

AMTECH SYSTEMS INC
Form S-4/A
December 19, 2014
Table of Contents

As filed with the Securities and Exchange Commission on December 19, 2014.

Registration No. 333-200558

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Amendment No. 1
to
Form S-4
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

Amtech Systems, Inc.
(Exact Name of Registrant as Specified in its Charter)

Arizona (State or other jurisdiction of	3559 (Primary Standard Industrial	86-0411215 (I.R.S. Employer
incorporation or organization)	Classification Code Number) 131 South Clark Drive	Identification Number)

Tempe, Arizona 85281

(480) 967-5146

(Address, including Zip Code, and Telephone Number, including Area Code, of Registrant's Principal Executive Offices)

Bradley C. Anderson

Executive Vice President and Chief Financial Officer

Amtech Systems, Inc. 131 South Clark Drive

Tempe, Arizona 85281

(480) 967-5146

(Name, Address, including Zip Code, and Telephone Number, including Area Code, of Agent for Service)

With copies to:

Christopher D. Johnson, Esq.
Squire Patton Boggs (US) LLP
1 East Washington, Suite 2700
Phoenix, Arizona 85004
(602) 528-4046

Paul J. van der Wansem
Chairman, President and Chief
Executive Officer
BTU International, Inc.
23 Esquire Road
North Billerica, MA 01862
(978) 667-4111

Timothy C. Maguire, Esq.
Pierce Atwood LLP
100 Summer Street, #2250
Boston, MA 02110
(617) 488-8140

Approximate date of commencement of the proposed sale of the securities to the public:

As soon as practicable after this Registration Statement becomes effective and upon completion of the merger described in the enclosed document.

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

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act of 1933, as amended, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. "

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See the definitions of large accelerated filer, accelerated filer and smaller reporting company in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer " Accelerated filer x
Non-accelerated filer " (Do not check if a smaller reporting company) Smaller reporting company "

If applicable, place an X in the box to designate the appropriate rule provision relied upon in conducting this transaction:

Exchange Act Rule 13e-4(i) (Cross-Border Issuer Tender Offer) "

Exchange Act Rule 14d-1(d) (Cross-Border Third-Party Tender Offer) "

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

Table of Contents

Information contained herein is subject to completion or amendment. A registration statement relating to these securities has been filed with the Securities and Exchange Commission. These securities may not be sold nor may offers to buy be accepted prior to the time the registration statement becomes effective. This document shall not constitute an offer to sell or the solicitation of any offer to buy nor shall there be any sale of these securities in any jurisdiction in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such jurisdiction.

PRELIMINARY SUBJECT TO COMPLETION DATED DECEMBER 19, 2014

Proxy Statement

Prospectus

MERGER PROPOSED YOUR VOTE IS VERY IMPORTANT

Dear Stockholder:

On October 21, 2014, BTU International, Inc., or BTU, and Amtech Systems, Inc., or Amtech, entered into an Agreement and Plan of Merger (which we refer to as the merger agreement). Under the merger agreement, BTU Merger Sub, Inc., or Merger Sub, will merge with and into BTU with BTU surviving as a wholly owned subsidiary of Amtech (which we refer to as the merger).

In the merger, each share of BTU common stock (except for specified shares of BTU common stock held by BTU or Amtech) will be converted into the right to receive 0.3291 shares of Amtech common stock (which we refer to as the exchange ratio). Although the number of shares of Amtech common stock that BTU stockholders will receive is fixed, the market value of the merger consideration will fluctuate with the market price of Amtech common stock and will not be known at the time BTU stockholders vote on the merger. Based on the closing price of Amtech's common stock on the NASDAQ STOCK MARKET, or NASDAQ, on October 21, 2014, the last trading day before public announcement of the merger, the 0.3291 exchange ratio represented approximately \$3.33 in value for each share of BTU common stock. **We urge you to obtain current market quotations for Amtech (trading symbol ASYS) and BTU (trading symbol BTUI).**

Based on the current number of shares of BTU common stock outstanding and certain stock awards reserved for issuance under employee benefit plans, Amtech expects to issue up to a maximum of 3,647,301 shares of Amtech common stock to BTU stockholders in the aggregate upon completion of the merger. However, any increase or decrease in the number of shares of BTU common stock outstanding prior to the completion of the merger could cause the actual number of shares issued upon completion of the merger to change.

Amtech will hold a special meeting of its stockholders and BTU will hold a special meeting of its stockholders in connection with the merger. Amtech stockholders will be asked to vote to adopt the merger agreement and approve related matters as described in the attached proxy statement/prospectus. BTU stockholders will be asked to vote to adopt the merger agreement and approve related matters as described in the attached proxy statement/prospectus. Adoption of the merger agreement requires the affirmative vote of the holders of a majority of the outstanding shares of Amtech common stock entitled to vote and the affirmative vote of the holders of two-thirds of the outstanding

shares of BTU common stock entitled to vote.

The special meeting of Amtech stockholders will be held on January 29, 2015 at The Tempe Mission Palms Hotel, 60 East 5th Street, Tempe, Arizona, USA, at 9:00 a.m. local time. The special meeting of BTU stockholders will be held on January 29, 2015 at 23 Esquire Road, North Billerica, MA 01862, at 10:00 a.m. local time.

Amtech's board of directors unanimously recommends that Amtech stockholders vote FOR the adoption of the merger agreement and FOR the other matters to be considered at the Amtech special meeting.

BTU's board of directors unanimously recommends that BTU stockholders vote FOR the adoption of the merger agreement and FOR the other matters to be considered at the BTU special meeting.

This joint proxy statement/prospectus describes the special meeting of Amtech, the special meeting of BTU, the merger, the documents related to the merger and other related matters. **Please carefully read this entire joint proxy statement/prospectus, including Risk Factors, beginning on page 29, for a discussion of the risks relating to the proposed merger.** You also can obtain information about Amtech and BTU from documents that each has filed with the Securities and Exchange Commission.

Jong S. Whang

Executive Chairman

Amtech Systems, Inc.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of the securities to be issued in the merger or passed upon the adequacy or accuracy of this joint proxy statement/prospectus. Any representation to the contrary is a criminal offense.

Paul J. van der Wansem

Chairman, President and Chief Executive Officer

BTU International, Inc.

The date of the accompanying joint proxy statement/prospectus is [], and it is first being mailed or otherwise delivered to the stockholders of Amtech and BTU on or about December 30, 2014.

Table of Contents

NOTICE OF SPECIAL MEETING OF STOCKHOLDERS

To the Stockholders of BTU International, Inc.:

BTU International, Inc. will hold a special meeting of stockholders at 10:00 a.m local time, on January 29, 2015, at 23 Esquire Road, North Billerica, MA 01862 to consider and vote upon the following matters:

a proposal to adopt the Agreement and Plan of Merger, dated as of October 21, 2014, by and between Amtech Systems, Inc., BTU Merger Sub, Inc. and BTU International, Inc., pursuant to which Merger Sub will merge with and into BTU with BTU surviving as a wholly owned subsidiary of Amtech, as more fully described in the attached joint proxy statement/prospectus (which we refer to as the BTU merger proposal);

a proposal to adjourn the BTU special meeting, if necessary or appropriate, to solicit additional proxies in favor of the BTU merger proposal (which we refer to as the BTU adjournment proposal);

a proposal to approve, on an advisory (non-binding) basis, the compensation that certain executive officers of BTU may receive in connection with the merger pursuant to existing agreements or arrangements with BTU (which we refer to as the BTU merger-related compensation proposal); and

to transact such other business as may properly come before the meeting or any adjournment thereof.

We have fixed the close of business on December 16, 2014 as the record date for the special meeting. Only BTU common stockholders of record at that time are entitled to notice of, and to vote at, the BTU special meeting, or any adjournment or postponement of the BTU special meeting. Approval of the BTU merger proposal requires the affirmative vote of holders of at least two-thirds of the outstanding shares of BTU common stock entitled to vote. The BTU adjournment proposal will be approved if a majority of the votes cast at the BTU special meeting are voted in favor of the adjournment proposal. The BTU merger-related compensation proposal will be approved if a majority of the votes cast at the BTU special meeting are voted in favor of the BTU merger-related compensation proposal; however, such vote is advisory (non-binding) only.

BTU's board of directors has unanimously approved the merger agreement, has determined that the merger agreement and the transactions contemplated thereby, including the merger, are advisable and in the best interests of BTU and its stockholders, and unanimously recommends that BTU stockholders vote FOR the BTU merger proposal, FOR the BTU adjournment proposal, and FOR the BTU merger-related compensation proposal.

Your vote is very important. We cannot complete the merger unless BTU's common stockholders adopt the merger agreement.

We urge you to sign, date, and send in the enclosed proxy at your earliest convenience, or to vote via the toll-free telephone number or via the Internet as instructed on the proxy card, whether or not you expect to be present at the meeting. Sending in your proxy or voting by telephone or on the Internet will not prevent you from voting your shares personally at the meeting, since you may revoke your proxy at any time before it is

voted.

Regardless of whether you plan to attend the BTU special meeting, please vote as soon as possible. If you hold stock in your name as a stockholder of record of BTU, please complete, sign, date and return the accompanying proxy card in the enclosed postage-paid return envelope. If you hold your stock in street name through a bank or broker, please follow the instructions on the voting instruction card furnished by the record holder.

The enclosed joint proxy statement/prospectus provides a detailed description of the special meeting, the merger, the documents related to the merger and other related matters. We urge you to read the joint proxy statement/prospectus, including any documents incorporated in the joint proxy statement/prospectus by reference, and its annexes carefully and in their entirety.

**BY ORDER OF THE BOARD OF
DIRECTORS,**

Paul J. van der Wansem
*Chairman, President and Chief Executive
Officer*

[]

Table of Contents

NOTICE OF SPECIAL MEETING OF STOCKHOLDERS

To the Stockholders of Amtech Systems, Inc.:

Amtech Systems, Inc. will hold a special meeting of stockholders at 9:00 a.m. local time, on January 29, 2015, at The Tempe Mission Palms Hotel, 60 East 5th Street, Tempe, Arizona, USA to consider and vote upon the following matters:

a proposal to adopt the Agreement and Plan of Merger, dated as of October 21, 2014, by and among Amtech Systems, Inc., BTU Merger Sub, Inc., and BTU International, Inc., pursuant to which Merger Sub will merge with and into BTU with BTU surviving as a wholly owned subsidiary of Amtech (which we refer to as the Amtech merger proposal), as more fully described in the attached joint proxy statement/prospectus;

a proposal to adjourn the Amtech special meeting, if necessary or appropriate, to solicit additional proxies in favor of the Amtech merger proposal (which we refer to as the Amtech adjournment proposal); and

to transact such other business as may properly come before the meeting or any adjournment thereof.

We have fixed the close of business on December 16, 2014 as the record date for the special meeting. Only Amtech common stockholders of record at that time are entitled to notice of, and to vote at, the Amtech special meeting, or any adjournment or postponement of the Amtech special meeting. Approval of the Amtech merger proposal requires the affirmative vote of holders of a majority of the outstanding shares of Amtech common stock entitled to vote. The Amtech adjournment proposal will be approved if a majority of the votes cast at the Amtech special meeting are voted in favor of the adjournment proposal.

IMPORTANT

Amtech's board of directors has unanimously approved the merger agreement and has determined that the merger agreement and the transactions contemplated thereby, including the merger, are advisable and in the best interests of Amtech and its stockholders, and unanimously recommends that Amtech stockholders vote FOR the Amtech merger proposal, FOR the Amtech adjournment proposal, and FOR the other matters to be considered at the special meeting.

Your vote is very important. We cannot complete the merger unless Amtech's stockholders adopt the merger agreement.

We urge you to sign, date, and send in the enclosed proxy at your earliest convenience, or to vote via the toll-free telephone number or via the Internet as instructed on the proxy card, whether or not you expect to be present at the meeting. Sending in your proxy or voting by telephone or on the Internet will not prevent you from voting your shares personally at the meeting, since you may revoke your proxy at any time before it is voted.

Regardless of whether you plan to attend the Amtech special meeting, please vote as soon as possible. If you hold stock in your name as a stockholder of record of Amtech, please complete, sign, date and return the accompanying proxy card in the enclosed postage-paid return envelope. If you hold your stock in street name through a bank or broker, please follow the instructions on the voting instruction card furnished by the record holder.

The enclosed joint proxy statement/prospectus provides a detailed description of the special meeting, the merger, the documents related to the merger and other matters to be considered at the Amtech special meeting. We urge you to read the joint proxy statement/prospectus, including any documents incorporated in the joint proxy statement/prospectus by reference, and its annexes carefully and in their entirety.

**BY ORDER OF THE BOARD OF
DIRECTORS,**

Jong S. Whang

Executive Chairman

[]

Table of Contents

REFERENCES TO ADDITIONAL INFORMATION

This joint proxy statement/prospectus incorporates important business and financial information about Amtech from documents filed with the Securities and Exchange Commission, or the SEC, that are not included in or delivered with this joint proxy statement/prospectus. You can obtain any of the documents filed with or furnished to the SEC by Amtech at no cost from the SEC's website at <http://www.sec.gov>. You may also request copies of these documents, including documents incorporated by reference in this joint proxy statement/prospectus, at no cost by contacting Amtech at the following address:

Amtech Systems, Inc.

131 South Clark Drive

Tempe, Arizona 85281

Attention: Investor Relations

Telephone: (480) 967-5146

You will not be charged for any of these documents that you request. To obtain timely delivery of these documents, you must request them no later than five business days before the date of your meeting. This means that Amtech stockholders requesting documents must do so by January 22, 2015, in order to receive them before the Amtech special meeting.

This joint proxy statement/prospectus references important business and financial information about BTU from documents filed with the Securities and Exchange Commission, or the SEC, that are not included in or delivered with this joint proxy statement/prospectus. You can obtain any of the documents filed with or furnished to the SEC by BTU at no cost from the SEC's website at <http://www.sec.gov>. You may also request copies of these documents at no cost by contacting BTU at the following address:

BTU International, Inc.

23 Esquire Road

North Billerica, MA 01862

Attention: Investor Relations

Telephone: (978) 667-4111

You will not be charged for any of these documents that you request. To obtain timely delivery of these documents, you must request them no later than five business days before the date of your meeting. This means that BTU stockholders requesting documents must do so by January 22, 2015, in order to receive them before the BTU special meeting.

You should rely only on the information contained in, or incorporated by reference by Amtech into, this document. No one has been authorized to provide you with information that is different from that contained in, or incorporated by reference by Amtech into, this document. This document is dated [], and you should assume that the

information in this document is accurate only as of such date. You should assume that the information incorporated by reference by Amtech into this document is accurate as of the date of such document. Neither the mailing of this document to BTU stockholders or Amtech stockholders nor the issuance by Amtech of shares of Amtech common stock in connection with the merger will create any implication to the contrary.

This document does not constitute an offer to sell, or a solicitation of an offer to buy, any securities, or the solicitation of a proxy, in any jurisdiction to or from any person to whom it is unlawful to make any such offer or solicitation in such jurisdiction. Except where the context otherwise indicates, information contained in this document regarding BTU has been provided by BTU and information contained in this document regarding Amtech has been provided by Amtech.

See [Where You Can Find More Information](#) beginning on page 163 for more details.

Table of Contents

TABLE OF CONTENTS

	Page
<u>QUESTIONS AND ANSWERS</u>	1
<u>SUMMARY</u>	8
<u>SELECTED CONSOLIDATED HISTORICAL FINANCIAL DATA OF AMTECH</u>	16
<u>SELECTED CONSOLIDATED HISTORICAL FINANCIAL DATA OF BTU</u>	17
<u>SELECTED UNAUDITED PRO FORMA FINANCIAL DATA</u>	19
<u>UNAUDITED PRO FORMA CONDENSED COMBINED FINANCIAL STATEMENTS</u>	20
<u>RISK FACTORS</u>	29
<u>CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS</u>	37
<u>THE BTU SPECIAL MEETING</u>	38
<u>Date, Time and Place of Meeting</u>	38
<u>Matters to Be Considered</u>	38
<u>Recommendation of BTU's Board of Directors</u>	38
<u>BTU Record Date and Quorum</u>	38
<u>Required Vote; Treatment of Abstentions and Failure to Vote</u>	39
<u>Voting on Proxies; Incomplete Proxies</u>	39
<u>Shares Held in Street Name</u>	40
<u>Revocability of Proxies and Changes to a BTU Stockholder's Vote</u>	40
<u>Delivery of Proxy Materials</u>	40
<u>Solicitation of Proxies</u>	40
<u>Attending the BTU Special Meeting</u>	41
<u>Other Matters to Come Before the BTU Special Meeting</u>	41
<u>Assistance</u>	41
<u>BTU PROPOSALS</u>	42
<u>PROPOSAL NO. 1 BTU MERGER PROPOSAL</u>	42
<u>PROPOSAL NO. 2 BTU ADJOURNMENT PROPOSAL</u>	42
<u>PROPOSAL NO. 3 BTU MERGER-RELATED COMPENSATION PROPOSAL</u>	42
<u>THE AMTECH SPECIAL MEETING</u>	44
<u>Date, Time and Place of Meeting</u>	44
<u>Matters to Be Considered</u>	44
<u>Recommendation of Amtech's Board of Directors</u>	44
<u>Record Date and Quorum</u>	44
<u>Required Vote; Treatment of Abstentions and Failure to Vote</u>	45
<u>Voting on Proxies; Incomplete Proxies</u>	45
<u>Shares Held in Street Name ; Broker Non-Votes</u>	45
<u>Revocability of Proxies and Changes to an Amtech Stockholder's Vote</u>	46
<u>Solicitation of Proxies</u>	46
<u>Attending the Meeting</u>	46
<u>Delivery of Proxy Materials</u>	46
<u>Other Matters to Come Before the Amtech Special Meeting</u>	47
<u>Assistance</u>	47
<u>AMTECH PROPOSALS</u>	48
<u>PROPOSAL NO. 1 AMTECH MERGER PROPOSAL</u>	48
<u>PROPOSAL NO. 2 AMTECH ADJOURNMENT PROPOSAL</u>	48

<u>INFORMATION ABOUT AMTECH</u>	48
<u>INFORMATION ABOUT BTU</u>	49
<u>BTU's Financial Statements</u>	69
<u>THE MERGER</u>	100
<u>Terms of the Merger</u>	100
<u>Background of the Merger</u>	100
<u>BTU's Reasons for the Merger; Recommendation of BTU's Board of Directors</u>	106

Table of Contents

	Page
<u>Opinion of Needham & Company</u>	110
<u>Amtech's Reasons for the Merger: Recommendation of Amtech's Board of Directors</u>	117
<u>Opinion of Stifel</u>	118
<u>Interests of BTU's Directors and Executive Officers in the Merger</u>	126
<u>Merger-Related Compensation for BTU's Named Executive Officers</u>	131
<u>Golden Parachute Compensation</u>	131
<u>Vote Required</u>	132
<u>Public Trading Markets</u>	132
<u>Amtech's Dividend Policy</u>	132
<u>Dissenters' Rights in the Merger</u>	133
<u>Litigation Relating to the Merger</u>	133
<u>THE MERGER AGREEMENT</u>	134
<u>Structure of the Merger</u>	134
<u>Treatment of BTU Stock Options and Other Equity-Based Awards</u>	135
<u>Closing and Effective Time of the Merger</u>	135
<u>Conversion of Shares; Exchange of Certificates</u>	135
<u>Representations and Warranties</u>	136
<u>Covenants and Agreements</u>	137
<u>Stockholder Meetings and Recommendation of BTU's and Amtech's Boards of Directors</u>	141
<u>Agreement Not to Solicit Other Offers</u>	141
<u>Termination Fee</u>	142
<u>Expenses and Fees</u>	144
<u>Amendment, Waiver and Extension of the Merger Agreement</u>	144
<u>Employment and Services Agreements</u>	145
<u>ACCOUNTING TREATMENT</u>	146
<u>MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES OF THE MERGER</u>	147
<u>Tax Consequences of the Merger Generally</u>	147
<u>DESCRIPTION OF CAPITAL STOCK OF AMTECH</u>	149
<u>Authorized Capital Stock</u>	149
<u>Common Stock</u>	149
<u>Preferred Stock</u>	149
<u>COMPARISON OF STOCKHOLDERS' RIGHTS</u>	151
<u>COMPARATIVE MARKET PRICES AND DIVIDENDS</u>	157
<u>LEGAL MATTERS</u>	158
<u>EXPERTS</u>	158
<u>Amtech</u>	158
<u>BTU</u>	158
<u>DEADLINES FOR SUBMITTING STOCKHOLDER PROPOSALS</u>	158
<u>Amtech</u>	158
<u>BTU</u>	158
<u>VOTING AND MANAGEMENT INFORMATION</u>	159
<u>Information if Proxies, Consents, or Authorizations Are to Be Solicited</u>	159
<u>WHERE YOU CAN FIND MORE INFORMATION</u>	163
<u>ANNEX A Merger Agreement</u>	A-1
<u>ANNEX B Opinion of Stifel, Nicolaus & Company, Incorporated</u>	B-1
<u>ANNEX C Opinion of Needham & Company, LLC</u>	C-1
<u>PART II INFORMATION NOT REQUIRED IN PROSPECTUS</u>	II-1

<u>Item 20. Indemnification of Directors and Officers</u>	II-1
<u>Item 21. Exhibits and Financial Statement Schedules</u>	II-2
<u>Item 22. Undertakings</u>	II-2
<u>SIGNATURES</u>	II-4
<u>EXHIBIT INDEX</u>	II-5

Table of Contents

QUESTIONS AND ANSWERS

The following are some questions that you may have about the merger and the BTU special meeting or the Amtech special meeting and brief answers to those questions. We urge you to read carefully the remainder of this joint proxy statement/prospectus because the information in this section does not provide all of the information that might be important to you with respect to the merger and the BTU special meeting or the Amtech special meeting. Additional important information is also contained in the documents incorporated by reference into this joint proxy statement/prospectus. See **Where You Can Find More Information** beginning on page 163.

Unless the context otherwise requires, references in this joint proxy statement/prospectus to **Amtech** refer to Amtech Systems, Inc., an Arizona corporation, and its affiliates, and references to **BTU** refer to BTU International, Inc., a Delaware corporation, and its affiliates.

Q: What is the merger?

A: Amtech and BTU have entered into an Agreement and Plan of Merger, dated as of October 21, 2014 (which we refer to as the **merger agreement**).

Under the merger agreement, Merger Sub will be merged with and into BTU, with BTU surviving as a wholly owned subsidiary of Amtech. A copy of the merger agreement is included in this joint proxy statement/prospectus as Annex A.

The merger cannot be completed unless, among other things, both Amtech stockholders and BTU stockholders approve their respective proposals to adopt the merger agreement.

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

A: We are delivering this document to you because it is a joint proxy statement being used by both the Amtech and BTU boards of directors to solicit proxies of their respective stockholders in connection with approval of the merger and related matters.

In order to approve the merger and related matters, Amtech has called a special meeting of its stockholders (which we refer to as the **Amtech special meeting**). This document serves as proxy statement for the Amtech special meeting and describes the proposals to be presented at the Amtech special meeting.

In order to approve the merger and related matters, BTU has called a special meeting of its stockholders (which we refer to as the **BTU special meeting**). This document serves as proxy statement for the BTU special meeting and describes the proposals to be presented at the BTU special meeting.

Finally, this document is also a prospectus that is being delivered to BTU stockholders because Amtech is offering shares of its common stock to BTU stockholders in connection with the merger.

This joint proxy statement/prospectus contains important information about the merger and the other proposals being voted on at the meetings. You should read it carefully and in its entirety. The enclosed materials allow you to have your shares voted by proxy without attending your meeting. Your vote is important. We encourage you to submit your proxy as soon as possible.

Q: In addition to the merger proposal, what else are BTU stockholders being asked to vote on?

A: In addition to the merger proposal, BTU is soliciting proxies from its stockholders with respect to two additional proposals; completion of the merger is not conditioned upon approval of these proposals:

a proposal to adjourn the BTU special meeting, if necessary or appropriate, to solicit additional proxies in favor of the BTU merger proposal; and

a proposal to approve, on an advisory (non-binding) basis, the compensation that certain executive officers of BTU may receive in connection with the merger pursuant to existing agreements or arrangements with BTU.

Table of Contents

Q: In addition to the merger proposal, what else are Amtech stockholders being asked to vote on?

A: In addition to the merger proposal, Amtech is soliciting proxies from its stockholders with respect to one additional proposal; completion of the merger is not conditioned upon approval of this proposal:

a proposal to adjourn the Amtech special meeting, if necessary or appropriate, to solicit additional proxies in favor of the Amtech merger proposal (which we refer to as the Amtech adjournment proposal).

Q: What will BTU stockholders receive in the merger?

A: If the merger is completed, BTU stockholders will receive 0.3291 shares of Amtech common stock (which we refer to as the exchange ratio) for each share of BTU common stock held immediately prior to the merger. Amtech will not issue any fractional shares of Amtech common stock in the merger. BTU stockholders who would otherwise be entitled to a fractional share of Amtech common stock upon the completion of the merger will instead receive, in lieu thereof, one whole share of Amtech common stock.

Q: What will Amtech stockholders receive in the merger?

A: If the merger is completed, Amtech stockholders will not receive any merger consideration and will continue to hold the shares of Amtech common stock that they currently hold. Following the merger, shares of Amtech common stock will continue to be traded on NASDAQ.

Q: How will the merger affect BTU equity awards?

A: The BTU equity awards will be affected as follows:

Restricted Stock: Each restricted stock unit relating to BTU common stock granted to any employee or director of BTU, any of its subsidiaries or any of its predecessors under any BTU stock plan that is outstanding immediately prior to the effective time of the merger shall, by virtue of the merger and without any action on the part of the holder thereof, become a fully vested and unrestricted share of BTU common stock immediately prior to the effective time of the merger.

