

The information in this prospectus supplement and the accompanying prospectus is not complete and may be changed. This prospectus supplement and the accompanying prospectus are not an offer to sell these securities, nor are they soliciting offers to buy these securities, in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated January 15, 2013

PROSPECTUS SUPPLEMENT
(To Prospectus dated July 20, 2011)

Shares

AtriCure[®]

Common Stock

\$ _____ per share

AtriCure, Inc. is offering _____ shares of common stock.

- The last reported sale price of our common stock on January 14, 2013 was \$7.46 per share.
- Trading symbol: Nasdaq Global Market — ATRC.

This investment involves risks. See “[Risk Factors](#)” beginning on page 4 of our Annual Report on Form 10-K for the year ending December 31, 2011, page S-4 of this prospectus supplement and on page 5 of the accompanying prospectus.

	Per Share	Total
Public Offering Price	\$ _____	\$ _____
Underwriting discount	\$ _____	\$ _____
Proceeds, before expenses, to AtriCure, Inc	\$ _____	\$ _____

The underwriter has a 30-day option to purchase up to _____ additional shares of common stock to cover over-allotments, if any. If the underwriter exercises this option in full, the total underwriting discount will be \$ _____, and our total proceeds, before expenses, will be \$ _____.

The underwriter expects to deliver the shares against payment on or about January _____, 2013.

Neither the Securities and Exchange Commission nor any state securities commission has approved of anyone’s investment in these securities or determined if this prospectus supplement and the accompanying prospectus are truthful or complete. Any representation to the contrary is a criminal offense.

Piper Jaffray
Sole Manager

The date of this prospectus supplement is January _____, 2013.

TABLE OF CONTENTS

Prospectus Supplement

PROSPECTUS SUPPLEMENT SUMMARY	S-1
THE OFFERING	S-3
RISK FACTORS	S-4
SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS	S-5
USE OF PROCEEDS	S-6
DESCRIPTION OF CAPITAL STOCK	S-7
CAPITALIZATION	S-7
DILUTION	S-8
UNDERWRITING	S-9
LEGAL MATTERS	S-11
EXPERTS	S-11
WHERE YOU CAN FIND MORE INFORMATION	S-11
IMPORTANT INFORMATION INCORPORATED BY REFERENCE	S-11

Prospectus

ABOUT THIS PROSPECTUS	2
WHERE YOU CAN FIND MORE INFORMATION	3
INFORMATION INCORPORATED BY REFERENCE	3
RISK FACTORS	5
SPECIAL NOTE REGARDING FORWARD LOOKING STATEMENTS	5
ATRICURE, INC.	5
USE OF PROCEEDS	7
DESCRIPTION OF THE SECURITIES WE MAY OFFER	7
DESCRIPTION OF DEBT SECURITIES	7
DESCRIPTION OF COMMON STOCK	13
DESCRIPTION OF PREFERRED STOCK	15
DESCRIPTION OF WARRANTS	17
DESCRIPTION OF DEPOSITARY SHARES	19
DESCRIPTION OF UNITS	21
SELLING SECURITYHOLDERS	22
PLAN OF DISTRIBUTION	23
LEGAL MATTERS	24
EXPERTS	24

Table of Contents

We provide information to you about this offering of shares of our common stock in two separate documents that are bound together: (1) this prospectus supplement, which describes the specific details regarding this offering; and (2) the accompanying prospectus, which provides general information, some of which may not apply to this offering. Generally, when we refer to this “prospectus,” we are referring to both documents combined. If information in this prospectus supplement is inconsistent with the accompanying prospectus, you should rely on this prospectus supplement.

You should rely only on information contained in or incorporated by reference into this prospectus supplement and the accompanying prospectus. We have not, and the underwriter has not, authorized anyone to provide you with information that is different. We are offering to sell and seeking offers to buy shares of our common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein are accurate only as of their respective dates, regardless of the time of delivery of this prospectus supplement or of any sale of our common stock.

Unless otherwise stated in this prospectus supplement, we have assumed throughout this prospectus supplement that the over-allotment option granted to the underwriter will not be exercised.

PROSPECTUS SUPPLEMENT SUMMARY

The items in the following summary are described in more detail later in this prospectus supplement, in the accompanying prospectus and in the documents incorporated by reference herein and therein. This summary provides an overview of selected information and does not contain all the information you should consider before investing in our common stock. Therefore, you should carefully read this prospectus supplement and the accompanying prospectus, including the documents incorporated by reference, which are described under “Where You Can Find More Information” and “Incorporation of Documents by Reference” in this prospectus supplement. You should also carefully consider the matters discussed in the sections in this prospectus entitled “Risk Factors” and in the accompanying prospectus and in other periodic reports incorporated herein by reference.

Our Business

We are a medical device company and a leader in developing, manufacturing and selling innovative cardiac surgical ablation systems designed to create precise lesions, or scars, in cardiac, or heart, tissue for the treatment of atrial fibrillation, or AF, and systems for the exclusion of the left atrial appendage. We are the only company with a system cleared by the United States Food and Drug Administration, or FDA, for the treatment of patients with persistent and long-standing persistent AF. We have two primary product lines for the ablation of cardiac tissue. Our primary product line for the ablation of cardiac tissue, which accounts for a majority of our revenue, is the AtriCure Synergy Ablation System, a bipolar ablation clamp system and related radiofrequency ablation devices. We also offer a cryoablation product line, which features reusable and disposable cryoablation devices. Additionally, we offer the AtriClip™ Gillinov-Cosgrove Left Atrial Appendage System, or AtriClip system, which is designed to safely and effectively exclude the left atrial appendage.

Cardiothoracic surgeons have adopted our AtriCure Synergy Ablation System, or Synergy System, and cryoablation systems to treat AF in an estimated 120,000 patients since January 2003, and we believe that we are currently the market leader in the surgical treatment of AF. Our products are utilized by cardiothoracic surgeons during concomitant open-heart surgical procedures and also during sole-therapy minimally invasive cardiac ablation procedures. During a concomitant open procedure, the surgeon ablates cardiac tissue and/or excludes the left atrial appendage, secondary, or concomitant, to a primary cardiac procedure such as a valve or coronary bypass. Additionally, cardiothoracic surgeons have adopted our products as a treatment alternative for AF patients who may be candidates for sole-therapy minimally invasive surgical procedures. Our Synergy System, which includes our Isolator® Synergy clamps, a radiofrequency generator and related switchbox, is cleared by the FDA, for the treatment of patients with persistent and long-standing persistent AF during open-heart concomitant coronary artery bypass grafting and/or valve replacement or repair procedures. During 2011, product sales of the Synergy System in the United States, or U.S, represented approximately 40% of our U.S. revenue. To date, none of our other products have been approved or cleared by the FDA for the treatment of other forms of AF or for other uses for the treatment of AF. Additionally, the FDA has not cleared or approved our products for a reduction in the risk of stroke. We anticipate that substantially all of our revenue for the foreseeable future will relate to products we currently sell, or are in the process of developing, which surgeons generally use to ablate cardiac tissue for the treatment of AF or for the exclusion of the left atrial appendage.

AF affects approximately 1% of the population in the United States. It is the most common cardiac arrhythmia, or irregular heartbeat, encountered in clinical practice and accounts for more doctor visits and hospital days than any other cardiac arrhythmia. AF is a condition wherein abnormal electrical impulses cause the atria, or upper chambers of the heart, to fibrillate, or quiver, at rapid rates of 400 to 600 beats per minute. As a result of this quivering, blood in the atria may become static, creating an

[Table of Contents](#)

increased risk that a blood clot will form and cause a stroke or other serious complications. If AF persists, patients often progress from experiencing AF intermittently to having AF continuously, a condition that is more difficult to treat. Symptoms of AF may include heart palpitations, dizziness, fatigue and shortness of breath, and these symptoms may be debilitating and life threatening in some cases. Although there is often no specific cause of AF, the condition is often associated with high blood pressure and other forms of heart disease. In most cases, AF is associated with cardiovascular disease, in particular hypertension, congestive heart failure, left ventricular dysfunction, coronary artery disease and valvular disease.

In the United States we primarily sell our products to medical centers through our direct sales force. AtriCure Europe, B.V., our wholly-owned subsidiary incorporated and based in the Netherlands, markets and sells our products throughout Europe, the Middle East and Africa, or EMEA, primarily through distributors, while in certain markets, such as Germany and the Benelux region, we sell directly to medical centers. Additionally, we sell our products to other international distributors, primarily in Asia, South America and Canada. Our business is primarily transacted in U.S. dollars with the exception of transactions with our European subsidiary which are substantially transacted in Euros. Our sales outside of the United States represented 24% and 19% of our revenue during 2011 and 2010, respectively.

Recent Developments***Financial Information***

On January 7, 2013, AtriCure announced that preliminary revenue for the fourth quarter of 2012 is expected to be approximately \$18.4 million, reflecting growth of approximately 9.5% over the fourth quarter of 2011. Based on these preliminary estimates, revenue from U.S. customers is expected to be \$13.7 million, reflecting growth of 10.2%, and revenue from international customers is expected to be \$4.7 million, reflecting growth of 7.7%, or 10.0% on a constant currency basis.

Preliminary revenue for full year 2012 is expected to be \$70.0 million, reflecting year over year growth of 9.1% over full year 2011.

The preliminary financial results for the fourth quarter and full year ended December 31, 2012 are pending completion of our annual report on Form 10-K for the fiscal year ended December 31, 2012 and accordingly are subject to change.

Corporate Information

We were incorporated in the State of Delaware as AtriCure, Inc. on October 31, 2000 in connection with a spin-off transaction from Enable Medical Corporation, in which shares of our common stock were distributed to the Enable shareholders. The spin-off was intended to allow us to focus on the development of products designed to treat AF and to raise capital for that purpose, while Enable continued its broader research and manufacturing activities. On August 5, 2005, we completed an initial public offering of our common stock. On August 10, 2005, we acquired Enable Medical Corporation, the manufacturer of our Isolator clamps, which are an essential part of our Synergy System. Additionally, in December 2005, we formed AtriCure Europe, B.V. Our principal executive offices are located at 6217 Centre Park Drive, West Chester, Ohio 45069, and our main telephone number is (513) 755-4100. Our

internet website address is <http://www.atricure.com>. We do not incorporate by reference into this prospectus supplement or the accompanying prospectus the information on, or accessible through, our website, and you should not consider it as part of this prospectus supplement or the accompanying prospectus.

THE OFFERING

Common stock offered	shares
Common stock to be outstanding after this offering	shares
Use of proceeds	We intend to use the net proceeds from this offering for general corporate purposes and working capital.
Risk factors	You should read the “Risk Factors” beginning on page 20 of our Annual Report on Form 10-K for the year ended December 31, 2011, on page S-4 of this prospectus supplement, on page 5 of the accompanying prospectus and in the documents incorporated by reference in this prospectus supplement and the accompanying prospectus for a discussion of factors to consider before deciding to purchase shares of our common stock.
Nasdaq Global Market symbol	ATRC

The number of shares of common stock to be outstanding after this offering as reflected in the table above is based on the actual number of shares outstanding as of January 14, 2013 which was 16,895,940, and does not include, as of that date:

- 3,171,012 shares of common stock issuable upon the exercise of outstanding options, with a weighted average exercise price of \$8.81 per share;
- 432,052 shares of common stock reserved for future issuance under our 2005 Equity Incentive Plan, as amended.

