 shares of common stock, par value \$.01 per share. As of June 12, 2012, we had issued and outstanding 21,208,162 shares of common stock, held by approximately 120 stockholders of record. As of June 12, 2012, 1,466,200 common shares were reserved for issuance upon the exercise of outstanding stock options. Each common share has the same relative rights as, and is identical in all respects with, each other common share. As of June 12, 2012, no shares of preferred stock were issued or outstanding.

Common Stock

Holders of common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. Thus, holders of a majority of the shares of common stock entitled to vote in any election of directors may elect all of the directors standing for election. Holders of common stock are entitled to receive ratably any dividends that may be declared by our board of directors out of funds legally available for dividends, subject to any preferential dividend rights of outstanding preferred stock. If we liquidate, dissolve or wind up, the holders of common stock are entitled to receive ratably all of our assets available after payment of all debts and other liabilities, subject to the prior rights of any outstanding preferred

Table of Contents

stock. Holders of common stock have no preemptive, subscription, redemption or conversion rights or any rights to share in any sinking fund. The rights, preferences and privileges of the holders of 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 certificate of incorporation authorizes the issuance of preferred stock from time to time in one or more series with rights and privileges that might be senior to our common stock, without the consent of holders of the common stock. Our certificate also authorizes the board of directors to fix the powers, rights, designations, preferences, qualifications, limitations and restrictions, and dividend, voting and conversion rights pertaining to each series of preferred stock that we issue. The issuance of preferred stock with voting and other rights may adversely affect the voting power of the holders of our common stock and could have the effect of delaying, deferring or preventing a change in control. We have no present plans to issue any shares of preferred stock.

Antitakeover Provisions

Section 203 of the DGCL provides that, subject to certain exceptions specified therein, an interested stockholder of a Delaware corporation may not engage in any business combination with the corporation for a three-year period following the time that such stockholder becomes an interested stockholder unless (1) prior to such time, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder, (2) upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced (excluding certain shares), or (3) at or subsequent to such time, the business combination is approved by the board of directors of the corporation and authorized at an annual or special meeting of stockholders. Under certain circumstances, Section 203 makes it more difficult for a person who would be an interested stockholder to effect various business combinations with a corporation for a three-year period, although the stockholders may elect to exclude a corporation from the restrictions imposed thereunder. Our certificate of incorporation does not exclude us from the restrictions imposed under Section 203. The provisions of Section 203 may encourage companies interested in acquiring us to negotiate in advance with our board, since the stockholder approval requirement would be avoided if a majority of the directors then in office approve either the business combination or the transaction which results in the stockholder becoming an interested stockholder. These provisions also may have the effect of preventing changes in our management. It is possible that such provisions could make it more difficult to accomplish transactions which stockholders may otherwise deem to be in their best interests.

Anti-Takeover Provisions of Our Certificate of Incorporation or By-laws

General

The provisions of our certificate of incorporation, by-laws, and Delaware statutory law described in this section may delay or make it more difficult for someone to acquire us without the approval of our board. These provisions could have the effect of discouraging third parties from making acquisition proposals although such proposals, if made, might be considered desirable by a majority of our stockholders. These provisions may also have the effect of making it more difficult for third parties to cause the replacement of our current management without the concurrence of our board.

Classified Board of Directors

The certificate of incorporation provides for our board (other than those directors elected solely by any series of preferred stock created by resolution of our board) to be divided into three classes of directors serving staggered three year terms. As a result, approximately one-third of our board will be elected each year.

Table of Contents

We believe a classified board will help to assure the continuity and stability of our board, and our business strategies and policies as determined by our board, because a majority of the directors at any given time will have prior experience as our directors. This provision should also help to ensure that our board, if confronted with an unsolicited proposal from a third party that has acquired a block of our voting stock, will have sufficient time to review the proposal and appropriate alternatives and to seek the best available result for all stockholders.

This provision could prevent a party who acquires control of a majority of the outstanding voting stock from obtaining control of our board until the second annual stockholders' meeting following the date the acquiror obtains the controlling stock interest, could have the effect of discouraging a potential acquiror from making a tender offer or otherwise attempting to obtain control of us and could thus increase the likelihood that incumbent directors will retain their positions.

