

PRODUCTION TAPPING SOLUTIONS

Foolproof results developed over five generations.

JARFLO FORM TAPS



Jarvis CUTTING TOOLS

1 INTRODUCTION

A letter from the President.

3 MANUFACTURING SINCE 1901.

We have been manufacturing taps for a long time.

5 WE STARTED WITH, “WHY?”

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General features of our tools.

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What's the point?



Thank you for looking at our brochure.

We have put this together for two reasons.

First, we want to help you decide if Jarvis and your company are a good fit. Jarvis is not the right partner for everyone, but if the fit is right, magic can happen.

Second, we want to tell you about what makes our Jarflos (form taps) so special. We have a great collection of both application experience and great technology that combine to improve quality and lower cost per hole.

Thank you for looking and if we are the right fit and you want superior Jarflos, please contact us. We want to work with you!

Sincerely,

A handwritten signature in black ink, appearing to read 'Costikyan Jarvis', written in a cursive style.

Costikyan Jarvis
President and 5th Generation



We have been manufacturing taps for a long time.

For over 115 years.

Throughout these 115+ years we have discovered a few things about ourselves: we make more custom, specially designed tools than standard, off-the-shelf tools; and we care about you and lowering your cost per hole.

Sure, “custom, specially designed tools” and “lowering your cost per hole” doesn’t necessarily sound like two statements that would go together. But, in the case of working with us, it’s true! That’s the plus in making taps for so long, you learn to master these concepts of making customer specific tools that in the long run, cost you less. It’s almost like, magic or something.

In these next few pages, we will introduce you to this wizardry and tell you a little bit more about our process and our tools. Hopefully, this will help ease the process of you deciding on where to get your taps from next.

1901

Founded in 1901 by Charles L. Jarvis; and was known as the “**Ideal Manufacturing Company**”. It was located on a small site close to the Connecticut River which is now included in the Hartford Civic Center area. The original products of the Ideal Manufacturing Company were nutcrackers and nutpicks

1910

By 1910, the company had grown sufficiently to attract his son, Marshall N. Jarvis. That same year the entire operation was placed on a barge and shipped down the Connecticut River to Portland, CT. Three years later, to honor the work of Charles, the company was renamed **The Charles L. Jarvis Company**.

1934

William F. Jarvis joined his father, Marshall, and the company moved again to an even larger facility in Middletown, CT.

1949

The company started a program of expansion through acquisitions. **This first acquisition moved the company into the cutting tool industry** by purchasing a factory producing high speed steel taps.

1954

In 1954 the company shortened its name to **The Jarvis Corporation**.

1955

The 1950's and 1960's saw continued growth under the leadership of William. Acquisitions continued with the purchase of the Medfield Drill Company and other facilities were established in Lynn, MA and North Attleboro, MA. The marketplace's continued demand for Jarvis' quality and service enabled Jarvis to finance an aggressive 10-year plan **that catapulted Jarvis into a major position in the cutting tool industry**.

1965

To accomplish this goal, the **Greenwood, SC** facility was built in **1965**. And the **Rochester, NH** facility was built in **1967**.

1967

The decision to build in Rochester demonstrated the Jarvis family's attention to detail. Jarvis had, and continues to have, a customer base around the world and across North America. Before the creation of FedEx and UPS Next Day, shipments were done through the U.S. Postal Service.

In 1967, US Postal Service trucks started their daily pick-up route in Rochester and ended at Logan Airport in Boston, MA. This daily route enabled Jarvis to provide Next Day shipments to the Los Angeles market and other points across the United States.

1992

Costikyan Jarvis (son of Marshall N. Jarvis, II) has been with Jarvis Cutting Tools since 1992. He began his career as an Application Engineer and has held a number of positions in engineering, operations, and sales.

2012

Rebecca Jarvis (daughter of Marshall N. Jarvis, II) joined the company in 2012 as a Process Engineer and Health and Safety Coordinator. She has a Bachelor of Arts from Claremont McKenna College and a Bachelor of Science from Columbia University School of Engineering and Applied Science. (In 2014, she was promoted to Manager of Precision Grinding and Health and Safety)

2015

In January, 2015, Costikyan was promoted to President. Costikyan is the 5th generation Jarvis to be an owner/manager. Costikyan is a graduate of St. Lawrence University and the Harvard Business School. Also in 2015, **Rebecca was promoted to Vice President of Manufacturing and Compliance**.