RISK FACTORS

Before you make a decision to invest in our common stock, you should consider carefully the risks described below, together with other information in this prospectus supplement, the accompanying prospectus and the information incorporated by reference herein and therein. If any of the following events actually occur, our business, operating results, prospects or financial condition could be materially and adversely affected. This could cause the trading price of our common stock to decline and you may lose all or part of your investment. The risks described below are not the only ones that we face. Additional risks not presently known to us or that we currently deem immaterial may also significantly impair our business operations and could result in a complete loss of your investment.

See “Risk Factors” beginning on page 20 of our Annual Report on Form 10–K for the year ended December 31, 2011 and on page 5 of the accompanying prospectus, which are incorporated herein by reference.

Risks Related to This Offering

Management will have broad discretion as to the use of the proceeds from this offering, and we may not use the proceeds effectively.

We have not designated any portion of the net proceeds from this offering to be used for any particular purpose. Accordingly, our management will have broad discretion as to the application of the net proceeds from this offering, and could spend the proceeds in ways that do not necessarily improve our operating results or enhance the value of our common stock.

You will experience immediate dilution in the book value per share of the common stock you purchase.

Because the price per share of our common stock being offered is substantially higher than the book value per share of our common stock, you will suffer substantial dilution in the net tangible book value of the common stock you purchase in this offering. After giving effect to the sale by us of _____ shares of common stock in this offering, and based on a public offering price of \$ _____ per share in this offering and a pro forma net tangible book value of our common stock of \$13.5 million, or \$0.81 per share, as of September 30, 2012, if you purchase shares of common stock in this offering, you will suffer immediate and substantial dilution of \$ _____ per share in the net tangible book value of the common stock. If the underwriter exercises its over-allotment option, you will experience additional dilution. See “Dilution” on page S–8 for a more detailed discussion of the dilution you will incur in connection with this offering.

Risks Relating to our Business

If we do not achieve our projected development goals in the quantities or time frames we estimate, the commercialization of our products may be delayed and our business prospects may suffer. The assumptions underlying our product placement and development goals also may prove to be materially inaccurate.

From time to time, we estimate the timing of the accomplishment of various scientific, clinical, regulatory and other product development goals. These goals may include the commencement or completion of scientific studies and clinical trials, the timing and number of product placements and the submission of regulatory filings. We also may disclose projected expenditures or other forecasts for future periods in information that we furnish to the SEC from time to time. These and other projections are based on management’s current expectations and may not contain sufficient margin of error or cushion for any specific uncertainties, or for the uncertainties inherent in all forecasting. The actual timing of our product placement and development goals and actual expenditures or other financial results can vary dramatically compared to our estimates, in some cases for reasons beyond our control. If we do not meet

[Table of Contents](#)

projections as announced from time to time, the development, placement and commercialization of our products may be delayed and our business prospects may suffer. The assumptions management has used to produce these projections may significantly change or prove to be inaccurate. Accordingly, you should not unduly rely on any of these forward-looking statements.

Our ability to use net operating losses to offset future taxable income may be subject to certain limitations.

We currently have significant net operating losses (NOLs) that may be used to offset future taxable income. In general, under Section 382 of the Internal Revenue Code of 1986, as amended (the “Code”), a corporation that undergoes an “ownership change” is subject to limitations on its ability to utilize its pre-change NOLs to offset future taxable income. This offering or future changes in our stock ownership, some of which are outside of our control, could result in an ownership change under Section 382 of the Code, which would significantly limit our ability to utilize NOLs to offset future taxable income.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement and the accompanying prospectus, including the documents that we incorporate by reference herein and therein, and other information that we may furnish to the Securities and Exchange Commission from time to time contain forward-looking statements about us and our industry that involve substantial risks and uncertainties. We intend such forward-looking statements to be covered by the safe harbor provisions for forward-looking statements contained in Section 21E of the Securities Exchange Act of 1934, as amended, and Section 27A of the Securities Act of 1933, as amended. All statements, other than statements of historical facts, included in this prospectus supplement and the accompanying prospectus and information that we furnish to or file with the Securities and Exchange Commission regarding our strategy, future operations, future financial position, future net sales, projected expenses, products’ placements, performance and acceptance, prospects and plans and management’s objectives, as well as the growth of the overall market for our products in general and certain products in particular and the relative performance of other market participants are forward-looking statements. These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievement to be materially different from those expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terms such as “anticipate,” “believe,” “estimate,” “expect,” “intend,” “may,” “might,” “plan,” “project,” “will,” “would,” “should,” “could,” “can,” “predict,” “potential,” “continue,” “objective,” or the negative of these terms, and similar expressions intended to identify forward-looking statements. However, not all forward-looking statements contain these identifying words. These forward-looking statements reflect our current views about future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. Our actual results may differ materially from those anticipated in these forward-looking statements as a result of various factors, including but not limited to:

- the ability of our products to achieve widespread market acceptance within the medical community as a standard treatment alternative for the surgical treatment of AF during open-heart surgical procedures and as a sole-therapy minimally invasive procedure;
- our receipt of additional FDA approvals to promote our products for the treatment of AF or reduction in stroke risk, which is conditioned on the safety and efficacy of our products as demonstrated in clinical trials;
- our reliance that our ablation and ablation related products will continue to be a primary source of revenue and will not become obsolete;

Table of Contents

- competition from new and existing products and procedures in the highly competitive medical device industry;
- failure of third-party payors to reimburse our customers for the use of our clinical diagnostic products or reduction of reimbursement levels, which could harm our ability to promote and sell our products;
- failure of our products to perform as expected or to obtain certain approvals or the questioning of the reliability of the technology on which our products are based, which could cause lost revenue, delayed or reduced market acceptance of our products, increased costs and damage to our reputation;
- our ability to retain our current employees and/or require additional qualified personnel, upon whom the success of our business is highly dependent; and
- those set forth under “Risk Factors” in our Annual Report on Form 10-K.

These forward-looking statements represent our estimates and assumptions only as of the date of this prospectus supplement. Unless required by U.S. federal securities laws, we do not intend to update any of these forward-looking statements to reflect circumstances or events that occur after the statement is made or to conform these statements to actual results. The following discussion should be read in conjunction with the consolidated financial statements and notes thereto appearing in our Annual Report on Form 10-K. Our actual results may differ materially from those anticipated in these forward-looking statements as a result of various factors, including those set forth under “Risk Factors” in this prospectus supplement and the accompanying prospectus.

You should carefully consider all the information in or incorporated by reference in this prospectus supplement and the accompanying prospectus prior to investing in our securities.

USE OF PROCEEDS

We estimate that the net proceeds from the sale of the _____ shares of common stock we are offering will be approximately \$ _____ million, or approximately \$ _____ million if the underwriter exercises its over-allotment option in full. “Net proceeds” is what we expect to receive after paying the underwriting discount and other expenses of this offering payable by us.

We will use the net proceeds from the sale of the common stock for general corporate purposes and working capital.

Until we use the net proceeds of this offering, we may invest the funds in short-term, investment grade, interest-bearing securities.

DESCRIPTION OF CAPITAL STOCK

As of the date of this prospectus supplement, our authorized capital stock consists of 90,000,000 shares of common stock, par value \$0.001 per share, and 10,000,000 shares of undesignated preferred stock, par value \$0.001 per share. As of January 14, 2013, there were 16,895,940 shares of our common stock outstanding and there were no shares of our preferred stock outstanding.

In addition, as of January 14, 2013, there were: (i) 3,171,012 shares of common stock issuable upon the exercise of outstanding options, with a weighted average exercise price of \$8.81 per share; and (ii) 432,052 shares of common stock reserved for future issuance under our 2005 Equity Incentive Plan, as amended.

Holders of common stock are entitled to one vote for each share held of record on all matters submitted to a vote of shareholders. Shareholders do not have the right to cumulate their votes in the election of directors. Holders of common stock are entitled to receive dividends when and if declared by our board of directors out of funds legally available therefor, subject to any contractual restrictions on the payment of dividends and to any restrictions on the payment of dividends imposed by the terms of any outstanding preferred shares or debt securities. Shares of common stock carry no preemptive or conversion or subscription rights and are not subject to redemption or sinking fund provisions.

CAPITALIZATION

The following table sets forth our capitalization as of September 30, 2012 on an actual basis and on an as adjusted basis to reflect this offering.

The table should be read in conjunction with, and is qualified in its entirety by reference to, our unaudited historical financial statements and the accompanying notes included in our Quarterly Report on Form 10-Q for the quarter ended September 30, 2012, which are incorporated by reference herein.

	September 30, 2012	
	Actual (unaudited)	As Adjusted (unaudited)
(dollars in thousands)		
Stockholders equity:		
Common Stock, \$0.001 par value; 90,000,000 shares authorized; 16,672,694 shares issued and outstanding as adjusted	\$ 17	\$ —
Preferred stock, \$0.001 par value; 10,000,000 shares authorized; no shares issued	—	—
Additional paid-in capital	122,268	
Accumulated deficit	108,731	
Total stockholders' equity	\$ 13,561	\$ —

The information above is based on 16,672,694 shares of our common stock outstanding as of September 30, 2012 and does not include:

- 2,522,670 shares of common stock issuable upon the exercise of options outstanding as of September 30, 2012, at a weighted average exercise price of \$9.50 per share (including 22,329 shares of common stock that were issued upon the exercise of options from September 30, 2012 through January 14, 2013 and options to purchase 56,429 shares of common stock that were forfeited or expired subsequent to September 30, 2012);
- 727,100 options granted under our 2005 Equity Incentive Plan, as amended, from September 30, 2012 through January 14, 2013; and
- 19,498 restricted shares of common stock that were forfeited to us and returned to the pool of authorized shares available for issuance under our 2005 Equity Incentive Plan, as amended, from September 30, 2012 through January 14, 2013.

DILUTION

Our net tangible book value on September 30, 2012 was approximately \$13.5 million, or \$0.81 per share of common stock. “Net tangible book value” is total assets minus the sum of liabilities and intangible assets. “Net tangible book value per share” is net tangible book value divided by the total number of shares of common stock outstanding. After giving effect to the sale of shares of common stock offered by us in this offering at a price of \$ _____ per share, less the underwriting discounts and other expenses of this offering payable by us, our pro forma as adjusted net tangible book value on September 30, 2012 would have been approximately \$ _____ million, or \$ _____ per share of common stock. The following table illustrates the pro forma as adjusted increase in net tangible book value of \$ _____ per share and the dilution (the difference between the offering price per share and pro forma net tangible book value per share) of \$ _____ per share to new investors in this offering:

Public offering price per share	\$
Pro forma net tangible book value per share on September 30, 2012	\$0.81
Increase in pro forma net tangible book value per share attributable to offering	\$
Pro forma as adjusted net tangible book value per share on September 30, 2012 after giving effect to the offering	\$
Dilution per share to new investors in the offering	\$

The above discussion and table are based on 16,672,694 common shares outstanding at September 30, 2012, and do not include, as of that date:

- 2,522,670 shares of common stock issuable upon the exercise of options outstanding as of September 30, 2012, at a weighted average exercise price of \$9.50 per share (including 22,329 shares of common stock that were issued upon the exercise of options from September 30, 2012 through January 14, 2013 and options to purchase 56,429 shares of common stock that were forfeited or expired subsequent to September 30, 2012);
- 727,100 options granted under our 2005 Equity Incentive Plan, as amended, from September 30, 2012 through January 14, 2013; and
- 19,498 restricted shares of common stock that were forfeited to us and returned to the pool of authorized shares available for issuance under our 2005 Equity Incentive Plan, as amended, from September 30, 2012 through January 14, 2013.