Number of Directors; Removal; Vacancies

Our certificate of incorporation and by-laws provide that the number of directors shall not be less than five nor more than nine and, except as may be provided in the terms of any series of preferred stock created by resolution of our board, shall be determined from time to time exclusively by resolution adopted by affirmative vote of a majority of our directors then in office. The board of directors currently consists of eight directors. The certificate of incorporation also provides that our board shall have the exclusive right, except as may be required by law or provided in the terms of any series of preferred stock created by resolution of our board, to fill vacancies, including vacancies created by expansion of our board. Furthermore, except as may be required by law or provided in the terms of any preferred stock created by resolution of our board with respect to the election of directors by the holders of such series, directors may be removed by stockholders only for cause and only by the affirmative vote of at least $66\frac{2}{3}\%$ of the voting power of all of the shares of our capital stock then entitled to vote generally in the election of directors, voting together as a single class. This provision, in conjunction with the provision of the certificate of incorporation authorizing our board to fill vacant directorships, could prevent stockholders from removing incumbent directors without cause and filling the resulting vacancies with their own nominees.

No Stockholder Action by Written Consent; Special Meetings

Our certificate of incorporation provides that stockholder action can be taken only at an annual or special meeting of stockholders and cannot be taken by written consent in lieu of a meeting. Our certificate of incorporation also provides that special meetings of stockholders can only be called by our board pursuant to a resolution approved by a majority of the board. Stockholders are not permitted to call a special meeting of stockholders or to require that the board call a special meeting.

Advance Notice for Raising Business or Making Nominations at Meetings

Our by-laws establish an advance notice procedure with regard to stockholder proposals and nominations of individuals for election to the board of directors. In general, notice of a director nomination for a meeting must be delivered to us at our executive offices not less than 60 days nor more than 90 days before the date of the annual stockholders' meeting (unless we have not publicly disclosed the date of the meeting at least 70 days prior to the meeting date, in which event the stockholder proposal or director nomination shall be delivered to us no later than the close of business on the 10th day following the day on which the date of the meeting was publicly disclosed) and must contain specified information and conform to certain requirements, as set forth in our by-laws. Notice of a stockholder proposal for an annual meeting must be delivered to us at our executive offices not less than 120 days prior to the first anniversary of the date that our proxy statement in connection with the prior year's annual meeting was mailed (except that, if no annual meeting was held in the prior year or if the date of the annual meeting has been changed by more than 30 days from the prior year's meeting, a proposal must be received by us within 10 days after we publicly disclose the date of the meeting) and must contain specified information and conform to certain requirements, as set forth in our by-laws. If the presiding officer at any

Table of Contents

stockholders' meeting determines that a stockholder proposal or director nomination was not made in accordance with the by-laws, we may disregard such proposal or nomination.

The notice of any nomination for election as a director must set forth the name, age, business and residence address of the person or persons to be nominated; the business experience during the past five years of such person or persons, including the person's principal occupation or employment during such period, the name and principal business of any corporation or other organization in which such occupation or employment was carried on, and such other information as to the nature of the person's responsibilities and level of professional competence as may be sufficient to permit assessment of the person's prior business experience; the class or series and number of shares of our capital stock beneficially owned by the person and any other information relating to the person that would be required to be disclosed in a proxy statement or other filing required to be made in connection with solicitations of proxies for election of directors pursuant to Section 14 of the Exchange Act and the rules and regulations promulgated thereunder.

Amendments to By-Laws

Our certificate of incorporation provides that our board or the holders of at least 66 $\frac{2}{3}$ % of the voting power of all shares of our capital stock then entitled to vote generally in the election of directors, voting together as a single class, have the power to adopt, alter, amend or repeal our by-laws.

Preferred Stock and Additional Common Stock

Under the certificate of incorporation, our board will have the authority to provide by resolution for the issuance of shares of one or more series of preferred stock. Our board is authorized to fix by resolution the terms and conditions of each such other series.

We believe that the availability of our preferred stock, in each case issuable in series, and additional shares of common stock could facilitate certain financings and acquisitions and provide a means for meeting other corporate needs which might arise. The authorized shares of our preferred stock, as well as authorized but unissued shares of common stock will be available for issuance without further action by our stockholders, unless stockholder action is required by applicable law or the rules of any stock exchange on which any series of our stock may then be listed, or except as may be provided in the terms of any preferred stock created by resolution of our board.

These provisions give our board the power to approve the issuance of a series of preferred stock, or additional shares of common stock, that could, depending on its terms, either impede or facilitate the completion of a merger, tender offer or other takeover attempt. For example, the issuance of new shares of preferred stock might impede a business combination if the terms of those shares include voting rights which would enable a holder to block business combinations or, alternatively, might facilitate a business combination if those shares have general voting rights sufficient to cause an applicable percentage vote requirement to be satisfied.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Broadridge Corporate Issuer Solutions, Inc. and its telephone number is (800) 733-1121.

OTCQB Marketplace

Our common stock is traded on the OTCQB marketplace under the symbol NANX.