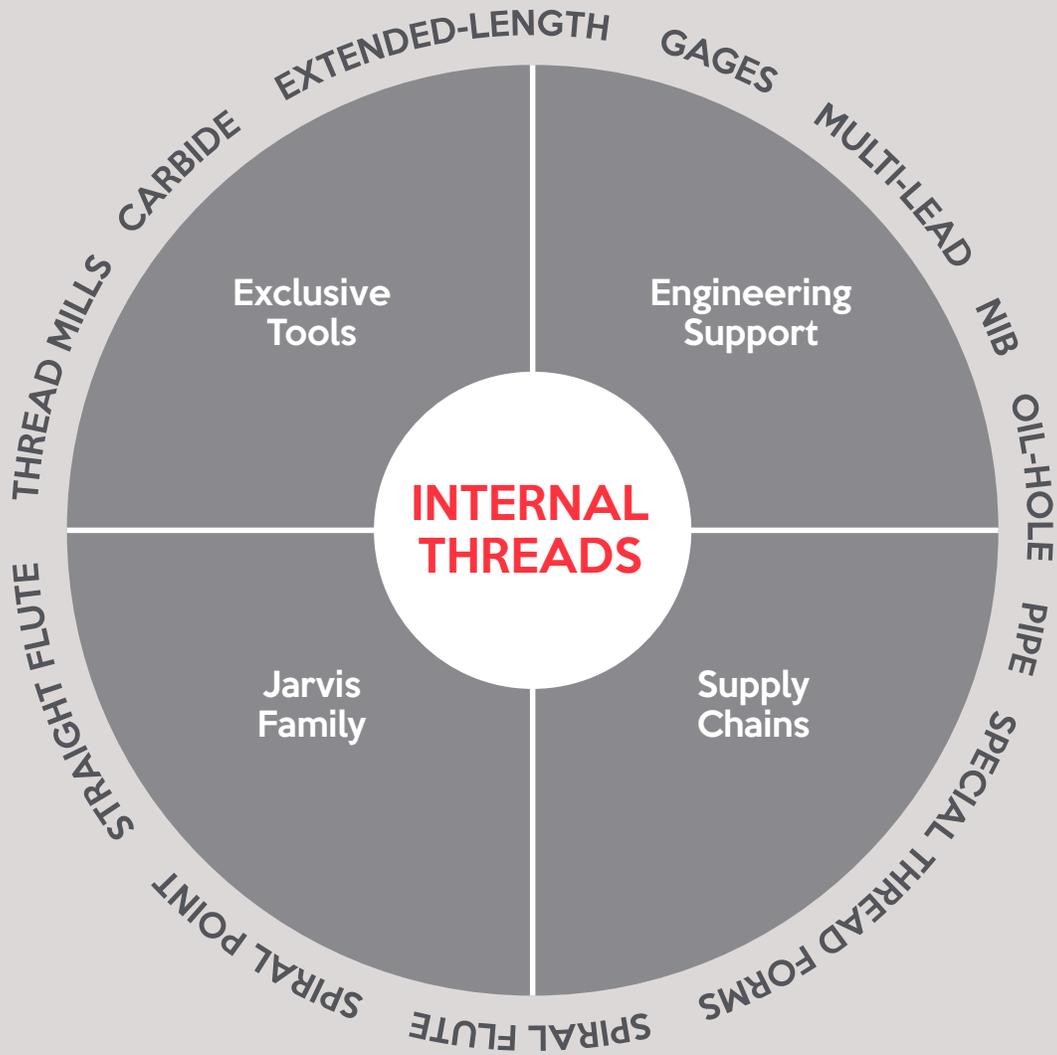
We started with, “Why?”

Why have we been manufacturing taps for a long time?

That is a great question. We would ask ourselves this all of the time. And the answer that we would always come up with would be, “Manufacturing taps is what we do, it’s who we are, it’s our passion”. Which, over time, that morphed into, “Internal Threads are our passion”. Great answer, right?! Not really...

It’s definitely great that we know what our passion is, and that we have it printed on a few flyer’s/ brochures, but how does knowing, *our passion* help you? Or how does it make this whole experience better *for you*? It doesn’t. You, are what matters. And your needs and what you experience matters more than what we deem our passion to be.

This newfound thought is what brought us to where we currently are, “We are your production tapping solution.” “Production Tapping Solutions. Foolproof results developed over 5 generations”. Now THAT, is something that is more useful and beneficial to you.



Engineering support provided directly from our factory engineers.

Supply chains customized to provide you tools when you need them.

Tools designed and manufactured exclusively for you and your application.

Become a part of the **Jarvis family**, we have been partnering with customers for 115 years and counting.

- - Carbide
- - Extended Length
- - Gages
- - Multi-Lead
- - Nib
- - Oil-Hole
- - Pipe
- - Special Thread Form
- - Spiral Flute
- - Spiral Point
- - Straight Flute
- - Thread Mills