UNDERWRITING

We are offering the shares of common stock described in this prospectus supplement through Piper Jaffray & Co. as the sole book-running manager. We have entered into a firm commitment underwriting agreement with Piper Jaffray, as underwriter. Subject to the terms and conditions of the underwriting agreement, we have agreed to sell to the underwriter, and the underwriter has agreed to purchase from us, _____ shares of common stock.

<u>Underwriter</u>	<u>Number of Shares</u>
Piper Jaffray & Co.	
Total	

The underwriter is committed to purchase all the shares of common stock offered by us if it purchases any shares, other than those shares covered by the over-allotment option described below.

The underwriter proposes to offer the common stock directly to the public at the initial public offering price set forth on the cover page of this prospectus supplement and to certain dealers at that price less a concession not in excess of \$ _____ per share. After the offering, these figures may be changed by the underwriter.

We have granted the underwriter an option to buy up to _____ additional shares of common stock from us to cover over-allotments. The underwriter may exercise this option at any time and from time to time during the 30-day period from the date of this prospectus supplement. If any additional shares of common stock are purchased, the underwriter will offer the additional shares on the same terms as those on which the shares are being offered.

The underwriting fee is equal to the public offering price per share of common stock less the amount paid by the underwriter to us per share of common stock. The following table shows the per share and total underwriting discount to be paid to the underwriter in this offering assuming both no exercise and full exercise of the underwriter's option to purchase additional shares.

	<u>With no Over-Allotment</u>	<u>With Over-Allotment</u>
Per share	\$ _____	\$ _____
Total	\$ _____	\$ _____

We estimate that the total fees and expenses payable by us, excluding underwriting discount, will be approximately \$ _____, which includes \$ _____ that we have agreed to reimburse the underwriter for the fees incurred by it in connection with the offering.

We have agreed to indemnify the underwriter against certain liabilities, including liabilities under the Securities Act, or to contribute to payments that the underwriter may be required to make in respect of those liabilities.

We and each of our directors and executive officers are subject to lock-up agreements that prohibit us and them from offering for sale, pledging, assigning, encumbering, announcing the intention to sell, selling, contracting to sell, granting any option, right or warrant to purchase, or otherwise transferring or disposing of, any shares of our common stock or any securities convertible into or exercisable or exchangeable for shares of our common stock for a period of at least 90 days following the date of this prospectus supplement without the prior written consent of Piper Jaffray. The lock-up agreement does not prohibit our directors and executive officers from transferring shares of our common stock for bona fide estate or tax planning purposes, subject to certain requirements, including that the transferee be subject to the same lock-up terms.

Table of Contents

The lock-up agreements do not prohibit us from issuing shares upon the exercise or conversion of securities outstanding on the date of this prospectus supplement. The lock-up provisions do not prevent us from selling shares to the underwriter pursuant to the underwriting agreement, or from granting options to acquire securities under our existing stock option plans or issuing shares upon the exercise or conversion of securities outstanding on the date of this prospectus supplement.

The 90-day lock-up period in all of the lock-up agreements is subject to extension if (i) during the last 17 days of the lock-up period we issue an earnings release or material news or a material event relating to us occurs or (ii) prior to the expiration of the lock-up period, we announce that we will release earnings results during the 16-day period beginning on the last day of the lock-up period, in which case the restrictions imposed in these lock-up agreements shall continue to apply until the expiration of the 18-day period beginning on the issuance of the earnings release or the occurrence of the material news or material event, unless Piper Jaffray waives the extension in writing.

Our shares are quoted on the Nasdaq Global Market under the symbol "ATRC."

To facilitate the offering, the underwriter may engage in transactions that stabilize, maintain or otherwise affect the price of our common stock during and after the offering. Specifically, the underwriter may over-allot or otherwise create a short position in the common stock for its own account by selling more shares of common stock than we have sold to it. Short sales involve the sale by the underwriter of a greater number of shares than the underwriter is required to purchase in the offering. The underwriter may close out any short position by either exercising its option to purchase additional shares or purchasing shares in the open market.

In addition, the underwriter may stabilize or maintain the price of the common stock by bidding for or purchasing shares of common stock in the open market and may impose penalty bids. If penalty bids are imposed, selling concessions allowed to syndicate members or other broker-dealers participating in the offering are reclaimed if shares of common stock previously distributed in the offering are repurchased, whether in connection with stabilization transactions or otherwise. The effect of these transactions may be to stabilize or maintain the market price of the common stock at a level above that which might otherwise prevail in the open market. The imposition of a penalty bid may also affect the price of the common stock to the extent that it discourages resales of the common stock. The magnitude or effect of any stabilization or other transactions is uncertain. These transactions may be effected on the Nasdaq Global Market or otherwise and, if commenced, may be discontinued at any time. The underwriter may also engage in passive market making transactions in our common stock. Passive market making consists of displaying bids on the Nasdaq Global Market is limited by the prices of independent market makers and effecting purchases limited by those prices in response to order flow. Rule 103 of Regulation M promulgated by the Commission limits the amount of net purchases that each passive market maker may make and the displayed size of each bid. Passive market making may stabilize the market price of the common stock at a level above that which might otherwise prevail in the open market and, if commenced, may be discontinued at any time.

This prospectus supplement and the accompanying prospectus in electronic format may be made available on the web sites maintained by the underwriter and the underwriter may distribute prospectuses and prospectus supplements electronically.

From time to time in the ordinary course of its businesses, the underwriter and certain of its affiliates have engaged, and may in the future engage, in commercial banking or investment banking transactions with us and our affiliates.

LEGAL MATTERS

Certain legal matters with respect to the validity of common stock offered by this prospectus supplement will be passed upon for us by Keating Muething & Klekamp PLL, Cincinnati, Ohio. Certain legal matters in connection with the common stock offered in this prospectus supplement will be passed upon for the underwriter by Goodwin Procter LLP, New York, New York.

EXPERTS

The financial statements incorporated in this prospectus supplement and the accompanying prospectus by reference from our Annual Report on Form 10-K for the year ended December 31, 2011 and the effectiveness of AtriCure, Inc.'s internal control over financial reporting have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their reports, which are incorporated herein by reference. Such financial statements have been so incorporated in reliance upon the reports of such firm given upon their authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-3 under the Securities Act of 1933 with respect to the shares of common stock we are offering under this prospectus supplement. This prospectus supplement and the accompanying prospectus do not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus supplement, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. Statements contained in this prospectus supplement as to the contents of any contract or any other document referred to are not necessarily complete, and in each instance, we refer you to the copy of the contract or other document filed as an exhibit to the registration statement. Each of these statements is qualified in all respects by this reference.

We also file annual reports, quarterly reports, proxy statements, and other documents with the SEC under the Securities Exchange Act of 1934, as amended (the "Exchange Act"). The public may read and copy any materials we file with the SEC, including the registration statement of which this prospectus supplement and the accompany prospectus are a part, at the SEC's Public Reference Room at 100 F Street, NE, Room 2521, Washington, D.C. 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. Also, the SEC maintains an internet site at www.sec.gov that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC, including AtriCure. General information about AtriCure, including our annual report on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K, as well as any amendments and exhibits to those reports, are available free of charge through our website at www.atricure.com as soon as reasonably practicable after we file them with, or furnish them to, the SEC. Information on or available through our website is not incorporated into this prospectus supplement and the accompanying prospectus.

IMPORTANT INFORMATION INCORPORATED BY REFERENCE

The SEC allows "incorporation by reference" into this prospectus supplement and the accompanying prospectus of information that we file with the SEC. This permits us to disclose important information to you by referencing these filed documents. Any information referenced this way is considered part of this prospectus supplement and the accompanying prospectus, and any information filed by us with the SEC and incorporated herein by reference subsequent to the date of this prospectus supplement and the accompanying prospectus will automatically be deemed to update and supersede this information. We incorporate by reference the following documents which have been filed with the SEC:

- Our Annual Report on Form 10-K for our fiscal year ended December 31, 2011 as filed with the SEC on March 12, 2012;

Table of Contents

- Our Quarterly Reports on Form 10–Q for our fiscal quarters ended March 31, 2012, June 30, 2012 and September 30, 2012, as filed with the SEC on May 4, 2012, August 3, 2012 and November 2, 2012, respectively;
- Our definitive proxy statement on Schedule 14A, relating to the annual meeting of stockholders held on May 15, 2012, as filed with the SEC on April 13, 2012; and
- Our Current Reports on Form 8–K filed on January 17, 2012, February 2, 2012, May 2, 2012, May 17, 2012, June 4, 2012, August 2, 2012, September 28, 2012, November 1, 2012 and January 7, 2013.

All documents filed by us under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act from the date of this prospectus supplement and the accompanying prospectus until the sale of all securities registered hereunder or the termination of the registration statement shall be deemed to be incorporated in this prospectus supplement and the accompanying prospectus by reference. Any statement contained in this prospectus supplement and the accompanying prospectus or in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this prospectus supplement and the accompanying prospectus to the extent that a statement contained in any subsequently filed document which is or is deemed to be incorporated by reference herein modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus supplement and the accompanying prospectus.

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

AtriCure, Inc.
6217 Centre Park Drive
West Chester, Ohio 45069
Attention: Secretary
Phone: (513) 755-4100

Exhibits to the filings will not be sent, unless those exhibits have been specifically incorporated by reference in this prospectus supplement and the accompanying prospectus.



\$50,000,000

**Debt Securities, Common Stock, Preferred Stock, Warrants, Depositary Shares and Units and
3,184,535 Shares of Common Stock**

By this prospectus and an accompanying prospectus supplement, we may from time to time offer and sell, in one or more offerings, up to \$50,000,000 in any combination of debt securities, common stock, preferred stock, warrants, depositary shares and units. Also, selling securityholders identified in this prospectus may, from time to time, offer and sell up to an additional 3,184,535 shares of common stock. See "Selling Securityholders."

We will provide you with more specific terms of these securities in one or more supplements to this prospectus. You should read this prospectus and the applicable prospectus supplement carefully before you invest.

We or any selling securityholders may offer these securities from time to time in amounts, at prices and on other terms to be determined at the time of offering. We or any selling securityholders may offer and sell these securities to or through underwriters, dealers or agents, or directly to investors, on a continuous or delayed basis. The supplements to this prospectus will provide the specific terms of the plan of distribution. The price to the public of such securities and the net proceeds we expect to receive from such sale will also be set forth in a prospectus supplement.

Our common stock is listed on the NASDAQ Global Market under the symbol "ATRC."

On July 18, 2011, the closing price of our common stock as reported by the NASDAQ Global Market was \$13.67 per share.

The aggregate market value of our outstanding voting common stock held by non-affiliates, based upon a closing sale price of our common stock on July 18, 2011, was \$152.4 million.

During the prior 12 calendar month period that ends on, and includes, the date of this prospectus, we have not offered any securities through a primary offering.

Investing in our securities involves risks. See "[Risk Factors](#)" beginning on page 5.