Stock Options: Each outstanding option to purchase shares of BTU common stock will be converted into an option to purchase Amtech common stock on the same terms and conditions as were applicable prior to the merger (taking into account any acceleration or vesting by reason of the consummation of the merger and its related transactions), except that (i) the number of shares of Amtech common stock subject to the new option will be equal to the product of (A) the number of shares of BTU common stock subject to the existing option and (B) the exchange ratio (rounding fractional shares down to the nearest whole share), and (ii) the exercise price per share of Amtech common stock under the new option will be equal to the exercise price per share of BTU common stock of the existing option divided by the exchange ratio (rounded up to the nearest whole cent).

Q: Will the value of the merger consideration change between the date of this joint proxy statement/prospectus and the time the merger is completed?

A: Although the number of shares of Amtech common stock that BTU stockholders will receive is fixed through the exchange ratio, the value of the merger consideration will fluctuate between the date of this joint proxy statement/prospectus and the completion of the merger based upon the market value for Amtech common stock. Any fluctuation in the market price of Amtech common stock after the date of this joint proxy statement/prospectus will change the value of the shares of Amtech common stock that BTU stockholders will receive.

Q: How does BTU's board of directors recommend that I vote at the special meeting?

A: BTU's board of directors unanimously recommends that you vote **FOR** the BTU merger proposal, **FOR** the BTU adjournment proposal, and **FOR** the BTU merger-related compensation proposal.

Table of Contents

Q: How does Amtech's board of directors recommend that I vote at the special meeting?

A: Amtech's board of directors unanimously recommends that you vote **FOR** the Amtech merger proposal and **FOR** the Amtech adjournment proposal.

Q: When and where are the meetings?

A: The BTU special meeting will be held at 23 Esquire Road, North Billerica, MA 01862 on January 29, 2015, at 10:00 a.m. local time.

The Amtech special meeting will be held at The Tempe Mission Palms Hotel, 60 East 5th Street, Tempe, Arizona, USA on January 29, 2015, at 9:00 a.m. local time.

Q: What do I need to do now?

A: After you have carefully read this joint proxy statement/prospectus and have decided how you wish to vote your shares, please vote your shares promptly so that your shares are represented and voted at the Amtech special meeting or BTU special meeting, as applicable. If you hold your shares in your name as a stockholder of record, you must complete, sign, date and mail your proxy card in the enclosed postage-paid return envelope as soon as possible. Alternatively, you may vote through the internet or by telephone. Information and applicable deadlines for voting through the internet or by telephone are set forth in the enclosed proxy card instructions. If you hold your shares in street name through a bank or broker, you must direct your bank or broker how to vote in accordance with the instructions you have received from your bank or broker. Street name stockholders who wish to vote in person at the special meeting or special meeting will need to obtain a legal proxy from the institution that holds their shares.

Q: What constitutes a quorum for the BTU special meeting?

A: The presence at the BTU special meeting, in person or by proxy, of holders of a majority of the issued and outstanding shares of BTU common stock entitled to vote at the special meeting will constitute a quorum for the transaction of business. Abstentions and broker non-votes, if any, will be included in determining the number of shares present at the meeting for the purpose of determining the presence of a quorum.

Q: What constitutes a quorum for the Amtech special meeting?

A: The presence at the Amtech special meeting, in person or by proxy, of holders of a majority of the outstanding shares of Amtech common stock entitled to vote at the special meeting will constitute a quorum for the transaction of business. Abstentions and broker non-votes, if any, will be included in determining the number of shares present at the meeting for the purpose of determining the presence of a quorum.

Q: What is the vote required to approve each proposal?

A: *BTU merger proposal:*

Standard: Approval of the BTU merger proposal requires the affirmative vote of the holders of at least two-thirds of the outstanding shares of BTU common stock entitled to vote on the proposal.

Effect of abstentions and broker non-votes: If you fail to vote, mark **ABSTAIN** on your proxy or fail to instruct your bank or broker with respect to the BTU merger proposal, it will have the same effect as a vote **AGAINST** the proposal.

BTU adjournment proposal:

Standard: The affirmative vote of a majority of votes cast (in person or by proxy) at the BTU special meeting and entitled to vote on such proposal, whether or not a quorum is present.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the BTU special meeting or fail to instruct your bank or broker how to vote with respect to the BTU adjournment proposal or the BTU merger-related compensation proposal, it will have no effect on such proposals.

Table of Contents

BTU merger-related compensation proposal:

Standard: The affirmative vote of a majority of votes cast (in person or by proxy) at the BTU special meeting and entitled to vote on such proposal.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the BTU special meeting or fail to instruct your bank or broker how to vote with respect to the BTU adjournment proposal or the BTU merger-related compensation proposal, it will have no effect on such proposals.

Although BTU is submitting the merger-related compensation proposal for consideration and approval, the approval of such proposal pursuant to the standard set forth above is not a condition to completion of the merger, and the vote with respect to such proposal is advisory only and will not be binding on Amtech or BTU. If the merger is completed, the merger-related compensation may be paid to BTU's named executive officers to the extent payable in accordance with the terms of the compensation agreements and arrangements even if BTU stockholders fail to approve the advisory vote regarding merger-related compensation.

Q: What is the vote required to approve each proposal at the Amtech special meeting?

A: Amtech merger proposal:

Standard: Approval of the Amtech merger proposal requires the affirmative vote of the holders of at least a majority of the outstanding shares of Amtech common stock entitled to vote on the proposal.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the Amtech special meeting or fail to instruct your bank or broker how to vote with respect to the Amtech merger proposal, it will have the same effect as a vote **AGAINST** the proposal.

Amtech adjournment proposal:

Standard: The Amtech adjournment proposal will be approved if a majority of the votes cast (in person or by proxy) at the Amtech special meeting, and entitled to vote on such proposal, are voted in favor of the Amtech adjournment proposal.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the Amtech special meeting or fail to instruct your bank or broker how to vote with respect to the Amtech adjournment proposal, it will have no effect on such proposal.

Q: What impact will my vote have on the amounts that certain executive officers of BTU may receive in connection with the merger?

A: Certain of BTU's executive officers are entitled, pursuant to the terms of their compensation arrangements, to receive certain payments in connection with the merger. If the merger is completed, BTU is contractually obligated to make these payments to these executives under certain circumstances. Accordingly, even if the BTU stockholders vote not to approve these payments, the compensation will be payable, subject to the terms and conditions of the arrangements. BTU is seeking your approval of these payments, on an advisory (non-binding) basis, in order to comply with the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 and related SEC rules.

Q: Why is my vote important?

A: If you do not vote, it will be more difficult for Amtech or BTU to obtain the necessary quorum to hold their special meetings. In addition, your failure to submit a proxy or vote in person, or failure to instruct your bank or broker how to vote, or abstention will have the same effect as a vote AGAINST adoption of the merger agreement. The merger agreement must be adopted by the affirmative vote of at least a majority of the outstanding shares of Amtech common stock entitled to vote on the Amtech merger proposal and by the affirmative vote of at least two-thirds of the outstanding shares of BTU common stock entitled to vote on the BTU merger proposal. The Amtech board of directors and the BTU board of directors unanimously recommend that you vote FOR the Amtech merger proposal and the BTU merger proposal, respectively.

Table of Contents

Q: If my shares of common stock are held in street name by my bank or broker, will my bank or broker automatically vote my shares for me?

A: Amtech stockholders: No. Your bank or broker cannot vote your shares without instructions from you. You should instruct your bank or broker how to vote your shares in accordance with the instructions provided to you. Please check the voting form used by your bank or broker.

BTU stockholders: No. Your bank or broker cannot vote your shares without instructions from you. You should instruct your bank or broker how to vote your shares in accordance with the instructions provided to you. Please check the voting form used by your bank or broker.

Q: Can I attend the meeting and vote my shares in person?

A: Yes. All stockholders of Amtech and BTU, including stockholders of record and stockholders who hold their shares through banks, brokers, nominees or any other holder of record, are invited to attend their respective meetings. Holders of record of Amtech and BTU common stock can vote in person at the Amtech special meeting and BTU special meeting, respectively. If you are not a stockholder of record, you must obtain a proxy card, executed in your favor, from the record holder of your shares, such as a broker, bank or other nominee, to be able to vote in person at the meetings. If you plan to attend your meeting, you must hold your shares in your own name or have a letter from the record holder of your shares confirming your ownership. In addition, BTU stockholders who plan to attend the BTU special meeting must bring a government issued proof of identification that includes a photo in order to be admitted. Amtech and BTU reserve the right to refuse admittance to anyone without proper proof of share ownership or, in the case of BTU, without proper photo identification. The use of cameras, sound recording equipment, communications devices or any similar equipment during the Amtech special meeting or BTU special meeting is prohibited without Amtech's or BTU's express written consent, respectively.

Q: Can I change my vote?

A: Amtech stockholders: Yes. If you are a holder of record of Amtech common stock, you may revoke any proxy at any time before it is voted by (1) signing and returning a proxy card with a later date, (2) delivering a written revocation letter to Amtech's corporate secretary, (3) attending the special meeting in person, notifying the corporate secretary and voting by ballot at the special meeting, or (4) voting by telephone or the internet at a later time. Attendance at the special meeting will not automatically revoke your proxy. A revocation or later-dated proxy received by Amtech after the vote will not affect the vote. Amtech's corporate secretary's mailing address is: Corporate Secretary, Amtech Systems, Inc., 131 South Clark Drive, Tempe, Arizona 85281. If you hold your shares in street name through a bank or broker, you should contact your bank or broker to revoke your proxy.

BTU stockholders: Yes. If you are a holder of record of BTU common stock, you may revoke any proxy at any time before it is voted by (1) signing and returning a proxy card with a later date, (2) delivering a written revocation letter to BTU's corporate secretary, (3) attending the special meeting in person, notifying the corporate secretary and voting by ballot at the special meeting, or (4) voting by telephone or the internet at a later time. Attendance at the special meeting by itself will not automatically revoke your proxy. A revocation or later-dated proxy received by BTU after the vote will not affect the vote. BTU's corporate secretary's mailing address is: Secretary, BTU International, Inc., 23

Esquire Road, North Billerica, Massachusetts 01862. If you hold your shares in street name through a bank or broker, you should contact your bank or broker to revoke your proxy.

Q: Will Amtech be required to submit the proposal to adopt the merger agreement to its stockholders even if Amtech's board of directors has withdrawn, modified or qualified its recommendation?

A: Yes. Unless the merger agreement is terminated before the Amtech special meeting, Amtech is required to submit the proposal to adopt the merger agreement to its stockholders even if Amtech's board of directors has withdrawn or modified its recommendation.

Table of Contents

Q: Will BTU be required to submit the proposal to adopt the merger agreement to its stockholders even if BTU's board of directors has withdrawn, modified or qualified its recommendation?

A: Yes. Unless the merger agreement is terminated before the BTU special meeting, BTU is required to submit the proposal to adopt the merger agreement to its stockholders even if BTU's board of directors has withdrawn or modified its recommendation.

Q: What are the U.S. federal income tax consequences of the merger to BTU stockholders?

A: The merger is intended to qualify as a reorganization within the meaning of Section 368(a) of the Code, and holders of BTU common stock are not expected to recognize any gain or loss for U.S. federal income tax purposes on the exchange of shares of BTU common stock for shares of Amtech common stock in the merger.

For further information, see Material U.S. Federal Income Tax Consequences of the Merger beginning on page 147.

The U.S. federal income tax consequences described above may not apply to all holders of BTU common stock. Your tax consequences will depend on your individual situation. Accordingly, we strongly urge you to consult your independent tax advisor for a full understanding of the particular tax consequences of the merger to you.

Q: Are BTU stockholders entitled to dissenters' rights?

A: No, BTU stockholders are not expected to be entitled to dissenters' rights. For further information, see The Merger Dissenters' Rights in the Merger beginning on page 133.

Q: If I am a BTU stockholder, should I send in my BTU stock certificates now?

A: No. Please do not send in your BTU stock certificates with your proxy. After the merger, an exchange agent will send you instructions for exchanging BTU stock certificates for the merger consideration. See The Merger Agreement Conversion of Shares; Exchange of Certificates beginning on page 135.

Q: What should I do if I hold my shares of BTU common stock in book-entry form?

A: You are not required to take any special additional actions if your shares of BTU common stock are held in book-entry form. After the completion of the merger, shares of BTU common stock held in book-entry form automatically will be exchanged for the merger consideration.

Q: Whom may I contact if I cannot locate my BTU stock certificate(s)?

A: If you are unable to locate your original BTU stock certificate(s), you should contact Computershare, BTU's transfer agent, at (800) 962-4284.

Q: What should I do if I receive more than one set of voting materials?

A: Amtech stockholders and BTU stockholders may receive more than one set of voting materials, including multiple copies of this joint proxy statement/prospectus and multiple proxy cards or voting instruction cards. For example, if you hold shares of Amtech and/or BTU common stock in more than one brokerage account, you will receive a separate voting instruction card for each brokerage account in which you hold such shares. If you are a holder of record of Amtech common stock or BTU common stock and your shares are registered in more than one name, you will receive more than one proxy card. In addition, if you are a holder of both Amtech common stock and BTU common stock, you will receive one or more separate proxy cards or voting instruction cards for each company. Please complete, sign, date and return each proxy card and voting instruction card that you receive or otherwise follow the voting instructions set forth in this joint proxy statement/prospectus to ensure that you vote every share of Amtech common stock and/or BTU common stock that you own.

Table of Contents

Q: When do you expect to complete the merger?

A: Amtech and BTU expect to complete the merger in the first calendar quarter of 2015. However, neither Amtech nor BTU can assure you of when or if the merger will be completed. Amtech and BTU must first obtain the approval of Amtech stockholders and BTU stockholders for the merger, as well as satisfy certain other closing conditions.

Q: What happens if the merger is not completed?

A: If the merger is not completed, holders of BTU common stock will not receive any consideration for their shares in connection with the merger. Instead, BTU will remain an independent public company and its common stock will continue to be listed and traded on NASDAQ. In addition, if the merger agreement is terminated in certain circumstances, a termination fee or expense reimbursement fee may be required to be paid by either Amtech or BTU. See The Merger Agreement Termination Fee beginning on page 142 for a complete discussion of the circumstances under which termination fees will be required to be paid.

Q: Whom should I call with questions?

A: *Amtech stockholders:* If you have any questions concerning the merger or this joint proxy statement/prospectus, would like additional copies of this joint proxy statement/prospectus or need help voting your shares of Amtech common stock, please contact Amtech's proxy solicitor, Georgeson, Inc., at (866) 647-8872.

BTU stockholders: If you have any questions concerning the merger or this joint proxy statement/prospectus, would like additional copies of this joint proxy statement/prospectus or need help voting your shares of BTU common stock, please contact BTU's proxy solicitor, Georgeson, Inc., at (866) 821-2570.

Table of Contents

SUMMARY

This summary highlights selected information from this joint proxy statement/prospectus. It may not contain all of the information that is important to you. We urge you to read carefully the entire joint proxy statement/prospectus, including the annexes, and the other documents to which we refer in order to fully understand the merger. See **Where You Can Find More Information** beginning on page 163. Each item in this summary refers to the page of this joint proxy statement/prospectus on which that subject is discussed in more detail.

In the Merger, BTU Common Stockholders Will Receive Shares of Amtech Common Stock (page 100)

Amtech and BTU are proposing a strategic merger. If the merger is completed, BTU common stockholders will receive 0.3291 shares of Amtech common stock for each share of BTU common stock they hold immediately prior to the merger. Amtech will not issue any fractional shares of Amtech common stock in the merger. BTU stockholders who would otherwise be entitled to a fraction of a share of Amtech common stock upon the completion of the merger will instead receive, in lieu thereof, one whole share of Amtech common stock. *For example, if you hold 100 shares of BTU common stock, you will receive 32 shares of Amtech common stock plus an additional whole share of Amtech common stock instead of the 0.91 shares of Amtech common stock that you otherwise would have received (100 shares \times 0.3291 = 32.91 shares).*

Amtech common stock is listed on NASDAQ under the symbol **ASYS**, and BTU common stock is listed on NASDAQ under the symbol **BTUI**. The following table shows the closing sale prices of Amtech common stock and BTU common stock as reported on NASDAQ on October 21, 2014, the last full trading day before the public announcement of the merger agreement, and on December 15, 2014, the last practicable trading day before the date of this joint proxy statement/prospectus. This table also shows the implied value of the merger consideration payable for each share of BTU common stock, which we calculated by multiplying the closing price of Amtech common stock on those dates by the exchange ratio of 0.3291.

	Amtech Common Stock	BTU Common Stock	Implied Value of One Share of BTU Common Stock
October 21, 2014	\$ 10.13	\$ 3.20	\$ 3.33
December 15, 2014	\$ 7.71	\$ 2.48	\$ 2.54

The merger agreement governs the merger. The merger agreement is included in this joint proxy statement/prospectus as Annex A. All descriptions in this summary and elsewhere in this joint proxy statement/prospectus of the terms and conditions of the merger are qualified by reference to the merger agreement. Please read the merger agreement carefully for a more complete understanding of the merger.

Amtech's Board of Directors Unanimously Recommends that Amtech Stockholders Vote FOR the Adoption of the Merger Agreement and the Other Proposals Presented at the Amtech Special Meeting (page 117)

Amtech's board of directors has determined that the merger, the merger agreement and the transactions contemplated by the merger agreement are advisable and in the best interests of Amtech and its stockholders and has unanimously approved the merger agreement. Amtech's board of directors unanimously recommends that Amtech stockholders vote **FOR** the adoption of the merger agreement and **FOR** the other proposals presented at the Amtech special meeting. For

the factors considered by Amtech's board of directors in reaching its decision to approve the merger agreement, see The Merger Amtech's Reasons for the Merger; Recommendation of Amtech's Board of Directors beginning on page 117.

BTU's Board of Directors Unanimously Recommends that BTU Stockholders Vote FOR the Adoption of the Merger Agreement and the Other Proposals Presented at the BTU Special Meeting (page 106)

BTU's board of directors has determined that the merger, the merger agreement and the transactions contemplated by the merger agreement are advisable and in the best interests of BTU and its stockholders and has unanimously approved the merger agreement. BTU's board of directors unanimously recommends that BTU stockholders vote FOR the adoption of the merger

Table of Contents

agreement and FOR the other proposals presented at the BTU special meeting. For the factors considered by BTU's board of directors in reaching its decision to approve the merger agreement, see The Merger BTU's Reasons for the Merger; Recommendation of BTU's Board of Directors beginning on page 106.

Opinion of Amtech's Financial Advisor (page 118 and Annex B)

Opinion of Stifel, Nicolaus & Company, Incorporated

In connection with its consideration of the merger, on October 20, 2014, the Amtech board of directors received from Stifel, Nicolaus & Company, Incorporated, Amtech's financial advisor (which we refer to as Stifel), its written opinion to the effect that, as of such date and subject to and based on the assumptions made, procedures followed, matters considered, limitations of the review undertaken and qualifications set forth in its opinion, the exchange ratio in the merger was fair, from a financial point of view, to the stockholders of Amtech. The full text of Stifel's written opinion is attached as Annex B to this joint proxy statement/prospectus. You should read the entire opinion for a discussion of, among other things, the assumptions made, procedures followed, matters considered and limitations on the review undertaken by Stifel in rendering its opinion. **Stifel provided its opinion to Amtech's board of directors (in its capacity as such) for the benefit and use of Amtech's board of directors in connection with and for purposes of its evaluation of the exchange ratio provided for in the merger from a financial point of view. Stifel's opinion does not address any other aspect of the merger and no opinion or view was expressed as to the relative merits of the merger in comparison to other strategies or transactions that might be available to Amtech or in which Amtech might engage or as to the underlying business decision of Amtech to proceed with or effect the merger. Stifel's opinion does not address any other aspect of the merger and does not constitute a recommendation to any stockholder as to how to vote or act in connection with the proposed merger or any related matter. Stifel's written opinion is addressed to the Amtech board of directors, is directed only to the exchange ratio in the merger and does not constitute a recommendation to any Amtech stockholder as to how such stockholder should vote with respect to the merger or any other matter.**

For further information, see The Merger Opinion of Stifel beginning on page 118.

Opinion of BTU's Financial Advisor (page 110 and Annex C)

Opinion of Needham & Company, LLC

In connection with the merger, the BTU board of directors received from Needham & Company, LLC (which we refer to as Needham & Company), BTU's financial advisor, its oral opinion, which opinion was confirmed by delivery of a written opinion, dated October 21, 2014, that, as of such date and based upon and subject to the assumptions and other matters described in the written opinion, the exchange ratio of 0.3291 pursuant to the merger agreement was fair, from a financial point of view, to the holders of BTU common stock (other than Amtech or BTU or any of their respective subsidiaries). **The complete text of Needham & Company's opinion, which sets forth the assumptions made, procedures followed, matters considered, and qualifications and limitations on and scope of the review undertaken by Needham & Company in connection with the opinion, is attached to this joint proxy statement/prospectus as Annex C and is incorporated by reference in this joint proxy statement/prospectus. Needham & Company provided its opinion to the BTU board of directors for the information and assistance of the BTU board of directors in connection with and for purposes of its evaluation of the transactions contemplated by the merger agreement. Needham & Company's opinion does not address any other aspect of the merger, or any related transaction, and does not constitute a recommendation to any stockholder of BTU as to how that stockholder should vote with respect to the merger or act upon any matter relating to the merger.**

For further information, see *The Merger Opinion of Needham & Company* beginning on page 110.

What Holders of BTU Stock Options and Other Equity-Based Awards Will Receive (page 135)

Stock Options. At the effective time of the merger, each outstanding option to purchase shares of BTU common stock will be converted into an option to purchase Amtech common stock on the same terms and conditions as were applicable prior to the merger (taking into account any acceleration or vesting by reason of the consummation of the merger and its related transactions),

Table of Contents

except that (i) the number of shares of Amtech common stock subject to the new option will be equal to the product of (A) the number of shares of BTU common stock subject to the existing option and (B) the exchange ratio (rounding fractional shares down to the nearest whole share), and (ii) the exercise price per share of Amtech common stock under the new option will be equal to the exercise price per share of BTU common stock of the existing option divided by the exchange ratio (rounded up to the nearest whole cent).

Restricted Stock. Each restricted stock unit relating to BTU common stock granted to any employee or director of BTU, any of its subsidiaries or any of its predecessors under any BTU stock plan that is outstanding immediately prior to the effective time of the merger shall, by virtue of the merger and without any action on the part of the holder thereof, become a fully vested and unrestricted share of BTU common stock immediately prior to the effective time of the merger.

Amtech Will Hold its Special Meeting on January 29, 2015 (page 44)

The special meeting of Amtech stockholders will be held on January 29, 2015, at 9:00 a.m. local time, at The Tempe Mission Palms Hotel, 60 East 5th Street, Tempe, Arizona, USA. At the special meeting, Amtech stockholders will be asked to:

approve the Amtech merger proposal; and

approve the Amtech adjournment proposal

Only holders of record at the close of business on December 16, 2014 will be entitled to vote at the special meeting. Each share of Amtech common stock is entitled to one vote on each proposal to be considered at the Amtech special meeting. As of the record date, there were 9,869,916 shares of Amtech common stock entitled to vote at the special meeting. As of the record date, the directors and executive officers of Amtech and their affiliates beneficially owned and were entitled to vote approximately 180,137 shares of Amtech common stock representing approximately 1.8% of the shares of Amtech common stock outstanding on that date.

BTU Will Hold its Special Meeting on January 29, 2015 (page 38)

The special meeting of BTU stockholders will be held on January 29, 2015, at 10:00 a.m. local time, at 23 Esquire Road, North Billerica, MA 01862. At the special meeting, BTU stockholders will be asked to:

approve the BTU merger proposal;

approve the BTU adjournment proposal; and

approve the BTU merger-related compensation proposal.

Only holders of record at the close of business on December 16, 2014 will be entitled to vote at the special meeting. Each share of BTU common stock is entitled to one vote on each proposal to be considered at the BTU special meeting. As of the record date, there were 9,591,671 shares of BTU common stock entitled to vote at the special

meeting. As of the record date, the directors and executive officers of BTU and their affiliates beneficially owned and were entitled to vote approximately 1,721,184 outstanding shares of BTU common stock representing approximately 17.9% of the shares of BTU common stock outstanding on that date.

Required Vote; Treatment of Abstentions and Failure to Vote (pages 39 and 45)

Amtech merger proposal:

Standard: The affirmative vote of a majority of the outstanding shares of Amtech common stock entitled to vote on the proposal.

Effect of abstentions and broker non-votes: If you mark ABSTAIN on your proxy card, fail to submit a proxy card or vote in person at the Amtech special meeting or fail to instruct your bank or broker how to vote with respect to the Amtech merger proposal, it will have the same effect as a vote AGAINST the proposal.

Table of Contents

Amtech adjournment proposal:

Standard: The affirmative vote of a majority of votes cast (in person or by proxy) at the Amtech special meeting and entitled to vote on such proposals.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the Amtech special meeting or fail to instruct your bank or broker how to vote with respect to the Amtech adjournment proposal, it will have no effect on such proposal.

BTU merger proposal:

Standard: Approval of the BTU merger proposal requires the affirmative vote of the holders of at least two-thirds of the outstanding shares of BTU common stock entitled to vote on the proposal.

Effect of abstentions and broker non-votes: If you fail to vote, mark **ABSTAIN** on your proxy or fail to instruct your bank or broker with respect to the Amtech merger proposal, it will have the same effect as a vote **AGAINST** the proposal.

BTU adjournment proposal:

Standard: The affirmative vote of a majority of votes cast (in person or by proxy) at the BTU special meeting and entitled to vote on such proposal, whether or not a quorum is present.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the BTU special meeting or fail to instruct your bank or broker how to vote with respect to the BTU adjournment proposal or the BTU merger-related compensation proposal, it will have no effect on such proposals.

BTU merger-related compensation proposal:

Standard: The affirmative vote of a majority of votes cast (in person or by proxy) at the BTU special meeting and entitled to vote on such proposal.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the BTU special meeting or fail to instruct your bank or broker how to vote with respect to the BTU adjournment proposal or the BTU merger-related compensation proposal, it will have no effect on such proposals.