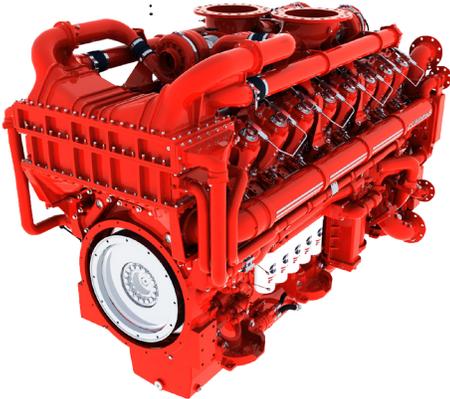
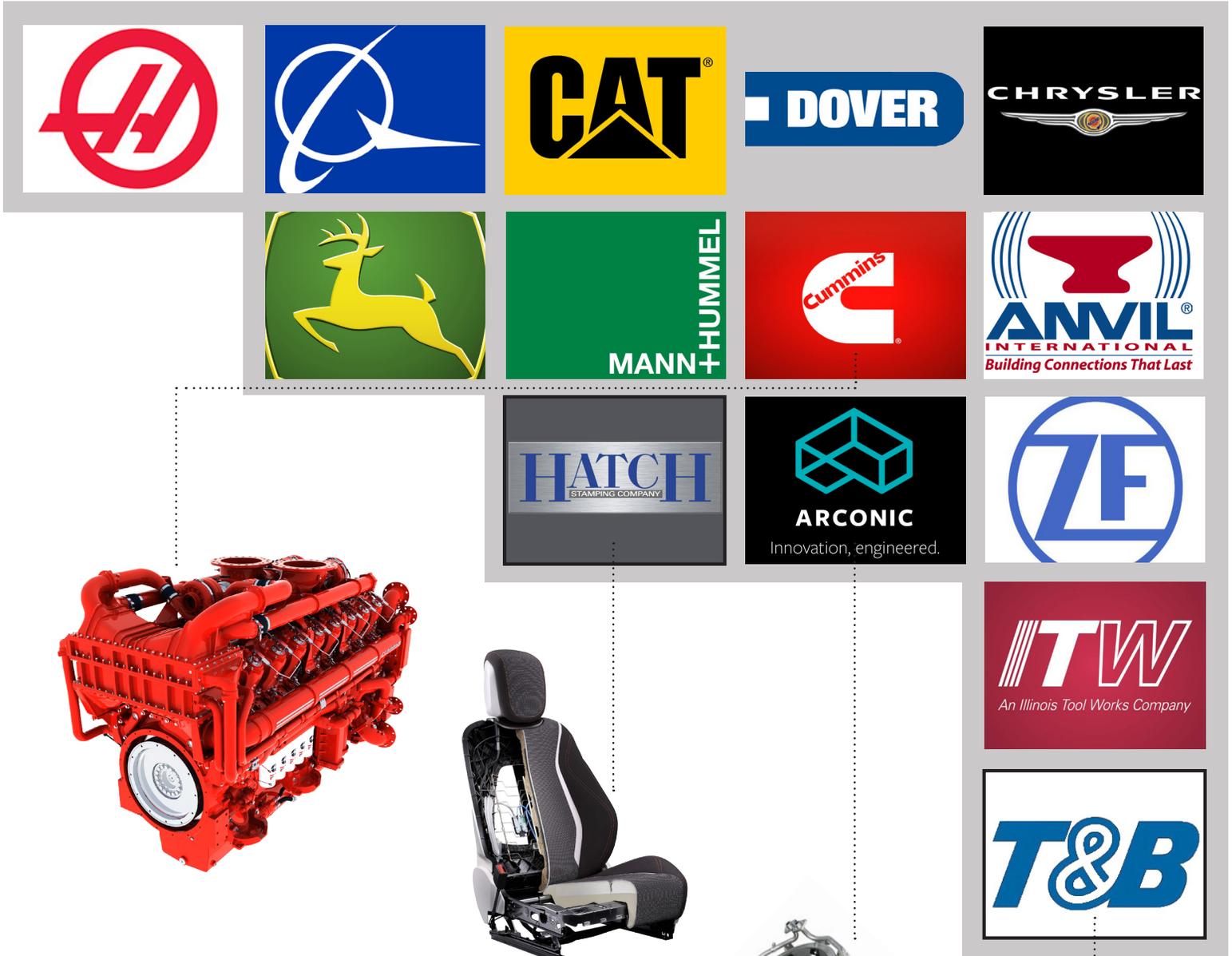
Who is this, “you”?

You. And others like you, are that you!

Our customers want a competitive advantage. And gaining an advantage in this competitive industry is not always easy. It requires work, discipline, and more work; it requires both you (aka the customer) and us (aka the tooling supplier) to define the objective, test the options, measure the results, and implement the solution.

You, are that customer that has production tapping needs, and we want to be that production tapping solution! This is how it all ties into the beginning part of this booklet, we make the custom tools that are the perfect fit for you and your needs, while doing that we lower your cost per hole, and you are now a part of our family, like those shown on this next page. There's the wizardry we were talking about from before.

Are you interested in being a part of this?



1. HASS 2. Boeing 3. Catepillar 4. Dover Corp 5. Chrysler 6. John Deere
 7. Mann and Hummel 8. Cummins 9 Anvil 10. Metrican 11. Arconic (was
 previously known as Alcoa) 12. ZF 13. ITW 14. Thomas & Betts

From good to great.