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

The date of this prospectus is July 20, 2011

TABLE OF CONTENTS

	Page
ABOUT THIS PROSPECTUS	2
WHERE YOU CAN FIND MORE INFORMATION	3
INFORMATION INCORPORATED BY REFERENCE	3
RISK FACTORS	5
SPECIAL NOTE REGARDING FORWARD LOOKING STATEMENTS	5
ATRICURE, INC.	5
USE OF PROCEEDS	7
DESCRIPTION OF THE SECURITIES WE MAY OFFER	7
DESCRIPTION OF DEBT SECURITIES	7
DESCRIPTION OF COMMON STOCK	13
DESCRIPTION OF PREFERRED STOCK	15
DESCRIPTION OF WARRANTS	17
DESCRIPTION OF DEPOSITARY SHARES	19
DESCRIPTION OF UNITS	21
SELLING SECURITYHOLDERS	22
PLAN OF DISTRIBUTION	23
LEGAL MATTERS	24
EXPERTS	24

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement filed with the Securities and Exchange Commission using a “shelf” registration process. Under this shelf process, we or any selling securityholders may sell the securities described in this prospectus in one or more offerings. This prospectus provides you with a general description of the securities which may be offered. Each time securities are offered for sale, we will provide a prospectus supplement that contains specific information about the terms of that offering. The prospectus supplement may also add or update information contained in this prospectus. You should read both this prospectus and any prospectus supplement together with additional information described below under “Where You Can Find More Information” and “Information Incorporated by Reference.”

The registration statement that contains this prospectus (including the exhibits thereto) contains additional important information about us and the selling securityholders and the securities we or any selling securityholders may offer under this prospectus. Specifically, we have filed certain legal documents that establish the terms of the securities offered by this prospectus as exhibits to the registration statement. We will file certain other legal documents that establish the terms of the securities offered by this prospectus as exhibits to reports we file with the SEC. You may obtain copies of that registration statement and the other reports and documents referenced herein as described below under the heading “Where You Can Find More Information.”

You should rely only on the information contained or incorporated by reference in this prospectus and in any prospectus supplement. We have not authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not making offers to sell or solicitations to buy the securities in any jurisdiction in which an offer or solicitation is not authorized or in which the person making that offer or solicitation is not qualified to do so or to anyone to whom it is unlawful to make an offer or solicitation. You should not assume that the information in this prospectus or any prospectus supplement, as well as the information we file or previously filed with the SEC that we incorporate by reference in this prospectus or any prospectus supplement, is accurate as of any date other than its respective date. Our business, financial condition, results of operations and prospects may have changed since those dates.

In this prospectus, unless the context otherwise requires, references to “we,” “us,” “our” or “AtriCure” refer to AtriCure, Inc. and its subsidiary.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and other reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at <http://www.sec.gov>. You may also read and copy any document we file at the SEC's Public Reference Room at 100 F Street, NE, Washington, D.C. 20549. Please call the SEC at 1—800—SEC—0330 for further information on the operation of the Public Reference Room. Our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, and Current Reports on Form 8-K, including any amendments to those reports, and other information that we file with or furnish to the SEC pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act") can also be accessed free of charge through the Internet.

We have filed with the SEC a registration statement under the Securities Act of 1933 relating to the offering of these securities. The registration statement, including the attached exhibits, contains additional relevant information about us, and the selling securityholders and the securities. This prospectus does not contain all of the information set forth in the registration statement. You can obtain a copy of the registration statement from the SEC as described above. The registration statement and the documents referred to below under "Information Incorporation by Reference" and our other SEC filings are also available on our Internet website, <http://www.atricure.com>. We have not incorporated by reference into this prospectus the information on our website, and you should not consider it to be a part of this prospectus.

INFORMATION INCORPORATED BY REFERENCE

The SEC allows us to incorporate by reference into this prospectus certain information we file with it, which means that we can disclose important information by referring you to those documents. The information incorporated by reference is considered to be a part of this prospectus, and information that we file later with the SEC will automatically update and supersede information contained in this prospectus and any accompanying prospectus supplement. We incorporate by reference the documents listed below that we have previously filed with the SEC (excluding any portions of any Form 8-K that are not deemed "filed" pursuant to the General Instructions of Form 8-K):

- our Annual Report on Form 10-K for the year ended December 31, 2010;
- our Quarterly Report on Form 10-Q for the quarter ended March 31, 2011;
- our Current Reports on Form 8-K filed on March 16, 2011 and May 23, 2011 (excluding any information furnished in such reports under Item 2.02, Item 7.01 or Item 9.01); and
- the description of our common stock contained in our Registration Statement on Form 8-A as filed with the SEC on or about August 1, 2005.

We also incorporate by reference into this prospectus additional documents that we may file with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act prior to the completion or termination of the offering, including all such documents we may file with the SEC after the date of the initial registration statement and prior to the effectiveness of the registration statement, but excluding any information deemed furnished and not filed with the SEC. Any statements contained in a previously filed document incorporated by reference into this prospectus is deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus, or in a subsequently filed document also incorporated by reference herein, modifies or supersedes that statement.

This prospectus may contain information that updates, modifies or is contrary to information in one or more of the documents incorporated by reference in this prospectus. You should rely only on the information incorporated by reference or provided in this prospectus. We have not authorized anyone else to provide you with different information. You should not assume that the information in this prospectus is accurate as of any date other than the date of this prospectus or the date of the documents incorporated by reference in this prospectus.

Table of Contents

We will provide to each person, including any beneficial owner, to whom this prospectus is delivered, upon written or oral request, at no cost to the requester, a copy of any and all of the information that is incorporated by reference in this prospectus.

Requests for such documents should be directed to:

**Investor Relations
AtriCure, Inc.
6217 Centre Park Drive
West Chester, Ohio 45069
Telephone: (513) 755-4100**

You may also access the documents incorporated by reference in this prospectus through our website at <http://www.atricure.com>. Except for the specific incorporated documents listed above, no information available on or through our website shall be deemed to be incorporated in this prospectus or the registration statement of which it forms a part.

RISK FACTORS

Investing in our securities involves risk. Please see the risk factors set forth in Part I, Item 1A in our Annual Report on Form 10-K for our most recent fiscal year, as updated by our quarterly reports on Form 10-Q and other filings we make with the SEC, as incorporated by reference in this prospectus. Additional risk factors may be included in a prospectus supplement relating to a particular series or offering of securities. Before making an investment decision, you should carefully consider these risks as well as other information we include or incorporate by reference in this prospectus. The risks and uncertainties we have described are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our business operations. These risks could materially affect our business, results of operations or financial condition and cause the value of our securities to decline.

SPECIAL NOTE REGARDING FORWARD LOOKING STATEMENTS

This prospectus (including the information incorporated by reference) contains certain statements that may be deemed to be “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. Forward-looking statements anticipate results based on our estimates, assumptions and plans that are subject to uncertainty. The Private Securities Litigation Reform Act of 1995 provides a safe harbor for forward-looking statements. All statements in this prospectus and any accompanying prospectus supplement not dealing with historical results or current facts are forward-looking and are based on estimates, assumptions and projections. Statements which include the words “believes”, “seeks”, “expects”, “may”, “should”, “intends”, “likely”, “targets”, “plans”, “anticipates”, “estimates” or the negative version of those words and similar statements of a future or forward-looking nature identify forward-looking statements.

Factors that could cause actual results to differ from those in the forward-looking statements may accompany the statements themselves. In addition, generally applicable factors that could cause actual results or outcomes to differ from those expressed in the forward-looking statements are and will be discussed in our reports on Forms 10-K, 10-Q and 8-K incorporated by reference in this prospectus.

All forward-looking statements address matters that involve risks and uncertainties. Accordingly, there are or will be important factors that could cause actual results to differ materially from those indicated in these statements. These risks and uncertainties include the rate and degree of market acceptance of AtriCure’s products, AtriCure’s ability to develop and market new and enhanced products, the timing of and ability to obtain and maintain regulatory clearances and approvals for its products, the timing of and ability to obtain reimbursement of procedures utilizing AtriCure’s products, competition from existing and new products and procedures or AtriCure’s ability to effectively react to other risks and uncertainties described from time to time in AtriCure’s SEC filings, such as fluctuation of quarterly financial results, reliance on third party manufacturers and suppliers, litigation or other proceedings, government regulation and stock price volatility. We do not undertake any obligation to publicly update or review any forward-looking statement.

ATRICURE, INC.

We are a medical device company and a leader in developing, manufacturing and selling innovative cardiac surgical ablation systems designed to create precise lesions, or scars, in cardiac, or heart, tissue and devices for the exclusion of the left atrial appendage. We have two primary product lines for the ablation of cardiac tissue. Our primary product line for the ablation of cardiac tissue, which accounts for a majority of our revenue, is the Isolator® Synergy bipolar ablation clamp system, or Isolator system, and related radiofrequency ablation devices. Additionally, we offer a cryoablation product line, which features reusable and disposable cryoablation devices. Additionally, we offer the AtriClip™ Gillinov-Cosgrove® Left Atrial Appendage System, or AtriClip system, which is designed to safely and effectively exclude the left atrial appendage.

Table of Contents

Cardiothoracic surgeons have adopted our Isolator and cryoablation systems to treat atrial fibrillation, or AF, in an estimated 100,000 patients since January 2003, and we believe that we are currently the market leader in the surgical treatment of AF. Our products are utilized by cardiothoracic surgeons during concomitant cardiac surgical procedures and also during sole-therapy minimally invasive cardiac ablation procedures. During a concomitant open procedure, the surgeon ablates cardiac tissue and/or treats the left atrial appendage, secondary, or concomitant, to a primary cardiac procedure such as a valve or coronary bypass. Medical journals have described the adoption by leading cardiothoracic surgeons of our Isolator system as a treatment alternative during open-heart surgical procedures to create lesions in cardiac tissue to block the abnormal electrical impulses that cause AF, a rapid, irregular quivering of the upper chambers of the heart. Additionally, leading cardiothoracic surgeons and publications in medical journals have described our Isolator system as a standard treatment alternative for AF patients who may be candidates for sole-therapy minimally invasive surgical procedures. To date, none of our products have been approved or cleared by the Food and Drug Administration, or FDA, for the treatment of AF or the reduction in stroke risk. We anticipate that substantially all of our revenue for the foreseeable future will relate to products we currently sell, or are in the process of developing, which surgeons generally use to ablate cardiac tissue for the treatment of AF or for the exclusion of the left atrial appendage.

AF affects approximately 1% of the population in the United States. It is the most common cardiac arrhythmia, or irregular heartbeat, encountered in clinical practice and accounts for more doctor visits and hospital days than any other cardiac arrhythmia. AF is a condition wherein abnormal electrical impulses cause the atria, or upper chambers of the heart, to fibrillate, or quiver, at rapid rates of 400 to 600 beats per minute. As a result of this quivering, blood in the atria may become static, creating an increased risk that a blood clot will form and cause a stroke or other serious complications. If AF persists, patients often progress from experiencing AF intermittently to having AF continuously, a condition that is more difficult to treat. Symptoms of AF may include heart palpitations, dizziness, fatigue and shortness of breath, and these symptoms may be debilitating and life threatening in some cases. Although there is often no specific cause of AF, the condition is often associated with high blood pressure and other forms of heart disease. In most cases, AF is associated with cardiovascular disease, in particular hypertension, congestive heart failure, left ventricular dysfunction, coronary artery disease and valvular disease.

In the United States we primarily sell our products to medical centers through our direct sales force. AtriCure Europe, B.V., our wholly-owned subsidiary incorporated and based in the Netherlands, markets and sells our products throughout Europe, the Middle East and Africa, or EMEA, primarily through distributors, while in certain markets, such as Germany and the Netherlands, we sell directly to medical centers. Additionally, we sell our products to other international distributors, primarily in Asia, South America and Canada. Our business is primarily transacted in U.S. dollars with the exception of transactions with our European subsidiary which are substantially transacted in Euros. Our sales outside of the United States represented 19% of our revenue during 2010 and 2009.

