

AMTECH SYSTEMS INC
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Prospectus

AMTECH SYSTEMS, INC.

700,000 SHARES OF COMMON STOCK

The stockholders of Amtech Systems, Inc., Inc. listed in this prospectus are offering for sale up to 700,000 shares of common stock that may be issued and sold upon: (i) the conversion of up to 540,000 shares of preferred stock; (ii) the exercise of a warrant for 60,000 shares of common stock; and (iii) 100,000 shares of common stock reserved for issuance upon the Company's election to pay preferred stock dividends in common stock, in lieu of cash.

We expect that sales made pursuant to this prospectus will be made:

in broker's transactions;

in block trades on the NASDAQ National Stock Market;

in transactions directly with market makers; or

in privately negotiated sales or otherwise.

Except for proceeds of up to \$280,200 we may receive in connection with the exercise of the warrant, we will not receive any of the proceeds of sales by the selling stockholders. We will pay the expenses incurred to register the shares for resale, but the selling stockholders will pay any underwriting discounts, concessions, or brokerage commissions associated with the sale of their shares of common stock.

The selling stockholders will determine when they will sell their shares, and in all cases they will sell their shares at the current market price or at negotiated prices at the time of the sale. Securities laws and SEC regulations may require the selling stockholders to deliver this prospectus to purchasers when they resell their shares of common stock.

Our common stock is traded on the NASDAQ National Stock Market under the symbol ASYS. On January 11, 2006, the last sale price of our common stock as reported on the NASDAQ National Stock Market was \$ 7.5027 per share.

Consider carefully the risk factors beginning on page 3 of this prospectus before investing.

This investment involves a high degree of risk. You should purchase shares only if you can afford a complete loss.

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 February 3, 2006.

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WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly, current and special reports, proxy statements and other information with the Securities and Exchange Commission (the SEC) under the Securities Exchange Act of 1934, as amended. You may read and copy this information at the following location of the SEC:

Public Reference Room
450 Fifth Street, N.W.
Washington, D.C. 20549

You may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330.

The SEC also maintains an Internet web site that contains reports, proxy and information statements, and other information about issuers that file electronically with the SEC. The address of that site is *www.sec.gov*.

We have filed a registration statement on Form S-3 with the SEC that covers the resale of the common stock offered by this prospectus. This prospectus is a part of the registration statement, but the prospectus does not include all of the information included in the registration statement. You should refer to the registration statement for additional information about us and the common stock being offered in this prospectus. Statements that we make in this prospectus relating to any documents filed as an exhibit to the registration statement or any document incorporated by reference into the registration statement may not be complete and you should review the referenced document itself for a complete understanding of its terms.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

We are incorporating by reference into this prospectus certain information we file with the SEC, which means that we are disclosing important information to you by referring you to those documents. The information incorporated by reference is deemed to be part of this prospectus, except for any information superseded by information contained directly in this prospectus. This prospectus incorporates by reference our:

Annual Report on Form 10-K for the fiscal year ended September 30, 2005; and

Current Report on Form 8-K filed with the SEC on November 2, 2005.

All documents we file with the SEC pursuant to Section 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934 from the date of this prospectus to the end of the offering of the common stock under this prospectus shall also be deemed to be incorporated herein by reference and will automatically update information in this prospectus.

You may request a copy of these filings, at no cost, by writing or calling us at the following address or telephone number:

Corporate Secretary
Amtech Systems, Inc.
131 South Clark Drive
Tempe, Arizona 85281
(480) 967-5146

Exhibits to the filings will not be sent, however, unless those exhibits have specifically been incorporated by reference in this document.

Any statements contained in a document incorporated by reference in this prospectus shall be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus (or in any other subsequently filed document which also is incorporated by reference in this prospectus) modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed to constitute a part of this prospectus except as so modified or superseded.

Important Notice About the Information Presented In This Prospectus

You should rely only on the information provided in this prospectus and the information incorporated by reference. We have not authorized anyone to provide you with different information. The selling stockholders are not offering to sell, or seeking offers to buy, the shares in any state where offers or sales are not permitted. We do not claim the accuracy of the information in this prospectus as of any date other than the date stated on the cover.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents we incorporate by reference contain certain forward-looking statements that involve a number of risks and uncertainties.

Certain information contained or incorporated by reference in this prospectus and the documents we incorporate by reference contain statements that are forward-looking in nature. All statements included or incorporated by reference in this Report, or made by the management of Amtech Systems, Inc. and its subsidiaries (Amtech), other than statements of historical fact, are hereby identified as forward-looking statements (as such term is defined in Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended). Examples of forward-looking statements include statements regarding our future financial results, operating results, business strategies, projected costs, products under development, competitive positions and plans and objectives of Amtech and our management for future operations. In some cases, forward-looking statements can be identified by terminology such as may, will, should, would, expects, plans, anticipates, believes, estimates, predicts, potential, continue, or the negative of these terms or other comparable terminology. All expectations based on these forward-looking statements are subject to risks and uncertainties and other important factors, including the Risk Factors discussed herein and those discussed in the section entitled Item 1A: Risk Factors in our Annual Report on Form 10-K for the fiscal year ended September 30, 2005. These and many other factors could affect our future operating results and financial condition, and could cause actual results to differ materially from expectations based on forward-looking statements made in this document or elsewhere by us or on our behalf. Unless noted otherwise, all references to a year apply to our fiscal year, which ends on September 30th. All references to we, our, us, or Amtech refer to Amtech Systems, Inc. and its subsidiaries.

We undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, after the date of this prospectus to conform them to actual results. We do not, nor does any other person, assume responsibility for the accuracy and completeness of those statements. All of the forward-looking statements are qualified in their entirety by reference to the factors discussed under the caption Risk Factors.

We caution the reader that these risk factors may not be exhaustive. We operate in a continually changing business environment, and new risk factors emerge from time to time. Management cannot predict such new risk factors, nor can it assess the impact, if any, of such new risk factors on our businesses or the extent to which any factor or combination of factors may cause actual results to differ materially from those projected in any forward-looking statements. In light of these risks, uncertainties and assumptions, the forward-looking events discussed in this prospectus and the documents we incorporate by reference might not occur.

For these statements, we claim the protection of the safe harbor for forward-looking statements contained in Section 21E of the Securities Act.

You should carefully read this prospectus and the documents incorporated by reference in their entirety. They contain information that you should consider when making your investment decision.

PROSPECTUS SUMMARY

This summary highlights selected information from this prospectus and does not contain all of the information that you need to consider in making your investment decision. You should read the entire prospectus, including the risks of investing discussed under Risk Factors beginning on page 3 and the following summary together with the more detailed information regarding our company, the shares, our financial statements and the notes to those statements and the other documents incorporated by reference to this prospectus, and the exhibits to the registration statement of which this prospectus is a part.

References in this prospectus to Amtech, the Company, we, us, and our, refer to Amtech Systems, Inc. and its subsidiaries, unless otherwise specified.

Amtech Systems, Inc.

Overview

Amtech Systems, Inc., an Arizona corporation (Amtech), and its wholly-owned subsidiaries, P. R. Hoffman Machine Products, Inc. (P. R. Hoffman), based in the United States, and Bruce Technologies, Inc. based in the United States and Bruce Technologies Europe GmbH based in the Federal Republic of Germany (together referred to as Bruce Technologies) and Tempress Systems, Inc., Tempress Holdings B.V., Tempress Systems B.V., Tempress Manufacturing B.V. and Tempress Engineering B.V. (together referred to as Tempress), based in the Netherlands, comprise the Company. We design, assemble, sell and install capital equipment and related consumables used in certain semiconductor fabrication processes and in the manufacture of wafers of various materials, primarily silicon wafers for the semiconductor industry. These products are sold to semiconductor fabricators and manufacturers of silicon wafers, solar cells and MEMS (microelectromechanical system), particularly in the United States, Asia and Western Europe. In addition, we provide semiconductor manufacturing support services.

April 2005 Private Offering

In April of 2005, we completed a private offering of 540,000 shares of our preferred stock and a warrant to purchase 60,000 shares of our common stock. We received gross proceeds of \$2.16 million from the offering and are using the net proceeds of the private offering as working capital to support our growth plan. We issued shares of our preferred stock at a purchase price of \$4.00 per share in the private offering to the selling stockholders described on pages 10-11 of this prospectus, all of whom were accredited investors. The preferred shares are convertible into common stock and will receive dividends payable, at our option, in cash or common shares. We are registering for resale 540,000 shares of our common stock, which may be issued upon the conversion of 540,000 shares of preferred stock, which were issued in the private offering to the selling stockholders. We are also registering for resale pursuant to this prospectus, 60,000 shares of common stock underlying a warrant to purchase 60,000 shares that we issued to Catalyst Financial, LLC, who served as the exclusive placement agent in the private offering. The warrant issued in the private offering had an exercise price of \$4.67 per share and had a maximum term of five (5) years from the date of issuance. Additionally, we are registering 100,000 shares of common stock that may be issued and paid as dividends on the preferred shares, at the option of the Company, in lieu of cash dividends.

Principal Executive Offices

We are an Arizona corporation with our principal executive offices located at 131 South Clark Drive, Tempe, AZ 85281. Our telephone number is (480) 967-5146. Our website address is www.amtechsystems.com. Information on our website does not constitute part of this prospectus.

The Offering

Common Stock Offered by the selling stockholders

700,000 shares⁽¹⁾

Common Stock currently outstanding

2,715,121 shares ⁽²⁾

Use of Proceeds

We will not receive any of the proceeds of sales of common stock by the selling stockholders. See Use of Proceeds.

Risk Factors

You should carefully consider all of the information contained in, and incorporated by reference into, this prospectus, and in particular, you should evaluate the specific risks set forth under Risk Factors, beginning on page 3.

Nasdaq National Stock Market Symbol

ASYS

⁽¹⁾ 540,000 shares will be issued upon conversion of Series A Convertible Preferred Stock, which is convertible at any time by its holders into common stock at a one to one conversion rate (subject to certain adjustments), 60,000 shares will be issued upon the exercise of a warrant to purchase common shares and 100,000 shares of common stock may be issued and paid as dividends on the preferred shares at the option of the Company in lieu of cash dividends.

⁽²⁾ The number of shares outstanding does not include, as of December 31, 2005, 464,206 shares of common stock reserved for issuance upon exercise of options outstanding under our stock options plans.

RISK FACTORS

Before you invest in the securities offered pursuant to this prospectus, you should be aware that there are various related investment risks, including those described below. You should consider carefully these risk factors together with all of the other information included in this prospectus, and the exhibits to this prospectus.

If any of the following risks actually occur, our business, financial condition, results of operations or prospects could be materially adversely affected. In such case, the trading price of our common stock could decline, and you could lose part or all of your investment.

Risks Related to our Business and Industry.

If demand for horizontal diffusion furnaces and related equipment declines, our financial position and results of operations could be materially adversely affected.