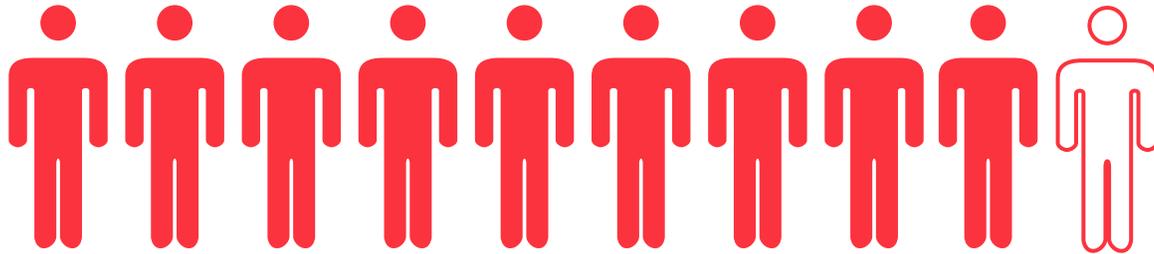
Improvements take time.

In order to go from good tools to great tools, there is usually a risk involved. If it ain't broke, why fix it, right? Alas! This is where we come in! To let you know that this aversion to change, is just an illusion, and to help alleviate those burdens that come with making these risky changes/decisions!

How do we help, you ask? We help by starting you off with some trials. Our trials usually go like this: at no cost to you, we specially design the taps for you and your application, **we typically go through 1-3 trials with you** (to make sure that you get best results that you require), once you're satisfied, a purchase order is placed, and ta-da! You're now in the Jarvis family!

Testimonials

We did a variety of case studies to show that our trial process with our customer's truly does make a difference in their cost savings.



90%

Jarvis can provide a cost savings in 90% of the opportunities with 3 trials or less.

From 8 holes per tap to 50 holes per tap.

Our engineer knew they could do better. The company agreed to test an exclusive designed Jarvis tap, one built just for this application. A few weeks later, Jarvis delivered the new taps, and the company did a small batch of parts in a test run. The results? Instead of 8 holes, the Jarvis tap produced 50 holes before it needed to be replaced.

In addition, the technician found he could run the Jarvis tap continuously. With the previous tap, he'd been forced to stop and start the tapping ("peck-tapping") to prevent the tool from breaking off in the hole. He also found the Jarvis tap could operate at a much higher RPM.

5X THE HOLES
4MINUTE CYCLE

The Results?

They got five times as many holes per tap, and they slashed their cycle time for this process from 22 minutes to just 4 minutes.

70% INCREASE IN TOOL PERFORMANCE

A 70% increase in tool performance was great, but it looked even better when Jarvis sat down with the company to go over their cost numbers. Both Jarvis and the "off the shelf" supplier sold their taps at roughly \$45/tap. By the numbers, the experiment showed:

ORIGINAL TAP:

\$45 / 10,000 Fasteners
= \$0.0045 per Fastener

JARVIS TAP:

\$45 / 17,000 Fasteners
= **\$0.0026** per Fastener

ORIGINAL TAP:

\$0.0045 x 30 Million Fasteners
= \$135,000

JARVIS TAP:

\$0.0026 x 30 Million Fasteners
= **\$79,412**

ON A YEARLY BASIS, THIS IS WHAT YOU COULD SAVE USING JARVIS TAPS.

In total, Jarvis helped this company find:

HIDDEN SAVINGS = \$55,500 PER YEAR

Our Form Taps!

But, we call them, "Jarflo's".



Did you know?
25% of the US Market uses
our form taps for their
applications.*

*According to most recent 2017 USCTI Data

AUTOMOTIVE

The Automotive Industry is full of threaded holes. Jarvis has years of experience designing, manufacturing, and supplying taps for a variety of products including engines, transmissions, steering components, and fasteners.

Our products are relied upon the OEM's Tier 1 and Tier 2 manufacturers who require the highest quality, most consistent, and best productivity from their suppliers.

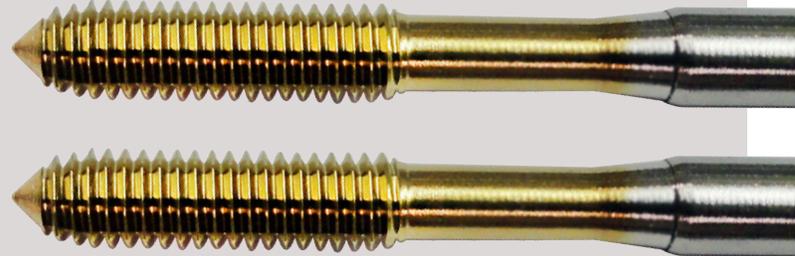
Our taps have been used in: Automotive Transmissions Valves, Tie-Rod's, and Differential Cases.



ELECTRICAL

The Electrical Industry's process and products have many unique challenges. Jarvis understands the process requirements driven by Ettco Notches, In-Die Tapping, and secondary tapping of stamped holes.

We know the product demands of electrical boxes, conduit, and enclosures. Jarvis has decades of experience with galvanized steel, copper, brass, and aluminum, and our designs are proven to provide the productivity and quality that our customers require.