We were incorporated in the State of Delaware as AtriCure, Inc. on October 31, 2000 in connection with a spin-off transaction from Enable Medical Corporation, in which shares of our common stock were distributed to the Enable shareholders. The spin-off was intended to allow us to focus on the development of products designed to treat AF and to raise capital for that purpose, while Enable continued its broader research and manufacturing activities. On August 5, 2005, we completed an initial public offering of our common stock. On August 10, 2005, we acquired Enable Medical Corporation, the manufacturer of our Isolator clamps, which are an essential part of our Isolator system. Additionally, in December 2005, we formed AtriCure Europe, B.V.

Our principal executive offices are located at 6217 Centre Park Drive, West Chester, Ohio 45069. Our telephone number is (513) 755-4100. SEC filings, news releases, our Code of Ethics applicable to directors, officers and employees and other information may be accessed free of charge through our Internet site at <http://www.atricure.com>. Other than the information specifically incorporated by reference in this prospectus, information on our website is not part of this prospectus.

USE OF PROCEEDS

Unless otherwise indicated in an accompanying prospectus supplement, we expect to use the net proceeds from the sale of any securities offered by us for general corporate purposes, which may include the repayment of outstanding debt. Until the net proceeds are used for these purposes, we may deposit them in interest-bearing accounts or invest them in marketable securities. The specific allocations, if any, of the proceeds from the sale of any of the securities will be described in the prospectus supplement relating to the offering of the securities.

Unless otherwise indicated in a prospectus supplement, we will not receive any proceeds from the sale of securities by any selling securityholder.

DESCRIPTION OF THE SECURITIES WE MAY OFFER

We may issue, in one or more offerings, any combination of senior or subordinated debt securities, common stock, preferred stock, warrants, depository shares and units.

This prospectus contains a summary of the general terms of the various securities that we may offer. The prospectus supplement relating to any particular securities offered will describe the specific terms of the securities. The summary in this prospectus and in any prospectus supplement does not describe every aspect of the securities and is subject to and qualified in its entirety by reference to all applicable provisions of the documents relating to the securities offered. These documents are or will be filed as exhibits to or incorporated by reference in the registration statement.

In addition, the prospectus supplement will set forth the terms of the offering, the initial public offering price and net proceeds to us. Where applicable, the prospectus supplement will also describe any material United States federal income tax considerations relating to the securities offered and indicate whether the securities offered are or will be listed on any securities exchange.

DESCRIPTION OF DEBT SECURITIES

We may offer debt securities. The following description sets forth the general terms and provisions of the debt securities. The applicable prospectus supplement will describe the specific terms of the debt securities offered by that prospectus supplement and any applicable tax considerations and any general terms outlined in this section that will not apply to those debt securities.

Our senior debt securities are to be issued under a senior indenture between us and U.S. Bank National Association, as trustee, a form of which is filed as an exhibit to the registration statement of which this prospectus forms a part. Our subordinated debt securities are to be issued under a subordinated indenture between us and U.S. Bank National Association, as trustee, a form of which is filed as an exhibit to the registration statement of which this prospectus forms a part. The senior indenture and the subordinated indenture are sometimes referred to collectively as the “indentures” and each individually as an “indenture.”

Because the following summaries of the material terms and provisions of the indentures and the related debt securities are not complete, you should refer to the forms of the indentures and the debt securities for complete information regarding the terms and provisions of the indentures, including the definitions of some of the terms used below, and the debt securities. Whenever we refer to particular articles, sections or defined terms of an indenture, those articles, sections or defined terms are incorporated herein by reference. Whenever we refer to particular articles, sections or defined terms of an indenture, without specific reference to an indenture, those articles, sections or defined terms are contained in all indentures. The senior indenture and the subordinated indenture are substantially identical, except for certain covenants of ours and provisions relating to subordination.

Table of Contents

If we had issued senior debt securities on June 30, 2011, except as described below, we would have had no debt outstanding senior to the senior debt securities, no debt outstanding *pari passu* to the senior debt securities and no debt outstanding junior to the senior debt securities. If we had issued subordinated debt securities on December 31, 2010, except as described below, we would have had no debt outstanding senior to the subordinated debt securities, no debt outstanding *pari passu* to the subordinated debt securities and no debt outstanding junior to the subordinated debt securities. Under our existing credit facility with Silicon Valley Bank, we have a term loan and a revolving credit facility, which revolving credit facility provides a maximum availability of \$10,000,000. \$7,125,000 was outstanding under the term loan as of June 30, and no amounts were outstanding under the \$10,000,000 revolving credit facility as of June 30. The amount of such loans and commitments may be increased or decreased without the consent of the holder of any debt securities. Amounts due under the credit facility would rank as *pari passu* with all senior debt securities and senior to all subordinated debt securities. In addition, because our obligations under the credit facility are secured by substantially all of our assets, the lender under the credit facility has a prior claim to such assets upon our default, liquidation or insolvency. As a result all debt securities would be effectively subordinated to our obligation under the credit facility. Any debt securities issued would be effectively subordinated to all existing and future indebtedness and other liabilities and commitments of our subsidiary.

The prospectus supplement relating to any series of debt securities will describe the following specific financial, legal and other terms particular to such series of debt securities:

- the designation of the debt securities of the series;
- any limit upon the aggregate principal amount of the debt securities of the series and any limitation on our ability to increase the aggregate principal amount after the initial issuance of the debt securities of that series;
- the date or dates on which the principal of the debt securities of the series is payable (which date or dates may be fixed or extendible);
- the annual rate or rates (which may be fixed or variable) at which the debt securities of the series shall bear interest, if any, the date or dates from which such interest shall accrue, on which such interest shall be payable and on which a record shall be taken for the determination of holders to whom interest is payable and/or the method by which such rate or rates or date or dates shall be determined;
- the place or places where principal of, premium, if any, and interest on debt securities of the series shall be payable;
- our right, if any, to redeem debt securities of the series, in whole or in part, at our option and the period or periods within which, the price or prices at which and any terms and conditions upon which debt securities of the series may be so redeemed;
- our obligation, if any, to redeem, purchase or repay debt securities of the series pursuant to any mandatory redemption or at the option of a holder and the price or prices at which and the period or periods within which and any of the terms and conditions upon which debt securities of the series shall be redeemed, purchased or repaid, in whole or in part;
- if other than denominations of \$1,000 and integral multiples of \$1,000, the denominations in which debt securities of the series shall be issuable;
- if other than the principal amount, the portion of the principal amount of debt securities of the series which shall be payable upon declaration of acceleration of the maturity;
- whether the debt securities of the series or any portion thereof will be issuable as registered debt securities or unregistered debt securities (with or without coupons) (and if so, whether such debt securities will be issued in temporary or permanent global form), or any combination of the foregoing;

Table of Contents

- whether the debt securities of the series may be exchangeable for and/or convertible into our common stock or any other security;
- whether and under what circumstances we will pay additional amounts on the debt securities of the series held by a person who is not a U.S. person in respect of any tax, assessment or governmental charge withheld or deducted and, if so, whether we will have the option to redeem such debt securities rather than pay such additional amounts;
- provisions, if any, for the defeasance of the debt securities of the series (including provisions permitting defeasance of less than all debt securities of the series);
- any other events of default or covenants with respect to the debt securities of the series; and
- any other terms of the debt securities of the series (which terms shall not be inconsistent with the provisions of the applicable indenture), and any requirement to have our subsidiaries guarantee the debt securities.

Events Of Default

You will have special rights if an “event of default” occurs, with respect to any series of debt securities, and is not cured, as described later in this subsection. Under the indenture, the term “event of default” means any of the following:

- we do not pay the principal on a debt security on its due date;
- we do not pay interest on a debt security within 30 days of its due date;
- we remain in breach of any covenant or warranty described in the indenture for 90 days after we receive a notice stating it is in breach, which notice must be sent by either the trustee or direct holders of at least 25% of the principal amount of outstanding debt securities;
- we or one of our significant subsidiaries fails to pay an amount of indebtedness totaling more than \$25,000,000 in principal amount, our obligation to repay is accelerated by its lenders, and this payment obligation remains accelerated for 30 days;
- we or one of our significant subsidiaries fails to pay an amount of indebtedness totaling more than \$25,000,000 in principal amount when due, and this payment obligation remains accelerated for 30 days;
- we become subject to one or more final, non-appealable judgments, orders or decrees (not covered by insurance) requiring payments of more than \$25,000,000 and such judgments, orders or decrees remain unsatisfied for 60 days during which a stay of enforcement has not been in effect; or
- certain events of bankruptcy, insolvency or reorganization.

For purposes of the indentures, a “significant subsidiary” means a subsidiary meeting any of the conditions set forth in Rule 405 promulgated under the Securities Act.

Remedies if an Event of Default Occurs

If an event of default has occurred and has not been cured (if a cure period is provided for), the trustee or the direct holders of 25% in principal amount of the outstanding debt securities may declare the entire principal amount of all the debt securities of that series to be due and immediately payable. This is called a “declaration of acceleration of maturity.”

Except in cases of default, whereby a trustee has some special duties, a trustee is not required to take any action under the indenture at the request of any direct holders unless the direct holders offer the trustee reasonable protection from costs, expenses and liability (called an “indemnity”). If reasonable indemnity is

[Table of Contents](#)

provided, the direct holders of a majority in principal amount of the outstanding debt securities of the relevant series may direct the time, method and place of conducting any lawsuit or other formal legal action seeking any remedy available to the trustee. These majority direct holders may also direct the trustee in performing any other action under the indenture.

In general, before you bypass the trustee and bring your own lawsuit or other formal legal action or take other steps to enforce your rights or protect your interests relating to the debt securities, the following must occur:

- you must give the trustee written notice that an event of default has occurred and remains uncured;
- the direct holders of at least 25% in principal amount of all outstanding debt securities of the relevant series must make a written request that the trustee take action in its own name as trustee because of the default, and must offer reasonable indemnity to the trustee against the costs, expenses and other liabilities of taking that action;
- the trustee must have not taken action for 60 days after receipt of the above notice and offer of indemnity; and
- the trustee must not have received from direct holders of a majority in principal amount of the outstanding debt securities of that series a direction inconsistent with the written notice during the 60 day period after receipt of the above notice.

However, you are entitled at any time to bring a lawsuit for the payment of money due on your debt security on or after its due date.

Modification

There are three types of changes we can make to the indentures and the debt securities.

Changes Requiring Your Approval

First, there are changes that cannot be made to the indentures or your debt securities without your specific approval. Following is a list of those types of changes:

- change the payment due date;
- reduce any amounts due on a debt security;
- change the place or currency of payment on a debt security;
- impair your right to sue for payment;
- waive a default in payment on a debt security;
- reduce the percentage in principal amount of debt securities, the consent of whose holders is required to modify or amend the indenture;
- reduce the percentage in principal amount of debt securities, the consent of whose holders is required to waive compliance with certain provisions of the indenture or to waive certain defaults; and
- modify any other aspect of the provisions dealing with modification and waiver of the indenture.

Changes Requiring a Majority Vote

The second type of change to the indentures and the debt securities is the kind that requires consent of the holders of a majority in principal amount of the outstanding debt securities of the particular series affected. With a majority vote, the holders may waive past defaults, provided that such defaults are not of the type described previously under “Changes Requiring Your Approval.”