The revenues of our semiconductor equipment segment, which accounts for approximately 75% of our consolidated revenues, is comprised primarily of sales of horizontal diffusion furnaces and our automation products. Our automation products are useable only with horizontal diffusion furnaces. There is a trend in the semiconductor industry, related to the trend to produce smaller chips on larger wafers, towards the use in semiconductor manufacturing facilities of newer technology, such as vertical diffusion furnaces. Vertical diffusion furnaces are more efficient than the horizontal diffusion furnaces in certain manufacturing processes for smaller chips on larger wafers. As early as 1994, we had expected that demand for our horizontal diffusion furnaces would decline as a result of this trend. We believe this trend has not yet adversely affected us to the extent originally expected primarily because:

we have experienced continued demand from manufacturers that do not require the more expensive vertical furnaces, such as from manufacturers of analog, power management, DSP and MEMS chips and micro-controllers used in a number of consumer applications, including wireless phones;

China's significant investments in its semiconductor industry have resulted in increased sales of our horizontal furnaces there;

certain larger equipment manufacturers have decided to de-emphasize their horizontal product line and we have acquired the Bruce Technologies product line, thereby allowing us to increase our market share;

we are pursuing alternative markets, such as solar cell manufacturers and certain research and development facilities; and

we believe that because of improvements in automation for horizontal diffusion furnaces, such as our robotic product line, and due to the significantly higher cost of vertical furnaces, horizontal diffusion furnaces continue to be an acceptable alternative to the vertical furnaces for certain devices.

However, to the extent that the trend to use vertical diffusion furnaces over horizontal diffusion furnaces continues, our revenues may decline and our corresponding ability to generate income may be adversely affected.

The ongoing volatility of the semiconductor equipment industry may negatively impact our business and results of operations and our corresponding ability to efficiently budget our expenses.

The semiconductor equipment industry is highly cyclical. As such, demand for and the profitability of our products can change significantly from period to period as a result of numerous factors, including, but not limited to, changes in:

1. global and regional economic conditions;
2. changes in capacity utilization and production volume of manufacturers of semiconductors, silicon wafers, solar cells and MEMS;
3. the shift of semiconductor production to Asia, where there often is increased price competition; and
4. the profitability and capital resources of those manufacturers.

For these and other reasons, our results of operations for past periods may not necessarily be indicative of future operating results.

Since our business has historically been subject to cyclical industry conditions, we have experienced significant fluctuations in our quarterly new orders and net revenues, both within and across years. Demand for semiconductor and silicon wafer manufacturing equipment and related consumable products has also been volatile as a result of sudden changes in semiconductor supply and demand and other factors in both semiconductor devices and wafer fabrication processes. Our orders tend to be more volatile than our revenues, as any change in demand is reflected immediately in orders booked, which are net of cancellations, while revenues tend to be recognized over multiple quarters as a result of procurement and production lead times and the deferral of certain revenues under our revenue recognition policies. Customer delivery schedules on large system orders can also add to this volatility.

The purchasing decisions of our customers are highly dependent on the economies of both their domestic markets and the worldwide semiconductor industry. The timing, length and severity of the up-and-down cycles in the semiconductor equipment industry are difficult to predict. The cyclical nature of our marketplace affects our ability to accurately budget our expense levels, which are based in part on our projections of future revenues.

When cyclical fluctuations result in lower than expected revenue levels, operating results may be adversely affected and cost reduction measures may be necessary in order for us to remain competitive and financially sound. During a down cycle, we must be able to make timely adjustments to our cost and expense structure to correspond to the prevailing market conditions. In addition, during periods of rapid growth, we must be able to increase manufacturing capacity and personnel to meet customer demand, which may require additional liquidity. We can provide no assurance that these objectives can be met in a timely manner in response to changes within the industry cycles. If we fail to respond to these cyclical changes, our business could be seriously harmed.

During the most recent down cycle, beginning in the first half of 2001, the semiconductor industry experienced excess production capacity that caused semiconductor manufacturers to decrease capital spending. We do not have long-term volume production contracts with our customers and we do not control the timing or volume of orders placed by our customers. Whether and to what extent our customers place orders for any specific products and the mix and quantities of products included in those orders are factors beyond our control. Insufficient orders would result in under-utilization of our manufacturing facilities and infrastructure and will negatively affect our financial position and results of operations. Changes in demand for our products have not significantly affected our factory utilization during the last three fiscal years.

We are dependent on key personnel for our business development, product development and sales, and any loss of our key personnel to competitors or other industries could dramatically impact our ability to continue operations.

Historically, our product development has been accomplished through cooperative efforts with two key customers. Our relationship with one of these customers, as well as with our joint development partner for the new technology Asher, is substantially dependent on personal relations established by our CEO. Furthermore, our relationship with a major European customer that has been instrumental in the development of the small batch vertical is substantially dependent upon our European General Manager. While there can be no assurance that such relationships will continue, such cooperation is expected to continue to be a significant element in our future development efforts.

Amtech is the beneficiary of life insurance policies on the life of our President and Chief Executive Officer, Mr. J.S. Whang, in the amount of \$2,000,000, but there is no assurance that such amount will be sufficient to cover the cost of finding and hiring a suitable replacement for Mr. Whang. It may not be feasible for any successor to maintain the same business relationships that Mr. Whang has established. If we were to lose the services of Mr. Whang for any reason, it could have a material adverse affect on our business.