FASTENERS

Jarvis taps fasteners for every industry and every material. From High Nickel-Alloy, Multi-lead Aerospace fasteners, to low carbon furniture fasteners.

Jarvis has solutions to optimize your threading operations. Jarvis' taps have achieved hundred of thousands of high quality threaded holes!

Our taps have been used in: Pronged Tee Nuts, Multi-Lead Aerospace Fasteners, and U-Nuts.



Features:

Coating:

Jarvis' most cost-effective solution is to purchase our own coating system. And this is just what many of competitors have done but not Jarvis. Why? Our goal is to provide the optimal coating for the application. As a result, we work with a group of coating companies. Each company has their own coatings and is constantly working to bring new coatings to the market. Because we are a valued customer of many coating companies, we have access to the best coatings and are not committed to only one system.

So if a single layer coating is what you need, we have a great, cost-effective option. If your application could benefit from a multi-layer coating, we have lots of options.

Whatever will optimize your application, we can provide the solution.

Geometry:

The geometry starts with the application.

First, we look at the part print. What are the requirements of the part? How many full threads are specified? What is the tolerance for the pitch diameter and minor diameter?

Second, we understand the tapping process. What material is being tapped? What cycle time do you want to achieve? What machine tools are being used? What lubrication is used?

Finally, our engineers combine all the options to achieve the optimal results. How many lobes and coolant grooves (Lube Grooves) should there be? What should the reliefs be? What should the shape of the relief look like?

The result? A tool geometry that is optimal for your application. And because we make exclusive tools, this geometry and Jarvis part number is just for you.

Heat Treatment:

Our heat treat department has two goals. First, we want to give our customers the optimal combination of toughness and hardness. Second, we want each lot to have the identical heat treat properties (or characteristics).

Jarvis uses NC furnaces to monitor and control the entire heat treat process. We have in-house designed software that tracks each lot and insures that we provide our customers a consistent and optimal heat treat.

Base Material:

Jarvis offers multiple grades of conventional and powdered steels. Using the different steel grades allow us to provide the optimal combination of hot hardness and wear resistance depending on the application.

Jarvis works directly with steel mills in the United States and Europe.



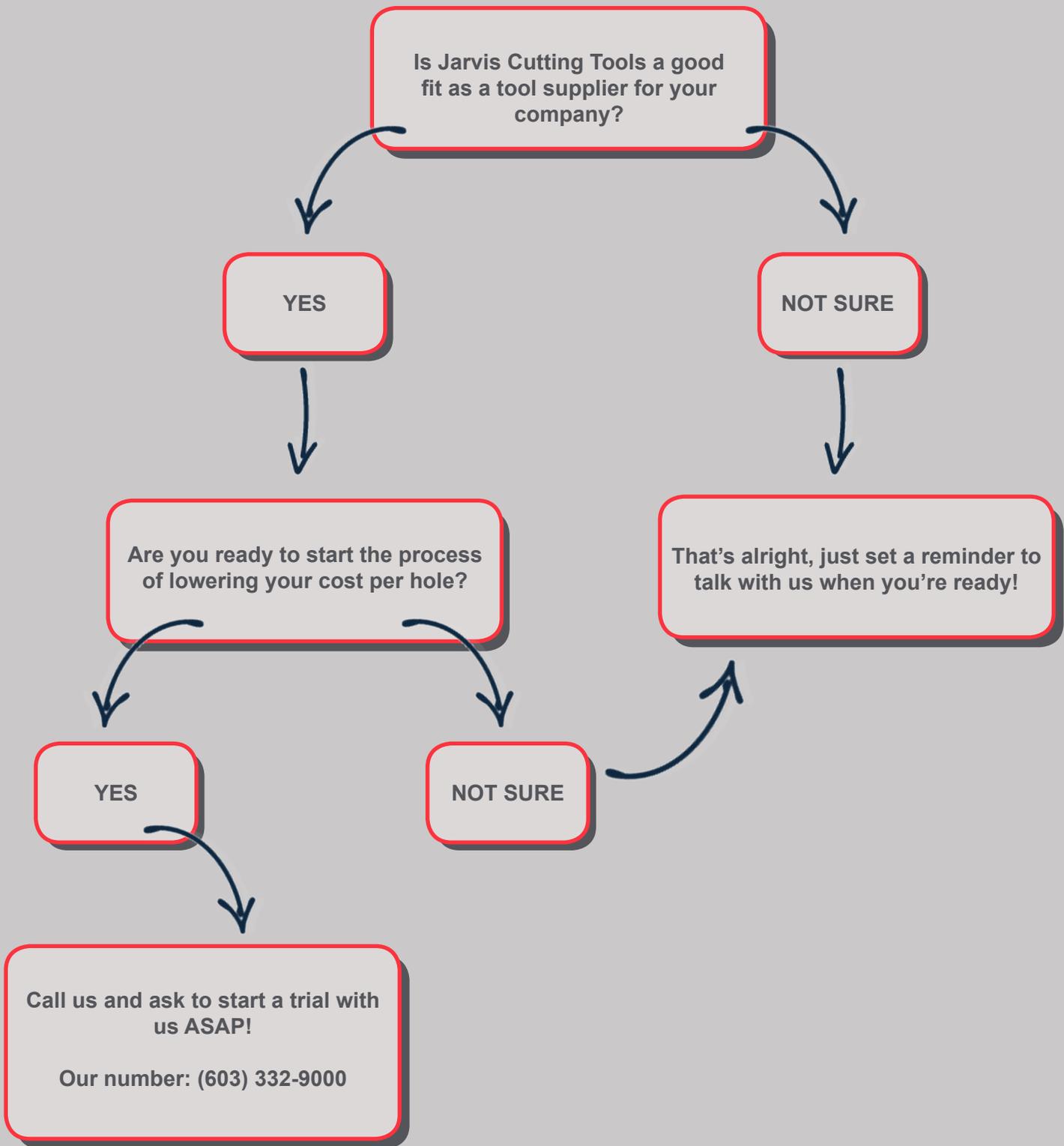
So... What's next?