[Table of Contents](#)

Changes Not Requiring Approval

The third type of change does not require any vote by direct holders of debt securities. This type is limited to clarifications and certain other changes that would not adversely affect holders of the debt securities.

Consolidation, Merger And Sale Of Assets

We may consolidate or merge with or into another entity, and we may sell or lease substantially all of our assets to another entity if the following conditions, among others, are met:

- where we merge out of existence or sell or lease substantially all our assets, the other entity must be a corporation organized and validly existing under the laws of the United States or any jurisdiction of the United States, and it must agree to be legally responsible for the debt securities; and
- the merger, sale of assets or other transaction must not cause a default or an event of default on the debt securities.

Form, Exchange, Registration And Transfer

Generally, we will issue debt securities only in registered global form. See “Global Securities” below. However, if specified in the prospectus supplement, we may issue certificated securities in definitive form.

You may have your debt securities broken into more debt securities of smaller denominations or combined into fewer debt securities of larger denominations, as long as the total principal amount is not changed. This is called an “exchange.”

You may exchange or transfer debt securities at the office of the trustee. The trustee acts as our agent for registering debt securities in the names of holders and transferring debt securities. The trustee may appoint another entity or perform this role itself. The entity performing the role of maintaining the list of registered direct holders is called the “security registrar.” It will also perform transfers. You will not be required to pay a service charge to transfer or exchange debt securities, but you may be required to pay for any tax or other governmental charge associated with the exchange or transfer. The transfer or exchange will only be made if the security registrar is satisfied with your proof of ownership.

If the debt securities are redeemable and we redeem less than all of the debt securities of a particular series, we may block the transfer or exchange of those debt securities during the period beginning 15 days before the day we mail the notice of redemption and ending on the day of that mailing, in order to freeze the list of holders to prepare the mailing. We may also refuse to register transfers or exchanges of debt securities selected for redemption, except that we will continue to permit transfers and exchanges of the unredeemed portion of any debt security being partially redeemed.

Global Securities

The debt securities of any series may be represented, in whole or in part, by one or more global securities. Each global security will:

- be registered in the name of a depository that we will identify in a prospectus supplement;
- be deposited with the depository or its nominee or custodian; and
- bear any required legends.

Table of Contents

No global security may be exchanged in whole or in part for debt securities registered in the name of any person other than the depositary or any nominee unless:

- the depositary has notified us that it is unwilling or unable to continue as depositary or has ceased to be qualified to act as depositary;
- we elect for any reason in our sole discretion to issue certificated debt securities in exchange for all of any portion of the global debt securities; or
- any other circumstances described in a prospectus supplement occur.

As long as the depositary, or its nominee, is the registered owner of a global security, the depositary or nominee will be considered the sole owner and holder of the debt securities represented by the global security for all purposes under the indenture. Except in the above limited circumstances, owners of beneficial interests in a global security:

- will not be entitled to have the debt securities registered in their names;
- will not be entitled to physical delivery of certificated debt securities; and
- will not be considered to be holders of those debt securities under the indenture.

Payments on a global security will be made to the depositary or its nominee as the holder of the global security. Some jurisdictions have laws that require that certain purchasers of securities take physical delivery of such securities in definitive form. These laws may impair the ability to transfer beneficial interests in a global security.

Institutions that have accounts with the depositary or its nominee are referred to as “participants.” Ownership of beneficial interests in a global security will be limited to participants and to persons that may hold beneficial interests through participants. The depositary will credit, on its book-entry registration and transfer system, the respective principal amounts of debt securities represented by the global security to the accounts of its participants. Each person owning a beneficial interest in a global security must rely on the procedures of the depositary (and, if such person is not a participant, on procedures of the participant through which such person owns its interest) to exercise any rights of a holder under the indenture.

Ownership of beneficial interests in a global security will be shown on and effected through records maintained by the depositary, with respect to participants’ interests, or by any participant, with respect to interests of persons held by participants on their behalf. Payments, transfers and exchanges relating to beneficial interests in a global security will be subject to policies and procedures of the depositary. The depositary policies and procedures may change from time to time. Neither we nor the trustee will have any responsibility or liability for the depositary’s or any participant’s records with respect to beneficial interests in a global security.

Notices

Notices to holders of debt securities will be given by mail to the addresses of such holders as they appear in the security register.

The Trustee

U.S. Bank National Association acts as trustee under each of the senior indenture and the subordinated indenture.

DESCRIPTION OF COMMON STOCK

This section summarizes the general terms of the common stock that we may offer. The prospectus supplement relating to the common stock offered will set forth the number of shares offered, the initial offering price and recent market prices, dividend information and any other relevant information. The summary in this section and in the prospectus supplement does not describe every aspect of the common stock and is subject to and qualified in its entirety by reference to all the provisions of our Amended and Restated Certificate of Incorporation and Second Amended and Restated Bylaws and to the provisions of the Delaware General Corporate Law.

The total number of authorized shares of common stock is 90,000,000, par value \$0.001 per share. Holders of common stock are entitled to one vote for each share held of record on all matters submitted to a vote of shareholders. Shareholders do not have the right to cumulate their votes in the election of directors.

Holders of common stock are entitled to receive dividends when and if declared by our board of directors out of funds legally available therefor, subject to any contractual restrictions on the payment of dividends and to any restrictions on the payment of dividends imposed by the terms of any outstanding preferred shares or debt securities.

Upon our dissolution or liquidation or the sale of all or substantially all of our assets, after payment in full of all amounts required to be paid to creditors and to the holders of preferred shares having liquidation preferences, if any, the holders of our common stock will be entitled to receive pro rata our remaining assets available for distribution.

As of July 12, 2011, we had 16,281,641 shares of common stock outstanding. Shares of common stock carry no preemptive or conversion or subscription rights and are not subject to redemption or sinking fund provisions. All outstanding shares of common stock are, and any shares of common stock issued upon conversion of any convertible securities will be, fully paid and non-assessable.

Our common stock is listed on the NASDAQ Global Market and trades under the symbol "ATRC." Our registrar and transfer agent is American Stock Transfer & Trust Company.

Anti-Takeover Effects of Provisions of Our Amended and Restated Certificate of Incorporation and Bylaws

Provisions of our Amended and Restated Certificate of Incorporation and Second Amended and Restated Bylaws may have the effect of making it more difficult for a third party to acquire, or of discouraging a third party from attempting to acquire, control of us. Because our shareholders do not have cumulative voting rights, our shareholders representing a majority of the shares of common stock outstanding will be able to elect all of our directors. Our Amended and Restated Certificate of Incorporation and Second Amended and Restated Bylaws provide that all shareholder action must be effected at a duly called meeting of shareholders and not by a consent in writing, and that only our board of directors, chairman of the board, chief executive officer or president (in the absence of a chief executive officer) may call a special meeting of shareholders. Our Amended and Restated Certificate of Incorporation requires a 66 2/3% shareholder vote for the amendment, repeal or modification of certain provisions of our Amended and Restated Certificate of Incorporation and Second Amended and Restated Bylaws relating to the absence of cumulative voting, limitations of liability of our directors, the requirement that shareholder actions be effected at a duly-called meeting and the designated parties entitled to call a special meeting of the shareholders.

The combination of the lack of cumulative voting and the 66 2/3% shareholder voting requirement will make it more difficult for our existing shareholders to replace our board of directors as well as for another party to obtain control of us by replacing our board of directors. Since our board of directors has the power to retain

[Table of Contents](#)

and discharge our officers, these provisions could also make it more difficult for existing shareholders or another party to effect a change in management. In addition, the authorization of undesignated preferred stock makes it possible for our board of directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to change our control.

These provisions may have the effect of deterring hostile takeovers or delaying changes in our control or management. These provisions are intended to enhance the likelihood of continued stability in the composition of our board of directors and in the policies they implement, and to discourage certain types of transactions that may involve an actual or threatened change of our control. These provisions are designed to reduce our vulnerability to an unsolicited acquisition proposal. The provisions also are intended to discourage certain tactics that may be used in proxy fights. However, such provisions could have the effect of discouraging others from making tender offers for our shares and, as a consequence, they also may inhibit fluctuations in the market price of our shares that could result from actual or rumored takeover attempts. Such provisions may also have the effect of preventing changes in our management.

Delaware Anti-Takeover Statute

We are subject to Section 203 of the Delaware General Corporation Law. This law prohibits a publicly held Delaware corporation from engaging in any “business combination” with any “interested shareholder” for a period of three years following the date that the shareholder became an interested shareholder unless:

- prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction that resulted in the shareholder becoming an interested shareholder;
- upon consummation of the transaction which resulted in the shareholder becoming an interested shareholder, the interested shareholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the number of shares outstanding those shares owned by persons who are directors or officers or by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or subsequent to the date of the transaction, the business combination is approved by the board of directors and authorized at an annual or special meeting of shareholders, and not by written consent, by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested shareholder.

Section 203 defines “business combination” to include:

- any merger or consolidation involving the corporation and the interested shareholder;
- any sale, transfer, pledge or other disposition of 10% or more of our assets involving the interested shareholder;
- in general, any transaction that results in the issuance or transfer by us of any of our stock to the interested shareholder;
- any transaction involving the corporation that has the effect of increasing the proportionate share of the stock or any class or series of the corporation beneficially owned by the interested shareholder; or
- the receipt by the interested shareholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an “interested shareholder” as an entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with or controlling or controlled by the entity or person.

DESCRIPTION OF PREFERRED STOCK

The following briefly summarizes the material terms of the preferred stock that we may offer, other than pricing and related terms which will be disclosed in a prospectus supplement. You should read the particular terms of any series of preferred stock that we offer, which we will describe in more detail in any prospectus supplement relating to such series. You should also read the more detailed provisions of our Articles of Incorporation and the statement with respect to shares relating to each particular series of preferred stock for provisions that may be important to you. The statement with respect to shares relating to each particular series of preferred stock offered by the accompanying prospectus supplement and this prospectus will be filed as an exhibit to a document incorporated by reference in the registration statement. The prospectus supplement will also state whether any of the terms summarized below do not apply to the series of preferred stock being offered.

General

Our board of directors is authorized to issue up to 10,000,000 shares of preferred stock, par value \$0.001 per share. As of the date of this prospectus, we have not issued any shares of preferred stock. Our board of directors can issue shares of preferred stock in one or more series and can specify the following terms for each series:

- the number of shares;
- the designation, powers, preferences and rights of the shares; and
- the qualifications, limitations or restrictions, except as otherwise stated in our Amended and Restated Certificate of Incorporation.

Before issuing any series of preferred stock, our board of directors will adopt resolutions creating and designating the series as a series of preferred stock, and the resolutions will be filed in a statement with respect to shares as an amendment to our Amended and Restated Certificate of Incorporation.

The rights of holders of the preferred stock offered may be adversely affected by the rights of holders of any shares of preferred stock that may be issued in the future. Our board of directors may cause shares of preferred stock to be issued in public or private transactions for any proper corporate purpose. Examples include issuances to obtain additional financing in connection with acquisitions or otherwise, and issuances to our officers, directors and employees and its subsidiaries pursuant to benefit plans or otherwise. The preferred stock could have the effect of acting as an anti-takeover device to prevent a change in control of us.

Unless the particular prospectus supplement states otherwise, holders of each series of preferred stock will not have any preemptive or subscription rights to acquire more of our stock.