Although BTU is submitting the merger-related compensation proposal for consideration and approval, the approval of such proposal pursuant to the standard set forth above is not a condition to completion of the merger, and the vote

with respect to such proposal is advisory only and will not be binding on Amtech or BTU. If the merger is completed, the merger-related compensation may be paid to BTU's named executive officers to the extent payable in accordance with the terms of the compensation agreements and arrangements even if BTU stockholders fail to approve the advisory vote regarding merger-related compensation.

The Merger Will Be Tax-Free to Holders of BTU Common Stock as to the Shares of Amtech Common Stock They Receive (page 147)

The merger will be treated as a reorganization within the meaning of Section 368(a) of the Internal Revenue Code, and it is a condition to the respective obligations of each of Amtech and BTU to complete the merger that it receives a legal opinion to that effect. Subject to the limitations and qualifications described in Material U.S. Federal Income Tax Consequences of the Merger, the merger generally will be tax-free to a holder of BTU common stock for U.S. federal income tax purposes as to the shares of Amtech common stock he or she receives in the merger.

For further information, see Material U.S. Federal Income Tax Consequences of the Merger beginning on page 147.

The U.S. federal income tax consequences described above may not apply to all holders of BTU common stock. Your tax consequences will depend on your individual situation. Accordingly, we strongly urge you to consult your independent tax advisor for a full understanding of the particular tax consequences of the merger to you.

Table of Contents

BTU's Officers and Directors Have Financial Interests in the Merger that Differ from Your Interests (page 126)

BTU stockholders should be aware that some of BTU's directors and executive officers have interests in the merger and have arrangements that are different from, or in addition to, those of BTU stockholders generally. BTU's board of directors were aware of these interests and considered these interests, among other matters, when making its decision to approve the merger agreement, and in recommending that BTU stockholders vote in favor of adopting the merger agreement.

These interests include the following:

Mr. van der Wansem has entered into a one-year employment agreement with Amtech, which will become effective if the merger is consummated. He has also entered into a two-year consulting agreement with Amtech, which will become effective following the completion of the employment agreement. Amtech has also agreed to nominate Mr. van der Wansem to its board of directors for a period of three years following the consummation of the merger.

Mr. Tallian, who is expected to continue employment with Amtech following the merger, has amended his employment agreement with BTU, which will become effective if the merger is consummated.

Messrs. van der Wansem, Tallian, and McCaffrey will receive, pursuant to their employment agreements with BTU, certain merger-related compensation if the merger is consummated.

For further information, see *The Merger Interests of BTU's Directors and Executive Officers in the Merger* beginning on page 126.

BTU Stockholders Are Not Expected To Be Entitled To Assert Dissenters' Rights (page 133)

Under the Delaware General Corporation Law (which we refer to as the *DGCL*), which is the law under which BTU is incorporated, the holders of BTU common stock will not be entitled to any appraisal rights or dissenters' rights in connection with the merger if, on the record date for the BTU special meeting, their shares are listed on a national securities exchange. BTU common stock is currently listed on NASDAQ, a national securities exchange, and is expected to continue to be so listed on the record date for the BTU special meeting. For more information, see *The Merger Dissenters' Rights in the Merger* beginning on page 133.

Conditions that Must Be Satisfied or Waived for the Merger To Occur (page 137)

Currently, Amtech and BTU expect to complete the merger in the first calendar quarter of 2015. As more fully described in this joint proxy statement/prospectus and in the merger agreement, the completion of the merger depends on a number of conditions being satisfied or, where legally permissible, waived. These conditions include (1) adoption of the merger agreement by Amtech's stockholders and by BTU's stockholders, (2) authorization for listing on NASDAQ of the shares of Amtech common stock to be issued in the merger, (3) effectiveness of the registration statement of which this joint proxy statement/prospectus is a part, (4) the absence of any order, injunction or other legal restraint preventing the completion of the merger or making the completion of the merger illegal, (5) subject to the materiality standards provided in the merger agreement, the accuracy of the representations and warranties of Amtech and BTU and no material adverse change with respect to the respective businesses having occurred,

(6) performance in all material respects by each of Amtech and BTU of its obligations under the merger agreement and (7) receipt by each of Amtech and BTU of an opinion from its counsel as to certain tax matters.

Neither Amtech nor BTU can be certain when, or if, the conditions to the merger will be satisfied or waived, or that the merger will be completed.

Termination of the Merger Agreement (page 142)

The merger agreement can be terminated at any time prior to completion of the merger in the following circumstances:

by mutual written consent of Amtech and BTU;

Table of Contents

by either the board of directors of Amtech or the board of directors of BTU if the merger has not been consummated on or before 120 days following the date this joint proxy statement/prospectus is filed with the SEC (the outside date), provided, that the party seeking to terminate the merger agreement has not materially breached any of its obligations in any manner that proximately causes or results in the failure of the merger to have been consummated by the outside date;

by either the board of directors of Amtech or the board of directors of BTU if any governmental entity shall have issued a final and nonappealable order permanently enjoining, restraining, or otherwise prohibiting the consummation of the transactions contemplated by the merger agreement, provided, however, that the right to terminate the merger agreement shall not be available to any party whose breach of any representation, warranty, covenant, or agreement set forth in the merger agreement is the cause of, or results in, the issuance, promulgation, enforcement or entry of any such order;

by either the board of directors of Amtech or the board of directors of BTU if the Amtech merger proposal shall not have been approved by the Amtech stockholders or the BTU merger proposal shall not have been approved by the BTU stockholders;

by Amtech, if BTU or the board of directors of BTU (A) (1) fails to recommend in this joint proxy statement/prospectus that the stockholders of BTU adopt the merger agreement, or withdraws, amends, modifies or materially qualifies such recommendation in a manner adverse to Amtech or Merger Sub, (2) recommends or endorses an alternative takeover proposal, (3) fails to recommend against acceptance of any tender offer or exchange offer for the shares of BTU common stock constituting a takeover proposal within ten business days after the commencement of such offer, (4) makes any public statement inconsistent with the BTU board recommendation in favor of the merger; or (5) resolves or agrees to take any of the foregoing actions; (B) permits BTU to enter into, or publicly announces its intention to enter into, any agreement or any contract relating to any takeover proposal; (C) fails to reaffirm (publicly, if requested by Amtech) its recommendation in favor of the merger within ten business days after the date any takeover proposal (or material modification thereto) is first publicly disclosed; (D) receives a tender offer or exchange offer for outstanding BTU common stock by a person unaffiliated with Amtech and does not send to its stockholders, within ten business days after such tender or exchange offer is first disclosed, a statement reaffirming the BTU board recommendation in favor of the merger with Amtech and recommending that BTU stockholders reject such tender or exchange offer; (E) publicly announces its intentions to do any of the foregoing; or (F) if BTU breaches any representation, warranty, covenant, or agreement such that the conditions to closing the merger would not be satisfied, and such breach is incapable of being cured by the outside date; provided, that Amtech gives BTU at least 30 days written notice prior to terminating the merger agreement, and provided, further, that Amtech cannot terminate the merger agreement if Amtech is then in material breach of any of its representations, warranties, covenants, or agreements; or

by BTU, if (A) prior to the receipt of the BTU stockholder approval, the BTU board of directors authorizes BTU to enter into any agreement or contract relating to a superior proposal; (B) Amtech or Merger Sub breaches any representation, warranty, covenant, or agreement such that the conditions to closing the merger would not be satisfied, and such breach is incapable of being cured by the outside date; provided, that BTU gives Amtech at least 30 days written notice prior to terminating the merger agreement, and provided, further, that BTU cannot terminate the merger agreement if BTU is then in material breach of any of its representations, warranties,

covenants, or agreements; or (C) Amtech fails to recommend in this joint proxy statement/prospectus that the stockholders of Amtech adopt the merger agreement, or withdraws, amends, modifies or materially qualifies such recommendation in a manner adverse to BTU, or makes any public statement inconsistent with the Amtech board recommendation in favor of the merger, or resolves or agrees to take any of the foregoing actions.

Termination Fee (page 142)

If the merger agreement is terminated under certain circumstances, including circumstances involving alternative acquisition proposals and changes in the recommendation of Amtech's or BTU's respective boards of directors, Amtech or BTU may be required to pay to the other party a termination fee equal to \$1,320,000. These termination fees could discourage other companies from seeking to acquire or merge with Amtech or BTU.

Table of Contents

Employment and Services Agreements (pages 145)

In connection with the execution of the merger agreement, Amtech entered into a one-year employment agreement with Mr. van der Wansem, to be effective as of and subject to the consummation of the merger, and a two-year consulting agreement with Mr. van der Wansem, which will become effective following the termination of the employment agreement. In addition, in connection with the execution of the merger agreement, Mr. Tallian entered into an amendment to his employment agreement, to be effective as of and subject to the consummation of the merger. Each agreement sets forth the terms and conditions of each individual's employment or consulting relationship following the consummation of the merger.

For more detail on the terms of these employment agreements or agreements for services, see *The Merger Interests of BTU's Directors and Officers in the Merger* beginning on page 126.

The Rights of BTU Stockholders Will Change as a Result of the Merger (page 151)

The rights of BTU stockholders will change as a result of the merger due to differences in Amtech's and BTU's governing documents and states of incorporation. The rights of BTU stockholders are governed by Delaware law and by BTU's certificate of incorporation and bylaws, each as amended to date. Upon the completion of the merger, BTU stockholders will become stockholders of Amtech and the rights of BTU stockholders will therefore be governed by Arizona law and Amtech's amended and restated articles of incorporation and amended and restated bylaws.

See *Comparison of Stockholders' Rights* beginning on page 151 for a description of the material differences in stockholders' rights under each of the Amtech and BTU governing documents.

Information About the Companies (page 48)

Amtech Systems, Inc.

Amtech Systems Inc. is an Arizona corporation that provides thermal processing systems, including related automation, parts and services for the solar / photovoltaic, semiconductor, silicon wafer and microelectromechanical systems industries and also offer PECVD (plasma-enhanced chemical vapor deposition) equipment to the solar industry. Amtech also produces consumables and machinery for lapping (fine abrading) and polishing of materials, such as sapphire substrates, optical components, silicon wafers, numerous types of crystal materials, ceramics and metal components. Current growth markets include LED lighting and mobile devices. Each of these market segments utilizes sapphire substrates manufactured using lapping and polishing technologies offered under Amtech's PR Hoffman brand name.

Amtech's stock is traded on NASDAQ under the symbol *ASYS*.

Amtech's principal office is located at 131 South Clark Drive Tempe, Arizona 85281. Additional information about Amtech and its subsidiaries is included in documents incorporated by reference in this joint proxy statement/prospectus. See *Where You Can Find More Information*, beginning on page 163.

BTU International, Inc.

BTU International, Inc., which was founded in 1950, was incorporated as a Delaware corporation in 1981 and is headquartered in North Billerica, Massachusetts. BTU operates as a single business segment called Thermal Processing Capital Equipment. Its business consists of the designing, manufacturing, selling and servicing of thermal

processing equipment and related process controls for use in the electronics, alternative energy, automotive and other industries. This includes the supply of solder reflow systems used for surface mount applications in printed circuit board assembly. Thermal processing equipment is used in: low temperature curing/encapsulation; hybrid integrated circuit manufacturing; integrated circuit packaging and sealing; and processing multi-chip modules. In addition, the equipment is used for solar cell processing, sintering nuclear fuel for commercial power generation, as well as brazing and the sintering of ceramics and powdered metals, and the deposition of precise thin film coatings. BTU's customers are multinational original equipment manufacturers and contract manufacturing companies.

Table of Contents

BTU's stock is traded on NASDAQ under the symbol BTUI .

BTU's principal office is located at 23 Esquire Road, North Billerica, Massachusetts 01862 where BTU owns a 150,000 square foot facility. BTU also operates an approximately 45,000 square foot leased manufacturing, engineering, sales and service facility in Shanghai, China. In England, BTU leases a facility for their European and Near East sales and service operations. In the Asia Pacific region, they lease sales and service offices in Singapore and Malaysia. See *Where You Can Find More Information*, beginning on page 163.

Litigation Relating to the Merger (page 133)

On November 4, 2014, a putative stockholder class action complaint was filed, purportedly on behalf of BTU's public stockholders, in the Court of Chancery of the State of Delaware against BTU, members of the BTU Board, Amtech, and Merger Sub. The complaint generally alleges, among other things, that the members of BTU's board of directors breached their fiduciary duties owed to BTU's public stockholders by causing BTU to enter into the merger agreement and by approving the merger, and that Amtech and Merger Sub aided and abetted such alleged breaches of fiduciary duties. In addition, the complaint alleges that the merger agreement improperly favors Amtech and unduly restricts BTU's ability to negotiate with other potential bidders. The complaint generally seeks, among other things, declaratory and injunctive relief concerning the alleged fiduciary breaches, injunctive relief prohibiting Amtech, Merger Sub, and BTU from consummating the Merger, other forms of equitable relief, and compensatory damages. Both Amtech and BTU believe that the claims are without merit and each intends to vigorously defend itself (and its directors) against the litigation.

On November 17, 2014, a separate putative stockholder class action complaint was filed, also purportedly on behalf of BTU's public stockholders, in the Court of Chancery of the State of Delaware against BTU, members of the BTU board, Amtech and Merger Sub. The complaint generally alleges, among other things, that the members of BTU's board of directors breached their fiduciary duties owed to BTU's public stockholders by failing to engage in a competitive sale and bidding process, and that Amtech and Merger Sub aided and abetted such alleged breaches of fiduciary duties. The complaint further alleges that these fiduciary breaches gave Amtech an unfair advantage on account of the BTU board's failing to solicit other potential acquirers. The complaint generally seeks, among other things, injunctive relief prohibiting the defendants from consummating the merger, compensatory damages for alleged breaches of fiduciary duties, and other forms of equitable relief. Both Amtech and BTU believe that the claims are without merit and each intends to vigorously defend itself (and its directors) against the litigation.

Risk Factors (page 29)

You should consider all the information contained in or incorporated by reference into this joint proxy statement/prospectus in deciding how to vote for the proposals presented in the joint proxy statement/prospectus. In particular, you should consider the factors described under *Risk Factors* beginning on page 29.

Table of Contents**SELECTED CONSOLIDATED HISTORICAL FINANCIAL DATA OF AMTECH**

The following selected consolidated financial information for the fiscal years ended September 30, 2010 through September 30, 2014 is derived from audited financial statements of Amtech. You should not assume the results of operations for any past periods indicate results for any future period. You should read this information in conjunction with Amtech's consolidated financial statements and related notes thereto included in Amtech's Annual Report on Form 10-K for the fiscal year ended September 30, 2014 which is incorporated by reference into this joint proxy statement/prospectus. See "Where You Can Find More Information" beginning on page 163.

	As of and for the years ended September 30,				
	2014	2013	2012	2011	2010
	(in thousands, except per share data)				
Operating Data:					
Net revenue	\$ 56,501	\$ 34,798	\$ 81,539	\$ 246,705	\$ 120,019
Gross profit	\$ 11,626	\$ 4,313	\$ 9,193	\$ 90,657	\$ 42,712
Operating income (loss)(1)	\$ (13,089)	\$ (19,994)	\$ (32,984)	\$ 38,279	\$ 15,909
Net income (loss) attributable to Amtech Systems, Inc.(2)	\$ (13,047)	\$ (20,069)	\$ (23,031)	\$ 22,882	\$ 9,563
Earnings (loss) per share attributable to Amtech Systems, Inc.:					
Basic earnings (loss) per share	\$ (1.34)	\$ (2.11)	\$ (2.43)	\$ 2.41	\$ 1.06
Diluted earnings (loss) per share	\$ (1.34)	\$ (2.11)	\$ (2.43)	\$ 2.34	\$ 1.04
Order backlog	\$ 28,522	\$ 26,766	\$ 18,703	\$ 85,892	\$ 94,427
Balance Sheet Data:					
Cash and cash equivalents	\$ 27,367	\$ 37,197	\$ 46,726	\$ 67,382	\$ 56,764
Working capital	\$ 32,289	\$ 42,861	\$ 58,832	\$ 89,797	\$ 65,638
Total assets	\$ 89,904	\$ 110,947	\$ 129,022	\$ 205,865	\$ 136,101
Total current liabilities	\$ 33,136	\$ 41,334	\$ 42,611	\$ 80,794	\$ 50,816
Total equity	\$ 53,588	\$ 66,803	\$ 84,051	\$ 122,331	\$ 84,243

(1) Includes \$0.3 million and \$3.7 million of expense related to inventory write-downs in fiscal 2014 and 2013, respectively. Includes \$12.8 million of expense related to inventory write-downs and loss contracts for inventory purchase commitments, and \$5.4 million of impairment charges in fiscal 2012. Includes \$2.9 million of expense related to reacquired shares in fiscal 2011.

(2) Includes \$1.7 million, \$2.0 million, \$5.6 million and \$0.9 million of losses in fiscal 2014, 2013, 2012 and 2011, respectively, resulting from the 55% controlling interest in Kingstone acquired February 18, 2011.

Table of Contents**SELECTED CONSOLIDATED HISTORICAL FINANCIAL DATA OF BTU**

The following selected consolidated financial information for the calendar years ended December 31, 2009 through December 31, 2013 is derived from audited financial statements of BTU. The financial information as of September 28, 2014 and September 29, 2013 and for the nine months ended September 28, 2014 and September 29, 2013 are derived from unaudited financial statements and, in the opinion of BTU's management, reflects all adjustments, consisting only of normal recurring adjustments, necessary for a fair presentation of this data for those dates. The results of operations for the nine months ended September 28, 2014 are not necessarily indicative of the results that may be expected for the entire year ending December 31, 2014. You should not assume the results of operations for any past periods indicate results for any future period. You should read this information in conjunction with BTU's consolidated financial statements and related notes thereto for the years ended December 31, 2013, 2012 and 2011 and the nine months ended September 28, 2014 and September 29, 2013, included elsewhere in this joint proxy statement/prospectus.

	Years Ended December 31,						
	Nine Months Ended September 28, 2014	Nine Months Ended September 29, 2013	2013	2012	2011	2010	2009
	(In thousands, except per share data)						
Consolidated Statement of Operations Data:							
Net sales	\$ 44,037	\$ 36,761	\$ 47,754	\$ 58,089	\$ 76,128	\$ 81,607	\$ 45,086
Cost of goods sold	26,925	25,103	33,048	41,617	47,542	47,851	32,706
Gross profit	17,112	11,658	14,706	16,472	28,586	33,756	12,380
Selling, general and administrative	14,622	15,237	19,786	20,965	22,721	23,063	18,957
Research, development and engineering	3,179	3,427	4,604	5,450	7,056	6,575	6,882
Restructuring				424	401		
Operating income (loss)	(689)	(7,006)	(9,684)	(10,367)	(1,592)	4,118	(13,459)
Interest income	26	36	53	63	77	81	236
Interest expense	(253)	(323)	(418)	(462)	(481)	(601)	(673)
Foreign exchange income (loss)	22	(147)	(193)	(224)	(139)	(33)	(278)
Other income (expense), net	10	63	65	58	365	(6)	44
Income (loss) before provision for income taxes	(884)	(7,377)	(10,177)	(10,932)	(1,770)	3,559	(14,130)
Provision for income taxes	308	1,083	1,291	65	952	1,378	435
Net income (loss)	\$ (1,192)	\$ (8,460)	\$ (11,468)	\$ (10,997)	\$ (2,722)	\$ 2,181	\$ (14,565)

Edgar Filing: AMTECH SYSTEMS INC - Form S-4/A

Income (loss) per share:

Basic	\$	(0.12)	\$	(0.89)	\$	(1.20)	\$	(1.16)	\$	(0.29)	\$	0.24	\$	(1.58)
Diluted	\$	(0.12)	\$	(0.89)	\$	(1.20)	\$	(1.16)	\$	(0.29)	\$	0.23	\$	(1.58)

Weighted average shares
outstanding:

Basic	9,564	9,536	9,539	9,509	9,434	9,277	9,222
Diluted	9,564	9,536	9,539	9,509	9,434	9,428	9,222

Table of Contents

	September		December 31,				
	28, 2014	September 29, 2013	2013	2012	2011	2010	2009
	(In thousands)						
Consolidated Balance Sheet Data:							
Cash and cash equivalents	\$ 10,428	\$ 16,672	\$ 13,991	\$ 20,218	\$ 18,948	\$ 22,753	\$ 25,397
Working capital	20,278	25,434	22,130	31,894	41,634	41,537	37,132
Total assets	39,255	42,262	40,330	48,669	56,718	67,645	58,794
Total liabilities	21,123	20,660	21,421	19,189	17,266	27,805	23,101
Stockholders equity	18,132	21,602	18,909	29,480	39,452	39,840	35,693

Table of Contents**SELECTED UNAUDITED PRO FORMA CONDENSED COMBINED FINANCIAL DATA**

The following table shows selected unaudited pro forma condensed combined financial data of Amtech after giving effect to the merger with BTU. The selected unaudited pro forma condensed combined financial data assumes that the merger is accounted for under the acquisition method of accounting with Amtech treated as the acquirer. Under the acquisition method of accounting, the assets and liabilities of BTU, as of the effective date of the merger, will be recorded by Amtech at their respective estimated fair values and the excess of the merger consideration over the fair value of BTU's net assets will be allocated to goodwill.

The table sets forth the information as if the merger had become effective on October 1, 2013, with respect to operating data, and on September 30, 2014, with respect to balance sheet data. The selected unaudited pro forma condensed combined financial data has been derived from, and should be read in conjunction with, the unaudited pro forma condensed combined financial information, including the notes thereto, which is included in this joint proxy statement/prospectus under Unaudited Pro Forma Condensed Combined Financial Information.

The selected unaudited pro forma condensed combined financial data is presented for informational purposes only and does not necessarily indicate the financial results that would have been achieved had the merger been completed as of the dates indicated or that may be achieved in the future and should not be taken as representative of future consolidated results of operations or financial condition of Amtech. Furthermore, no effect has been given in the selected unaudited pro forma condensed combined financial data for synergies and potential cost savings, if any, that may be realized through the combination of the two companies or the costs that may be incurred in integrating their operations. Further, as explained in more detail in the notes accompanying the unaudited pro forma condensed combined financial data included under Unaudited Pro Forma Condensed Combined Financial Information, the pro forma allocation of purchase price reflected in the selected unaudited pro forma condensed combined financial information is subject to adjustment and may vary from the actual purchase price allocation that will be recorded at the time the merger is completed. Additionally, the adjustments made in the unaudited pro forma condensed financial information, which are described in those notes, are preliminary and may be revised.

	As of and for the year ended September 30, 2014	
Operating Data:		
Net revenue	\$	111,531
Gross profit		31,786
Operating loss		(15,223)
Net loss attributable to Amtech Systems, Inc.		(16,082)
Earnings (loss) per share attributable to Amtech Systems, Inc.:		
Basic loss per share	\$	(1.25)
Diluted loss per share	\$	(1.25)
Balance Sheet Data:		
Cash and cash equivalents	\$	37,795
Working capital		49,241
Total assets		146,128
Total liabilities		64,735
Total equity		81,393

Table of Contents

UNAUDITED PRO FORMA CONDENSED COMBINED FINANCIAL INFORMATION

The following unaudited pro forma condensed combined financial information is based on and derived from the separate historical financial statements of Amtech and BTU, after giving effect to the proposed merger and gives effect to the assumptions and preliminary pro forma adjustments described in the accompanying notes to the unaudited pro forma condensed combined financial statements. The unaudited pro forma condensed combined balance sheet gives effect to the merger as if it had occurred on September 30, 2014. The unaudited pro forma condensed combined statement of operations gives effect to the merger as if it had occurred on October 1, 2013. The historical consolidated financial information has been adjusted to give effect to pro forma events that are directly attributable to the merger and factually supportable and, with respect to the unaudited pro forma condensed combined statement of operations, expected to have a continuing impact on the combined results.

Prior to entering into the definitive agreement, Amtech and BTU developed a reorganization plan to discontinue a product line and, as appropriate, align costs of production and operating expenses with expected revenue for product lines that are to be continued. Amtech and BTU expect to initially realize approximately \$4 to \$5 million in continuing, annual pre-tax cost savings from this plan, which management expects to be phased-in over a six to twelve month period following the merger. The estimated future savings are not reflected in the unaudited pro forma condensed combined statement of operations.

Amtech has a fiscal year that ends on September 30 while BTU has a fiscal year that ends on December 31. The unaudited pro forma condensed combined statement of operations for the year ended September 30, 2014 includes 1) Amtech's fiscal year ended September 30, 2014, and 2) BTU's twelve-month period ended September 28, 2014.

The unaudited pro forma condensed combined financial information was prepared using the acquisition method of accounting with Amtech considered the acquirer of BTU. Accordingly, consideration given by Amtech to complete the acquisition of BTU will be allocated to the assets and liabilities of BTU based upon their estimated fair values as of the date of completion of the merger. Any excess of the consideration over the fair value of assets acquired and liabilities assumed is allocated to goodwill. As of the date of this joint proxy statement/ prospectus, Amtech has not completed the detailed valuation studies necessary to arrive at the required estimates of the fair value of the BTU assets to be acquired and the liabilities to be assumed and the related allocations of purchase price, nor has it identified all adjustments necessary to conform BTU's accounting policies to Amtech's accounting policies. A final determination of the fair value of BTU's assets and liabilities will be based on the actual net tangible and intangible assets and liabilities of BTU that exist as of the date of completion of the merger and, therefore, cannot be made prior to the completion of the merger. Accordingly, the unaudited pro forma purchase price adjustments are preliminary and are subject to further adjustments as additional information becomes available and as additional analyses are performed, and such further adjustments may be material. The preliminary unaudited pro forma purchase price adjustments have been made solely for the purpose of providing the unaudited pro forma condensed combined financial information presented below. Amtech estimated the fair value of BTU's assets and liabilities based on discussions with BTU's management, preliminary valuation studies, due diligence and information presented in public filings.