Just get to the point already!

Let's do a quick run through: We told you about ourselves. We told why we do what we do. We told you who are our customers. And we gave you some testimonials

So, you might be thinking, "the point of this is...??"

The point of this is to get you to think about, **where you are now versus being a customer of Jarvis.** And if you need help on figuring that out, this yes/no map to your right can help you!



Other products available from Jarvis Cutting Tools:

We can mail you these brochures / flyers directly, or you can access them on our website. Go to, www.jarviscuttingtools.com and all will be under the "Literature" tab.

PRODUCTION TAPPING SOLUTIONS
Footproof results developed over five generations.

AEROSPACE TAPS

Jarvis CUTTING TOOLS

PRODUCTION TAPPING SOLUTIONS
Footproof results developed over five generations.

IN-DIE TAPPING

Jarvis CUTTING TOOLS

PRODUCTION TAPPING SOLUTIONS
Footproof results developed over five generations.

JARLOCK

THREAD FORM OFFERED:

FRONT RAMP

REAR RAMP

JARLOCK INCREASED PRODUCTION IN HOLES FROM 1 HOLES TO 34 HOLES

JARLOCK®

Jarvis CUTTING TOOLS

PRODUCTION TAPPING SOLUTIONS
Footproof results developed over five generations.

NUCON 77 MD 31 - HSS

2.6" Overall Length, 1.0" Thread of Hole

Engineered especially for close tolerance drilling

FRACTIONS				DECIMALS			
Size (in)	Major Diameter (in)	DRP#	Price	Size (in)	Major Diameter (in)	DRP#	Price
1/8	.125	100000	\$1.75	1/4	.250	100000	\$1.75
3/16	.1875	100000	\$1.75	5/16	.3125	100000	\$1.75
1/4	.250	100000	\$1.75	3/8	.375	100000	\$1.75
5/16	.3125	100000	\$1.75	1/2	.500	100000	\$1.75
3/8	.375	100000	\$1.75	5/8	.625	100000	\$1.75
1/2	.500	100000	\$1.75	3/4	.750	100000	\$1.75
5/8	.625	100000	\$1.75	7/8	.875	100000	\$1.75
3/4	.750	100000	\$1.75	1	1.000	100000	\$1.75
7/8	.875	100000	\$1.75	1 1/8	1.125	100000	\$1.75
1	1.000	100000	\$1.75	1 1/4	1.250	100000	\$1.75
1 1/8	1.125	100000	\$1.75	1 3/8	1.375	100000	\$1.75
1 1/4	1.250	100000	\$1.75	1 1/2	1.500	100000	\$1.75
1 3/8	1.375	100000	\$1.75	1 3/4	1.625	100000	\$1.75
1 1/2	1.500	100000	\$1.75	1 7/8	1.750	100000	\$1.75
1 3/4	1.625	100000	\$1.75	2	2.000	100000	\$1.75
1 7/8	1.750	100000	\$1.75	2 1/8	2.125	100000	\$1.75
2	2.000	100000	\$1.75	2 1/4	2.250	100000	\$1.75
2 1/8	2.125	100000	\$1.75	2 3/8	2.375	100000	\$1.75
2 1/4	2.250	100000	\$1.75	2 1/2	2.500	100000	\$1.75
2 3/8	2.375	100000	\$1.75	2 3/4	2.625	100000	\$1.75
2 1/2	2.500	100000	\$1.75	2 7/8	2.750	100000	\$1.75
2 3/4	2.625	100000	\$1.75	3	3.000	100000	\$1.75
2 7/8	2.750	100000	\$1.75	3 1/8	3.125	100000	\$1.75
3	3.000	100000	\$1.75	3 1/4	3.250	100000	\$1.75
3 1/8	3.125	100000	\$1.75	3 3/8	3.375	100000	\$1.75
3 1/4	3.250	100000	\$1.75	3 1/2	3.500	100000	\$1.75
3 3/8	3.375	100000	\$1.75	3 3/4	3.625	100000	\$1.75
3 1/2	3.500	100000	\$1.75	3 7/8	3.750	100000	\$1.75