We also depend on the management efforts of our officers and other key personnel and on our ability to attract and retain key personnel. Most of our products, other than the Atmoscan® and products acquired in the P.R. Hoffman and Bruce Technologies acquisitions were developed by our own personnel. We presently employ two engineers at our Tempe, Arizona plant, including one with a Ph.D. We employ eleven engineers, including two with Ph.D. s, at our Netherlands operation. These employees design and support the new small batch vertical furnace, horizontal diffusion furnace and conveyor furnace product lines manufactured in the Netherlands and the related automation products manufactured in Tempe. Two engineers are employed at our Carlisle, Pennsylvania operation. They design wafer lapping machines and carriers to meet customers processing requirements. During times of strong economic growth, competition is intense for highly skilled employees. There can be no assurance that we will be successful in attracting and retaining such personnel or that we can avoid increased costs in order to do so. There can be no assurance that employees will not leave Amtech or compete against us. Our failure to attract additional qualified employees, or to retain the services of key personnel, could negatively impact our financial position and results of operations.

We may not be able to keep pace with the rapid change in the technology we use in our products.

Success in the semiconductor equipment industry depends, in part, on continual improvement of existing technologies and rapid innovation of new solutions. For example, the semiconductor industry continues to shrink the size of semiconductor devices. These and other evolving customer needs require us to respond with continued development programs.

Technical innovations are inherently complex and require long development cycles and appropriate professional staffing. Our future business success depends on our ability to develop and introduce new products, or new uses for existing products, that successfully address changing customer needs, win market acceptance of these new products or uses and manufacture any new products in a timely and cost-effective manner. If we do not develop and introduce new products, technologies or uses for existing products in a timely manner and continually find ways of reducing the cost to produce them in response to changing market conditions or customer requirements, our business could be seriously harmed.

Our financial position and results of operations may be materially harmed if we are unable to recoup our investment in research and development.

The rapid change in technology in our industry requires that we continue to make investments in research and development in order to enhance the performance and functionality of our products, to keep pace with competitive products and to satisfy customer demands for improved performance, features and functionality. There can be no assurance that revenues from future products or enhancements will be sufficient to recover the development costs associated with such products or enhancements, or that we will be able to secure the financial resources necessary to fund future development. Research and development costs are typically incurred before we confirm the technical feasibility and commercial viability of a product, and not all development activities result in commercially viable products. In addition, we cannot ensure that products or enhancements will receive market acceptance, or that we will be able to sell these products at prices that are favorable to us. Our business could be seriously harmed if we are unable to sell our products at favorable prices, or if our products are not accepted by the markets in which we operate.

If third parties violate our proprietary rights, in which we have made significant investments, or accuse us of infringing upon their proprietary rights, such events could result in a loss of the value of some of our intellectual property or costly litigation.

Our success is dependent in part on our technology and other proprietary rights. We own various United States and international patents; have additional pending patent applications relating to some of our products and technologies; and license the right to manufacture certain products under patents owned by third parties, some of which are on a non-exclusive basis. The process of seeking patent protection is lengthy and expensive, and we cannot be certain that pending or future applications will actually result in issued patents, or that, issued patents will be of sufficient scope or strength to provide meaningful protection or commercial advantage to us. Other companies and individuals, including our larger competitors, may develop technologies that are similar or superior to our technology or design around the patents we own or license. The owner of the patent from whom we license the right to manufacture insert carriers may grant licenses to our competitors, diminishing or eliminating any competitive advantage we may have. We also maintain trademarks on certain of our products and claim copyright protection for certain proprietary software and documentation. However, we can give no assurance that our trademarks and copyrights will be upheld or successfully deter infringement by third parties.

While patent, copyright and trademark protection for our intellectual property is important, we believe our future success in highly dynamic markets is most dependent upon the technical competence and creative skills of our personnel. We attempt to protect our trade secrets and other proprietary information through confidentiality agreements with our customers, suppliers, employees and consultants and through other security measures. We also maintain exclusive and non-exclusive licenses with third parties for the technology used in certain products. However, these employees, consultants and third parties may breach these agreements, and we may not have adequate remedies for wrongdoing. In addition, the laws of certain territories in which we develop, manufacture or sell our products may not protect our intellectual property rights to the same extent as do the laws of the United States.

From time to time, we have received communications from other parties asserting the existence of patent rights or other intellectual property rights that they believe cover certain of our products, processes, technologies or information. In such cases, we evaluate our position and consider the available alternatives, which may include seeking licenses to use the technology in question on commercially reasonable terms or defending our position. Based on industry practice and prior experience, we believe that licenses or other rights, if necessary, will be available on commercially reasonable terms for existing or future claims. Nevertheless, we cannot ensure that licenses can be obtained, or if obtained will be on acceptable terms, or that litigation or other administrative proceedings will not occur. Defending our intellectual property rights through litigation could be very costly. If we are not able to negotiate the necessary licenses on commercially reasonable terms or successfully defend our position, our financial position and results of operations could be materially and adversely affected.

Our reliance on sales to a few major customers and granting credit to those customers places us at financial risk.

As of September 30, 2005, receivables from two customers comprised 14% and 10% of our accounts receivable, respectively. A concentration of our receivables from one or a small number of customers places us at risk. If any one or more of our major customers is unable to pay us it could adversely affect our financial position and results of operations. We attempt to manage this credit risk by performing credit checks, by requiring significant partial payments prior to shipment where appropriate and by actively monitoring collections. We also require letters of credit of certain customers depending on the size of the order, type of customer or its creditworthiness and its country of domicile.

If any of our customers cancel or fail to accept a large system order, our financial position and results of operations could be materially adversely affected.

