



# ALLIED MACHINE & ENGINEERING

Holemaking Solutions for Today's Manufacturing



Drilling



Boring



Reaming



Burnishing



Threading



## Specials

► Special Tooling Solutions

Now Featuring

 **SUPERION™**

## The Foundation

Since 1941, Allied Machine & Engineering has provided dependable and practical holemaking solutions to the world. What was once a small job shop in Ohio is now a worldwide leader in cutting tool technology. With three manufacturing facilities in Ohio, one in Georgia, another in Germany, and headquarters in both the United States and Europe, Allied Machine is positioned to bring innovative solutions and technical expertise directly to the customers' hands.



## The Beginning



Harold E. Stokey founded Allied Machine & Engineering to aid the war effort, manufacturing taper bearing lock nuts for the production of M1 tanks. Years later, after a sales meeting gone wrong, Stokey possessed a warehouse stocked with spade drill inserts. He set forth into the industry that would become Allied Machine's thriving identity: holemaking.

## The T-A<sup>®</sup>

When Harold's son, William H. Stokey, became the president and CEO, he developed the Throw Away—or T-A—spade drill insert system. The T-A revolutionized the holemaking industry, launching Allied Machine ahead of the competition. Since then, numerous innovations and advancements have been created from the T-A's inspiration.



## The Innovation

Since the development of the T-A, Allied Machine has expanded its product offering to support a vast range of customer applications, including large diameter and deep hole drilling, boring, reaming, burnishing, porting, and threading.



## The Future

Allied Machine is constantly investing in the brightest and sharpest minds, shaping a future filled with success and quality for customers around the world.



**Steve Stokey**  
Executive Vice President

**William H. Stokey**  
President and CEO

**Mike Stokey**  
Executive Vice President



**ALLIED MACHINE  
& ENGINEERING**

Holemaking Solutions for Today's Manufacturing

**WOHLHAUPTER**



**SUPERION**

**CRITERION**

# DRILLING

## High Penetration



GEN3SYS® XT Pro



GEN3SYS® XT



ASC 320®

## General Production

(certain sizes are ideal for deep hole drilling and/or large diameter drilling)



GEN2 T-A®



Original T-A®



High Performance



Universal

## Large Diameter



Revolution Drill®



Opening Drill®

## Large Diameter / Deep Hole



APX Drill



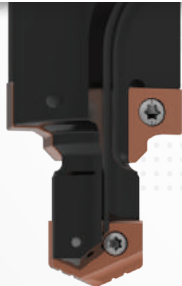
BT-A Drill

## Deep Hole



Guided T-A® Drill  
(special)

## Porting



AccuPort 432®

## Structural Steel



GEN3SYS® XT



T-A®

# BORING



**WOHLHAUPTER®**

Bringing you the finest in precision cutting tools

**CRITERION™**

# REAMING



ALVAN®  
Reaming Systems

S.C.A.M.I.®

# BURNISHING



S.C.A.M.I.®  
Roller Burnishing

# THREADING



AccuThread™ 856  
Pin Style Indexable



AccuThread™ 856  
Bolt-in Style Indexable



AccuThread™ 856  
Solid Carbide



ThreadMills USA  
Solid Carbide



# SPECIALS



Insta-Quote™  
Online custom tool builder and quote generator



i-Form  
Custom indexable drill / form tool system

## Engineered Specials

If your special holemaking needs cannot be met with the Insta-Quote system, Allied Machine can specially engineer ANY product to make your application a success. Simply contact your local Field Sales Engineer or the Allied Machine Application Engineering department for assistance with creating your special tooling. Let Allied Machine resolve your challenges today.

Allied Machine & Engineering patent information can be found at [www.alliedmachine.com/patents](http://www.alliedmachine.com/patents)

# Special Tooling Solutions

Superion™ | Insta-Quote™ | Engineered Specials



## Specialty is Our Specialty

It's true. When it comes to designing and developing special solutions for customers, Allied Machine is the top choice. Our engineers see applications in ways many others don't, and that ability allows us to win situations that haven't been won before.

If you have a particularly unique or difficult application, give us a call. Most of our tooling can be tweaked as specials, and we can create entirely new concepts if alterations to standard product won't do the trick.

After all, everyone deserves some special attention.



Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

### **WARNING**

**WARNING** (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

**NOTICE** means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

**NOTE** and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit [www.alliedmachine.com](http://www.alliedmachine.com) for the most up-to-date information and procedures.

# Special Tooling Solutions Contents

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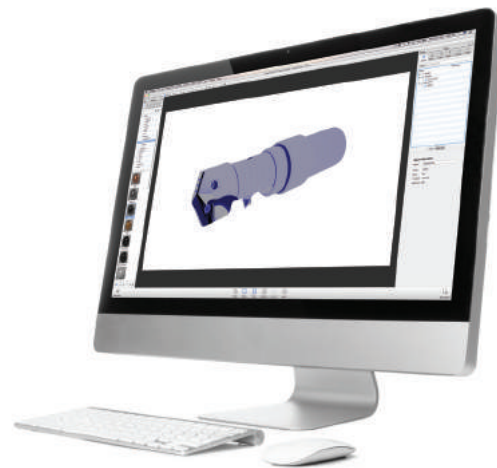
## Special Tooling Options

### Special Tooling is Our Specialty

Allied Machine offers three methods for obtaining special tooling to solve any application problem you encounter: Superion™, Insta-Quote™, and Engineered Specials. We know standard tooling can't be the answer for everyone, and that's why we specialize in developing unique tooling to fit your needs.