3 3/4	3.625	100000	\$1.75	4	4.000	100000	\$1.75
3 7/8	3.750	100000	\$1.75	4 1/8	4.125	100000	\$1.75
4	4.000	100000	\$1.75	4 1/4	4.250	100000	\$1.75
4 1/8	4.125	100000	\$1.75	4 3/8	4.375	100000	\$1.75
4 1/4	4.250	100000	\$1.75	4 1/2	4.500	100000	\$1.75
4 3/8	4.375	100000	\$1.75	4 3/4	4.625	100000	\$1.75
4 1/2	4.500	100000	\$1.75	4 7/8	4.750	100000	\$1.75
4 3/4	4.625	100000	\$1.75	5	5.000	100000	\$1.75
4 7/8	4.750	100000	\$1.75	5 1/8	5.125	100000	\$1.75
5	5.000	100000	\$1.75	5 1/4	5.250	100000	\$1.75
5 1/8	5.125	100000	\$1.75	5 3/8	5.375	100000	\$1.75
5 1/4	5.250	100000	\$1.75	5 1/2	5.500	100000	\$1.75
5 3/8	5.375	100000	\$1.75	5 3/4	5.625	100000	\$1.75
5 1/2	5.500	100000	\$1.75	5 7/8	5.750	100000	\$1.75
5 3/4	5.625	100000	\$1.75	6	6.000	100000	\$1.75
5 7/8	5.750	100000	\$1.75	6 1/8	6.125	100000	\$1.75
6	6.000	100000	\$1.75	6 1/4	6.250	100000	\$1.75
6 1/8	6.125	100000	\$1.75	6 3/8	6.375	100000	\$1.75
6 1/4	6.250	100000	\$1.75	6 1/2	6.500	100000	\$1.75
6 3/8	6.375	100000	\$1.75	6 3/4	6.625	100000	\$1.75
6 1/2	6.500	100000	\$1.75	6 7/8	6.750	100000	\$1.75
6 3/4	6.625	100000	\$1.75	7	7.000	100000	\$1.75
6 7/8	6.750	100000	\$1.75	7 1/8	7.125	100000	\$1.75
7	7.000	100000	\$1.75	7 1/4	7.250	100000	\$1.75
7 1/8	7.125	100000	\$1.75	7 3/8	7.375	100000	\$1.75
7 1/4	7.250	100000	\$1.75	7 1/2	7.500	100000	\$1.75
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7 3/4	7.625	100000	\$1.75	8	8.000	100000	\$1.75
7 7/8	7.750	100000	\$1.75	8 1/8	8.125	100000	\$1.75
8	8.000	100000	\$1.75	8 1/4	8.250	100000	\$1.75
8 1/8	8.125	100000	\$1.75	8 3/8	8.375	100000	\$1.75
8 1/4	8.250	100000	\$1.75	8 1/2	8.500	100000	\$1.75
8 3/8	8.375	100000	\$1.75	8 3/4	8.625	100000	\$1.75
8 1/2	8.500	100000	\$1.75	8 7/8	8.750	100000	\$1.75
8 3/4	8.625	100000	\$1.75	9	9.000	100000	\$1.75
8 7/8	8.750	100000	\$1.75	9 1/8	9.125	100000	\$1.75
9	9.000	100000	\$1.75	9 1/4	9.250	100000	\$1.75
9 1/8	9.125	100000	\$1.75	9 3/8	9.375	100000	\$1.75
9 1/4	9.250	100000	\$1.75	9 1/2	9.500	100000	\$1.75
9 3/8	9.375	100000	\$1.75	9 3/4	9.625	100000	\$1.75
9 1/2	9.500	100000	\$1.75	9 7/8	9.750	100000	\$1.75
9 3/4	9.625	100000	\$1.75	10	10.000	100000	\$1.75
9 7/8	9.750	100000	\$1.75	10 1/8	10.125	100000	\$1.75
10	10.000	100000	\$1.75	10 1/4	10.250	100000	\$1.75
10 1/8	10.125	100000	\$1.75	10 3/8	10.375	100000	\$1.75
10 1/4	10.250	100000	\$1.75	10 1/2	10.500	100000	\$1.75
10 3/8	10.375	100000	\$1.75	10 3/4	10.625	100000	\$1.75
10 1/2	10.500	100000	\$1.75	10 7/8	10.750	100000	\$1.75
10 3/4	10.625	100000	\$1.75	11	11.000	100000	\$1.75
10 7/8	10.750	100000	\$1.75	11 1/8	11.125	100000	\$1.75
11	11.000	100000	\$1.75	11 1/4	11.250	100000	\$1.75
11 1/8	11.125	100000	\$1.75	11 3/8	11.375	100000	\$1.75
11 1/4	11.250	100000	\$1.75	11 1/2	11.500	100000	\$1.75
11 3/8	11.375	100000	\$1.75	11 3/4	11.625	100000	\$1.75
11 1/2	11.500	100000	\$1.75	11 7/8	11.750	100000	\$1.75