Our backlog includes orders for large systems, such as our diffusion furnaces, with system prices of up to \$1.0 million depending on the system configuration, options included and any special requirements of the customer. As of September 30, 2005 our backlog includes a multi-system order totaling \$5.1 million, or approximately 35% of the total backlog and equivalent to 18% of our 2005 consolidated revenue. Our financial position and results of operations could be materially adversely affected should any large systems order be cancelled prior to shipment, or not be accepted by the customer. We have experienced significant cancellations in the past, including \$1.2 million in fiscal 1999, \$3.5 million in fiscal 2001, and \$1.2 million in 2002. Likewise, a significant change in the liquidity or financial position of any of our customers that purchase large systems could have a material impact on the collectibility of our accounts receivable and our future operating results. Our backlog does not provide any assurance that we will realize a profit from those orders or indicate in which period revenue will be recognized.

Our business might be adversely affected by our dependence on foreign business.

During 2005, 60% of our sales were made to customers outside of North America as follows:

Asia (including Korea, People's Republic of China, Taiwan, Japan, Singapore, Indonesia, Malaysia, Australia and India) 36%
(includes 16% from Taiwan)

Europe 24%

Because of our significant dependence on revenues from international customers, our operating results could be negatively affected by a decline in the economies of any of the countries or regions in which we do business. Each region in the global semiconductor equipment market exhibits unique characteristics that can cause capital equipment investment patterns to vary significantly from period to period. Periodic local or international economic downturns, trade balance issues, political instability and fluctuations in interest and currency exchange rates could negatively affect our business and results of operations.

We recorded a loss of \$0.1 million in both 2005 and 2004 and gains of \$0.1 million during 2003, as a result of foreign currency transactions. While our business has not been materially affected in the past by currency fluctuations, there is a risk that it may be materially adversely affected in the future. Such risk includes possible losses due to currency exchange rate fluctuations, possible future prohibitions against repatriation of earnings, or proceeds from disposition of investments, and from possible social and military instability in the case of India, South Korea, Taiwan and possibly elsewhere. Our wholly-owned subsidiary, Tempres Systems, has conducted its operations in the Netherlands since 1995 and during 2005 we established a subsidiary in Germany to conduct the European sales of our Bruce Technologies product line. As a result, such operations are subject to the taxation policies, employment and labor laws, transportation regulations, import and export regulations and tariffs, possible foreign exchange restrictions, international monetary fluctuations, and other political, economic and legal policies of that nation, the European Economic Union and the other European nations in which it conducts business. Consequently, we might encounter unforeseen or unfamiliar difficulties in conducting our European operations. Changes in such laws and regulations may have a material adverse effect on our revenues and costs.

The semiconductor equipment industry is competitive and we are relatively small in size and have fewer resources in comparison with our competitors.

Our industry includes large manufacturers with substantial resources to support customers worldwide. Our future performance depends, in part, upon our ability to continue to compete successfully worldwide. Some of our competitors are diversified companies having substantially greater financial resources and more extensive research, engineering, manufacturing, marketing and customer service and support capabilities than we can provide. We face competition from companies whose strategy is to provide a broad array of products, some of which compete with the products and services that we offer. These competitors may bundle their products in a manner that may discourage customers from purchasing our products. In addition, we face competition from smaller emerging semiconductor equipment companies whose strategy is to provide a portion of the products and services that we offer at often a lower price than ours, using innovative technology to sell products into specialized markets. Loss of competitive position could impair our prices, customer orders, revenues, gross margin and market share, any of which would negatively affect our financial position and results of operations. Our failure to compete successfully with these other companies would seriously harm our business. There is risk that larger, better-financed competitors will develop and market more advanced products than those that we currently offer, or that competitors with greater financial resources may decrease prices thereby putting us under financial pressure. The occurrence of any of these events could have a negative impact on our revenues and operating results.

Acquisitions can result in an increase in our operating costs, divert management's attention away from other operational matters and expose us to other risks associated with acquisitions.

We continually evaluate potential acquisitions. We make acquisitions of, or significant investments in, other businesses with synergistic products, services and technologies. Acquisitions involve numerous risks, including, but not limited to:

difficulties and increased costs in connection with integration of the personnel, operations, technologies and products of acquired companies;

diversion of management's attention from other operational matters;

the potential loss of key employees of acquired companies;

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

the risk that the issuance of our common stock, if any, in an acquisition or merger could be dilutive to our stockholders, if anticipated synergies are not realized; and

acquired assets becoming impaired as a result of technological advancements or worse-than-expected performance of the acquired company.

If our critical suppliers fail to deliver sufficient quantities of quality product in a timely and cost-effective manner, it could negatively affect our business.

We use a wide range of materials and services in the production of our products including custom electronic and mechanical components, and we use numerous suppliers of materials. We generally do not have guaranteed supply arrangements with our suppliers. Because of the variability and uniqueness of customer orders, we try to avoid maintaining an extensive inventory of materials for manufacturing. Key suppliers include two steel mills capable of producing the types of steel to the tolerances needed for our carriers, an injection molder that molds plastic inserts into our steel carriers, an adhesive manufacturer that supplies the critical glue used in the production of the semiconductor polishing templates and a pad supplier that produces a unique material used to attach semiconductor wafers to the polishing template. We also rely on third parties for machined parts, steel frames and metal panels and other components used particularly in the assembly of semiconductor production equipment.

Although we make reasonable efforts to ensure that parts are available from multiple suppliers, this is not always practical or even possible; accordingly, some key parts are being procured from a single supplier or a limited group of suppliers. During the semiconductor industry peak years, increases in demand for capital equipment resulted in longer lead-times for many important system components, which could cause delays in meeting shipments to our customers. Because the selling price of some systems exceeds \$1 million, the delay in the shipment of even a single system could cause significant variations in quarterly revenues, operating results and the market value of our common stock. We have sought, and will continue to seek, to minimize the risk of production and service interruptions and shortages of key parts by:

selecting and qualifying alternative suppliers for key parts;

monitoring the financial stability of key suppliers; and

maintaining appropriate inventories of key parts.