Table of Contents

DESCRIPTION OF SUBSCRIPTION RIGHTS

The Subscription Rights

We are distributing to the record holders of our common stock as of the record date non-transferable subscription rights to purchase shares of our common stock. The subscription price of \$0.33 per full share was determined by our board of directors after a review of recent closing sales and volume weighted average prices of our common stock and a number of other factors. The subscription rights will entitle the holders of our common stock to purchase up to 7,250,000 shares of our common stock for an aggregate purchase price of approximately \$2.4 million.

Each holder of record of our common stock will receive one subscription right for each share of our common stock owned by such holder as of 5:00 p.m., New York City time, on the record date. Each subscription right will entitle the holder to a basic subscription privilege and an over-subscription privilege.

Basic Subscription Privilege

With your basic subscription privilege, you may purchase 0.342 shares of our common stock per subscription right, upon delivery of the required documents and payment of the subscription price of \$0.33 per full share, prior to the expiration of the rights offering. You may exercise all or a portion of your basic subscription privilege. However, if you exercise less than your full basic subscription privilege you will not be entitled to purchase shares pursuant to your over-subscription privilege.

Fractional shares of our common stock resulting from the exercise of the basic subscription privilege will be eliminated by rounding down to the nearest whole share, with the total subscription payment being adjusted accordingly. Any excess subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

We will deliver certificates representing shares of our common stock purchased with the basic subscription privilege as soon as practicable after the rights offering has expired.

Over-Subscription Privilege

If you fully exercise your basic subscription privilege and other stockholders do not fully exercise their basic subscription privileges, you may also exercise an over-subscription right to purchase additional shares of common stock that remain unsubscribed at the expiration of the rights offering, subject to the availability and pro rata allocation of shares among persons exercising this over-subscription right. To the extent the number of the unsubscribed shares is not sufficient to satisfy all of the properly exercised over-subscription rights requests, then the available shares will be prorated among those who properly exercised over-subscription rights based on the number of shares each rights holder subscribed for under the basic subscription privilege. If this pro rata allocation results in any stockholder receiving a greater number of common shares than the stockholder subscribed for pursuant to the exercise of the over-subscription privilege, then such stockholder will be allocated only that number of shares for which the stockholder oversubscribed, and the remaining common shares will be allocated among all other stockholders exercising the over-subscription privilege on the same pro rata basis described above. The proration process will be repeated until all shares have been allocated or all over-subscription exercises have been fulfilled, whichever occurs earlier.

In order to properly exercise your over-subscription privilege, you must deliver the subscription payment related to your over-subscription privilege prior to the expiration of the rights offering. Because we will not know the total number of unsubscribed shares prior to the expiration of the rights offering, if you wish to maximize the number of shares you purchase pursuant to your over-subscription privilege, you will need to deliver payment in an amount equal to the aggregate subscription price for the maximum number of shares of our common stock

Table of Contents

available to you, assuming that no stockholder other than you has purchased any shares of our common stock pursuant to their basic subscription privilege and over-subscription privilege.

We can provide no assurances that you will actually be entitled to purchase the number of shares issuable upon the exercise of your over-subscription privilege in full at the expiration of the rights offering. We will not be able to satisfy your exercise of the over-subscription privilege if all of our stockholders exercise their basic subscription privileges in full, and we will only honor an over-subscription privilege to the extent sufficient shares of our common stock are available following the exercise of subscription rights under the basic subscription privileges. In no case shall shares purchased under the over-subscription privilege exceed four times the number of shares that a stockholder purchased under the basic subscription privilege.

If the amount you pay in connection with the exercise of your over-subscription privilege exceeds the subscription price of the number of shares allocated to you, you will be allocated only the number of unsubscribed shares available to you, and any excess subscription payment will be returned to you, without interest, as soon as practicable. If the amount you pay in connection with the exercise of your over-subscription privilege is less than the subscription price of the maximum number of unsubscribed shares available for purchase under your over-subscription privilege, you will be allocated only the number of shares for which you actually paid the subscription price.

Fractional shares of our common stock resulting from the exercise of the over-subscription privilege will be eliminated by rounding down to the nearest whole share, with the total subscription payment being adjusted accordingly. Any excess subscription payments received by the subscription agent will be returned, without interest, as soon as practicable.

We will deliver certificates representing shares of our common stock purchased with the over-subscription privilege as soon as practicable after the expiration of the rights offering.

Limitation on the Purchase of Shares

In no event may a stockholder exercise over-subscription privileges to the extent that any such exercise would result in the stockholder purchasing more than four times the number of shares purchased under the basic subscription privilege.