The transfer agent, registrar, dividend disbursing agent and redemption agent for shares of each series of preferred stock will be named in the prospectus supplement relating to such series.

Rank

Unless otherwise specified in the prospectus supplement relating to the shares of any series of preferred stock, the shares will rank on an equal basis with each other series of preferred stock and prior to the common stock as to dividends and distributions of assets.

Dividends

Unless the particular prospectus supplement states otherwise, holders of each series of preferred stock will be entitled to receive cash dividends, when, as and if declared by our board of directors out of funds legally available for dividends. The rates and dates of payment of dividends will be set forth in the prospectus supplement relating to each series of preferred stock. Dividends will be payable to holders of record of preferred stock as they appear on our books. Dividends on any series of preferred stock may be cumulative or noncumulative.

Table of Contents

We may not declare, pay or set apart for payment dividends on the preferred stock unless full dividends on any other series of preferred stock that ranks on an equal or senior basis have been paid or sufficient funds have been set apart for payment for:

- all prior dividend periods of the other series of preferred stock that pay dividends on a cumulative basis; or
- the immediately preceding dividend period of the other series of preferred stock that pay dividends on a noncumulative basis.

Partial dividends declared on shares of preferred stock and any other series of preferred stock ranking on an equal basis as to dividends will be declared pro rata. A pro rata declaration means that the ratio of dividends declared per share to accrued dividends per share will be the same for all such series of preferred stock.

Similarly, we may not declare, pay or set apart for payment non-stock dividends or make other payments on the common stock or any other stock ranking junior to the preferred stock unless full dividends on all series of preferred stock have been paid or set apart for payment for:

- all prior dividend periods if the preferred stock pays dividends on a cumulative basis; or
- the immediately preceding dividend period if the preferred stock pays dividends on a noncumulative basis.

Conversion and Exchange

The prospectus supplement for any series of preferred stock will state the terms, if any, on which shares of that series are convertible into or exchangeable for shares of our common stock.

Redemption

If so specified in the applicable prospectus supplement, a series of preferred stock may be redeemable at any time, in whole or in part, at our option or at the option of the holders, or may be mandatorily redeemed.

Any partial redemptions of preferred stock will be made in a way that our board of directors decides is equitable.

Unless we default in the payment of the redemption price, dividends will cease to accrue after the redemption date on shares of preferred stock called for redemption and all rights of holders of such shares will terminate except for the right to receive the redemption price.

Liquidation Preference

Upon our voluntary or involuntary liquidation, dissolution or winding up, holders of each series of preferred stock will be entitled to receive distributions upon liquidation in the amount set forth in the prospectus supplement relating to such series of preferred stock, plus an amount equal to any accrued and unpaid dividends. Such distributions will be made before any distribution is made on any securities ranking junior to the preferred stock with respect to liquidation, including common stock.

If the liquidation amounts payable relating to the preferred stock of any series and any other securities ranking on a parity regarding liquidation rights are not paid in full, the holders of the preferred stock of such series and such other securities will share in any such distribution of our available assets on a ratable basis in proportion to the full liquidation preferences. Holders of such series of preferred stock will not be entitled to any other amounts from us after they have received their full liquidation preference.

[Table of Contents](#)

Voting Rights

If we issue voting preferred stock, holders of preferred stock will be entitled to one vote per share on each matter submitted to our shareholders. If we issue non-voting preferred stock, holders of preferred stock will have no voting rights, except as required by applicable law. The prospectus supplement will state the voting rights, if any, applicable to any particular series of preferred stock.

DESCRIPTION OF WARRANTS

We may issue warrants for the purchase of common stock, debt securities or other securities registered pursuant to this registration statement and described in this prospectus. We may issue warrants independently or together with other securities that may be attached to or separate from the warrants. We will issue each series of warrants under a separate warrant agreement that will be entered into between us and a bank or trust company, as warrant agent, and will be described in the prospectus supplement relating to the particular issue of warrants. The warrant agent will act solely as our agent in connection with the warrant of such series and will not assume any obligation or relationship of agency for or with holders or beneficial owners of warrants. The following describes certain general terms and provisions of debt warrants or common stock warrants we may offer. We will set forth further terms of the debt warrants, common stock warrants or warrants to purchase other securities and the applicable warrant agreement in the applicable prospectus supplement.

Common Stock Warrants

The applicable prospectus supplement will describe the terms of any common stock warrants, including the following:

- the title of such warrants;
- the offering price of such warrants, which we may distribute proportionately free of charge to our shareholders (in the applicable prospectus supplement, we may refer to warrants distributed proportionately free of charge to our shareholders as rights to purchase our common stock and any securities not taken by our shareholders may be reoffered to the public);
- the aggregate number of such warrants;
- the designation and terms of the common stock purchasable upon exercise of such warrants;
- if applicable, the designation and terms of the securities with which such warrants are issued and the number of such warrants issued with each such security;
- if applicable, the date from and after which such warrants and any securities issued therewith will be separately transferable;
- the number of shares of common stock purchasable upon exercise of the warrants and the price at which such shares may be purchased upon exercise;
- provisions for changes to or adjustments in the exercise price;
- the date on which the right to exercise such warrants shall commence and the date on which such right shall expire;
- if applicable, the minimum or maximum amount of such warrants which may be exercised at any one time;
- the currency, currencies or currency units in which the offering price, if any, and the exercise price are payable;
- if applicable, a discussion of certain United States federal income tax considerations;

Table of Contents

- the identity of the warrant agent for the warrants; and
- the anti-dilution provisions of the warrants, if any.

Debt Warrants

The applicable prospectus supplement will describe the terms of any debt warrants, including the following:

- the title of the debt warrants;
- the offering price for the debt warrants;
- the aggregate number of the debt warrants;
- the designation and terms of the debt securities purchasable upon exercise of such debt warrants;
- if applicable, the designation and terms of the securities with which such debt warrants are issued and the number of such debt warrants issued with each security;
- if applicable, the date from and after which such debt warrants and any securities issued therewith will be separately transferable;
- the principal amount of debt securities purchasable upon exercise of a debt warrant and the price at which such principal amount of debt securities may be purchased upon exercise;
- the date on which the right to exercise such debt warrants shall commence and the date on which such right shall expire;
- if applicable, the minimum or maximum amount of such debt warrants which may be exercised at any one time;
- whether the debt warrants represented by the debt warrant certificates or debt securities that may be issued upon exercise of the debt warrants will be issued in registered form;
- information with respect to book-entry procedures, if any;
- the currency, currencies or currency units in which the offering price, if any, and the exercise price are payable;
- if applicable, a discussion of certain United States federal income tax considerations;
- the identity of the warrant agent for the warrants;
- the anti-dilution provisions of such debt warrants, if any;
- the redemption or call provisions, if any, applicable to such debt warrants; and
- any additional terms of the debt warrants, including terms, procedures and limitations relating to the exchange and exercise of such debt warrants.

DESCRIPTION OF DEPOSITARY SHARES

The following briefly summarizes the provisions of the depositary shares and depositary receipts that we may issue from time to time and which would be important to holders of depositary receipts, other than pricing and related terms, which will be disclosed in the applicable prospectus supplement. The prospectus supplement will also state whether any of the general provisions summarized below do not apply to the depositary shares or depositary receipts being offered and provide any additional provisions applicable to the depositary shares or depositary receipts being offered. The following description and any description in a prospectus supplement may not be complete and are subject to, and qualified in their entirety by reference to the terms and provisions of the form of deposit agreement filed as an exhibit to the registration statement which contains this prospectus.

Depositary Shares

We may offer depositary shares evidenced by depositary receipts. Each depositary share represents a fraction or a multiple of a share of a particular series of preferred stock that we issue and deposit with a depositary. The fraction or the multiple of a share of preferred stock, which each depositary share represents, will be set forth in the applicable prospectus supplement.

We will deposit the shares of any series of preferred stock represented by depositary shares according to the provisions of a deposit agreement to be entered into between us and a bank or trust company, which we will select as its preferred stock depositary. We will name the depositary in the applicable prospectus supplement. Each holder of a depositary share will be entitled to all the rights and preferences of the underlying preferred stock in proportion to the applicable fraction or multiple of a share of preferred stock represented by the depositary share. These rights include any applicable dividend, voting, redemption, conversion and liquidation rights. The depositary will send the holders of depositary shares all reports and communications that we deliver to the depositary and which we are required to furnish to the holders of depositary shares.

Depositary Receipts

The depositary shares will be evidenced by depositary receipts issued pursuant to the deposit agreement. Depositary receipts will be distributed to anyone who is buying the fractional shares of preferred stock in accordance with the terms of the applicable prospectus supplement.

Withdrawal of Preferred Stock

Unless the related depositary shares have previously been called for redemption, a holder of depositary shares may receive the number of whole shares of the related series of preferred stock and any money or other property represented by the holder's depositary receipts after surrendering the depositary receipts at the corporate trust office of the depositary, paying any taxes, charges and fees provided for in the deposit agreement and complying with any other requirement of the deposit agreement. Partial shares of preferred stock will not be issued. If the surrendered depositary shares exceed the number of depositary shares that represent the number of whole shares of preferred stock the holder wishes to withdraw, then the depositary will deliver to the holder at the same time a new depositary receipt evidencing the excess number of depositary shares. Once the holder has withdrawn the preferred stock, the holder will not be entitled to re-deposit that preferred stock under the deposit agreement or to receive depositary shares in exchange for such preferred stock.

Dividends and Other Distributions

The depositary will distribute to record holders of depositary shares any cash dividends or other cash distributions it receives on preferred stock. Each holder will receive these distributions in proportion to the number of depositary shares owned by the holder. The depositary will distribute only whole U.S. dollars and cents. The depositary will add any fractional cents not distributed to the next sum received for distribution to record holders of depositary shares.

[Table of Contents](#)

In the event of a non-cash distribution, the depositary will distribute property to the record holders of depositary shares, unless the depositary determines that it is not feasible to make such a distribution. If this occurs, the depositary may, with our approval, sell the property and distribute the net proceeds from the sale to the holders.

The amounts distributed to holders of depositary shares will be reduced by any amounts required to be withheld by the preferred stock depositary or by we on account of taxes or other governmental charges.

Redemption of Depositary Shares

If the series of preferred stock represented by depositary shares is subject to redemption, then we will give the necessary proceeds to the depositary. The depositary will then redeem the depositary shares using the funds it received from us for the preferred stock. The redemption price per depositary share will be equal to the redemption price payable per share for the applicable series of the preferred stock and any other amounts per share payable with respect to the preferred stock multiplied by the fraction of a share of preferred stock represented by one depositary share. Whenever we redeem shares of preferred stock held by the depositary, the depositary will redeem the depositary shares representing the shares of preferred stock on the same day, provided we have paid in full to the depositary the redemption price of the preferred stock to be redeemed and any accrued and unpaid dividends. If fewer than all the depositary shares of a series are to be redeemed, the depositary shares will be selected by lot or ratably or by any other equitable method as the depositary will decide.

After the date fixed for redemption, the depositary shares called for redemption will no longer be considered outstanding. Therefore, all rights of holders of the depositary shares will cease, except that the holders will still be entitled to receive any cash payable upon the redemption and any money or other property to which the holder was entitled at the time of redemption. To receive this amount or other property, the holders must surrender the depositary receipts evidencing their depositary shares to the preferred stock depositary. Any funds that we deposit with the preferred stock depositary for any depositary shares that the holders fail to redeem will be returned to us after a period of two years from the date we deposit the funds.