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There can be no assurance that our financial position and results of operations will not be materially and adversely affected if, in the future, we do not receive in a timely and cost-effective manner a sufficient quantity and quality of parts to meet our production requirements.

We might require additional financing to expand our operations.

On September 13, 2000, we issued 383,000 shares of common stock, and warrants to purchase an aggregate of up to 59,300 shares of common stock, in a private placement in which we raised net proceeds of \$4.6 million. In April 2005 we issued 8% convertible preferred stock in a private placement in which we received net proceeds of \$1.9 million. The proceeds from those offerings have been used to fund our growth initiatives and improve our liquidity. We believe that current cash balances, the existing small line of credit, cash flows generated from our operations and additional available financing will provide adequate working capital for at least the next twelve months. However, additional financing is expected to be required for further implementation of our growth plans. Furthermore, we expect our liquidity will shrink during the execution of the \$5.1 million order discussed above and until we receive the initial payments in April 2006. There is no assurance that any additional financing will be available if and when required, or, even if available, that it would not materially dilute the ownership percentage of the then existing shareholders.

Terrorist attacks and threats or actual war may negatively impact all aspects of our operations, revenues, costs and stock price.

The 2001 terrorist attacks in the United States, as well as events occurring in response or connection to them, including, without limitation, future terrorist attacks against United States targets, rumors or threats of war, actual conflicts involving the United States or its allies or military or trade disruptions impacting our domestic or foreign suppliers of parts, components and subassemblies, may impact our operations, including, among other things, by causing delays or losses in the delivery of supplies or finished goods and decreased sales of our products. More generally, any of these events could cause consumer confidence and spending to decrease or result in increased volatility in the United States and worldwide financial markets and economy. They could also result in economic recession in the United States or abroad. Any of these occurrences could have a significant adverse impact on our financial position and results of operations.

We are subject to environmental regulations, and our inability or failure to comply with these regulations could adversely affect our business.

We are subject to environmental regulations in connection with our business operations, including, but not limited to, regulations related to manufacturing and our customers use of our products. From time to time, we receive notices regarding these regulations. It is our policy to respond promptly to these notices and to take any necessary corrective action. Our failure or inability to comply with existing or future environmental regulations could result in significant remediation liabilities, the imposition of fines and/or the suspension or termination of development, manufacturing or use of certain of our products, each of which could damage our financial position and results of operations.

Risks Related To The Securities Offered Pursuant to this Prospectus.

Our common stock is thinly traded and you may not be able to sell the securities at all or when you want to do so.

Our common stock currently is quoted on The Nasdaq National Stock Market and currently is thinly traded. Over the three years ended December 31, 2005, the weekly trading volume for our common stock was as low as 3,100 shares per week and as high as 1,384,973 shares per week as reported by NASDAQ. Our average daily trading volume was 19,414 for the quarter ended December 31, 2005 as reported by NASDAQ. Because of the limited public market for our common stock, you may be unable to sell our common stock when you want to do so if the trading market for our common stock continues to be limited.

Our current capital structure could delay, defer or prevent a change of control.

We are authorized to issue up to 100,000,000 shares of common stock and up to 100,000,000 shares of preferred stock. As of December 31, 2005, there were 2,715,221 shares of common stock outstanding and 540,000 shares of convertible preferred stock, which are convertible into an equal number of shares of common stock. Authorized but unissued common stock may be issued for such consideration as the board of directors determines to be adequate. The board of directors may issue preferred stock with such rights, preferences, privileges and restrictions as they determine, without shareholder vote. Although we do not currently intend to issue any additional shares of our preferred stock, there can be no assurance that we will not do so in the future. Shareholders may or may not be given the opportunity to vote thereon, depending upon the nature and size of any such transactions, applicable law, the rules and policies of the national securities exchange on which the common stock or preferred stock, as the case may be, is then trading, if any, and the judgment of the board of directors. Shareholders have no preemptive rights to subscribe for newly issued shares of our capital stock.

On May 17, 1999, we declared a dividend distribution of one preferred share purchase right for each outstanding share of common stock. The dividend was payable on June 9, 1999 to stockholders of record as of the close of business on that date. Each right entitles the registered holder to purchase one one-hundredth of a share of Series A Participating Preferred Stock, subject to adjustment, at a price of \$8.50 per one one-hundredth of a share of Preferred Stock, subject to adjustment. The rights issuance was adopted as protection against a takeover by a third party.

Mr. Whang and certain other key employees have severance arrangements that require us to pay one times annual base salary (three times annual base salary in the case of Mr. Whang) and acceleration of the vesting of their stock options in the event they are terminated following a change of control in ownership.

Having the outstanding rights, and a substantial number of authorized and unreserved shares of common stock, preferred stock and severance arrangements with key employees could have the effect of making it more difficult for a third party to acquire a majority of our outstanding voting stock. Management could use the additional shares to resist a takeover effort even if the terms of the takeover offer are favored by a majority of the independent shareholders. This could delay, defer or prevent a change in control.

If our securities become ineligible for trading on the NASDAQ system, they might be subject to Rule 15g-9 of the Securities Exchange Act of 1934, which imposes additional sales practice requirements on broker-dealers who sell such securities to persons other than established customers and accredited investors.