The unaudited pro forma condensed combined financial information is provided for informational purposes only. The unaudited pro forma condensed combined financial information is not necessarily, and should not be assumed to be, an indication of the results that would have been achieved had the merger been completed as of the dates indicated or that may be achieved in the future and should not be taken as representative of future consolidated results of operations or financial condition of Amtech. Furthermore, no effect has been given in the unaudited pro forma condensed combined statement of operations for synergies and potential cost savings, if any, that may be realized through the combination of the two companies or the costs that may be incurred in integrating their operations.

The unaudited pro forma condensed combined financial information should be read in conjunction with:

The accompanying notes to the unaudited pro forma condensed combined financial statements;

Amtech's audited historical consolidated financial statements and accompanying notes as of and for the year ended September 30, 2014, included in Amtech's Annual Report on Form 10-K for the year ended September 30, 2014, and incorporated by reference in this joint proxy statement/prospectus;

Table of Contents

BTU s audited historical consolidated financial statements and accompanying notes as of and for the year ended December 31, 2013 included elsewhere in this joint proxy statement/prospectus;

BTU s unaudited historical consolidated financial statements and accompanying notes as of September 28, 2014 and for the nine months ended September 28, 2014 and September 29, 2013 included elsewhere in this joint proxy statement/prospectus;

Other information pertaining to Amtech and BTU incorporated by reference or included in this joint proxy statement/prospectus. See Selected Consolidated Historical Financial Data of Amtech and Selected Consolidated Historical Financial Data of BTU included elsewhere in this joint proxy statement/prospectus.

Table of Contents**UNAUDITED PRO FORMA CONDENSED COMBINED BALANCE SHEET****AS OF SEPTEMBER 30, 2014****(in thousands)**

	Historical Amtech	Historical BTU(2)	Pro Forma Adjustments	Pro Forma Combined
Assets				
Current assets:				
Cash and cash equivalents	\$ 27,367	\$ 10,428	\$	\$ 37,795
Restricted cash	2,380	249		2,629
Accounts receivable	15,776	12,578		28,354
Inventories	16,760	10,696	450 (a)	27,906
Deferred income taxes	1,060			1,060
Other	2,082	515		2,597
Total current assets	65,425	34,466	450	100,341
Property, plant, and equipment, net	9,752	2,624	9,676 (b)	22,052
Deferred income taxes long term	1,300			1,300
Intangible assets net	2,678		940 (c)	3,618
Goodwill	8,323		5,903 (c)	14,226
Other assets long term	2,426	2,165		4,591
Total Assets	\$ 89,904	\$ 39,255	\$ 16,969	\$ 146,128

Liabilities and Stockholders Equity**Current liabilities:**

Current portion of long-term debt	\$	\$ 380	\$	\$ 380
Accounts payable	6,003	7,418		13,421
Accrued compensation and related taxes	4,269	625	800 (g)	5,694
Accrued warranty expense	628	488		1,116
Deferred profit	6,908			6,908
Customer deposits	4,992	438		5,430
Other accrued liabilities	5,346	2,980	3,065 (g)	11,504
			113 (d)	
Income taxes payable	4,990	1,859	(202)(g)	6,647
Total current liabilities	33,136	14,188	3,776	51,100
Long-term debt, less current portion		6,935		6,935
Deferred income taxes long term			3,520 (d)	3,520
Income taxes payable long-term	3,180			3,180
Total Liabilities	36,316	21,123	7,296	64,735

Stockholders Equity:

Edgar Filing: AMTECH SYSTEMS INC - Form S-4/A

Preferred stock				
Common stock	98	109	(109)(e)	130
			32 (f)	
Additional paid-in capital, net of treasury stock	81,884	47,676	(47,676)(e)	113,320
			31,436 (f)	
Accumulated other comprehensive income	(5,790)	2,392	(2,392)(e)	(5,790)
Retained earnings (deficit)	(21,051)	(32,045)	32,045 (e)	(24,714)
			(3,663)(g)	
Total stockholders equity	55,141	18,132	9,673	82,946
Noncontrolling interest	(1,553)			(1,553)
Total equity	53,588	18,132	9,673	81,393
Total Liabilities and Stockholders Equity	\$ 89,904	\$ 39,255	\$ 16,969	\$ 146,128

See accompanying notes to unaudited pro forma condensed combined financial statements.

Table of Contents**UNAUDITED PRO FORMA CONDENSED COMBINED STATEMENT OF OPERATIONS****FOR THE YEAR ENDED SEPTEMBER 30, 2014****(in thousands, except per share data)**

	Historical Amtech	Historical BTU	Pro Forma Adjustments	Pro Forma Combined
Revenues, net of returns and allowances	\$ 56,501	\$ 55,030	\$	\$ 111,531
Cost of sales	44,875	34,870		79,745
Gross profit	11,626	20,160		31,786
Selling, general, and administrative	18,424	19,171	(1,338)(h)	36,362
			105(i)	
Research, development and engineering	6,291	4,356		10,647
Operating income (loss)	(13,089)	(3,367)	1,233	(15,223)
Interest and other income (expense), net	40	(317)		(277)
Income (loss) before income taxes	(13,049)	(3,684)	1,233	(15,500)
Income tax provision (benefit)	1,240	516	68(j)	1,824
Net income (loss)	(14,289)	(4,200)	1,165	(17,324)
Add: net loss attributable to noncontrolling interest	1,242			1,242
Net income (loss) attributable to Amtech Systems, Inc.	\$ (13,047)	\$ (4,200)	\$ 1,165	\$ (16,082)
Loss per share				
Basic loss per share attributable to Amtech shareholders	\$ (1.34)			\$ (1.25)
Diluted loss per share attributable to Amtech shareholders	\$ (1.34)			\$ (1.25)
Weighted shares outstanding				
Basic	9,732		3,182(k)	12,914
Diluted	9,732		3,182(k)	12,914

See accompanying notes to unaudited pro forma condensed combined financial statements.

Table of Contents**NOTES TO UNAUDITED PRO FORMA CONDENSED COMBINED****FINANCIAL STATEMENTS****1. Description of the merger**

On October 21, 2014, Amtech, BTU and Merger Sub entered into the merger agreement, pursuant to which Amtech will acquire BTU, on the terms and subject to the conditions set forth in the merger agreement. The merger agreement has been approved by the Boards of Directors of both Amtech and BTU and is subject to approval of Amtech's and BTU's stockholders.

Subject to the terms and conditions set forth in the merger agreement, holders of outstanding shares of BTU common stock and holders of BTU restricted stock units will receive 0.3291 shares of Amtech common stock. All outstanding BTU stock options will be converted into options to purchase shares of Amtech common stock on substantially the same terms and conditions, with appropriate adjustments based upon the exchange ratio to the exercise price and the number of shares of Amtech common stock subject to such stock options.

2. Basis of Pro Forma Presentation

The unaudited pro forma condensed combined financial statements have been derived from the historical consolidated financial statements of Amtech and BTU. Certain financial information presented in the "Historical BTU" column in the unaudited pro forma condensed combined balance sheet has been reclassified to conform to the historical presentation in Amtech's consolidated balance sheet.

BTU's historical consolidated financial statements have a fiscal year ending on December 31. In order to derive the unaudited condensed consolidated statement of operations for the year ended September 30, 2014, Amtech utilized BTU's statements of operations for the year ended December 31, 2013 and the nine-month periods ended September 28, 2014 and September 29, 2013. The following is a reconciliation of how the historical consolidated financial statements were utilized to derive BTU's statement of operations for the twelve months ended September 28, 2014 used in the unaudited pro forma condensed combined statement of operations.

BTU**Historical statement of operations (in thousands, except per share data)**

	(1) Year Ended December 31, 2013	(2) Nine Months Ended September 29, 2013	(3) Nine months ended September 28, 2014	(1) - (2) + (3) Twelve Months Ended September 28, 2014
Net sales	\$ 47,754	\$ 36,761	\$ 44,037	\$ 55,030
Cost of sales	33,048	25,103	26,925	34,870

Edgar Filing: AMTECH SYSTEMS INC - Form S-4/A

Gross profit	14,706	11,658	17,112	20,160
Selling, general and administrative	19,786	15,237	14,622	19,171
Research, development and engineering	4,604	3,427	3,179	4,356
Operating loss	(9,684)	(7,006)	(689)	(3,367)
Interest income	53	36	26	43
Interest expense	(418)	(323)	(253)	(348)
Foreign exchange gain (loss)	(193)	(147)	22	(24)
Other income, net	65	63	10	12
Loss before provision for income taxes	(10,177)	(7,377)	(884)	(3,684)
Provision (benefit) for income taxes	1,291	1,083	308	516
Net loss	\$ (11,468)	\$ (8,460)	\$ (1,192)	\$ (4,200)
Loss per share, basic and diluted	\$ (1.20)	\$ (0.89)	\$ (0.12)	\$ (0.44)
Weighted average shares outstanding, basic and diluted	9,539	9,536	9,564	9,560

Table of Contents**3. Estimate of Merger Consideration and Merger Consideration Allocation**

Each share of BTU's common stock outstanding immediately prior to closing will be exchanged for 0.3291 of a share of Amtech common stock. Additionally, all outstanding restricted stock units will vest upon closing and be exchanged for 0.3291 of a share of Amtech common stock. The value of the merger consideration is subject to change based on changes in the market price of Amtech common stock prior to closing. An estimate of the merger consideration paid to BTU stockholders at closing is presented below (in thousands, except per share amounts):

BTU common shares outstanding at 9/28/14	9,574
BTU restricted stock units outstanding at 9/28/14	95
Total BTU common shares and restricted stock units eligible for exchange	9,669
Exchange ratio	0.3291
Amtech common shares to be issued	3,182
Amtech price per common share at 11/21/14	\$ 9.67
Consideration for BTU common shares and restricted stock units	\$ 30,770
Vested BTU stock options exchanged for Amtech stock options	698
Fair value of total consideration transferred	\$ 31,468

The merger is reflected in the unaudited pro forma condensed combined financial information as an acquisition of BTU by Amtech in accordance with Accounting Standards Codification Topic 805, Business Combinations, using the acquisition method of accounting. Under these accounting standards, the total estimated purchase price is calculated as described below; the assets acquired and the liabilities assumed have been measured at their estimated fair values. The fair value measurements utilize estimates based on key assumptions of the merger, including historical and current market data. The unaudited pro forma adjustments included herein are preliminary and will be revised at the time of the merger as additional information becomes available and as additional analyses are performed. The final purchase price allocation will be determined at the time that the merger is completed, and the final amounts recorded for the merger may differ materially from the information presented herein.

Under the acquisition method of accounting, the total estimated acquisition consideration is allocated to the acquired tangible and intangible assets and assumed liabilities of BTU based on their estimated fair values as of the acquisition date. Any excess of the acquisition consideration over the fair value of assets acquired and liabilities assumed is allocated to goodwill. The Company expects that such goodwill will not be deductible for tax purposes. For the purposes of the unaudited pro forma condensed combined financial statements, Amtech has made a preliminary allocation of the acquisition consideration as follows (in thousands):

Cash	\$ 10,428
Inventories	11,146
Other current assets	13,342
Property, plant, and equipment	12,300
Intangible assets	940

Edgar Filing: AMTECH SYSTEMS INC - Form S-4/A

Other long-term assets	2,165
Long-term debt	(7,315)
Accounts payable and accrued liabilities	(13,808)
Deferred tax liabilities	(3,633)
Fair value of assets acquired and liabilities assumed	25,565
Goodwill	5,903
Total preliminary acquisition consideration	\$ 31,468

Table of Contents

4. Reorganization Plan

Prior to entering into the merger agreement, Amtech and BTU developed a reorganization plan to discontinue a product line and, as appropriate, align costs of production and operating expenses with the expected revenue. Amtech and BTU expect to initially realize approximately \$4 to \$5 million in continuing, annual pre-tax cost savings from this plan, which management expects to be phased-in over six to twelve months. These estimated savings are not reflected in the unaudited pro forma condensed combined financial statements.

BTU is implementing a restructuring plan and expects to incur non-recurring reorganization costs, including employee severance and certain write-downs. BTU estimates these reorganization costs to be approximately \$2.6 million and expects that most of these expenses will be incurred during the first half of fiscal year 2015. Aside from the contractual payments noted in footnote 5.(g) below, these non-recurring costs are not reflected in the unaudited pro forma condensed combined financial statements.

5. Pro Forma Adjustments

Unaudited Pro Forma Condensed Combined Balance Sheet

- (a) Reflects an adjustment for the step-up of historical BTU inventories to estimated fair value. This inventory adjustment is expected to be fully recognized in cost of sales in the first six months following consummation of the merger. We expect this step up in basis and amortization of this amount to have a negative effect on margins.
- (b) Reflects an adjustment for the step-up of historical BTU property, plant, and equipment to estimated fair value. The estimated fair value is comprised of \$8.4 million of real property and \$3.9 million of equipment and other assets.
- (c) Reflects the estimated fair value of goodwill of \$5.9 million and intangible assets acquired, including \$0.7 million of trade name and technology and \$0.2 million of customer relationships.
- (d) Reflects the recognition of deferred tax liabilities resulting from fair value adjustments to inventories, property, plant and equipment and identifiable intangible assets acquired based primarily on a combined federal and state statutory rate of 34%.
- (e) Reflects an adjustment to remove the historical equity balances of BTU.
- (f) Reflects the issuance of 3.2 million shares of \$0.01 par value Amtech common stock as merger consideration, as described in the Basis of Pro Forma Presentation note above.
- (g)

Reflects the recognition of \$3.1 million of merger-related transaction costs and \$0.8 million of contractual change in control payments, net of related tax effects of \$0.2 million, based on the deductible portion and a combined federal and state statutory rate of 34%.

Unaudited Pro Forma Condensed Combined Statement of Operations

- (h) Reflects the elimination of non-recurring merger-related transaction costs that have been recorded in Amtech's and BTU's historical results.
- (i) Reflects the incremental depreciation and amortization expense based on the preliminary fair values of the tangible and intangible assets acquired as follows (in thousands):

	Intangible Assets	Estimated Useful Lives (years)	Pro Forma Amortization
Trade name and technology	\$ 700	7.5	\$ 93
Customer relationships	240	12.5	19
	\$ 940		\$ 112

Table of Contents

	Tangible Assets	Estimated Useful Lives (years)	Pro Forma Depreciation
Real property	\$ 8,400	20.0	\$ 420
Personal Property	3,900	5.0	780
	\$ 12,300		1,200
Less historical depreciation expense			1,207
Incremental pro forma depreciation expense			\$ (7)

- (j) Reflects the elimination of historical tax benefits related to the deductible portion of Amtech transaction costs at a combined federal and state statutory rate of 34%.
- (k) Reflects the issuance of 3.2 million shares of Amtech common stock as merger consideration, as described in the Basis of Pro Forma Presentation note above.

Table of Contents**COMPARATIVE PER SHARE DATA****(Unaudited)**

Presented below for Amtech and BTU is historical, unaudited pro forma combined and pro forma equivalent per share financial data as of and for the fiscal year ended September 30, 2014. The information presented below should be read together with the historical consolidated financial statements of Amtech, including the related notes, filed by Amtech with the SEC and incorporated by reference into this joint proxy statement/prospectus, and of BTU included elsewhere in this joint proxy statement/prospectus, and the unaudited pro forma condensed combined financial information in **Unaudited Pro Forma Condensed Combined Financial Information** included elsewhere in this joint proxy statement/prospectus.

The historical, unaudited pro forma combined and pro forma equivalent per share data as of and for the fiscal year ended September 30, 2014 were prepared based on the audited consolidated financial statements of Amtech as of and for the fiscal year ended September 30, 2014 and of BTU for the year ended December 31, 2013 and the unaudited condensed consolidated financial statements of BTU as of September 28, 2014 and for the nine months ended September 28, 2014 and September 29, 2013. The unaudited pro forma and pro forma per equivalent share information gives effect to the merger as if the merger had been effective on September 30, 2014 in the case of the book value data, and as if the merger had been effective as of October 1, 2013 in the case of the earnings per share and the cash dividends data. The unaudited pro forma data combines the historical results of BTU into Amtech's consolidated statement of operations. While certain adjustments were made for the estimated impact of fair value adjustments and other acquisition-related activity, they are not indicative of what could have occurred had the acquisition taken place on October 1, 2013.

The unaudited pro forma equivalent data of BTU was calculated by multiplying the corresponding unaudited pro forma consolidated data of Amtech by the exchange ratio set forth in the merger agreement (0.3291). This data shows how each share of BTU common stock would have participated in net loss and book value of Amtech if the companies had always been consolidated for accounting and financial reporting purposes for all periods presented. These amounts, however, are not intended to reflect future per share levels of net income and book value of Amtech.

	Amtech Historical	BTU Historical	Pro Forma Combined	Per Equivalent BTU Share(1)
For the year ended September 30, 2014:				
Basic earnings per share(2)	\$ (1.34)	\$ (0.44)	\$ (1.25)	\$ (0.41)
Diluted earnings per share(2)	\$ (1.34)	\$ (0.44)	\$ (1.25)	\$ (0.41)
Cash dividends declared	\$	\$	\$	\$
Book value per share as of September 30, 2014	\$ 5.44	\$ 1.89	\$ 6.25	\$ 2.06

(1) Reflects BTU shares at the exchange ratio of 0.3291.

(2) Pro forma combined earnings per share data excludes the impact of anticipated cost savings and potential revenue enhancements that may be realized through the merger.

Table of Contents

RISK FACTORS

*In addition to general investment risks and the other information contained in or incorporated by reference into this joint proxy statement/prospectus, including the matters addressed under the section **Cautionary Statement Regarding Forward-Looking Statements**, you should carefully consider the following risk factors in deciding how to vote for the proposals presented in this joint proxy statement/prospectus. You should also consider the other information in this joint proxy statement/prospectus and the other documents incorporated by reference into this joint proxy statement/prospectus. See **Where You Can Find More Information**.*

Risk Factors Related to the Merger

Because the market price of Amtech common stock will fluctuate, BTU stockholders cannot be certain of the market value of the merger consideration they will receive.

Upon completion of the merger, each share of BTU common stock (except for specified shares of BTU common stock held by BTU or Amtech) will be converted into 0.3291 shares of Amtech common stock. The market value of the merger consideration will vary from the closing price of Amtech common stock on the date Amtech and BTU announced the merger, on the date that this joint proxy statement/prospectus is mailed to BTU stockholders, on the date of the special meeting of the BTU stockholders and on the date the merger is completed and thereafter. Any change in the market price of Amtech common stock prior to the completion of the merger will affect the market value of the merger consideration that BTU stockholders will receive upon completion of the merger, and there will be no adjustment to the merger consideration for changes in the market price of either shares of Amtech common stock or shares of BTU common stock. Stock price changes may result from a variety of factors that are beyond the control of Amtech and BTU, including, but not limited to, general market and economic conditions, changes in our respective businesses, operations and prospects and regulatory considerations. Therefore, at the time of the BTU special meeting you will not know the precise market value of the consideration you will receive at the effective time of the merger. You should obtain current market quotations for shares of Amtech common stock and for shares of BTU common stock.

The market price of Amtech common stock after the merger may be affected by factors different from those affecting the shares of BTU or Amtech currently.

Upon completion of the merger, holders of BTU common stock will become holders of Amtech common stock. Amtech's business differs in important respects from that of BTU, and, accordingly, the results of operations of the combined company and the market price of Amtech common stock after the completion of the merger may be affected by factors different from those currently affecting the independent results of operations of each of Amtech and BTU. For a discussion of the businesses of Amtech and BTU and of some important factors to consider in connection with those businesses, see the documents included elsewhere in this joint proxy statement/prospectus or incorporated by reference in this joint proxy statement/prospectus and referred to under **Where You Can Find More Information** beginning on page 163.

Combining the two companies may be more difficult, costly or time consuming than expected and the anticipated benefits and cost savings of the merger may not be realized.

Amtech and BTU have operated and, until the completion of the merger, will continue to operate, independently. The success of the merger, including anticipated benefits and cost savings, will depend, in part, on Amtech's ability to successfully combine and integrate the businesses of Amtech and BTU in a manner that permits growth opportunities and does not materially disrupt the existing customer relations nor result in decreased revenues due to loss of

customers. It is possible that the integration process could result in the loss of key employees, the disruption of either company's ongoing businesses or inconsistencies in standards, controls, procedures and policies that adversely affect the combined company's ability to maintain relationships with clients, customers and employees or to achieve the anticipated benefits and cost savings of the merger. The loss of key employees could adversely affect Amtech's ability to successfully conduct its business, which could have an adverse effect on Amtech's financial results and the value of its common stock. If Amtech experiences difficulties with the integration process, the anticipated benefits of the merger may not be realized fully or at all, or may take longer to realize than expected. Integration efforts between the two companies will also divert management attention and resources. These integration matters could have an adverse effect on each of BTU and Amtech during this transition period and for an undetermined period after completion of the merger on the combined company. In addition, the actual cost savings of the merger could be less than anticipated.

Table of Contents

The unaudited pro forma condensed combined financial statements included in this document are preliminary and the actual financial condition and results of operations after the merger may differ materially.

The unaudited pro forma condensed combined financial statements in this document are presented for illustrative purposes only and are not necessarily indicative of what Amtech's actual financial condition or results of operations would have been had the merger been completed on the dates indicated. The unaudited pro forma condensed combined financial statements reflect adjustments, which are based upon preliminary estimates, to record the BTU identifiable assets acquired and liabilities assumed at fair value and the resulting goodwill recognized. The purchase price allocation reflected in this document is preliminary, and final allocation of the purchase price will be based upon the actual purchase price and the fair value of the assets and liabilities of BTU as of the date of the completion of the merger. Accordingly, the final acquisition accounting adjustments may differ materially from the pro forma adjustments reflected in this document. For more information, see "Unaudited Pro Forma Condensed Combined Financial Statements" beginning on page 20.

Certain of BTU's directors and executive officers have interests in the merger that may differ from the interests of BTU's stockholders.

BTU's stockholders should be aware that some of BTU's directors and executive officers have interests in the merger and have arrangements that are different from, or in addition to, those of BTU's stockholders generally. These interests and arrangements may create potential conflicts of interest. BTU's board of directors was aware of these interests and considered these interests, among other matters, when making its decision to approve the merger agreement, and in recommending that BTU's stockholders vote in favor of adopting the merger agreement.

For more information, see "The Merger" "Interests of BTU's Directors and Executive Officers in the Merger" beginning on page 126.

Termination of the merger agreement could negatively impact BTU or Amtech.

If the merger agreement is terminated, there may be various consequences. For example, BTU's or Amtech's businesses may have been impacted adversely by the failure to pursue other beneficial opportunities due to the focus of management on the merger, without realizing any of the anticipated benefits of completing the merger. Additionally, if the merger agreement is terminated, the market price of BTU's or Amtech's common stock could decline to the extent that the current market prices reflect a market assumption that the merger will be completed. If the merger agreement is terminated under certain circumstances, BTU or Amtech may be required to pay to the other party a termination fee of \$1,320,000 or an expense reimbursement amount of up to \$1,000,000.

BTU and Amtech will be subject to business uncertainties and contractual restrictions while the merger is pending.

Uncertainty about the effect of the merger on employees and customers may have an adverse effect on BTU or Amtech. These uncertainties may impair BTU's or Amtech's ability to attract, retain and motivate key personnel until the merger is completed, and could cause customers and others that deal with BTU or Amtech to seek to change existing business relationships with BTU or Amtech. Retention of certain employees by BTU or Amtech may be challenging while the merger is pending, as certain employees may experience uncertainty about their future roles with BTU or Amtech. If key employees depart because of issues relating to the uncertainty and difficulty of integration or a desire not to remain with BTU or Amtech, BTU's business or Amtech's business could be harmed. In addition, subject to certain exceptions, each of BTU and Amtech has agreed to operate its business in the ordinary course prior to closing. See "The Merger Agreement" "Covenants and Agreements" for a description of the restrictive covenants applicable to BTU and Amtech.

If the merger is not completed, Amtech and BTU will have incurred substantial expenses without realizing the expected benefits of the merger.

Each of Amtech and BTU has incurred and will incur substantial expenses in connection with the negotiation and completion of the transactions contemplated by the merger agreement, as well as the costs and expenses of filing, printing and mailing this joint proxy statement/prospectus and all filing and other fees paid to the SEC in connection with the merger. If the merger is not completed, Amtech and BTU would have to recognize these expenses without realizing the expected benefits of the merger.

Table of Contents

The merger agreement limits Amtech's and BTU's ability to pursue acquisition proposals and requires each company to pay a termination fee of \$1,320,000, plus an expense reimbursement amount of up to \$1,000,000 under limited circumstances, including circumstances relating to acquisition proposals.

The merger agreement prohibits Amtech and BTU from initiating, soliciting, knowingly encouraging or knowingly facilitating certain third-party acquisition proposals. See [The Merger Agreement Agreement Not to Solicit Other Offers](#). The merger agreement also provides that Amtech or BTU must pay a termination fee in the amount of \$1,320,000, plus an expense reimbursement amount of up to \$1,000,000 in the event that the merger agreement is terminated under certain circumstances, including involving such party's failure to abide by certain obligations to not solicit acquisition proposals. See [The Merger Agreement Termination Fee](#). These provisions might discourage a potential competing acquirer that might have an interest in acquiring all or a significant part of BTU or Amtech from considering or proposing such an acquisition.

The shares of Amtech common stock to be received by BTU stockholders as a result of the merger will have different rights from the shares of BTU common stock.

Upon completion of the merger, BTU stockholders will become Amtech stockholders and their rights as stockholders will be governed by the Arizona business corporation act and the Amtech amended and restated articles of incorporation and bylaws. The rights associated with BTU common stock are different from the rights associated with Amtech common stock. Please see [Comparison of Stockholders Rights](#) beginning on page 151 for a discussion of the different rights associated with Amtech common stock.

Holders of BTU and Amtech common stock will have a reduced ownership and voting interest after the merger and will exercise less influence over management.