Voting the Preferred Stock

Upon receipt of notice of any meeting at which the holders of preferred stock are entitled to vote, the depositary will notify holders of depositary shares of the upcoming vote and arrange to deliver our voting materials to the holders. The record date for determining holders of depositary shares that are entitled to vote will be the same as the record date for the preferred stock. The materials the holders will receive will describe the matters to be voted on and explain how the holders, on a certain date, may instruct the depositary to vote the shares of preferred stock underlying the depositary shares. For instructions to be valid, the depositary must receive them on or before the date specified. To the extent possible, the depositary will vote the shares as instructed by the holder. We agree to take all reasonable actions that the depositary determines are necessary to enable it to vote as a holder has instructed. The depositary will abstain from voting shares of preferred stock deposited under a deposit agreement if it has not received specific instructions from the holder of the depositary shares representing those shares.

Amendment and Termination of the Deposit Agreement

We may agree with the depositary to amend the deposit agreement and the form of depositary receipt at any time. However, any amendment that materially and adversely alters the rights of the holders of depositary receipts will not be effective unless it has been approved by the holders of at least a majority of the affected depositary shares then outstanding. We will make no amendment that impairs the right of any holder of depositary shares, as described above under “—Withdrawal of Preferred Stock,” to receive shares of preferred stock and any money or other property represented by those depositary shares, except in order to comply with mandatory provisions of applicable law. If an amendment becomes effective, holders are deemed to agree to the amendment and to be bound by the amended deposit agreement if they continue to hold their depositary receipts.

[Table of Contents](#)

The deposit agreement automatically terminates if a final distribution in respect of the preferred stock has been made to the holders of depositary receipts in connection with our liquidation, dissolution or winding-up. We may also terminate the deposit agreement at any time we wish with at least 60 days prior written notice to the depositary. If we do so, the depositary will give notice of termination to the record holders not less than 30 days before the termination date. Once depositary receipts are surrendered to the depositary, it will send to each holder the number of whole or fractional shares of the series of preferred stock underlying that holder's depositary receipts.

Charges of Depositary and Expenses

We will pay all transfer and other taxes and governmental charges arising solely from the existence of the depositary arrangements. We will pay all charges of the depositary in connection with the initial deposit of the related series of offered preferred stock, the initial issuance of the depositary shares, all withdrawals of shares of the related series of offered preferred stock by holders of the depositary shares and the registration of transfers of title to any depositary shares. However, holders of depositary receipts will pay other taxes and governmental charges and any other charges provided in the deposit agreement to be payable by them.

Limitations on Our Obligations and Liability to Holders of Depositary Receipts

The deposit agreement will expressly limit our obligations and the obligations of the depositary. It will also limit our liability and the liability of the depositary as follows:

- we and the depositary are only liable to the holders of depositary receipts for negligence or willful misconduct; and
- we and the depositary have no obligation to become involved in any legal or other proceeding related to the depositary receipts or the deposit agreement on your behalf or on behalf of any other party, unless you provide us with satisfactory indemnity.

Resignation and Removal of Depositary

The depositary may resign at any time by notifying us of its election to do so. In addition, we may remove the depositary at any time. Within 60 days after the delivery of the notice of resignation or removal of the depositary, we will appoint a successor depositary.

Reports to Holders

We will deliver all required reports and communications to holders of the offered preferred stock to the depositary, and it will forward those reports and communications to the holders of depositary shares.

DESCRIPTION OF UNITS

We may, from time to time, issue units comprised of one or more of the other securities that may be offered under this prospectus, in any combination. Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately at any time, or at any time before a specified date.

Any applicable prospectus supplement will describe:

- the material terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;
- any material provisions relating to the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units; and
- any material provisions of the governing unit agreement that differ from those described above.

SELLING SECURITYHOLDERS

The shares of common stock to be sold pursuant to this prospectus were issued in private placements completed before our initial public offering as follows:

<u>Name and address of beneficial owner</u>	<u>Shares beneficially owned prior to this offering</u>		<u>Percentage of shares</u>	<u>Shares beneficially owned after offering</u>		
	<u>Common stock</u>	<u>Options</u>		<u>Shares to be sold in offering</u>	<u>Common stock and options</u>	<u>Percentage of shares</u>
U.S. Venture Partners (1)	2,252,745	—	13.87%	2,252,745	—	—
Camden Partners (2)	931,790	—	5.74%	931,790	—	—

1. This Selling Securityholder's holdings consist of 2,202,444 shares held by U.S. Venture Partners VIII, L.P.; 17,031 shares held by USVP VIII Affiliates Fund, L.P.; 21,653 shares held by USVP Entrepreneur Partners VIII-A, L.P. and 11,617 shares held by USVP Entrepreneur Partners VIII-B, L.P. Presidio Management Group VIII, LLC is the general partner of U.S. Venture Partners VIII, L.P., USVP VIII Affiliates Fund, L.P., USVP Entrepreneur Partners VIII-A, L.P. and USVP Entrepreneur Partners VIII-B, L.P. The managing members of Presidio Management Group VIII, LLC are Irwin Federman, Winston Fu, Steven Krausz, David Liddle, Jonathan Root, Christopher Rust and Philip Young and each may be deemed to share voting and investment power with respect to the securities held by these entities and disclaims beneficial ownership of the securities held by these entities, except as to his pecuniary interest therein.
2. This Selling Securityholder's holdings consist of 868,605 shares held by Camden Partners Strategic Fund II-A, L.P., 51,527 shares held by Camden Partners Strategic Fund II-B, L.P. and 11,658 shares held by Camden Partners Holdings, LLC. Camden Partners Strategic II, LLC is the general partner of Camden Partners Strategic Fund II-A, L.P. and Camden Partners Strategic Fund II-B, L.P. David L. Warnock, Richard M. Berkeley and Donald W. Hughes each may be deemed to share voting and investment power with respect to the securities held by these entities and disclaims beneficial ownership of the securities held by these entities, except as to his pecuniary interest therein. Richard M. Johnston, who has served as a director of AtriCure since June 2002 and as Chairman of the Board since February 2005, served as a Managing Member of both Camden Partners Holdings, LLC and Camden Partners Strategic II, LLC, and is now a Retired Member of each.

PLAN OF DISTRIBUTION

We and the selling securityholders may offer the securities covered by this prospectus in any of the following ways (or in any combination) from time to time:

- to or through underwriters or dealers;
- directly to purchasers or to a single purchaser; or
- through agents; or
- in “at the market offerings,” within the meaning of Rule 415(a)(4) of the Securities Act, to or through a market maker or into an existing trading market, on an exchange or otherwise.

In addition, we and any selling securityholder may enter into derivative or other hedging transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If any applicable prospectus supplement indicates, in connection with such a transaction, such third parties may, pursuant to this prospectus and any applicable prospectus supplement, sell securities covered by this prospectus and any applicable prospectus supplement. If so, the third party may use securities borrowed from others to settle such sales and may use securities received from us to close out any related short positions. We and the selling securityholders may also loan or pledge securities covered by this prospectus and any applicable prospectus supplement to third parties, who may sell the loaned securities or, in an event of default in the case of a pledge, sell the pledged securities pursuant to this prospectus and any applicable prospectus supplement.

Any applicable prospectus supplement will set forth the terms of the offering of the securities covered by this prospectus, including:

- the name or names of any underwriters, dealers or agents and the amounts of securities underwritten or purchased by each of them, if any;
- any material relationship with the underwriter and the nature of such relationship, if any;
- the over-allotment options under which underwriters may purchase additional securities, if any;
- the public offering price or purchase price of the securities and the proceeds to us and any discounts, commissions, or concessions or other items constituting compensation allowed, re-allowed or paid to underwriters, dealers or agents, if any;
- any securities exchanges on which the securities may be listed, if any; and
- the manner for refunding any excess amount paid (including whether interest will be paid).

Any public offering price or purchase price and any discounts, commissions, concessions or other items constituting compensation allowed or re-allowed or paid to underwriters, dealers or agents may be changed from time to time.

The securities may be offered and sold from time to time in one or more transactions, including negotiated transactions, at a fixed price or prices or at varying prices determined at the time of sale. If underwriters are used in the sale of any securities, the securities will be acquired by the underwriters for their own account and may be resold from time to time in one or more transactions described above. The securities may be either offered to the public through underwriting syndicates represented by managing underwriters, or directly by underwriters. Generally, the underwriters’ obligations to purchase the securities will be subject to certain conditions precedent. The underwriters will be obligated to purchase all of the securities if they purchase any of the securities.

We and the selling securityholders may sell the securities through agents from time to time. If required by applicable law, any applicable prospectus supplement will name any agent involved in the offer or sale of the securities and any commissions we pay to them. Generally, unless otherwise indicated in any applicable prospectus

Table of Contents

supplement, any agent will be acting on a best efforts basis for the period of its appointment. If a dealer is used in the sale of the securities in respect of which the prospectus is delivered, we or the selling stockholders will sell such securities to the dealer, as principal. The dealer may then resell such securities to the public at varying prices to be determined by such dealer at the time of resale.

We and the selling securityholders may authorize underwriters, dealers or agents to solicit offers by certain purchasers to purchase the securities from us at the public offering price set forth in any applicable prospectus supplement or other prices pursuant to delayed delivery or other contracts providing for payment and delivery on a specified date in the future. Any delayed delivery contracts will be subject only to those conditions set forth in any applicable prospectus supplement, and any applicable prospectus supplement will set forth any commissions we pay for solicitation of these delayed delivery contracts.

Each underwriter, dealer and agent participating in the distribution of any offered securities that are issuable in bearer form will agree that it will not offer, sell, resell or deliver, directly or indirectly, offered securities in bearer form in the United States or to United States persons except as otherwise permitted by Treasury Regulations Section 1.163-5(c)(2)(i)(D).

Offered securities may also be offered and sold, if so indicated in any applicable prospectus supplement, in connection with a remarketing upon their purchase, in accordance with a redemption or repayment pursuant to their terms, or otherwise, by one or more remarketing firms, acting as principals for their own accounts or as agents for us or the selling securityholders. Any remarketing firm will be identified and the terms of its agreements, if any, with us, and its compensation will be described in any applicable prospectus supplement.

We and the selling securityholders may sell equity securities in an offering “at the market,” as defined in Rule 415 under the Securities Act. A post-effective amendment to this Registration Statement will be filed to identify the underwriter(s) at the time of the take-down for “at the market” offerings.

Agents, underwriters and other third parties described above may be entitled under relevant underwriting or other agreements to indemnification by us or the selling securityholders against certain civil liabilities under the Securities Act, or to contribution with respect to payments which the agents, underwriters or other third parties may be required to make in respect thereof. Agents, underwriters and such other third parties may be customers of, engage in transactions with, or perform services for us or the selling Securityholders in the ordinary course of business.

LEGAL MATTERS

The validity of the securities offered by this prospectus will be passed upon for us by Keating Muething & Klekamp PLL, Cincinnati, Ohio.

EXPERTS

The consolidated financial statements and the related financial statement schedules, incorporated in this prospectus by reference from the Company’s Annual Report on Form 10-K have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their reports, which are incorporated by reference herein. Such financial statements and financial statement schedules have been so incorporated in reliance upon the reports of such firm given upon their authority as experts in accounting and auditing.

Shares
AtriCure, Inc.
Common Stock



PROSPECTUS SUPPLEMENT

Piper Jaffray

January , 2013