While our common stock is now included on the NASDAQ National Market®, continued listing on NASDAQ will depend on our ability to meet certain eligibility requirements established from time to time by the NASDAQ National Market® or the NASDAQ SmallCap Market. Loss of NASDAQ eligibility could result from material operating losses, or if the market price of our common stock falls below \$1.00 per share. For transactions covered by the rule, the broker-dealer must make a special suitability determination for the purchaser and receive the purchaser's written consent to the transaction prior to the sale. The rule may adversely affect the ability of broker-dealers to sell our securities, and consequently may limit the public market for, and the trading price of, our common stock.

Cost of Compliance with Section 404 of the Sarbanes Oxley Act could adversely affect future operating results, the trading price of our common stock and failure to comply could result in loss of our listing on NASDAQ, civil penalties and other liabilities.

Section 404 of the Sarbanes Oxley Act requires management to certify that it has tested and found the Company's internal controls to be effective. It is also required that the Company's independent auditors audit management's assessment of, and the effectiveness of, internal control over financial reporting. The adequacy of internal controls generally takes into consideration that the anticipated benefits of a control should outweigh the cost of that control. Auditing Standards of the Public Company Accounting Oversight Board (PCAOB) related to the internal control requirements of Section 404 of the Sarbanes Oxley Act will significantly increase the cost and time needed to comply with the requirements of Section 404. Based upon the existing deadlines, we must fully comply with all requirements of Section 404, as they are interpreted by the PCAOB, no later than September 30, 2007. Estimates of complying with these requirements approximate \$0.5 million in the first year and fifty percent of that amount in each ensuing year. Failure to comply could result in civil penalties, loss of our listing on NASDAQ, and the cost of possible litigation. Because of the complexities and limited time available, there can be no assurance of meeting the compliance deadline.

Our stock price is volatile and you might not be able to resell your securities at or above the price you have paid.

If you purchase the securities, you might not be able to resell the shares of our common stock comprising or underlying the securities at or above the price you have paid. The market price of our common stock might fluctuate significantly in response to many factors, some of which are beyond our control, including the following:

actual or anticipated fluctuations in our annual and quarterly results of operations;

changes in securities analysts' expectations;

variations in our operating results, which could cause us to fail to meet analysts' or investors' expectations;

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announcements by our competitors or us of significant technical innovations, contracts, acquisitions, strategic partnerships, joint ventures or capital commitments;

conditions and trends in the title insurance and real estate business;

general market, economic, industry and political conditions;

changes in market values of comparable companies;

additions or departures of key personnel;

stock market price and volume fluctuations attributable to inconsistent trading volume levels; and

future sales of equity or debt securities, including sales which dilute existing investors.

In addition, the stock market has experienced extreme volatility that often has been unrelated to the performance of its listed companies. Moreover, only a limited number of our shares are traded each day, which could increase the volatility of the price of our stock. These market fluctuations might cause our stock price to fall regardless of our performance. In the past, companies that have experienced volatility in the market price of their stock have been the objects of securities class action litigation. If we were involved in securities class action litigation, it could result in substantial costs and a diversion of our attention and resources and have a material adverse effect on our business.

USE OF PROCEEDS

The selling stockholders will receive the net proceeds from the sale of their shares of common stock. We will not receive any proceeds from these sales. However, we will receive up to \$280,200 for the exercise of the outstanding warrant issued to Catalyst Financial, LLC in connection with the April 2005 private offering, if exercised. In addition, the Company may pay preferred stock dividends in shares of common stock being registered hereunder in lieu of making cash payments. We received estimated aggregate gross proceeds of \$2.16 million from the sale of the shares of preferred stock pursuant to our April 2005 private offering. We have been using, and will continue to use, the net proceeds of \$1.91 million from the private offering, and the proceeds from the exercise of the warrant, if exercised, to fund our working capital necessary to support our growth plan.

SELLING STOCKHOLDERS

The following table sets forth, as of January 13, 2006, (i) the name of each of the selling stockholders, (ii) the number of shares and percentage of common stock beneficially owned by each such selling stockholder that may be offered for the account of such selling stockholder under this prospectus, and (iii) the number of shares and percentage of common stock beneficially owned by each such selling stockholder upon completion of this offering. Such information was obtained from the selling stockholders but has not been independently verified by us. The term "selling stockholder" includes the persons listed below and their respective transferees, pledgees, donees, or other successors.

| Name | Common Stock Beneficially Owned Before the Offering ⁽¹⁾ | | Shares of Common Stock Being Registered for Resale in this Offering ⁽²⁾ | Common Stock Beneficially Owned After Completion of Offering ⁽¹⁾ | |
|-------------------------|--|------------|--|---|------------|
| | Number of Shares | Percentage | | Number of Shares | Percentage |
| Brett M. Averick | 6,250 | * | 6,250 | 0 | * |
| Catalyst Fund, LP | 196,250 | 6.7% | 196,250 | 0 | * |
| Merlin Partners, LP | 25,000 | * | 25,000 | 0 | * |
| Amtech Investments, LLC | 312,500 | 10.3% | 312,500 | 0 | * |
| Catalyst Financial, LLC | 60,000 | 2.2% | 60,000 | 0 | * |

* Less than 1%

- (1) Except as otherwise indicated, each person named in the table has sole voting and investment power with respect to all shares of common stock beneficially owned by him or her, subject to applicable community property law. In calculating the percentage of ownership, all shares of common stock which the identified person or group had the right to acquire through conversion of their preferred shares, or otherwise within 60 days of January 13, 2006, are deemed to be outstanding for the purpose of computing the percentage of the shares of common stock owned by such person or group, but are not deemed to be outstanding for the purpose of computing the percentage of the shares of common stock owned by any other person.
- (2) Shares being registered represent shares approved, but not issued, which will be issued upon conversion of the preferred shares or exercise of the warrant held by Catalyst Financial, LLC. We have no assurance that the selling stockholders will convert their preferred shares to common shares, or exercise the warrant, as the case may be, or sell any of the securities being registered hereby.