Holders of BTU and Amtech common stock currently have the right to vote in the election of the board of directors and on other matters affecting BTU and Amtech, respectively. Upon the completion of the merger, each BTU stockholder who receives shares of Amtech common stock will become a stockholder of Amtech with a percentage ownership of Amtech that is smaller than the stockholder's percentage ownership of BTU. It is currently expected that the former stockholders of BTU as a group will receive shares in the merger constituting approximately 24.5% of the outstanding shares of Amtech common stock immediately after the merger. As a result, current stockholders of Amtech as a group will own approximately 75.5% of the outstanding shares of Amtech common stock immediately after the merger. These percentages assume 3,200,000 shares of Amtech common stock are issued in the merger and is based on 9,869,916 shares of Amtech common stock outstanding as of December 16, 2014. Because of this, BTU stockholders may have less influence on the management and policies of Amtech than they now have on the management and policies of BTU and current Amtech stockholders may have less influence than they now have on the management and policies of Amtech.

BTU stockholders are not expected to have dissenters' or appraisal rights in the merger.

Dissenters' rights are statutory rights that, if applicable under law, enable stockholders to dissent from an extraordinary transaction, such as a merger, and to demand that the corporation pay the fair value for their shares as determined by a court in a judicial proceeding instead of receiving the consideration offered to stockholders in connection with the extraordinary transaction. Under the DGCL, a stockholder may not dissent from a merger as to shares that are listed on a national securities exchange at the record date fixed to determine the stockholders entitled to receive notice of the meeting of stockholders to vote upon the agreement of merger or consolidation.

Because BTU common stock is listed on NASDAQ, a national securities exchange, and is expected to continue to be so listed on the record date, and because the merger otherwise satisfies the foregoing requirements, holders of BTU common stock will not be entitled to dissenters' or appraisal rights in the merger with respect to their shares of BTU common stock.

Pending litigation against BTU and Amtech could result in an injunction preventing the completion of the merger or a judgment resulting in the payment of damages.

On November 4, 2014, a putative stockholder class action complaint was filed, purportedly on behalf of BTU's public stockholders, in the Court of Chancery of the State of Delaware against BTU, members of the BTU Board, Amtech, and Merger

Table of Contents

Sub. The complaint generally alleges, among other things, that the members of BTU's board of directors breached their fiduciary duties owed to BTU's public stockholders by causing BTU to enter into the merger agreement and by approving the merger, and that Amtech and Merger Sub aided and abetted such alleged breaches of fiduciary duties. In addition, the complaint alleges that the merger agreement improperly favors Amtech and unduly restricts BTU's ability to negotiate with other potential bidders. The complaint generally seeks, among other things, declaratory and injunctive relief concerning the alleged fiduciary breaches, injunctive relief prohibiting Amtech, Merger Sub, and BTU from consummating the Merger, other forms of equitable relief, and compensatory damages. Both Amtech and BTU believe that the claims are without merit and each intends to vigorously defend itself (and its directors) against the litigation.

On November 17, 2014, a separate putative stockholder class action complaint was filed, also purportedly on behalf of BTU's public stockholders, in the Court of Chancery of the State of Delaware against BTU, members of the BTU board, Amtech and Merger Sub. The complaint generally alleges, among other things, that the members of BTU's board of directors breached their fiduciary duties owed to BTU's public stockholders by failing to engage in a competitive sale and bidding process, and that Amtech and Merger Sub aided and abetted such alleged breaches of fiduciary duties. The complaint further alleges that these fiduciary breaches gave Amtech an unfair advantage on account of the BTU board's failing to solicit other potential acquirers. The complaint generally seeks, among other things, injunctive relief prohibiting the defendants from consummating the merger, compensatory damages for alleged breaches of fiduciary duties, and other forms of equitable relief. Both Amtech and BTU believe that the claims are without merit and each intends to vigorously defend itself (and its directors) against the litigation.

Risks Related to BTU

BTU's industry has historically been cyclical and experienced periodic downturns.

BTU's business depends on capital spending by electronics, semiconductor, solar cell and nuclear fuel manufacturers, which in turn depends on current and anticipated market demand for printed circuit boards, integrated circuits and solar panels and the products that use them as well as the need for nuclear fuel for power generation. BTU continues to experience a significant downturn in the solar industry. The electronics and semiconductor industries have historically been cyclical and have experienced periodic downturns that have had a material adverse effect on the demand for equipment that BTU manufactures and markets.

BTU has made substantial investments in its organization to develop new products for the electronics and alternative energy markets. Sales of BTU's products to these markets are subject to substantial risks.

Electronics. BTU has recently introduced new lower priced products in the electronics segment. To date, sales of such products have trailed expectations. If BTU is unable to successfully market and sell lower priced, lower cost products to the electronics sector, its market penetration in the China market may slow or decrease.

Solar Energy. The solar energy sector is primarily dependent upon continuation of governmental subsidies which have been scaled back. A further decline in these subsidies would reduce BTU's ability to grow its business in this market due to reduced capital spending by the manufacturers of solar panels. The solar industry is currently facing overcapacity in its production capacity. This overcapacity has a meaningful negative impact on demand for capital equipment supplied to this industry.

Nuclear Energy. The market for nuclear fuel pellets used in power generation is dependent upon further growth in nuclear power production. Consequently, without growth in the production of nuclear power, BTU's opportunities to grow in this area will be limited. In addition, BTU may need export licenses to supply this type of equipment to

certain countries. Failure to maintain such licenses or obtain new required licenses may impact BTU's ability to expand its revenue from this market.

BTU's strategy of developing products for the solar market has yet to achieve consistent positive cash flows, and it is relying on a combination of cash on hand and cash flow from sales of its products to the non-solar market to fund its operations and investment in the solar market strategy.

Since 2005, BTU has been pursuing a strategy of developing and selling thermal products for the solar market. Although this strategy produced meaningful sales in the solar market in 2010 and 2011, the significant decline in the solar market in 2012 and 2013 has meant that BTU has not achieved the results it had hoped for. Although BTU continues to believe that the solar market presents an attractive opportunity for its products, in the near term BTU is funding its investments and operations in the solar

Table of Contents

market from cash flows from sales of its products to the non-solar market and its cash on hand. If the solar market does not improve, or if BTU's products do not gain the acceptance it has planned, BTU's cash resources will not allow it to continue making investments in the solar market and it may need to take action to restructure itself. Such actions, which could include exiting the solar business, selling assets or workforce reductions, could have a material adverse effect on its financial condition and result of operations and on the price of its stock.

If BTU is unable to increase sales and reduce costs, its profitability and liquidity may be affected negatively.

BTU had an operating loss of \$9.7 million in 2013 compared to operating loss of \$10.4 million in 2012. BTU attributes a large portion of the operating loss in 2013 to decreases in sales and the under-absorption of costs in its facilities, and the result of the legal settlement that was recognized in BTU's consolidated statement of operations for the three months ended September 29, 2013. BTU may not experience growth in its business in 2014 and 2015, which will negatively impact its profitability and liquidity.

BTU's future success will depend on its ability to effectively develop and market its products against those of its competitors.

The industry in which BTU does business is highly competitive. Some of BTU's competitors have substantially greater financial, engineering, manufacturing and customer support capabilities and offer more extensive product offerings. If customers prefer products offered by BTU's competitors, BTU will have difficulty maintaining or increasing its revenue. BTU's principal competitors for solder reflow systems are Vitronics-Soltec, Heller, Folungwin, ERSA, and Rehm. BTU's principal competitors for advanced semiconductor packaging are Vitronics-Soltec and Heller. BTU's systems for the alternative energy markets and other applications compete primarily against products offered by Centrotherm, Amtech, Factory 48, Despatch, Schmidt, Smit and Harper. BTU expects its competitors to continue to improve the design and performance of their current products and to introduce new products with improved performance capabilities. BTU's failure to introduce new products in a timely manner, or the introduction by its competitors of products with perceived or actual advantages, could result in reduced sales of, or lower margins on, its products. In future years, BTU expects to face increased competition based on price, particularly from companies in Asia. If BTU is unable to reduce the costs of its products or introduce new lower cost products, it may lose sales to these competitors.

A significant amount of BTU's cash is in China and may not be brought back to the United States without tax consequences, which reduces BTU's flexibility in deploying its liquidity.

BTU does not accrue incremental U.S. taxes on its revenues from China as these earnings are considered to be indefinitely reinvested outside of the U.S. While BTU has no plans to do so, events may occur in the future that could effectively force BTU to change its intent not to repatriate its foreign earnings. If BTU changes its intent and repatriates such earnings, it will have to accrue the applicable amount of taxes associated with such earnings and pay taxes at a substantially higher rate than its effective income tax rate in 2013. These increased taxes could materially adversely affect BTU's financial condition and results of operations and therefore reduce the flexibility it has to deploy its cash.

Sales made by BTU's international operations are subject to the economic, political, legal and business environments of the countries in which it does business, and its failure to operate successfully or adapt to changes in these environments could cause its international sales and operations to be limited or disrupted.

BTU's international sales accounted for 82.1% of its consolidated revenue for 2013. BTU expects to continue to generate a significant percentage of its revenue outside the U.S. for the foreseeable future. In addition, BTU has direct

investments in a number of subsidiaries outside of the U.S., primarily in Asia and Europe. BTU's international operations could be limited or disrupted, and the value of its direct investments may be diminished, by any of the following:

fluctuations in currency exchange rates;

the imposition of governmental controls;

import and export license requirements;

political instability;

Table of Contents

difficulties enforcing contractual and intellectual property rights;

terrorist activities and armed conflict;

restrictions on direct investments by foreign entities and trade restrictions;

changes in tax laws and tariffs;

costs and difficulties in staffing and managing international operations; and

longer customer payment cycles.

Additionally, BTU is subject to the Foreign Corrupt Practices Act, which may place it at a competitive disadvantage to foreign companies that are not subject to similar regulations.

BTU conducts only a small portion of its sales in currencies other than the U.S. dollar. BTU recognizes foreign currency gains or losses arising from its operations in the period in which it incurs those gains or losses. As a result, currency fluctuations among the U.S. dollar and the other currencies in which BTU does business have caused foreign currency transaction gains and losses in the past and will likely do so in the future. Because of the number of currencies involved, the variability of currency exposures and the potential volatility of currency exchange rates, BTU may suffer foreign currency transaction losses in the future due to the effect of exchange rate fluctuations.

Over the past few years, a majority of BTU's revenue has been generated from sales in the Asia Pacific region. BTU's operations are particularly vulnerable to instability in this region and competition from organizations based in this region.

During 2013, 61.0% of BTU's revenue was generated from sales in the Asia Pacific region. Political or economic instability in any of the major Asia Pacific economies may adversely impact the demand for capital equipment, including equipment of the type BTU manufactures and markets. In addition, BTU faces competition from a number of suppliers based in the Asia Pacific region that have certain advantages over U.S. suppliers, including BTU. These advantages include, among other things, lower operating and regulatory costs, proximity to customers, favorable tariffs and affiliation with significantly larger organizations. In addition, changes in the amount or price of electronics or solar cells produced in the Asia Pacific region could negatively impact spending by BTU's customers.

If BTU fails to maintain positive relationships with key personnel, it may be unable to successfully grow its business.

BTU's future operating results depend substantially upon the continued service of its key personnel, who are not bound by employment agreements. BTU's future operating results also depend in significant part upon BTU's ability to attract and retain qualified management, manufacturing, technical, engineering, marketing, sales and support personnel. Competition for qualified personnel, particularly those with technical skills, is intense, and BTU may fail to attract and retain qualified personnel. BTU's business, financial condition and results of operations could be materially adversely affected by the loss of any of its key employees, by the failure of any key employee to perform in his or her current position, or by its inability to attract and retain skilled employees.

The income tax rate on BTU's consolidated income before taxes is subject to variables beyond its control.

BTU's net income and cash flow can be adversely affected by innumerable conditions affecting income taxes which are outside of its control. To name but a few of the potential uncontrollable circumstances that could affect the consolidated tax rate:

BTU sells and operates globally, with manufacturing in both the United States and China. Disagreements could occur on the jurisdiction of income and taxation among different country governmental tax authorities. Potential areas of disputes could include transfer pricing values, inter-company cross charges and inter-company balances.

BTU is subject to a China withholding tax on certain non-tangible charges made under its transfer pricing agreements. The interpretation of what charges are subject to the tax and when the liability for the tax occurs has varied and could change in the future.

Table of Contents

In the United States, new tax disclosure regulations, unfavorable interpretations and unforeseen enforcements by the government tax authorities of various provisions of the federal and state tax codes, could have an unfavorable impact on the amount and timing of BTU's tax provision and cash flow.

Failure of critical suppliers to deliver sufficient quantities of parts in a timely and cost-effective manner would adversely impact BTU's operations.

Although BTU uses numerous vendors to supply components for the manufacture of its products, not all are qualified suppliers for all of BTU's parts. Some key parts may only be available from a single supplier. Accordingly, BTU may experience problems in obtaining adequate and reliable quantities of various components. In addition, suppliers may cease manufacturing certain components that are difficult to replace without significant reengineering of BTU's products. BTU's results of operations will be materially adversely impacted if it is unable to obtain adequate supplies of components in a timely and cost effective manner.

The occurrence of natural disasters in the Asia Pacific region may adversely impact BTU's operations and sales.

BTU has an expanding engineering and manufacturing facility in China, and the majority of its sales are made to destinations in the Asia Pacific region. This region is known for being vulnerable to natural disasters and other risks, such as earthquakes and floods, which at times have disrupted the local economies. A significant earthquake or other crisis could materially affect BTU's operating results. BTU is not insured for most losses and business interruptions of this kind, and it does not have redundant, multiple site capacity in the event of a natural disaster. In the event of such a disaster, BTU's business would suffer.

BTU faces the risk of product liability claims or other litigation, which could be expensive and may divert management's attention from running its business.

The manufacture and sale of BTU's products involves the risk of product liability claims. In addition, a failure of one of BTU's products at a customer site could interrupt the business operations of such customer. BTU's existing insurance coverage limits may not be adequate to protect it from all liabilities that it might incur in connection with the manufacture and sale of its products if a successful product liability claim or series of product liability claims were brought against it. BTU may also be involved in other legal proceedings or claims and experience threats of legal action from time to time in the ordinary course of its business.

Regulations related to conflict minerals could adversely impact BTU's business.

The Dodd-Frank Wall Street Reform and Consumer Protection Act contains provisions to improve transparency and accountability concerning the supply of certain minerals, known as conflict minerals, originating from the Democratic Republic of Congo (DRC) and adjoining countries. As a result, the SEC has adopted annual disclosure and reporting requirements for those companies who use conflict minerals mined from the DRC and adjoining countries in their products. BTU filed its first Form SD and related conflict mineral report on June 2, 2014. Additional costs to BTU include complying with the SEC's requirements, including determining whether BTU's products contain conflict minerals, determining the source of the minerals, making changes to BTU's products, processes or suppliers and the diversion of management's attention away from business activities. In addition, BTU might be limited to a smaller pool of suppliers, relationships with suppliers may deteriorate and BTU might incur reputational harm among customers and stockholders if it is unable to determine that its products are conflict mineral free.

Provisions in BTU's organizational documents could prevent or frustrate attempts by stockholders to replace its current management and could make acquisitions more difficult.

BTU's certificate of incorporation and by-laws contain provisions that could make it more difficult for a third party to acquire it without the consent of its board of directors. BTU's certificate of incorporation provides that its stockholders may not take action by written consent. This provision may have the effect of preventing or hindering attempts by its stockholders to replace its current management. Furthermore, Delaware law prohibits a corporation from engaging in a business combination

Table of Contents

with any holder of 15% or more of its capital stock until the holder has held the stock for three years unless, among other possibilities, the corporation's board of directors approves the transaction. BTU's board of directors may use this provision to prevent changes in its management. Also, BTU's board of directors may adopt additional anti-takeover measures in the future.

BTU's officers and directors may be able to block proposals for a change in control.

Paul J. van der Wansem, BTU's chairman and chief executive officer, beneficially owns approximately 20.14% of BTU's outstanding common stock as of December 15, 2014. Due to this concentration of ownership, Mr. van der Wansem may be able to prevail on all matters requiring a stockholder vote, including:

the election of directors;

the amendment of BTU's organizational documents; or

the approval of a merger, sale of assets, or other major corporate transaction.

However, in connection with the merger agreement, Mr. van der Wansem and certain persons and trusts affiliated with him, who in the aggregate own approximately 13.76% of the outstanding BTU common stock, entered into a voting and support agreement with Amtech pursuant to which Mr. van der Wansem and his affiliates who are a party thereto have agreed, among other things, to vote all of their BTU common stock in favor of the BTU merger proposal and the transactions contemplated thereby.

Table of Contents

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

Some of the statements contained or incorporated by reference in this joint proxy statement/prospectus are forward looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 giving Amtech's or BTU's expectations or predictions of future financial or business performance or conditions. Forward-looking statements are typically identified by words such as believe, expect, anticipate, intend, target, estimate, positions, prospects or potential, by future conditional verbs such as will, would, should, could or variations of such words or by similar expressions. Such forward-looking statements include, but are not limited to, statements about the benefits of the business combination transaction involving Amtech and BTU, including future financial and operating results, the combined company's plans, objectives, expectations and intentions and other statements that are not historical facts. These forward-looking statements are subject to numerous assumptions, risks and uncertainties which change over time. In addition to factors previously disclosed in Amtech's and BTU's reports filed with the Securities and Exchange Commission, the following factors, among others, could cause actual results to differ materially from forward-looking statements: ability to meet closing conditions to the merger, including the requisite approvals by Amtech and BTU stockholders; delay in closing the merger; difficulties and delays in integrating the Amtech and BTU businesses or fully realizing cost savings and other benefits; business disruption following the proposed transaction; the inability to sustain revenue and earnings growth; inflation; the introduction, withdrawal, success and timing of business initiatives; competitive conditions; the inability to realize cost savings or revenues or to implement integration plans and other consequences associated with mergers, acquisitions and divestitures; economic conditions; changes in Amtech's stock price before closing, including as a result of the financial performance of BTU prior to closing; the reaction to the transaction of the companies' customers, employees and counterparties; and the impact, extent and timing of technological changes.

For any forward-looking statements made in this joint proxy statement/prospectus or in any documents incorporated by reference into this joint proxy statement/prospectus, Amtech and BTU claim the protection of the safe harbor for forward-looking statements contained in the Private Securities Litigation Reform Act of 1995. You are cautioned not to place undue reliance on these statements, which speak only as of the date of this joint proxy statement/prospectus or the date of the applicable document incorporated by reference in this joint proxy statement/prospectus. Amtech and BTU do not undertake to update forward-looking statements to reflect facts, circumstances, assumptions or events that occur after the date the forward-looking statements are made. All subsequent written and oral forward-looking statements concerning the merger or other matters addressed in this joint proxy statement/prospectus and attributable to Amtech, BTU or any person acting on their behalf are expressly qualified in their entirety by the cautionary statements contained or referred to in this joint proxy statement/prospectus.

Table of Contents

THE BTU SPECIAL MEETING

This section contains information for BTU stockholders about the special meeting that BTU has called to allow its stockholders to consider and vote on the merger agreement and other matters. BTU is mailing this joint proxy statement/prospectus to you, as a BTU stockholder, on or about December 30, 2014. This joint proxy statement/prospectus is accompanied by a notice of the special meeting of BTU stockholders and a form of proxy card that BTU's board of directors is soliciting for use at the special meeting and at any adjournments or postponements of the special meeting.

Date, Time and Place of Meeting

The special meeting of BTU stockholders will be held at BTU's offices at 23 Esquire Road, North Billerica, MA 01862 at 10:00 a.m., Eastern time, on January 29, 2015. On or about December 30, 2014, BTU commenced mailing this document and the enclosed form of proxy card to its stockholders entitled to vote at the BTU special meeting.

Matters to Be Considered

At the BTU special meeting, BTU stockholders will be asked to consider and vote upon the following matters:

the BTU merger proposal;

the BTU adjournment proposal;

the BTU merger-related compensation proposal; and

to transact such other business as may properly come before the meeting or any adjournment thereof.

Recommendation of BTU's Board of Directors

The BTU board of directors recommends that you vote **FOR** the BTU merger proposal, **FOR** the BTU adjournment proposal (if necessary or appropriate), and **FOR** the BTU merger-related compensation proposal.

BTU Record Date and Quorum

The BTU board of directors has fixed the close of business on December 16, 2014 as the record date for determining the holders of BTU common stock entitled to receive notice of and to vote at the BTU special meeting.

As of the BTU record date, there were 9,591,671 shares of BTU common stock outstanding and entitled to vote at the BTU special meeting held by 396 holders of record. Each share of BTU common stock entitles the holder to one vote at the BTU special meeting on each proposal to be considered at the BTU special meeting.

The representation (in person or by proxy) of holders of at least a majority of the issued and outstanding shares entitled to vote at the BTU special meeting constitutes a quorum for transacting business at the BTU special meeting. All shares of BTU common stock, whether present in person or represented by proxy, including abstentions and

broker non-votes, will be treated as present for purposes of determining the presence or absence of a quorum for all matters voted on at the BTU special meeting.

As of the record date, the directors and executive officers of BTU and their affiliates owned and were entitled to vote 1,721,184 outstanding shares of BTU common stock, representing approximately 17.9% of the shares of BTU common stock outstanding on that date. BTU currently expects that BTU's directors and executive officers will vote their shares in favor of the BTU merger proposal, the BTU merger-related compensation proposal and the BTU adjournment proposal, although none of them has entered into any agreements obligating them to do so (other than Mr. van der Wansem as described in the section of this joint proxy statement/prospectus entitled "The Merger Voting and Support Agreements"). As of the record date, Amtech did not beneficially hold any shares of BTU common stock.

Table of Contents

Required Vote; Treatment of Abstentions and Failure to Vote

BTU merger proposal:

Standard: The affirmative vote of at least two-thirds of the outstanding shares of BTU common stock.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the BTU special meeting or fail to instruct your bank or broker how to vote with respect to the BTU merger proposal, it will have the same effect as a vote **AGAINST** the proposal.

BTU adjournment proposal:

Standard: The affirmative vote of a majority of votes cast (in person or by proxy) at the BTU special meeting and entitled to vote on such proposal, whether or not a quorum is present.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the BTU special meeting or fail to instruct your bank or broker how to vote with respect to the BTU adjournment proposal or the BTU merger-related compensation proposal, it will have no effect on such proposals.

BTU merger-related compensation proposal:

Standard: The affirmative vote of a majority of votes cast (in person or by proxy) at the BTU special meeting and entitled to vote on such proposal.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the BTU special meeting or fail to instruct your bank or broker how to vote with respect to the BTU adjournment proposal or the BTU merger-related compensation proposal, it will have no effect on such proposals.

Although BTU is submitting the merger-related compensation proposal for consideration and approval, the approval of such proposal pursuant to the standard set forth above is not a condition to completion of the merger, and the vote with respect to such proposal is advisory only and will not be binding on Amtech or BTU. If the merger is completed, the merger-related compensation may be paid to BTU's named executive officers to the extent payable in accordance with the terms of the compensation agreements and arrangements even if BTU stockholders fail to approve the advisory vote regarding merger-related compensation.

Voting on Proxies; Incomplete Proxies

A BTU stockholder may vote by proxy or in person at the BTU special meeting. If you hold your shares of BTU common stock in your name as a stockholder of record, to submit a proxy, you, as a BTU stockholder, may use one of the following methods:

By telephone: by calling the toll-free number indicated on the proxy card and following the recorded instructions.

Through the Internet: by visiting the website indicated on the proxy card and following the instructions.

Complete and return the proxy card in the enclosed envelope. The envelope requires no additional postage if mailed in the United States.

BTU requests that BTU stockholders vote by telephone, over the Internet or by completing and signing the accompanying proxy card and returning it as soon as possible in the enclosed postage-paid envelope. When the accompanying proxy card is returned properly executed, the shares of BTU stock represented by it will be voted at the BTU special meeting in accordance with the instructions contained on the proxy card. If any proxy card is returned without indication as to how to vote, the shares of BTU common stock represented by the proxy card will be voted as recommended by the BTU board of directors.

If a BTU stockholder's shares are held in street name by a broker, bank or other nominee, the stockholder should check the voting form used by that firm to determine whether it may vote by telephone or the Internet.

Table of Contents

Every BTU stockholder's vote is important. Accordingly, each BTU stockholder should sign, date and return the enclosed proxy card, or vote via the Internet or by telephone, whether or not the BTU stockholder plans to attend the BTU special meeting in person. Sending in your proxy card or voting by telephone or on the Internet will not prevent you from voting your shares personally at the meeting, since you may revoke your proxy at any time before it is voted.

Shares Held in Street Name

If you are a BTU stockholder and your shares are held in street name through a bank, broker or other holder of record, you must provide the record holder of your shares with instructions on how to vote the shares. Please follow the voting instructions provided by the bank or broker. You may not vote shares held in street name by returning a proxy card directly to BTU or by voting in person at the BTU special meeting unless you provide a legal proxy, which you must obtain from your broker, bank or other nominee. Further, banks or other nominees who hold shares of BTU common stock on behalf of their customers may not give a proxy to BTU to vote those shares with respect to any of the proposals without specific instructions from their customers, as brokers, banks and other nominees do not have discretionary voting power on these matters.

Revocability of Proxies and Changes to a BTU Stockholder's Vote

You have the power to change your vote at any time before your shares of BTU common stock are voted at the BTU special meeting by:

attending and voting in person at the BTU special meeting;

giving notice of revocation of the proxy at the BTU special meeting;

voting by telephone or the Internet at a later time; or

delivering to the Corporate Secretary of BTU at 23 Esquire Road, North Billerica, MA 01862 (i) a written notice of revocation or (ii) a duly executed proxy card relating to the same shares and matters to be considered at the BTU special meeting, bearing a date later than the proxy card previously executed.

Attendance at the BTU special meeting will not in and of itself constitute a revocation of a proxy.