11 3/4	11.625	100000	\$1.75	12	12.000	100000	\$1.75
11 7/8	11.750	100000	\$1.75	12 1/8	12.125	100000	\$1.75
12	12.000	100000	\$1.75	12 1/4	12.250	100000	\$1.75
12 1/8	12.125	100000	\$1.75	12 3/8	12.375	100000	\$1.75
12 1/4	12.250	100000	\$1.75	12 1/2	12.500	100000	\$1.75
12 3/8	12.375	100000	\$1.75	12 3/4	12.625	100000	\$1.75
12 1/2	12.500	100000	\$1.75	12 7/8	12.750	100000	\$1.75
12 3/4	12.625	100000	\$1.75	13	13.000	100000	\$1.75
12 7/8	12.750	100000	\$1.75	13 1/8	13.125	100000	\$1.75
13	13.000	100000	\$1.75	13 1/4	13.250	100000	\$1.75
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13 3/8	13.375	100000	\$1.75	13 3/4	13.625	100000	\$1.75
13 1/2	13.500	100000	\$1.75	13 7/8	13.750	100000	\$1.75
13 3/4	13.625	100000	\$1.75	14	14.000	100000	\$1.75
13 7/8	13.750	100000	\$1.75	14 1/8	14.125	100000	\$1.75
14	14.000	100000	\$1.75	14 1/4	14.250	100000	\$1.75
14 1/8	14.125	100000	\$1.75	14 3/8	14.375	100000	\$1.75
14 1/4	14.250	100000	\$1.75	14 1/2	14.500	100000	\$1.75
14 3/8	14.375	100000	\$1.75	14 3/4	14.625	100000	\$1.75
14 1/2	14.500	100000	\$1.75	14 7/8	14.750	100000	\$1.75
14 3/4	14.625	100000	\$1.75	15	15.000	100000	\$1.75
14 7/8	14.750	100000	\$1.75	15 1/8	15.125	100000	\$1.75
15	15.000	100000	\$1.75	15 1/4	15.250	100000	\$1.75
15 1/8	15.125	100000	\$1.75	15 3/8	15.375	100000	\$1.75
15 1/4	15.250	100000	\$1.75	15 1/2	15.500	100000	\$1.75
15 3/8	15.375	100000	\$1.75	15 3/4	15.625	100000	\$1.75
15 1/2	15.500	100000	\$1.75	15 7/8	15.750	100000	\$1.75
15 3/4	15.625	100000	\$1.75	16	16.000	100000	\$1.75
15 7/8	15.750	100000	\$1.75	16 1/8	16.125	100000	\$1.75
16	16.000	100000	\$1.75	16 1/4	16.250	100000	\$1.75
16 1/8	16.125	100000	\$1.75	16 3/8	16.375	100000	\$1.75
16 1/4	16.250	100000	\$1.75	16 1/2	16.500	100000	\$1.75
16 3/8	16.375	100000	\$1.75	16 3/4	16.625	100000	\$1.75
16 1/2	16.500	100000	\$1.75	16 7/8	16.750	100000	\$1.75
16 3/4	16.625	100000	\$1.75	17	17.000	100000	\$1.75
16 7/8	16.750	100000	\$1.75	17 1/8	17.125	100000	\$1.75
17	17.000	100000	\$1.75	17 1/4	17.250	100000	\$1.75
17 1/8	17.125	100000	\$1.75	17 3/8	17.375	100000	\$1.75
17 1/4	17.250	100000	\$1.75	17 1/2	17.500	100000	\$1.75
17 3/8	17.375	100000	\$1.75	17 3/4	17.625	100000	\$1.75
17 1/2	17.500	100000	\$1.75	17 7/8	17.750	100000	\$1.75
17 3/4	17.625	100000	\$1.75	18	18.000	100000	\$1.75
17 7/8	17.750	100000	\$1.75	18 1/8	18.125	100000	\$1.75
18	18.000	100000	\$1.75	18 1/4	18.250	100000	\$1.75
18 1/8	18.125	100000	\$1.75	18 3/8	18.375	100000	\$1.75
18 1/4	18.250	100000	\$1.75	18 1/2	18.500	100000	\$1.75
18 3/8	18.375	100000	\$1.75	18 3/4	18.625	100000	\$1.75
18 1/2	18.500	100000	\$1.75	18 7/8	18.750	100000	\$1.75
18 3/4	18.625	100000	\$1.75	19	19.000	100000	\$1.75
18 7/8	18.750	100000	\$1.75	19 1/8	19.125	100000	\$1.75
19	19.000	100000	\$1.75	19 1/4	19.250	100000	\$1.75
19 1/8	19.125	100000	\$1.75</				