Table of Contents

PLAN OF DISTRIBUTION

As soon as practicable after the record date for the rights offering, we will distribute the subscription rights and rights certificates to individuals who owned shares of our common stock at 5:00 p.m., New York City time, on June 13, 2012. If you wish to exercise your subscription rights and purchase shares of our common stock, you should complete the rights certificate and return it with payment for the shares by hand delivery, first class mail or overnight courier service to the subscription agent, Broadridge Corporate Issuer Solutions, Inc., at the following address:

Broadridge Corporate Issuer Solutions, Inc.

1981 Marcus Avenue

Suite 100

Lake Success, NY 11042

Attention: Subscription Department

See The Rights Offering Method of Exercising Subscription Rights. If you have any questions, you should contact Broadridge Corporate Issuer Solutions, Inc. at (800) 733-1121.

We have agreed to pay the subscription agent and the information agent customary fees plus certain expenses in connection with the rights offering. We have not employed any brokers, dealers or underwriters in connection with the solicitation or exercise of rights in the rights offering and, except as described herein, no commissions, fees or discounts will be paid in connection with the rights offering. Some of our employees may solicit responses from you as a holder of subscription rights, but we will not pay our employees any commissions or compensation for these services other than their normal employment compensation. We estimate that our total expenses in connection with the rights offering will be approximately \$180,000.

Other than as described herein, we do not know of any existing agreements between or among any stockholder, broker, dealer, underwriter or agent relating to the sale or distribution of the underlying common stock.

LEGAL MATTERS

The validity of the rights and the shares of common stock offered by this prospectus have been passed upon for us by Faegre Baker Daniels LLP, Indianapolis, Indiana.

EXPERTS

The financial statements as of December 31, 2011 and December 31, 2010 and for each of the two years in the period ended December 31, 2011, incorporated by reference in this prospectus have been so incorporated in reliance on the report of McGladrey LLP (formerly McGladrey & Pullen, LLP), an independent registered public accounting firm, incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting.

INCORPORATION BY REFERENCE

The SEC allows us to incorporate by reference information contained in documents we file with it, which means that we can disclose important information to you by referring you to those documents already on file with the SEC that contain that information. The information incorporated by reference is considered to be part of this prospectus. The following documents, which have been filed with the SEC pursuant to the Exchange Act, are incorporated by reference:

our Proxy Statement on Schedule 14A filed with the SEC on June 21, 2011;

our Annual Report on Form 10-K for the fiscal year ended December 31, 2011;

Table of Contents

our Quarterly Report on Form 10-Q for the three months ended March 31, 2012;

our Current Reports on Form 8-K, filed with the SEC on January 20, 2012, March 7, 2012 (solely with respect to information filed pursuant to Item 3.01), April 4, 2012 and June 6, 2012; and

the description of our common stock, which is registered under Section 12 of the Exchange Act, contained in our Registration Statement on Form 8-A (File No. 000-22333) filed with the SEC on October 14, 1997, including any subsequently filed amendments and reports updating such description.

You may request copies of the documents incorporated by reference in this prospectus, at no cost, by writing or telephoning us at:

Nanophase Technologies Corporation

1319 Marquette Drive

Romeoville, Illinois 60446

(630) 771-6708

Attention: Frank Cesario

AVAILABLE INFORMATION

We file periodic reports, proxy statements and other information with the SEC. Our 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 with the SEC at the SEC's Public Reference Room, located at 100 F Street, N.E., Washington, D.C. 20549. You can also obtain copies of the documents at prescribed rates by writing to the Public Reference Section of the SEC at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of its Public Reference Room. Additionally, we make these filings available, free of charge, on our website at www.nanophase.com as soon as reasonably practicable after we electronically file such materials with, or furnish them to, the SEC. Except for those SEC filings incorporated by reference in this prospectus, none of the information contained on, or that may be accessed through, our website is a prospectus or constitutes part of, or is otherwise incorporated into, this prospectus, and should not be relied upon in connection with making any investment decision with respect to our common stock. We will also provide you with a copy of any or all of the reports or documents that have been incorporated by reference into this prospectus or the registration statement of which it is a part upon written or oral request, and at no cost to you. If you would like to request any reports or documents from the Company, please contact Frank Cesario at Nanophase Technologies Corporation, 1319 Marquette Drive, Romeoville, Illinois 60446, (630) 771-6708.

DISCLOSURE OF COMMISSION POSITION ON INDEMNIFICATION

FOR SECURITIES ACT LIABILITIES

Insofar as indemnification for liabilities arising under the Securities Act of 1933, as amended (the "Securities Act") may be permitted to our directors, officers or persons controlling us, we have been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable. In addition, indemnification may be limited by state securities laws.

Table of Contents

**Subscription Rights to Purchase up to 7,250,000 Shares
of Common Stock of Nanophase Technologies Corporation at \$0.33 per Full Share**

PROSPECTUS

June 13, 2012