If you choose to send a completed proxy card bearing a later date than your original proxy card, the new proxy card must be received before the beginning of the BTU special meeting. If you have instructed a bank, broker or other nominee to vote your shares of BTU common stock, you must follow the directions you receive from your bank, broker or other nominee in order to change or revoke your vote.

Delivery of Proxy Materials

As permitted by applicable law, only one copy of this joint proxy statement/prospectus is being delivered to stockholders residing at the same address, unless such stockholders have notified BTU of their desire to receive multiple copies of the joint proxy statement/prospectus.

BTU will promptly deliver, upon oral or written request, a separate copy of the joint proxy statement/prospectus to any stockholder residing at an address to which only one copy of such document was mailed. Requests for additional copies should be directed to Investor Relations, at BTU's corporate offices, 23 Esquire Road, North Billerica, MA 01862 or by telephone at (978) 667-4111 ext. 107.

Solicitation of Proxies

In addition to solicitation by mail, directors, officers, and employees of BTU may solicit proxies by personal interview, telephone, or electronic mail. BTU reimburses brokerage houses, custodians, nominees, and fiduciaries for their expenses in forwarding proxies and proxy material to their principals. BTU has retained Georgeson, Inc. to assist in the solicitation of proxies, which firm will, by agreement, receive compensation of approximately \$10,000 plus reasonable expenses for these services. BTU will bear the entire cost of soliciting proxies from you.

Table of Contents

Attending the BTU Special Meeting

Subject to space availability, all BTU stockholders as of the record date, or their duly appointed proxies, may attend the BTU special meeting. Since seating is limited, admission to the BTU special meeting will be on a first-come, first-served basis. Registration and seating will begin at 9:30 a.m., local time.

If you hold your shares of BTU common stock in your name as a stockholder of record and you wish to attend the BTU special meeting, please bring your proxy card and evidence of your stock ownership, such as your most recent account statement, to the BTU special meeting. You should also bring a valid government-issued photo identification card.

If your shares of BTU common stock are held in street name in a stock brokerage account or by a bank or nominee and you wish to attend the BTU special meeting, you need to bring a copy of a bank or brokerage statement to the BTU special meeting reflecting your stock ownership as of the record date. You should also bring valid picture identification.

Other Matters to Come Before the BTU Special Meeting

Management knows of no other business to be presented at the BTU special meeting, but if any other matters are properly presented to the meeting or any adjournments thereof, the persons named in the proxies will vote upon them in accordance with the board of directors' recommendations.

Assistance

If you need assistance in completing your proxy card, have questions regarding BTU's special meeting or would like additional copies of this joint proxy statement/prospectus, please contact Investor Relations at (978) 667-4111 ext. 107 or BTU's proxy solicitor, Georgeson, Inc., at (866) 821-2570.

Table of Contents

BTU PROPOSALS

PROPOSAL NO. 1

BTU MERGER PROPOSAL

BTU is asking its stockholders to adopt the merger agreement and approve the transactions contemplated thereby. Holders of BTU common stock should read this joint proxy statement/prospectus carefully and in its entirety, including the annexes, for more detailed information concerning the merger agreement and the merger. A copy of the merger agreement is attached to this joint proxy statement/prospectus as Annex A.

After careful consideration, the BTU board of directors, by a unanimous vote of all directors, approved the merger agreement and declared the merger agreement and the transactions contemplated thereby, including the merger, to be advisable and in the best interest of BTU and the stockholders of BTU. See *The Merger BTU's Reasons for the Merger; Recommendation of BTU's Board of Directors* beginning on page 106 of this joint proxy statement/prospectus for a more detailed discussion of the BTU board of directors' recommendation.

The BTU board of directors recommends a vote FOR the BTU merger proposal.

PROPOSAL NO. 2

BTU ADJOURNMENT PROPOSAL

The BTU special meeting may be adjourned to another time or place, if necessary or appropriate, to solicit additional proxies if there are insufficient votes at the time of the BTU special meeting to adopt the BTU merger proposal.

If, at the BTU special meeting, the number of shares of BTU common stock present or represented and voting in favor of the BTU merger proposal is insufficient to adopt the BTU merger proposal, BTU intends to move to adjourn the BTU special meeting in order to enable the BTU board of directors to solicit additional proxies for approval of the merger. In that event, BTU will ask its stockholders to vote upon the BTU adjournment proposal, but not the BTU merger proposal or the BTU merger-related compensation proposal.

In this proposal, BTU is asking its stockholders to authorize the holder of any proxy solicited by the BTU board of directors on a discretionary basis to vote in favor of adjourning the BTU special meeting to another time and place for the purpose of soliciting additional proxies, including the solicitation of proxies from BTU stockholders who have previously voted.

The BTU board of directors recommends a vote FOR the BTU adjournment proposal.

PROPOSAL NO. 3

BTU MERGER-RELATED COMPENSATION PROPOSAL

Pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 and Rule 14a-21(c) of the Exchange Act, BTU is seeking non-binding, advisory stockholder approval of the compensation of BTU's named executive officers that is based on or otherwise relates to the merger as disclosed in *The Merger Merger-Related Compensation for BTU's Named Executive Officers* beginning on page 131. The proposal gives BTU's stockholders the opportunity to express their views on the merger-related compensation of BTU's named executive officers.

Accordingly, BTU is requesting stockholders to adopt the following resolution, on a non-binding, advisory basis:

RESOLVED, that the compensation that may be paid or become payable to BTU's named executive officers in connection with the merger and the agreements or understandings pursuant to which such compensation may be paid or become payable, in each case as disclosed pursuant to Item 402(t) of Regulation S-K in The Merger Interests of BTU Directors and Executive Officers in the Merger Merger-Related Compensation for BTU's Named Executive Officers, are hereby APPROVED.

Table of Contents

Approval of this proposal is not a condition to completion of the merger, and the vote with respect to this proposal is advisory only and will not be binding on Amtech or BTU. If the merger is completed, the merger-related compensation may be paid to BTU's named executive officers to the extent payable in accordance with the terms of the compensation agreements and arrangements even if BTU stockholders fail to approve the advisory vote regarding merger-related compensation.

The BTU board of directors recommends a vote FOR, on an advisory basis, the BTU merger-related compensation proposal.

Table of Contents

THE AMTECH SPECIAL MEETING

This section contains information for Amtech stockholders about the special meeting that Amtech has called to allow its stockholders to consider and vote on the merger agreement and other related matters. Amtech is mailing this joint proxy statement/prospectus to you, as an Amtech stockholder, on or about December 30, 2014. This joint proxy statement/prospectus is accompanied by a notice of the special meeting of Amtech stockholders and a form of proxy card that Amtech's board of directors is soliciting for use at the special meeting and at any adjournments or postponements of the special meeting.

Date, Time and Place of Meeting

The special meeting will be held on January 29, 2015, at The Tempe Mission Palms Hotel, 60 East 5th Street, Tempe, Arizona, USA, at 9:00 a.m. local time.

Matters to Be Considered

At the special meeting of stockholders, you will be asked to consider and vote upon the following matters:

the Amtech merger proposal;

the Amtech adjournment proposal; and

to transact such other business as may properly come before the meeting or any adjournment thereof.

Recommendation of Amtech's Board of Directors

Amtech's board of directors has determined that the merger agreement and the transactions contemplated thereby, including the merger, are advisable and in the best interests of Amtech and its stockholders, has unanimously approved the merger agreement and unanimously recommends that Amtech stockholders vote FOR the Amtech merger proposal and FOR the Amtech adjournment proposal. See The Merger Amtech's Reasons for the Merger; Recommendation of Amtech's Board of Directors beginning on page 117 for a more detailed discussion of Amtech's board of directors' recommendation.

Record Date and Quorum

Amtech's board of directors has fixed the close of business on December 16, 2014 as the record date for determining the holders of Amtech common stock entitled to receive notice of and to vote at the Amtech special meeting.

As of the record date, there were 9,869,916 shares of Amtech common stock outstanding and entitled to vote at the Amtech special meeting held by approximately 427 holders of record. Each share of Amtech common stock entitles the holder to one vote at the Amtech special meeting on each proposal to be considered at the Amtech special meeting.

As of the record date, the directors and executive officers of Amtech and their affiliates owned and were entitled to vote 180,137 shares of Amtech common stock, representing approximately 1.8% of the shares of Amtech common stock outstanding on that date. Amtech currently expects that Amtech's directors and executive officers will vote their

shares in favor of the Amtech merger proposal, and the Amtech adjournment proposal, although none of them (other than Mr. Whang as described in the section of this joint proxy statement/prospectus entitled "The Merger Voting Agreements") have entered into any agreements obligating them to do so.

The presence at the special meeting, in person or by proxy, of holders of a majority of the outstanding shares of Amtech common stock entitled to vote at the special meeting will constitute a quorum for the transaction of business. All shares of Amtech common stock present in person or represented by proxy, including abstentions and broker non-votes, will be treated as present for purposes of determining the presence or absence of a quorum for all matters voted on at the Amtech special meeting.

Table of Contents

Required Vote; Treatment of Abstentions and Failure to Vote

Amtech merger proposal:

Standard: The affirmative vote of a majority of the outstanding shares of Amtech common stock entitled to vote on the proposal.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the Amtech special meeting or fail to instruct your bank or broker how to vote with respect to the Amtech merger proposal, it will have the same effect as a vote **AGAINST** the proposal.

Amtech adjournment proposal:

Standard: The affirmative vote of a majority of votes cast (in person or by proxy) at the Amtech special meeting and entitled to vote on such proposals.

Effect of abstentions and broker non-votes: If you mark **ABSTAIN** on your proxy card, fail to submit a proxy card or vote in person at the Amtech special meeting or fail to instruct your bank or broker how to vote with respect to the Amtech adjournment proposal, it will have no effect on such proposal.

Voting on Proxies; Incomplete Proxies

An Amtech stockholder may vote by proxy or in person at the Amtech special meeting. If you hold your shares of Amtech common stock in your name as a stockholder of record, to submit a proxy, you, as an Amtech stockholder, may use one of the following methods:

By telephone: by calling the toll-free number indicated on their proxy card and following the recorded instructions.

Through the Internet: by visiting the website indicated on their proxy card and following the instructions.

Complete and return the proxy card in the enclosed envelope. The envelope requires no additional postage if mailed in the United States.

Amtech requests that Amtech stockholders vote by telephone, over the Internet or by completing and signing the accompanying proxy card and returning it to Amtech as soon as possible in the enclosed postage-paid envelope. When the accompanying proxy card is returned properly executed, the shares of Amtech stock represented by it will be voted at the Amtech special meeting in accordance with the instructions contained on the proxy card. If any proxy card is returned without indication as to how to vote, the shares of Amtech common stock represented by the proxy card will be voted as recommended by the Amtech board of directors.

If an Amtech stockholder's shares are held in street name by a broker, bank or other nominee, the stockholder should check the voting form used by that firm to determine whether it may vote by telephone or the Internet.

Every Amtech stockholder's vote is important. Accordingly, each Amtech stockholder should sign, date and return the enclosed proxy card, or vote via the Internet or by telephone, whether or not the Amtech stockholder plans to attend the Amtech special meeting in person. Sending in your proxy card or voting by telephone or on the Internet will not prevent you from voting your shares personally at the meeting, since you may revoke your proxy at any time before it is voted.

Shares Held in Street Name ; Broker Non-Votes

If you are an Amtech stockholder and your shares are held in street name through a bank, broker or other holder of record, you must provide the record holder of your shares with instructions on how to vote the shares. Please follow the voting instructions provided by the bank or broker. You may not vote shares held in street name by returning a proxy card directly to Amtech or by voting in person at the Amtech special meeting unless you provide a legal proxy, which you must obtain from your broker, bank or other nominee. Further, banks or other nominees who hold shares of Amtech common stock on behalf of their customers may not give a proxy to Amtech to vote those shares with respect to any of the proposals without specific instructions from their customers, as brokers, banks and other nominees do not have discretionary voting power on these matters.

Table of Contents

Revocability of Proxies and Changes to an Amtech Stockholder's Vote

You have the power to change your vote at any time before your shares of Amtech common stock are voted at the Amtech special meeting by:

attending and voting in person at the Amtech special meeting;

giving notice of revocation of the proxy at the Amtech special meeting;

voting by telephone or the Internet at a later time; or

delivering to the Corporate Secretary of Amtech at 131 South Clark Drive Tempe, Arizona 85281 (i) a written notice of revocation or (ii) a duly executed proxy card relating to the same shares and matters to be considered at the Amtech special meeting, bearing a date later than the proxy card previously executed.

Attendance at the Amtech special meeting will not in and of itself constitute a revocation of a proxy.

If you choose to send a completed proxy card bearing a later date than your original proxy card, the new proxy card must be received before the beginning of the Amtech special meeting. If you have instructed a bank, broker or other nominee to vote your shares of Amtech common stock, you must follow the directions you receive from your bank, broker or other nominee in order to change or revoke your vote.

Solicitation of Proxies

Amtech is soliciting your proxy in conjunction with the merger. Amtech will bear the entire cost of soliciting proxies from you. In addition to solicitation of proxies by mail, Amtech will request that banks, brokers and other record holders send proxies and proxy material to the beneficial owners of Amtech common stock and secure their voting instructions. Amtech will reimburse the record holders for their reasonable expenses in taking those actions. If necessary, Amtech may use its directors and several of its regular employees, who will not be specially compensated, to solicit proxies from the Amtech stockholders, either personally or by telephone, facsimile, letter or electronic means. Amtech has also made arrangements with Georgeson, Inc. to assist it in soliciting proxies and has agreed to pay Georgeson, Inc. approximately \$7,500 plus reasonable expenses for these services.

Attending the Meeting

Subject to space availability, all Amtech stockholders as of the record date, or their duly appointed proxies, may attend the Amtech special meeting. Since seating is limited, admission to the Amtech special meeting will be on a first-come, first-served basis. Registration and seating will begin at 8:30 a.m., local time.

If you hold your shares of Amtech common stock in your name as a stockholder of record and you wish to attend the Amtech special meeting, please bring your proxy card and evidence of your stock ownership, such as your most recent account statement, to the Amtech special meeting. You should also bring valid picture identification.

If your shares of Amtech common stock are held in street name in a stock brokerage account or by a bank or nominee and you wish to attend the Amtech special meeting, you need to bring a copy of a bank or brokerage statement to the Amtech special meeting reflecting your stock ownership as of the record date. You should also bring valid picture identification.

Delivery of Proxy Materials

As permitted by applicable law, only one copy of this joint proxy statement/prospectus is being delivered to stockholders residing at the same address, unless such stockholders have notified Amtech of their desire to receive multiple copies of the joint proxy statement/prospectus.

Amtech will promptly deliver, upon oral or written request, a separate copy of the joint proxy statement/prospectus to any stockholder residing at an address to which only one copy of such document was mailed. Requests for additional copies should be directed to Investor Relations at Amtech's corporate offices, 131 South Clark Drive Tempe, Arizona 85281 or by telephone at (480) 967-5146.

Table of Contents

Other Matters to Come Before the Amtech Special Meeting

Management knows of no other business to be presented at the Amtech special meeting, but if any other matters are properly presented at the meeting or any adjournments thereof, the persons named in the proxies will vote upon them in accordance with the board of directors' recommendations.

Assistance

If you have any questions concerning the merger or this joint proxy statement/prospectus, would like additional copies of this joint proxy statement/prospectus or need help voting your shares of Amtech common stock, please contact Amtech's proxy solicitor, Georgeson, Inc., at (866) 647-8872.

Table of Contents

AMTECH PROPOSALS

PROPOSAL NO. 1

AMTECH MERGER PROPOSAL

Amtech is asking its stockholders to adopt the merger agreement and approve the transactions contemplated thereby. Holders of Amtech common stock should read this joint proxy statement/prospectus carefully and in its entirety, including the annexes, for more detailed information concerning the merger agreement and the merger. A copy of the merger agreement is attached to this joint proxy statement/prospectus as Annex A.

After careful consideration, the Amtech board of directors, by a unanimous vote of all directors, approved the merger agreement and declared the merger agreement and the transactions contemplated thereby, including the merger, to be advisable and in the best interest of Amtech and the stockholders of Amtech. See *The Merger Amtech's Reasons for the Merger; Recommendation of Amtech's Board of Directors* beginning on page 117 in this joint proxy statement/prospectus for a more detailed discussion of the Amtech board of directors' recommendation.

The Amtech board of directors recommends a vote FOR the Amtech merger proposal.

PROPOSAL NO. 2

AMTECH ADJOURNMENT PROPOSAL

The Amtech special meeting may be adjourned to another time or place, if necessary or appropriate, to solicit additional proxies if there are insufficient votes at the time of the Amtech special meeting to adopt the Amtech merger proposal.

If, at the Amtech special meeting, the number of shares of Amtech common stock present or represented and voting in favor of the Amtech merger proposal is insufficient to adopt the Amtech merger proposal, Amtech intends to move to adjourn the Amtech special meeting in order to enable the Amtech board of directors to solicit additional proxies for approval of the merger. In that event, Amtech will ask its stockholders to vote upon the Amtech adjournment proposal, but not the Amtech merger proposal.

In this proposal, Amtech is asking its stockholders to authorize the holder of any proxy solicited by the Amtech board of directors on a discretionary basis to vote in favor of adjourning the Amtech special meeting to another time and place for the purpose of soliciting additional proxies, including the solicitation of proxies from Amtech stockholders who have previously voted.

The Amtech board of directors recommends a vote FOR the Amtech adjournment proposal.

INFORMATION ABOUT AMTECH

Amtech, which was incorporated in Arizona in October 1981, operates in two business segments: (i) solar and semiconductor equipment and (ii) polishing supplies. Amtech is a global manufacturer of capital equipment, including thermal processing, silicon wafer handling automation, and ion implant equipment and related consumables used in fabricating solar cells, LED and semiconductor devices. Semiconductors, or semiconductor chips, are fabricated on silicon wafer substrates, sliced from ingots, and are part of the circuitry, or electronic components, of many products including solar cells, computers, telecommunications devices, automotive products, consumer goods, and industrial

automation and control systems. Amtech's wafer handling, thermal processing and consumable products currently address the diffusion, oxidation, and deposition steps used in the fabrication of solar cells, LEDs, semiconductors, microelectromechanical systems (MEMS) and the polishing of newly sliced silicon wafers.

Amtech's stock is traded on NASDAQ under the symbol ASYS.

Amtech's principal office is located at 131 South Clark Drive Tempe, Arizona 85281. Additional information about Amtech and its subsidiaries is included in documents incorporated by reference in this joint proxy statement/prospectus. See "Where You Can Find More Information," beginning on page 163.

Table of Contents

INFORMATION ABOUT BTU

Overview

BTU, which was founded in 1950, was incorporated as a Delaware corporation in 1981 and is headquartered in North Billerica, Massachusetts. BTU operates as a single business segment called Thermal Processing Capital Equipment. BTU's business consists of the designing, manufacturing, selling and servicing of thermal processing equipment and related process controls for use in the electronics, alternative energy, automotive and other industries. This includes the supply of solder reflow systems used for surface mount applications in printed circuit board assembly. Thermal processing equipment is used in: low temperature curing/encapsulation; hybrid integrated circuit manufacturing; integrated circuit packaging and sealing; and processing multi-chip modules. In addition, the equipment is used for solar cell processing, sintering nuclear fuel for commercial power generation, as well as brazing and the sintering of ceramics and powdered metals, and the deposition of precise thin film coatings. BTU's customers are multinational original equipment manufacturers and contract manufacturing companies.

BTU's customers require high throughput, high yield and highly reliable thermal processing systems with tightly controlled temperature and atmospheric parameters. In electronics assembly, BTU's convection solder reflow systems are used to attach electronic components to the printed circuit boards, primarily in the advanced, high-density, surface mount segments of this market. In the semiconductor market, BTU participates in both wafer level and die level packaging, where its thermal processing systems are used to connect and seal integrated circuits into a package. In the solar market, BTU offers processing equipment for both silicon and thin film photovoltaics. In the alternative energy market, BTU's customers use its thermal systems for the processing of nuclear fuel.

Industry Background

Electronics Markets

Demand for increasingly sophisticated electronic devices continues, and BTU expects that new technologies such as wireless networks, next generation cellular phones and tablets will help to drive future growth. Electronic equipment continues to become more complex, yet end users are still demanding smaller, lighter and less expensive devices. This, in turn, requires increased performance and reduced cost, size, weight and power requirements of electronic assemblies, printed circuit boards and semiconductors. In response to these developments, manufacturers are increasingly employing more sophisticated production and assembly techniques requiring more advanced manufacturing equipment, such as that supplied by BTU.

Printed Circuit Board Assembly. In the printed circuit board assembly process, semiconductor and discrete-devices plus other components are attached to printed circuit boards. The attachment process, which creates a permanent physical and electrical bond, is called solder reflow or surface mount reflow. Manufacturers rely on high throughput and highly reliable equipment to get the maximum efficiency in their production process.

Wafer Level and Die Level Semiconductor Packaging. Semiconductor packaging processes include precision thermal processing steps. In advanced semiconductor packaging, processing takes place at both the wafer level and die level. At the wafer level, deposited solder must be thermally treated to form perfectly spherical bumps. At the die level, these bumps allow the integrated circuits to be bonded to the semiconductor package. Advancements in the semiconductor industry toward higher chip speeds, smaller form factors and reduced costs are driving the transition to wafer level packaging from the traditional wire bonding technique.

Across all markets, the need for more versatile, more reliable and more advanced capital equipment persists. In addition, the continued globalization of manufacturing and the shift to low cost regions such as China, particularly for electronics and silicon photovoltaic producers, has driven the demand for equipment with a lower cost of ownership.

Alternative Energy Markets

BTU's alternative energy business primarily addresses two markets: the manufacturing of solar cells and nuclear fuels.

Photovoltaics. Silicon photovoltaic applications are served by BTU's metallization and annealing furnaces and in-line diffusion systems.

Table of Contents

BTU's metallization products include the recently introduced SINTERRA metallization firing furnace. SINTERRA combines advanced process features with industry-leading uptime as the new flagship of the BTU metallization line. These systems generally range in price from \$100,000 to \$250,000.

The MERIDIAN thermal processing system is used for phosphorous diffusion. This system is targeted for customers transitioning from batch to in-line processing. The MERIDIAN sells in the range of \$700,000 to \$1.3 million.

BTU offers solar processing equipment for both silicon and thin film photovoltaics. In thin film photovoltaics, BTU's equipment is used for both the Copper Indium Gallium Selenide (CIGS) and Cadmium Telluride (CdTe) processes. These thin film systems generally sell in the range of \$800,000 to \$2.0 million.

Nuclear Fuel. Another application for BTU systems is for sintering nuclear fuel. These sintering processes operate at approximately 1750°C in a hydrogen reduction atmosphere. Our leading product for this application is our patented Walking Beam system, which is ideally suited for the high volume manufacture of nuclear fuels. It uses a walking beam transport system to eliminate friction associated with the conveyance of heavy loads through the process chamber. Walking Beam systems, which are used to sinter gadolinium and uranium pellets used for nuclear fuel generation, generally sell in the range of \$2.7 million to \$3.3 million.

Technological Challenges

Continuous thermal processing systems present significant engineering challenges related to temperature control, atmosphere control, product handling, flux containment and disposal, and high system up time. Thermal processing systems must maintain accurate and uniform temperatures within their process chambers. The temperature within the process chamber is influenced by the rate at which components are moved through the system and the weight and density of the product. In addition, the thermal processing system's heat convection and/or radiation rate must be varied and controlled as components and materials are processed. The chamber must also dispense heat uniformly across the product at precise temperatures to ensure maximum process uniformity. Products must be heated and cooled at closely preset rates in order to avoid damage caused by thermal stress.

Another technological challenge for continuous thermal processing systems is achieving precisely controlled atmospheric conditions within the process chamber. In order to facilitate thermal processing without contamination of or damage to the product, many thermal processing systems use a substantially oxygen-free atmosphere of nitrogen or hydrogen in their process chambers. If such gases are used, the exit of process gases and/or the entry of contaminating air must be minimized, even though the product enters and exits the system continuously from the ambient atmosphere. Maintaining a pure, safe and controlled atmosphere in the open process chamber, while minimizing the consumption of nitrogen or hydrogen gases in order to reduce operating costs, presents significant engineering challenges.

Handling products in thermal processing systems requires highly reliable conveyance systems that can easily be converted to process a wide variety of products having different specifications, sometimes on side-by-side tracks through the process chamber. The product handling system must also fully support a wide variety of product sizes.

The mechanical components in thermal processing systems must operate almost continuously in a demanding, elevated temperature environment with frequent thermal cycles. The use of materials that are resistant to high temperature and thermal stress is important to achieving high reliability.

In applications using flux or other process chemicals, the volatile compounds that are vaporized during the thermal processing cycle must be safely contained and collected so that they do not condense in the system or damage the

environment. The efficient containment, collection and disposal of the flux or other process chemicals are important factors in achieving high system up time, high throughput and reliability.

BTU s Solution

BTU delivers a broad range of thermal processing systems to serve the needs of manufacturers that require high throughput, process yields and reliability with tightly controlled process parameters. BTU s systems are designed to enable BTU s customers

Table of Contents

to increase product performance, throughput and yield for electronics assembly, solar cell processing and nuclear fuel sintering by providing precise atmospheric and temperature control. In addition to the expected high performance of BTU's products, BTU believes maintaining the quality standards of its organization and its worldwide service and support are important to its success with industry leading global manufacturers.

BTU believes its customers continue to choose its products because of the following factors:

Accurate and Uniform Temperature. BTU's systems use convection, radiation and infrared heating technologies. BTU's high-rate convection and fully-enclosed coil heating modules are designed to provide controlled heating capacities across many different applications, thereby enabling BTU's customers to maximize process uniformity and throughput. In addition, BTU's systems are designed to apply heat uniformly across the product load, which is critical to ensure optimum processing. Heat up and cool down profiles are also closely controlled for process consistency and the protection of product.