Material Relationships with the Selling Stockholders

Catalyst Financial, LLC (Catalyst) served as the executive placement agent in connection with our April 2005 private offering of 540,000 shares of preferred stock. Catalyst received a cash fee of \$172,800, reimbursement of expenses of \$43,200 and a warrant to purchase 60,000 shares of our common stock as consideration for its services as placement agent. The warrant issued to Catalyst has a term of up to five years and an exercise price of \$4.67 per share. Catalyst is currently our investment banker. Steven N. Bronson is the president of Catalyst Financial, LLC and the president of The Catalyst Fund GP LLC, which is the general partner of The Catalyst Fund, LP.

Brett M. Averick owns 6,250 shares of our preferred stock. Brett M. Averick is the brother of Robert M. Averick, a member of the board of directors of the Company.

Robert M. Averick, a member of the Company's board of directors, co-manages Amtech Investments, LLC, through his employment with Richard L. Scott Investments, LLC. Amtech Investments, LLC owns a public equity portfolio and purchased 312,500 shares of preferred stock in the Company's offering.

PLAN OF DISTRIBUTION

The common stock may be sold from time to time by the selling stockholders, or by pledgees, donees, transferees or other successors in interest. Such sales may be made on one or more exchanges or in the over-the-counter market or otherwise, at prices and at terms then prevailing or at prices related to the then current market price, or in negotiated transactions. The common stock may be sold in one or more of the following types of transactions:

- (a) a block trade in which a selling stockholder will engage a broker-dealer who will then attempt to sell the common stock, or position and resell a portion of the block as principal to facilitate the transaction;
- (b) purchases by a broker-dealer as principal and resale by such broker-dealer for its account pursuant to this prospectus;
- (c) an exchange distribution in accordance with the rules of such exchange; and
- (d) ordinary brokerage transactions and transactions in which the broker solicits purchasers. In effecting sales, broker-dealers engaged by the selling stockholders may arrange for other broker-dealers to participate in the re-sales.

In connection with distributions of the common stock or otherwise, the selling stockholders may enter into hedging transactions with broker-dealers. In connection with such transactions, broker-dealers may engage in short sales of the common stock in the course of hedging the positions they assume with selling stockholders. The selling stockholders may also sell common stock short and redeliver the common stock to close out such short positions. The selling stockholders may also enter into option or other transactions with broker-dealers which require the delivery to the broker-dealer of the common stock, which the broker-dealer may resell or otherwise transfer pursuant to this prospectus. The selling stockholders may also loan or pledge common stock to a broker-dealer and the broker-dealer may sell the common stock so loaned or, upon a default, the broker-dealer may effect sales of the pledged common stock pursuant to this prospectus.

Broker-dealers or agents may receive compensation in the form of commissions, discounts or concessions from the selling stockholders in amounts to be negotiated in connection with the sale. Such broker-dealers and any other participating broker-dealers may be deemed to be underwriters within the meaning of the Securities Act in connection with such sales and any such commission, discount or concession may be deemed to be underwriting discounts or commissions under the Securities Act. In addition, any securities covered by this prospectus which qualify for sale pursuant to Rule 144 may be sold under Rule 144 rather than pursuant to this prospectus.

Commissions and discounts, if any, attributable to the sales of the common stock will be borne by the selling stockholders. The selling shareholders may agree to indemnify any broker-dealer or agent that participates in transactions involving sales of the common stock against various liabilities, including liabilities arising under the Securities Act.

In order to comply with the securities laws of various states, if applicable, sales of the common stock made in those states will only be through registered or licensed brokers or dealers. In addition, some states do not allow the securities to be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with by us and the selling stockholders.

Under applicable rules and regulations of the Exchange Act, any person engaged in the distribution of the common stock may not simultaneously engage in market-making activities with respect to our common stock for a period of up to five business days prior to the commencement of such distribution. In addition to those restrictions, each selling stockholder will be subject to the Exchange Act and the rules and regulations under the Exchange Act, including, Regulation M and Rule 10b-7, which provisions may limit the timing of the purchases and sales of our securities by the selling stockholders.

LEGAL MATTERS

The validity of the shares of common stock offered hereby has been passed upon for us by our counsel, Squire, Sanders & Dempsey L.L.P., 40 North Central Avenue, Suite 2700, Phoenix, Arizona.

EXPERTS

The consolidated financial statements of Amtech Systems, Inc. and subsidiaries as of September 30, 2005, and for the year then ended, have been incorporated by reference herein in reliance upon the report of Mayer Hoffman McCann P.C., independent registered public accountants, incorporated by reference herein, and upon the authority of said firm as experts in accounting and auditing.

The consolidated financial statements of Amtech Systems, Inc. and subsidiaries as of September 30, 2004 and for the years ended September 30, 2004 and 2003, have been incorporated by reference herein and in the registration statement in reliance upon the report of KPMG LLP, an independent registered public accounting firm, incorporated by reference herein, and upon the authority of said firm as experts in accounting and auditing.

DISCLOSURE OF COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITY

Amtech Systems, Inc.'s Articles of Incorporation provide for indemnification of its directors, officers and agents under various circumstances. Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers or persons controlling Amtech pursuant to the foregoing provision, Amtech has been informed that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in such Act and is therefore unenforceable.

Amtech Systems, Inc.

700,000 Shares of Common Stock

PROSPECTUS

February 3, 2006