Atmosphere Uniformity and Control. BTU's thermal processing systems are designed to provide precision control over atmospheric conditions within their process chambers by integrating its gas and physical curtain technologies. BTU's systems are designed to be capable of excluding virtually all oxygen from the critical process steps to maintain the safety and integrity of the process chamber atmosphere. In addition, BTU's systems are intended to minimize the consumption of nitrogen or hydrogen, thereby reducing the operating cost of maintaining the atmosphere.

Repeatability from System to System. BTU designs its systems to provide a high degree of repeatability from system to system through its atmospheric and temperature controls and the expected reliability of its systems. This repeatability is achieved through BTU's industry leading closed loop convection technology that is intended to ensure the same convection rate regardless of change in altitude or temperature. This is a critical attribute because BTU's customers must achieve consistent, uniform manufacturing performance in plants located throughout the world.

Processing Flexibility. Major electronics and solar cell manufacturers process many sizes of products and often need rapid product changeover capabilities. BTU's systems can process printed circuit boards or solar cells of different sizes with minimal or no reconfiguration. Rapid changeover reduces down time and increases manufacturing volume. In addition, BTU's solar cell processing equipment can be configured for multiple process applications allowing for versatility in materials manufacturing.

Reliability. BTU's customers place a high premium on reliability. Reliability is a major contributor to low cost of ownership because high up time can increase the productivity and efficiency of an entire production line. BTU believes its systems are the most reliable advanced thermal processing systems in the world.

Systems Integration. BTU provides fully integrated systems that include automated handling of its products, as well as full software integration with BTU's customers' factory management systems. This allows BTU's customers to monitor and analyze the process in real time from a central location.

Worldwide Customer Support. BTU's goal is to provide its customers with global technical service support, in-depth process engineering support and rapid delivery of its systems and parts. BTU provides its customer support through its on-site direct service organization and its independent sales and service representatives, supplemented with twenty-four hours a day, seven days a week telephone support and extensive customer training programs.

BTU's Strategy

BTU's objective is to be the leading provider of thermal and other processing systems to the electronics assembly and alternative energy markets. To achieve this goal and maximize value for BTU's shareholders, BTU's strategy includes the following elements:

1. Deepen relationships with key partners to facilitate product and process development for next generation technologies;
2. Continue to focus on cost reduction initiatives, including the improvement of BTU's global supply chain and reduction in materials costs;
3. Further penetrate existing markets, such as electronics, and new customers by developing innovative products with a low cost of ownership and by offering exceptional customer support; and
4. Expand BTU's low-cost manufacturing and engineering operations in China.

Table of Contents

Products

BTU supplies a broad range of primarily thermal processing systems for the electronics assembly and alternative energy markets. BTU's products are used for such applications as printed circuit board assembly and semiconductor packaging, solar cell manufacturing and nuclear fuel processing. Most of BTU's products are used for thermal processing operations; typically having a processing chamber that allows products to enter and exit in a continuous mode through the process chamber via a transport mechanism in most cases a conveyor belt. A control system regulates a series of electric heaters to produce a consistent, even temperature profile through radiant, convection or infrared heating as required by the customers' process.

Electronics Products

Printed Circuit Board Assembly. BTU currently sells thermal processing systems used in the solder reflow and curing stages of printed circuit board assembly. BTU's printed circuit board assembly products are used primarily in the advanced, high-density segments of the market that utilize surface mount technology.

At the end of 2012, BTU announced the DYNAMO, the newest reflow oven platform, designed specifically for processing portable electronics. The DYNAMO convection reflow oven is positioned to maximize customer value for portable electronics manufacturers, where products are typically lighter, smaller and less complex than other applications. Featuring a new convection design, the DYNAMO delivers high efficiency through innovative thermal transfer delivering excellent temperature and gas flow uniformity across the chamber. The DYNAMO platform is targeted geographically in markets with high concentrations of portable electronics manufacturers such as Asia and South America.

BTU's PYRAMAX family of convection reflow systems is designed on a single platform to be rapidly configurable, which is intended to reduce the product build cycle and allow BTU to meet customer demands for shorter delivery lead times. BTU believes PYRAMAX products offer its customers reduced capital cost, lower nitrogen consumption and reduced scheduled maintenance cycles.

PYRAMAX systems provide increased process flexibility due to their ability to process printed circuit boards up to 24 inches wide. Rated up to 400°C, these products are designed to be capable of operating in air or nitrogen atmospheres and to have increased convection flow for greater performance and lead free processes. PYRAMAX utilizes impingement technology to transfer heat to the substrate. These systems are offered in 6, 8, 10 and 12-zone heated lengths and are capable of processing lead free solder. They generally range in price from \$40,000 to \$150,000.

The market need for lead free solder reflow presents a unique challenge by requiring a process temperature that is critically close to the destruct temperature of the components that are being attached. The PYRAMAX system's unique closed loop convection control is designed to provide a repeatable tight temperature window that is optimized for lead free solder reflow.

The solder reflow process requires the thermal processing system to manage flux residues eliminated during the processing of the printed circuit boards. PYRAMAX systems are equipped with a patented flux management system that is structured to isolate the flux outside the main process chamber, thereby helping to maintain the integrity of the atmosphere and facilitate easy disposal.

Wafer Level and Die Level Semiconductor Packaging. We sell several systems for the thermal processes used in advanced semiconductor packaging.

Flip-chip reflow provides the physical and electronic bond of the semiconductor device to its package. The PYRAMAX families of convection reflow systems, utilizing our closed loop convection technology, rate at up to 400°C and operate in air or nitrogen atmospheres. These products utilize impingement technology to transfer heat to the substrate. Using thermal power arrays of five-kilowatt heaters, they can process substrates in dual lane, dual speed configurations, thereby enabling our customers to double production without increasing the machine's footprint. These products are available in four models based on the heated lengths of thermal processing chambers. Heated length is based on the required production rate and loading requirements. The products generally range in price from \$70,000 to \$180,000.

Table of Contents

Alternative Energy Products

The processing of advanced materials used in non-fossil fuel power generation applications is a significant target market. The cost fluctuations of fossil fuels and environmental concerns have increased demand for clean power. For power generation applications, BTU serves the solar cell and nuclear fuel markets. BTU supports its worldwide alternative energy customers through its global sales and service network.

Solar Cells. BTU offers solar processing equipment for both silicon and thin film photovoltaics. Silicon photovoltaic applications are served by BTU's metallization, in-line diffusion, and annealing processes and systems. BTU's MERIDIAN in-line diffusion system features the MERIDIAN diffusion furnace and phosphorus coater, which includes key advances such as back-side and top-side coating and an integrated dryer. The system can be configured to achieve up to 1500 (156mm) wafers per hour and can also be configured to use third party coating applications. The in-line process offers reduced wafer handling and greater throughput than traditional batch processing. Reduced handling translates into lower breakage rates, improved yield and lower cost of ownership. The MERIDIAN system price starts at \$700,000 and varies depending on configuration.

For the metallization process, BTU offers a complete line of Rapid Thermal Processing furnaces utilizing near infrared heating technology. Systems come in varying lengths and widths to suit specific throughput requirements. The product line has been specifically designed for the solar cell metallization process and is used for contact drying and firing. Specialized features include rapid heating via densely spaced tungsten lamps and rapid cooling rates obtained through proprietary water cooling technology. BTU recently introduced the SINTERRA metallization product line. SINTERRA combines advanced process features with industry-leading uptime as the new flagship of the BTU metallization line. These systems generally range in price from \$100,000 to \$250,000.

To improve solar cell efficiency and reduce manufacturing cost, the solar market invests aggressively in new technologies. BTU offers next generation thermal processing equipment to enable such new technologies.

Annealing of additional and/or novel layers and plating are becoming important process steps. BTU has developed products for these applications, providing production scale equipment to several key solar companies and pilot units to others. BTU expects this to be an emerging business in the years to come, and BTU is well positioned to be a leader in this emerging area.

In thin film photovoltaics, BTU leverages its experience with large-scale, custom, in-line thermal processing systems. System designs are scalable and are sold for lab, pilot and production sized applications. These systems generally sell for in excess of \$1 million, although the price can vary widely based on size and features.

Nuclear Fuels. We offer both walking beam and pusher systems for sintering nuclear fuel. These processes operate at temperatures in the range of 1750°C in a hydrogen reduction atmosphere. BTU's most important product for this market is its patented Walking Beam system designed for high volume manufacture of nuclear fuels. It uses a walking beam transport system to eliminate friction associated with the conveyance of heavy loads. Walking Beam systems are used to sinter gadolinium and uranium fuel-pellets used for nuclear power generation. These systems generally sell in the range of \$2.7 million to \$3.3 million.

Customers

Many of BTU's principal customers are large-volume global manufacturers that use BTU's products in multiple facilities worldwide. Of BTU's top ten revenue generating customers in 2013, one customer accounted for \$8.2 million, or 17.4% of total net sales.

Sales and Support

BTU markets and sells its products primarily through its direct sales force and independent sales representatives throughout the world. BTU's on-site direct service organization and its independent sales representatives provide ongoing support to customers using BTU's products. These services include implementing continuous improvement tools related both to the cost of BTU's products and to their technical performance. As well as process support, BTU's strong global support infrastructure allows BTU to market future sales within its current customer base and contributes to its competitive position. BTU's management and

Table of Contents

sales teams participate in periodic trade conventions, through which BTU markets its products to potential customers. BTU has implemented a software based quotation system to simplify and accelerate its sales process for its customers.

Research, Development and Engineering

BTU's efforts in 2013 and 2014 have been directed towards development of new products for both the electronics and alternative energy businesses, improvements to its offerings in the solar cell equipment market, as well as upgrades to its core in-line furnace business. Product platform extensions are being handled by its U.S. and China technical team, while most new technology is being developed in the U.S. BTU's DYNAMO solder reflow platform was designed through collaboration between its China and U.S. teams. BTU's engineering and applications teams are working with a number of partners to further develop processes related to metallization, annealing and in-line diffusion for both standard and next generation high efficiency cells which would uniquely benefit from BTU's type of low cost process.

BTU's development team is looking at and modeling its heating, cooling, conveyance methods, insulation, and materials of construction to enhance its furnace performance and widen the possible number of process applications available to BTU. A number of these ideas are already being made available to BTU's customers, and BTU expects this to continue. BTU is also piloting a novel heating system and investigating possible applications for it.

BTU's research, development, and engineering costs for the years ending December 31, 2013, 2012, and 2011 can be found in BTU's historic financial statements beginning on page 72.

Manufacturing and Suppliers

BTU's principal manufacturing operations consist of final assembly, systems integration and testing at its facilities in North Billerica, Massachusetts and Shanghai, China. BTU outsources the manufacture of many of its subsystems to a number of key suppliers and maintains close relationships with them while also maintaining qualified alternative suppliers. In 2004, BTU's manufacturing facility in Shanghai, China was established for BTU's electronics assembly products and solar cell metallization products, as well as local sourcing of materials.

In the past few years, BTU has substantially improved its global supply chain and reduced its material costs. BTU has upgraded and reorganized its operations organization in the U.S. In addition, BTU has leveraged its presence in China to widen the supply base for its Shanghai manufactured electronics assembly and solar cell metallization products.

Continuous improvement in the supply chain is a key strategic imperative. BTU has established a global sourcing organization, based in China, to further develop high quality, cost effective suppliers throughout the world.

BTU's commitment to developing new products, a desire to increase collaboration between engineering teams located in the U.S. and China, and the need to protect BTU's intellectual property led BTU to implement an enterprise data management system in its North Billerica and Shanghai design centers. In addition to the overall benefits of increased collaboration and information control, the system has significantly improved the productivity of China-based engineers, speeding migration of new products to manufacturing facilities in Shanghai.

BTU has outsourced the manufacture of most of its significant component systems, thereby reducing cycle time and increasing its inventory turnover. BTU seeks to adhere closely to the principles of total quality management and has been ISO 9001 certified since 1998. In its North Billerica facility, it converted to ISO 9001:2008 in October 2009, and its Shanghai, China manufacturing operations have been ISO 9001:2008 certified since July 2009. BTU's customers, suppliers and employees are strongly encouraged to provide feedback and suggestions for improvements in products and services.

Intellectual Property

BTU seeks to protect its intellectual property by filing patents on proprietary features of its advanced thermal processing systems and by challenging third parties that it believes infringe on its patents. BTU also protects its intellectual property rights, including its trademarks, trade secrets and copyrights with nondisclosure and confidentiality agreements with employees,

Table of Contents

consultants and key customers. As a global supplier of equipment, BTU recognizes that the laws of certain foreign countries may not protect its intellectual property to the same extent as the laws of the U.S. BTU's current portfolio includes 68 issued patents, 27 trademarks that are registered and 20 pending patent applications.

BTU licenses software programs from third-party developers and incorporates them into its products. Generally, these agreements grant BTU non-exclusive licenses to use the software and terminate only upon a material breach by BTU. BTU believes that such licenses are generally available on commercially reasonable terms from a number of licensors.

Backlog

Backlog as of December 31, 2013, was \$6.5 million, compared to \$6.2 million as of December 31, 2012. As of December 31, 2013, BTU expected to ship its year-end backlog within 40 weeks. Solder reflow systems are typically shipped within 3 to 8 weeks. The backlog of BTU's custom systems is expected to be shipped within 12 to 40 weeks. BTU includes in backlog only those orders for which the customer has issued a purchase order and for which BTU has a defined delivery schedule within 12 months. Due to possible changes in delivery schedules, lead time variations and order cancellations, BTU's backlog at any particular date is not necessarily representative of sales for any subsequent period.

Competition

Several companies compete with BTU in selling thermal processing systems. Although price is a factor in buying decisions, BTU believes that technological leadership, process capability, throughput, environmental safeguards, uptime, mean time-to-repair, cost of ownership and after-sale support have become increasingly important factors. BTU competes primarily on the basis of these criteria, rather than on the basis of price only.

BTU's principal competitors for printed circuit board assembly equipment and advanced semiconductor packaging vary by product application. BTU's principal competitors for solder reflow systems are Vitronics-Soltec, Heller, Folungwin, ERSA, and Rehm. BTU's principal competitors for advanced semiconductor packaging are Vitronics-Soltec and Heller. BTU's systems for the alternative energy markets and other applications compete primarily against products offered by Despatch, Amtech, Centrotherm, SierraTherm, Smit and Harper. BTU also faces competition from emerging low cost Asian manufacturers and other established European manufacturers.

Employees

As of December 31, 2013, BTU had 290 employees, of whom 68 were engaged in sales, marketing and service, 27 in research, development and engineering, 32 in finance and administration and 163 in operations. Of these 290 employees, 190 reside outside of the U.S. None of BTU's employees are represented by a collective bargaining agreement, and BTU believes that it has satisfactory relations with its employees.

Environmental

One of BTU's core values is protecting the environment in which it operates and the environment in which its equipment operates. Compliance with laws and regulations regarding the discharge of materials into the environment, or otherwise relating to the protection of the environment, has not had any material effects on BTU's capital expenditures, earnings or competitive position. BTU does not anticipate any material capital expenditures for environmental control in its facilities in 2014.

As an equipment manufacturer, BTU generates and disposes of small quantities of solid waste that is considered hazardous under Environmental Protection Agency (EPA) regulations. Because BTU has historically used a waste disposal firm that disposed of the solid waste at a site that the EPA has designated as a Superfund site, BTU has been named by the EPA as one of the entities responsible for a portion of the expected clean-up costs. Based on its proportional responsibility, as negotiated with and agreed to by the EPA, BTU's liability related to this matter is \$221,613. This amount is included in Accrued Expenses on the Consolidated Balance Sheet as of September 28, 2014.

Table of Contents

BTU's Web Site

Our web site is www.btu.com. It provides information about BTU, and allows interested persons to obtain, free of charge, a copy of BTU's Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, including exhibits, and any amendments to those reports filed with or furnished to the Securities and Exchange Commission pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended. BTU makes these reports available through its web site as soon as reasonably practicable after its electronic filing of such materials with, or the furnishing of them to, the Securities and Exchange Commission. References to BTU's web site are inactive textual references only, and the information contained or incorporated on its web site is not a part of or incorporated into this joint proxy statement/prospectus.

Facilities

BTU maintains its headquarters in North Billerica, Massachusetts, where it owns a 150,000 square foot facility. The facility is subject to a mortgage which had an outstanding balance on September 28, 2014 of approximately \$7.3 million. BTU also operates an approximately 45,000 square foot leased manufacturing, engineering, sales and service facility in Shanghai, China.

In England, BTU leases a facility for its European and Near East sales and service operations. In the Asia Pacific region, BTU leases sales and service offices in Singapore and Malaysia.

Legal Proceedings

From time to time, BTU is involved in various legal matters arising in the ordinary course of business. BTU believes that the ultimate resolution of any existing matter will not have a material adverse effect on its business or consolidated financial results.

Shortly after BTU entered into the merger agreement with Amtech on October 21, 2014, BTU learned that two separate putative stockholder class action complaints were filed in the Court of Chancery of the State of Delaware. The first was filed on November 4, 2014, purportedly on behalf of BTU's public stockholders, against the members of the BTU Board, Amtech and Merger Sub. The complaint generally alleges, among other things, that the members of BTU's board of directors breached their fiduciary duties owed to BTU's public stockholders by causing BTU to enter into the merger agreement and by approving the merger, and that Amtech and Merger Sub aided and abetted such alleged breaches of fiduciary duties. In addition, the complaint alleges that the Merger Agreement improperly favors Amtech and unduly restricts BTU's ability to negotiate with other potential bidders. The complaint generally seeks, among other things, declaratory and injunctive relief concerning the alleged fiduciary breaches, injunctive relief prohibiting Amtech, Merger Sub, and BTU from consummating the merger, other forms of equitable relief, and compensatory damages. BTU believes that the claims are without merit and it intends to defend against the litigation vigorously on behalf of BTU and the BTU board of directors.

The second was filed on November 17, 2014, also purportedly on behalf of BTU's public stockholders, against BTU, members of the BTU board, Amtech and Merger Sub. The complaint generally alleges, among other things, that the members of BTU's board of directors breached their fiduciary duties owed to BTU's public stockholders by failing to engage in a competitive sale and bidding process, and that Amtech and Merger Sub aided and abetted such alleged breaches of fiduciary duties. The complaint further alleges that these fiduciary breaches gave Amtech an unfair advantage by failing to solicit other potential acquirers. The complaint generally seeks, among other things, injunctive relief prohibiting the defendants from consummating the Merger, compensatory damages for alleged breaches of fiduciary duties, and other forms of equitable relief. BTU also believes these claims are without merit, and it intends

to defend against the litigation vigorously on behalf of BTU and the BTU board of directors.

Table of Contents**Management's Discussion and Analysis of Financial Condition and Results of Operations of BTU**

You should read the following discussion and analysis of financial condition and results of operations together with the Selected Consolidated Historical Financial Data of BTU section of this joint proxy statement/prospectus and BTU's financial statements and the related notes included in this joint proxy statement/prospectus. In addition to historical information, the following discussion contains forward-looking statements that involve risks, uncertainties and assumptions. BTU's actual results could differ materially from those anticipated by the forward-looking statements due to important factors including, but not limited to, those set forth in the Risk Factors section of this joint proxy statement/prospectus beginning on page 29.

Overview

BTU, which was founded in 1950, was incorporated as a Delaware corporation in 1981 and is headquartered in North Billerica, Massachusetts. BTU operates as a single business segment called Thermal Processing Capital Equipment. BTU's business consists of the designing, manufacturing, selling and servicing of thermal processing equipment and related process controls for use in the electronics, alternative energy, automotive and other industries. This includes the supply of solder reflow systems used for surface mount applications in printed circuit board assembly. Thermal processing equipment is used in: low temperature curing/encapsulation; hybrid integrated circuit manufacturing; integrated circuit packaging and sealing; and processing multi-chip modules. In addition, the equipment is used for solar cell processing, sintering nuclear fuel for commercial power generation, as well as brazing and the sintering of ceramics and powdered metals, and the deposition of precise thin film coatings. BTU's customers are multinational original equipment manufacturers and contract manufacturing companies.

BTU's customers require high throughput, high yield and highly reliable thermal processing systems with tightly controlled temperature and atmospheric parameters. In electronics assembly, BTU's convection solder reflow systems are used to attach electronic components to the printed circuit boards, primarily in the advanced, high-density, surface mount segments of this market. In the semiconductor market, BTU participates in both wafer level and die level packaging, where its thermal processing systems are used to connect and seal integrated circuits into a package. In the solar market, BTU offers processing equipment for both silicon and thin film photovoltaics. In the alternative energy market, BTU's customers use BTU's thermal systems for the processing of nuclear fuel.

Critical Accounting Policies and Significant Estimates

The following is a discussion of those accounting policies that BTU deems to be critical—that is, they are important to the portrayal of BTU's financial condition and results of operations, and they reflect management's reliance on estimates regarding matters that are inherently uncertain.

Revenue Recognition. BTU recognizes revenue in accordance with Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) Topic 605, *Revenue Recognition* (ASC 605). Under these guidelines, BTU recognizes revenue when persuasive evidence of an arrangement exists, delivery has occurred or services rendered, the price is fixed or determinable and payment is reasonably assured. Under these requirements, BTU recognizes revenue upon acceptance when the terms of sale include customer acceptance provisions and compliance with those customer acceptance provisions has not been previously demonstrated. Applying the requirements of ASC 605 to future sales arrangements used in BTU's equipment sales may result in the deferral of the revenue for some equipment sales. Products shipped to customers that do not meet the threshold requirements for revenue recognition as outlined above remain in BTU's inventory on the Consolidated Balance Sheet until revenue is recognized. Any cash collected from customers for products for which revenue has been deferred is recorded as Deferred Revenue on the Consolidated Balance Sheet.

BTU also has certain sales transactions for products which are not completed within the normal operating cycle of the business. It is BTU's policy to account for these transactions using the percentage of completion method for revenue recognition purposes when all of the following criteria exist: (1) BTU has received the purchase order or entered into a legally binding contract, (2) the customer is credit worthy and collection is probable or customer prepayments are required at product completion milestones or specific dates, (3) the sales value of the product to be delivered is significant in amount when compared to BTU's other products, and (4) the costs can be reasonably estimated, there is no major technological uncertainty and the total engineering, material procurement, product assembly and test cycle time extend over a period of six months or longer.

Table of Contents

Under the percentage of completion method, revenue and gross margins to date are recognized based upon the ratio of costs incurred to date compared to the latest estimate of total costs to complete the product as a percentage of the total contract revenue for the product. Revisions in costs and gross margin percentage estimates are reflected in the period in which the facts causing the revision become known. Provisions for total estimated losses on uncompleted contracts, if any, are made in the period in which such losses are determined. For the years ended December 31, 2013, 2012 and 2011, BTU recorded revenue of \$0, \$1,731,686 and \$2,406,714, using the percentage of completion method, respectively.

Inventory Valuation. BTU's inventories consist of material, labor and manufacturing overhead costs. BTU determines the cost of inventory based on standard cost and then adjusts inventories to actual cost at reasonable intervals to reflect current conditions to approximate the first-in, first-out method. BTU regularly reviews the quantity of inventories on hand and compares these quantities to the expected usage of each applicable product or product line. BTU's inventories are adjusted in value to the lower of costs or net realizable value. Since the value of BTU's inventories depends in part on its estimates of each product's net realizable value, adjustments may be needed to reflect changes in valuation. Any adjustments BTU is required to make to lower the value of the inventories are recorded as a charge to cost of sales and establish a new cost basis. BTU recorded inventory provisions in cost of goods sold of \$1,868,000, \$5,261,000 and \$2,294,000 for the years ended December 31, 2013, 2012 and 2011, respectively.

Stock-Based Compensation. BTU accounts for share-based compensation in accordance with the provisions of FASB ASC Topic 718, *Compensation - Stock Compensation* (ASC 718). Under these guidelines, BTU expenses share-based compensation under the straight-line method. The choice of a valuation technique, and the approach utilized to develop the underlying assumptions for that technique, involve significant judgments. These judgments reflect management's assessment of the most accurate method of valuing the stock options BTU issues based on our historical experience, knowledge of current conditions and beliefs of what could occur in the future given available information. BTU's judgments could change over time as additional information becomes available to BTU, or the facts underlying BTU's assumptions change over time, and any change in BTU's judgments could have a material effect on its financial statements. BTU believes that its estimates incorporate all relevant information and represent a reasonable approximation in light of the difficulties involved in valuing non-traded stock options. For the years ended December 31, 2013, 2012 and 2011, BTU recorded share based compensation of \$631,000, \$836,000 and \$1,272,000, respectively.

Accounting for Income Taxes. BTU determines its annual income tax provision in each of the jurisdictions in which it operates. This involves determining our current and deferred income tax expense as well as accounting for differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. The future tax consequences attributable to these differences result in deferred tax assets and liabilities, which are included in BTU's Consolidated Balance Sheets. BTU assesses the recoverability of the deferred tax assets by considering whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. To the extent BTU believes that recovery does not meet this more likely than not standard as required in FASB ASC Topic 740, *Income Taxes* (ASC 740), it must establish a valuation allowance.

Management's judgments and estimates are required in determining BTU's income tax provision, deferred tax assets and liabilities and any valuation allowance recorded against deferred tax assets. A review of all available positive and negative evidence needs to be considered, including a company's performance, the market environment in which the company operates and the length of carryback and carryforward periods. According to those standards, a valuation allowance may be needed when the negative evidence includes cumulative losses in recent years. Therefore, cumulative losses weigh heavily in the overall assessment. As a result of management's review as of September 29, 2013, BTU concluded that it was appropriate to establish a full valuation allowance for net deferred tax assets in the China manufacturing subsidiary, where cumulative losses have been incurred during recent periods. The significant

fluctuations in BTU's quarterly tax rate, exclusive of the fluctuation related to the establishment of the valuation allowance, as a percent of consolidated pre-tax income or loss, are the result of the different statutory tax rates in each of BTU's non-U.S. locations and the fluctuations of pre-tax income (loss) generated in these jurisdictions. A portion of the consolidated annual tax provision relates to Chinese withholding taxes which are not directly related to pre-tax income in China. China withholding taxes primarily result from corporate royalty charges based on the China manufacturing subsidiary net sales. U.S. taxes have had no impact to the rate fluctuation as the U.S. company operates at a loss.

BTU assesses tax positions taken on tax returns, including recognition of potential interest and penalties, in accordance with the recognition thresholds and measurement attributes outlined in ASC 740. Interest and penalties recognized, if any, would be

Table of Contents

classified as a component of income tax expense. An uncertain tax position represents BTU's expected treatment of a tax position taken in a filed tax return, or planned to be taken in a future tax return, that has not been reflected in measuring income tax expense for financial reporting purposes. BTU believes that it has appropriate support for the income tax positions taken and to be taken on its tax returns and that its accruals for tax liabilities are adequate for all open years based on an assessment of many factors, including past experience and interpretations of tax law applied to the facts of each matter. As of December 31, 2013 and 2012, BTU has recorded accruals of approximately \$114,000 in connection with uncertain tax positions.

BTU's major tax jurisdictions include the United States and China. BTU is no longer subject to U.S. state or local and non-U.S. income tax examinations by tax authorities in its major jurisdictions for years before 2008, except to the extent of net operating loss and tax credit carryforwards from those years. For the year ended December 31, 2013, there were no material changes to the total amount of unrecognized tax benefits. BTU does not expect any significant increases or decreases for uncertain tax positions during the next 12 months.

In the past, BTU has benefited from a partial tax holiday in its Shanghai manufacturing subsidiary. The Chinese government tax authorities passed legislation that imposes an equalization of income tax rates for both domestic and foreign companies at a rate of 25%. This law became effective on January 1, 2008 and has been phased in by gradually increasing our tax rate until it reached 25% in the first quarter of 2012.

Results of Operations**Year ended December 31, 2013 compared to the year ended December 31, 2012**

The following table sets forth the percentage of net sales of certain items in BTU's Consolidated Statements of Operations for the periods indicated.

	Years Ended December 31,		
	2013	2012	2011
Net sales	100.0%	100.0%	100.0%
Cost of goods sold	69.2%	71.6%	62.5%
Gross profit	30.8%	28.4%	37.5%
Operating expenses:			
Selling, general and administrative	41.4%	36.1%	29.8%
Research, development and engineering	9.6%	9.4%	9.3%
Restructuring	0.0%	0.7%	0.5%
Operating loss	(20.3)%	(17.8)%	(2.1)%
Interest income	0.1%	0.1%	0.1%
Interest expense	(0.9)%	(0.8)%	(0.6)%
Foreign exchange loss	(0.4)%	(0.4)%	(0.2)%
Other income, net	0.1%	0.1%	0.5%
Loss before provision for income taxes	(21.3)%	(18.8)%	(2.3)%
Provision for income taxes	2.7%	0.1%	1.3%

Net loss	(24.0)%	(18.9)%	(3.6)%
----------	---------	---------	--------

Table of Contents**Year ended December 31, 2013 as compared to year ended December 31, 2012**

	Years Ended December 31,				Percent change
	2013	2012	(\$ in thousands)		
		% of net sales		% of net sales	
Net sales	\$ 47,754	100.0%	\$ 58,089	100.0%	(17.8)%
Cost of goods sold	33,048	69.2%	41,617	71.6%	(20.6)%
Gross profit	14,706	30.8%	16,472	28.4%	(10.7)%
Selling, general and administrative expenses	19,786	41.4%	20,965	36.1%	(5.6)%
Research, development and engineering expenses	4,604	9.6%	5,450	9.4%	(15.5)%
Restructuring		0.0%	424	0.7%	(100.0)%
Operating loss	(9,684)	(20.3)%	(10,367)	(17.8)%	(6.6)%
Loss before provision for income taxes	(10,177)	(21.3)%	(10,932)	(18.8)%	(6.9)%
Provision for income taxes	1,291	2.7%	65	0.1%	1886.2%
Net loss	\$ (11,468)	(24.0)%	\$ (10,997)	(18.9)%	4.3%

Net Sales. Net sales in 2013 decreased by \$10.3 million or 17.8% compared to 2012. Net sales for BTU's electronics market systems decreased from \$42.0 million in 2012 to \$40.2 million in 2013, a decrease of \$1.8 million or 4.4%. The alternative energy systems sales decreased from \$7.4 million in 2012 to \$1.6 million in 2013, a decrease of \$5.9 million or 79.1%. The other market systems, parts and service sales decreased from \$8.6 million in 2012 to \$6.0 million in 2013, a decrease of \$2.6 million or 30.3%. The electronic market systems decrease represents a decrease in demand for Surface Mount Technology systems and other electronics, particularly in Asia, offset by an increase in demand for semiconductor packaging systems in the United States. BTU's alternative energy systems 2013 sales decrease as compared to 2012 was due to the continued weakening of the worldwide solar industry which started in the second quarter of 2011. The other market systems, parts and service 2013 sales decrease as compared to 2012 was due to the cyclical nature of the parts and service business combined with a decrease in other market system sales.

As a result of the weakness in capital spending in the solar industry, BTU expects minimal revenue from solar products in the immediate future.

The following table sets forth, for the periods indicated, revenues from sales into select geographies expressed in dollars per thousand and as a percentage of total revenue. The values shown represent the amount sold into each of the listed geographical areas.

	2013		2012		2011	
United States	\$ 8,541	18%	\$ 8,756	15%	\$ 13,199	17%
Europe and Near East	6,647	14%	9,242	16%	5,759	8%

Edgar Filing: AMTECH SYSTEMS INC - Form S-4/A

Asia Pacific	29,138	61%	38,606	66%	53,052	70%
Other Americas	3,428	7%	1,485	3%	4,118	5%
Total Revenue	\$ 47,754		\$ 58,089		\$ 76,128	

Gross Profit. Gross profit for 2013 decreased to \$14.7 million or a decrease of 10.7% from \$16.5 million in 2012. The gross profit as a percentage of sales for 2013 increased to 30.8% from 28.4% for 2012, due primarily to lower inventory write-downs recorded in 2013 compared to 2012. BTU's results of operations in future quarters could also be affected by further inventory write-downs. BTU assesses inventory at each period end and records inventory write-downs as appropriate based on market conditions.

Selling, General and Administrative (SG&A). SG&A expenses decreased by \$1.2 million or 5.6% from \$21.0 million in 2012 to \$19.8 million in 2013, but increased as a percentage of sales from 36.1% in 2012 to 41.4% in 2013. For the year ended

Table of Contents

December 31, 2013 as compared to the year ended December 31, 2012, the decrease is primarily due to the lower commission on reduced sales and cost reduction actions taken in BTU's service, marketing and administrative functions; offset by higher legal expense in 2013 due to the settlement of previously disclosed litigation. BTU's results of operations in future quarters could also be affected by further reductions in operating expenses.

Research, Development and Engineering (RD&E). RD&E expenses decreased by \$0.8 million or 15.5% to \$4.6 million in 2013 from \$5.5 million in 2012. The decreases are the result of headcount reductions and expense reductions in the Company's RD&E functions as BTU moderated our spending on the development of new solar technologies.

Operating Loss. The 17.8% net sales decrease and its associated negative effect on gross profit combined with higher legal expenses in connection with the settlement of previously disclosed litigation resulted in an operating loss in 2013 of \$9.7 million as compared to an operating loss of \$10.4 million in 2012.

Interest Income (Expense). During the year ended December 31, 2013 as compared to the year ended December 31, 2012, net interest expense remained relatively flat at \$0.4 million.

Foreign Exchange Loss. The foreign exchange loss in 2013 was \$193,000 as compared to a loss of \$224,000 in 2012. The net exchange loss is primarily the result of foreign currency exposure in the Company's foreign operations.

Income Taxes. For the twelve months ended December 31, 2013, BTU recorded an income tax provision of \$1.3 million compared to a provision of \$65,000 in the same period in the prior year. The income tax provision recorded for the twelve months ended December 31, 2013 is primarily due to establishing a \$1.1 million valuation allowance on all deferred tax assets related to the China manufacturing subsidiary. The applicable accounting standards require that a valuation allowance be established when it is more likely than not that all or a portion of deferred tax assets will not be realized. A review of all available positive and negative evidence needs to be considered, including a company's performance, the market environment in which the company operates and the length of carryback and carryforward periods. According to those standards, a valuation allowance may be needed when the negative evidence includes cumulative losses in recent years. Therefore, cumulative losses weigh heavily in the overall assessment. As a result of BTU's review as of September 29, 2013, it concluded that it was appropriate to establish a full valuation allowance for net deferred tax assets in the China manufacturing subsidiary, where cumulative losses have been incurred during recent periods. The significant fluctuations in BTU's quarterly tax rate, exclusive of the fluctuation related to the establishment of the valuation allowance, as a percent of consolidated pre-tax income or loss, are the result of the different statutory tax rates in each of BTU's non-U.S. locations and the fluctuations of pre-tax income (loss) generated in these jurisdictions. A portion of the consolidated annual tax provision relates to Chinese withholding taxes which are not directly related to pre-tax income in China. China withholding taxes primarily result from corporate royalty charges based on the China manufacturing subsidiary net sales. U.S. taxes have had no impact to the rate fluctuation as the U.S. company operates at a loss.

BTU's statutory federal income tax rate is 34.0%. BTU's statutory income tax rate for its China manufacturing subsidiary is 25% in 2013 and 2012 and 24% in 2011. In 2014, the statutory tax rate for BTU's China manufacturing subsidiary will remain at 25%.

Table of Contents**Year ended December 31, 2012 as compared to year ended December 31, 2011**

	Years Ended December 31,				Percent change
	2012	2011			
	(\$ in thousands)				
		% of net sales		% of net sales	
Net sales	\$ 58,089	100.0%	\$ 76,128	100.0%	(23.7)%
Cost of goods sold	41,617	71.6%	47,542	62.5%	(12.5)%
Gross profit	16,472	28.4%	28,586	37.5%	(42.4)%
Selling, general and administrative expenses	20,965	36.1%	22,721	29.8%	(7.7)%
Research, development and engineering expenses	5,450	9.4%	7,056	9.3%	(22.8)%
Restructuring	424	0.7%	401	0.5%	5.7%
Operating loss	(10,367)	(17.8)%	(1,592)	(2.1)%	551.2%
Loss before provision for income taxes	(10,932)	(18.8)%	(1,770)	(2.3)%	517.6%
Provision for income taxes	65	0.1%	952	1.3%	(93.2)%
Net loss	\$ (10,997)	(18.9)%	\$ (2,722)	(3.6)%	304.0%

Net Sales. Net sales in 2012 decreased by \$18.0 million or 23.7% compared to 2011. Net sales for BTU's electronics market systems increased from \$34.9 million in 2011 to \$42.0 million in 2012, an increase of \$7.1 million or 20.3%. The alternative energy systems sales decreased from \$29.2 million in 2011 to \$7.4 million in 2012, a decrease of \$21.8 million or 74.6%. The other market systems, parts and service sales decreased from \$11.9 million in 2011 to \$8.6 million in 2012, a decrease of \$3.3 million or 27.7%. The electronic market systems increase represents an increase in demand for Surface Mount Technology systems, particularly in China and an increase in demand for semiconductor packaging systems in the United States. BTU's alternative energy systems 2012 sales decrease as compared to 2011 was due to the continued weakening of the worldwide solar industry which started in the second quarter of 2011. The other market systems, parts and service 2012 sales decrease as compared to 2011 was due to the cyclical nature of the parts and service business combined with a decrease in other market system sales.

As a result of the weakness in capital spending in the solar industry, BTU expects minimal revenue from solar products over the immediate future.

Gross Profit. Gross profit for 2012 decreased to \$16.5 million or a decrease of 42.4% from \$28.6 million in 2011. The gross profit as a percentage of sales for 2012 decreased to 28.4% from 37.5% for 2011, due primarily to lower volume, product mix and overhead under absorption at BTU's factories combined with higher inventory write-downs. BTU's results of operations in future quarters could also be affected by further inventory write-downs. BTU assesses inventory at each period end and records inventory write-downs as appropriate based on market conditions.

Selling, General and Administrative (SG&A). SG&A expenses decreased by \$1.8 million or 7.7% from \$22.7 million in 2011 to \$21.0 million in 2012, but increased as a percentage of sales from 29.8% in 2011 to 36.1% in 2012. For the year ended December 31, 2012 as compared to the year ended December 31, 2011, the decrease is primarily due to the lower commission on reduced sales and cost reduction actions taken in BTU's service, marketing and administrative

functions; offset by higher bad debt expense in 2012. In 2012, management determined certain accounts receivables were uncollectable and recorded bad debt expense of approximately \$1.4 million. BTU's results of operations in future quarters could also be affected by further reductions in operating expenses.

Research, Development and Engineering (RD&E). RD&E expenses decreased by \$1.6 million or 22.8% to \$5.5 million in 2012 from \$7.1 million in 2011. The decreases are the result of headcount reductions and expense reductions in BTU's RD&E functions as BTU moderated its spending on the development of new solar technologies.

Restructuring. BTU recorded a restructuring charge of \$424,000 in 2012 as compared to \$401,000 in 2011. This restructuring action was taken due to the continued slowdown in BTU's solar market product line.

Table of Contents

Operating Loss. The 23.7% net sales decrease and its associated negative effect on gross profit combined with higher inventory and bad debt reserves resulted in an operating loss in 2012 of \$10.4 million as compared to an operating loss of \$1.6 million in 2011.

Interest Income (Expense). During the year ended December 31, 2012 as compared to the year ended December 31, 2011, net interest expense remained relatively flat at \$0.4 million.

Foreign Exchange Loss. The foreign exchange loss in 2012 was \$224,000 as compared to a loss of \$139,000 in 2011. The net exchange loss is primarily the result of foreign currency exposure in BTU's foreign operations.

Income Taxes. In 2012, BTU recorded an income tax provision of \$65,000 as compared to \$1.0 million in 2011. BTU's income tax provision primarily relates to income and withholding taxes related to its China operations.

The significant fluctuations in BTU's quarterly tax rate, as a percent of consolidated pre-tax income or loss is the result of the different statutory tax rates in each of its non-U.S. locations and the fluctuations of pre-tax income (loss) generated in these jurisdictions. A portion of the consolidated annual tax provision relates to Chinese withholding taxes which are not directly related to pre-tax income in China. China withholding taxes primarily result from corporate royalty charges based on its China manufacturing subsidiary's net sales. U.S. income taxes have had no impact to the rate fluctuation as the U.S. company operates at a loss.

BTU's statutory federal income tax rate is 34.0%. BTU's statutory income tax rate for its China manufacturing subsidiary is 25% in 2012 and 24% in 2011.

Three months ended September 28, 2014 compared to the three months ended September 29, 2013

The following table sets forth certain items in BTU's Consolidated Statements of Operations as a percentage of net sales for the periods indicated.

Summary Condensed Consolidated Statements of Operations

	Three Months Ended				Percent Change
	September 28, 2014	September 29, 2013			
	(\$ in thousands)				
		% of		% of	
		Net Sales		Net Sales	
Net sales	\$ 15,917	100.0%	\$ 12,014	100.0%	32.5%
Cost of goods sold	9,840	61.8%	8,480	70.6%	16.0%
Gross profit	6,077	38.2%	3,534	29.4%	72.0%
Selling, general and administrative expenses	4,921	30.9%	6,228	51.8%	(21.0)%
Research, development and engineering expenses	939	5.9%	1,276	10.6%	(26.4)%
Operating income (loss)	217	1.4%	(3,970)	(33.0)%	(105.5)%
Income (loss) before provision for income taxes	110	0.7%	(4,076)	(33.9)%	(102.7)%
Provision for income taxes	110	0.7%	998	8.3%	(89.0)%

Net loss	\$	(0)	(0.0)%	\$ (5,074)	(42.2)%	(100.0)%
----------	----	-----	--------	------------	---------	----------

Net Sales. Net sales for the third quarter of 2014 were \$15.9 million representing an increase of \$3.9 million, or 32.5%, as compared to the same period in the prior year. Net sales of electronic market systems increased by \$3.4 million, or 36.4%, as compared to the same period in the prior year. Net sales of alternative energy systems increased by \$0.2 million or 13.7%, as compared to the same period in the prior year. Net sales for other market systems, parts and service increased by \$0.3 million, or 22.8%, as compared to the same period in the prior year. The electronic market systems increase represents an increase in demand for Surface Mount Technology systems, particularly in Asia. The increase in alternative energy sales is mainly due to increased

Table of Contents

nuclear product sales. BTU's overall alternative energy sales continue to be low due to the continued weakness of the worldwide solar industry which started in the second quarter of 2011. The increase in sales in the other market systems, parts and service is primarily due to an overall increase in our parts and service business.

The following table sets forth, for the periods indicated, revenues from sales into select geographies expressed in dollars per thousand and as a percentage of total revenue. The values shown represent the amount sold into each of the listed geographical areas.

	Three Months Ended			
	September 28, 2014		September 29, 2013	
	(\$ in thousands)			
	\$	% of Revenues	\$	% of Revenues
United States	\$ 3,665	23.0%	\$ 2,357	19.6%
Europe, Near East	2,196	13.8%	2,007	16.7%
Asia Pacific	9,794	61.5%	6,118	50.9%
Other Americas	262	1.7%	1,532	12.8%
Total Revenue	\$ 15,917		\$ 12,014	

Gross Profit. In the third quarter of 2014, gross profit was \$6.1 million, an increase of \$2.5 million, as compared to the same period in the prior year due primarily to the 32.5% increase in net sales. In the third quarter of 2014, gross profit as a percentage of sales increased to 38.2% as compared to 29.4% in the same period in the prior year. This increase in the third quarter of 2014 was mainly the result of product sales mix, lower inventory reserves and lower under-absorption in BTU's factories as compared to the same period in the prior year.

Selling, General and Administrative (SG&A). SG&A expense in the third quarter of 2014 of \$4.9 million decreased by \$1.3 million as compared to the same period in the prior year. The prior year comparable period SG&A expense included a legal settlement in the amount of \$1.5 million; offset by \$0.2 million of lower commission expense.

Research, Development and Engineering (RD&E). RD&E expense in the third quarter of 2014 of \$0.9 million decreased by \$0.3 million as compared to the same period in the prior year. This decrease in spending was the result of lower development project spending.

Interest Income (Expense). In the third quarter of 2014, net interest expense remained relatively flat at \$0.1 million as compared to the same period in the prior year.

Foreign Exchange Income (Loss). The foreign exchange loss in the third quarter of 2014 was \$34,000 as compared to a loss of \$33,000 in the same period in the prior year. The net exchange loss is primarily the result of foreign currency transactions in BTU's foreign operations for the applicable period.

Income Taxes. For the three months ended September 28, 2014, BTU recorded an income tax provision of \$110,000 as compared to an income tax provision of \$1.0 million for the same period in the prior year. BTU's income tax provision primarily relates to withholding taxes. However, the income tax provision recorded in the same period in the prior year included the establishment of a \$1.1 million valuation allowance on all deferred tax assets related to the China manufacturing subsidiary. The significant fluctuations in BTU's quarterly tax rate, exclusive of the fluctuation

related to the establishment of the valuation allowance, as a percent of consolidated pre-tax income or loss, are the result of the different statutory tax rates in each of BTU's non-U.S. locations and the fluctuations of pre-tax income (loss) generated in these jurisdictions. A portion of the consolidated annual tax provision relates to Chinese withholding taxes which are not directly related to pre-tax income in China. Chinese withholding taxes primarily result from corporate royalty charges on net sales of BTU's Chinese manufacturing subsidiary. U.S. taxes have had no impact on the rate fluctuation as the U.S. entity operates at a loss for which no benefit is recognized due to a full valuation allowance.

Table of Contents**Nine months ended September 28, 2014 compared to the nine months ended September 29, 2013**

The following table sets forth certain items in BTU's Consolidated Statements of Operations as a percentage of net sales for the periods indicated.

Summary Condensed Consolidated Statements of Operations

	September 28, 2014		September 29, 2013		Percent change
	(\$ in thousands)				
		% of net sales		% of net sales	
Net sales	\$ 44,037	100.0%	\$ 36,761	100.0%	19.8%
Cost of goods sold	26,925	61.1%	25,103	68.3%	7.3%
Gross profit	17,112	38.9%	11,658	31.7%	46.8%
Selling, general and administrative expenses	14,622	33.2%	15,237	41.4%	(4.0)%
Research, development and engineering expenses	3,179	7.2%	3,427	9.3%	(7.2)%
Operating loss	(689)	(1.6)%	(7,006)	(19.1)%	(90.2)%
Loss before provision for income taxes	(884)	(2.0)%	(7,377)	(20.1)%	(88.0)%
Provision for income taxes	308	0.7%	1,083	2.9%	(71.6)%
Net loss	\$ (1,192)	(2.7)%	\$ (8,460)	(23.0)%	(85.9)%

Net Sales. Net sales for the first nine months of 2014 were \$44.0 million representing an increase of \$7.3 million, or 19.8%, as compared to the same period in the prior year. Net sales of electronic market systems increased by \$4.8 million, or 15.9%, and net sales of alternative energy systems increased by \$1.1 million or 68.6%, as compared to the same period in the prior year. Net sales for BTU's other market systems, parts and service sales increased by \$1.4 million, or 29.0%, as compared to the same period in the prior year. The electronic market systems increase represents an increase in demand for Surface Mount Technology systems, particularly in Asia. The increase in alternative energy sales is mainly due to increased nuclear product sales. BTU's overall alternative energy sales continue to be low due to the continued weakness of the worldwide solar industry which started in the second quarter of 2011. The increase in sales in the other market systems and parts and service is primarily due to a \$1.1 million of other market custom sales in the first nine months of 2014 compared to no other market custom sales in the first nine months of 2013.

The following table sets forth, for the periods indicated, revenues from sales into select geographies expressed as a percentage of total revenues. The values shown represent the amount sold into each of the listed geographical areas.

	September 28, 2014		September 29, 2013	
	(\$ in thousands)			
	\$	% of revenues	\$	% of revenues

Edgar Filing: AMTECH SYSTEMS INC - Form S-4/A

United States	\$ 8,094	18.4%	\$ 6,333	17.2%
Europe, Near East	7,113	16.2%	4,695	12.8%
Asia Pacific	26,220	59.5%	22,567	61.4%
Other Americas	2,610	5.9%	3,166	8.6%
Total Revenue	\$ 44,037		\$ 36,761	

Gross Profit. The first nine months of 2014 gross profit of \$17.1 million increased by \$5.5 million compared to the first nine months of 2013 due primarily to the 19.8% increase in net sales. In the first nine months of 2014, gross profit as a percentage of sales increased to 38.9% as compared to 31.7% in the same period in 2013, due primarily to product mix and improved overhead under absorption at our factories combined with lower inventory write-downs. BTU assesses inventory at each period end and records inventory write-downs as appropriate based on market conditions.

Table of Contents

Selling, General and Administrative (SG&A). SG&A expense in the first nine months of 2014 of \$14.6 million decreased by \$0.6 million compared to the same period in the prior year. The prior year comparable period SG&A expense included a legal settlement in the amount of \$1.5 million; offset by current period increased commissions and warranty expense due to increased sales volume for the first nine months of 2014.

Research, Development and Engineering (RD&E). RD&E expense in the first nine months of 2014 of \$3.2 million decreased by \$0.2 million as compared to the same period in the prior year. This decrease in spending was the result of lower development project spending.

Interest Income (Expense). In the first nine months of 2014, net interest expense remained relatively flat at \$0.2 million as compared to the same period in 2013.

Foreign Exchange Income (Loss). The foreign exchange gain in the first nine months of 2014 was \$22,000 as compared to a loss of \$147,000 in the same period in the prior year. The net exchange gain or loss is primarily the result of foreign currency transactions in the BTU's foreign operations in the applicable period.

Income Taxes. For the nine months ended September 28, 2014, BTU recorded an income tax provision of \$308,000 compared to a provision of \$1.1 million in the same period in the prior year. BTU's income tax provision primarily relates to withholding taxes. However, the income tax provision recorded in the same period in the prior year included the establishment of a \$1.1 million valuation allowance on all deferred tax assets related to the China manufacturing subsidiary. The significant fluctuations in BTU's quarterly tax rate, exclusive of the fluctuation related to the establishment of the valuation allowance, as a percent of consolidated pre-tax income or loss, are the result of the different statutory tax rates in each of BTU's non-U.S. locations and the fluctuations of pre-tax income (loss) generated in these jurisdictions. A portion of the consolidated annual tax provision relates to Chinese withholding taxes which are not directly related to pre-tax income in China. Chinese withholding taxes primarily result from corporate royalty charges on net sales of BTU's Chinese manufacturing subsidiary. U.S. taxes have had no impact on the rate fluctuation as the U.S. entity operates at a loss for which no benefit is recognized due to the full valuation allowance.

Liquidity and Capital Resources

For the full year 2013, BTU's net cash used in operating activities was \$5.8 million. In the first nine months of 2014, BTU's net cash used in operating activities was \$3.2 million. BTU's operating loss was \$0.7 million in the first nine months of 2014. BTU's operating loss was \$9.7 million for the full year 2013. On September 28, 2014, BTU had cash and cash equivalents of approximately \$10.4 million, a decrease of \$3.6 million, compared to \$14.0 million at December 31, 2013.

During the nine months ended September 28, 2014, BTU used net cash of approximately \$3.2 million for operating activities. This use of cash was primarily the result of a net loss of \$1.2 million, a decrease in deferred revenue of \$1.4 million, an increase in accounts receivable of \$1.4 million, an increase in inventory of \$1.3 million, an increase in other assets of \$1.6 million and a decrease in accrued expenses of \$0.6 million; offset by an increase in accounts payable of \$2.0 million, a decrease in other current assets of \$0.4 million and the adding back of non-cash expenses for depreciation and amortization of \$0.9 million, stock-based compensation of \$0.5 million, and inventory provisions of \$0.3 million.