Many of our products can be altered as specials. In fact, many of our standard items are results of frequently requested special features. Many times, one special design can end up solving problems for multiple customers across a variety of industries. Our specials capabilities truly sets us apart from our competition.

Our Application Engineering team and Field Sales Engineers are trained and highly skilled to develop unique solutions that you won't find anywhere else. If you need special tooling, give us a call. Let us be the ones to tell you it can't be done. But don't expect us to.



### Advanced Capabilities

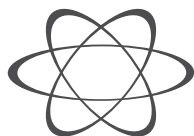
With the addition of the Superion™ solid carbide products, Allied Machine can now provide made-to-order special tooling to better help customers achieve optimal performance and productivity in their holemaking applications. Give us a call today and see the new solutions we can provide.

### Made-to-Order Solid Carbide Specials

- PCD Tooling
- Burnishing Drills
- Solid Carbide Drills
- Carbide / PCD Step Reamers



Solid Carbide Specials



Insta-Quote™

Insta-Quote is an online custom tool designer. The program is available 24/7 and guides you through the steps as you create a special tool designed to meet the requirements of your application.

### Products Available:

- T-A® Inserts
- T-A® Holders
- GEN3SYS® XT Holders
- ALVAN® Reamers



See pages X: 6 - 13



Engineered Specials

When the requirements of your application fall outside the limitations of Insta-Quote, your special tooling becomes an Engineered Special. These are tool designs that our engineers get to create and develop specifically for you.

### Reasons to Call:

- Many standard products can be specially engineered
- Allied Machine specials can save you time and increase tool life
- Our engineers have the skills and knowledge to create designs that meet the challenge



See pages X: 14 - 21



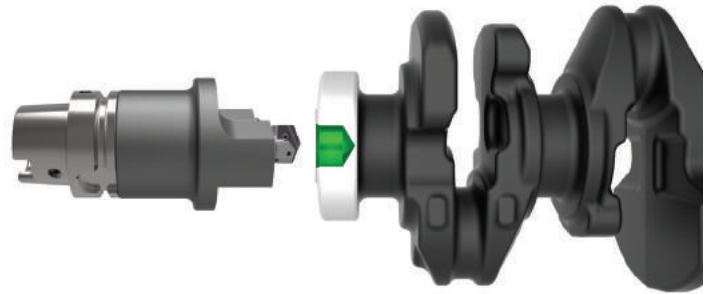
## Industry Solutions

### Every Industry Needs Some Special Attention

Many specific industry applications can be tricky, and processes can change drastically from one sector to the next. Allied's Field Sales Engineers and Application Engineers work together to develop breakthrough solutions that help customers master processes that before seemed impossible to improve.

You know your parts. You know your materials. You know what works and what doesn't. All you need to do is let us know what you're dealing with, and we'll take it from there. Whether you're machining the wings of an airplane or the engine block in a new car, we'll develop the right design to solve the problem you're facing.

For more industry examples, see Allied Machine's Case Studies and Success Stories at [www.alliedmachine.com/RealLifeResults](http://www.alliedmachine.com/RealLifeResults).



**Automotive**  
Engine Block



**Aerospace**  
Central Fuselage Wing Box

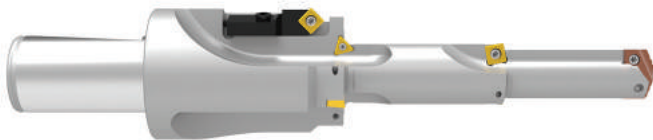


**Heavy Machinery**  
Track Links



**Oil and Gas**  
Heat Exchanger

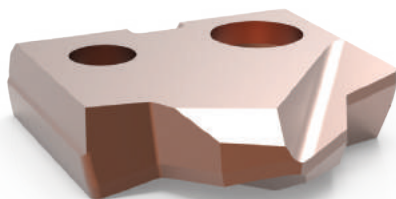
### COMPLEX SOLUTIONS



### INNOVATIVE SOLUTIONS



### LONG SOLUTIONS



EVERY PROBLEM  
HAS A  
**SOLUTION**

# Superion™

Solid Carbide Special Capabilities



a solid combination

### Providing New Capabilities

With the acquisition of Superion, Inc., Allied Machine has gained the ability to provide top-of-the-line solid carbide special tooling. Superion has built its reputation as a manufacturer of innovative special solid carbide and PCD tipped rotary cutting tools such as:

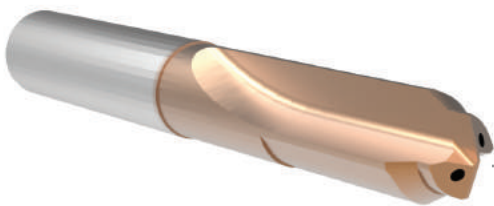
- PCD Tools
- Reamers
- Drills
- Step Tools

Superion is widely recognized as the expert in developing customized solutions in specialty tooling. And now Allied Machine is bringing that expertise to you.

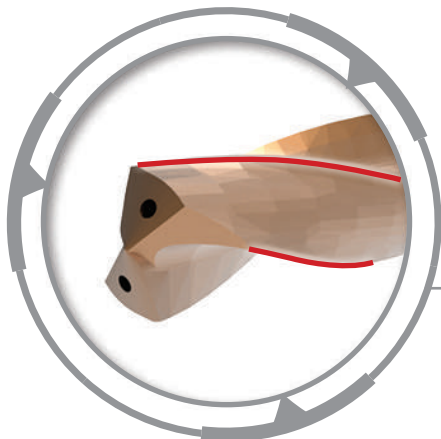
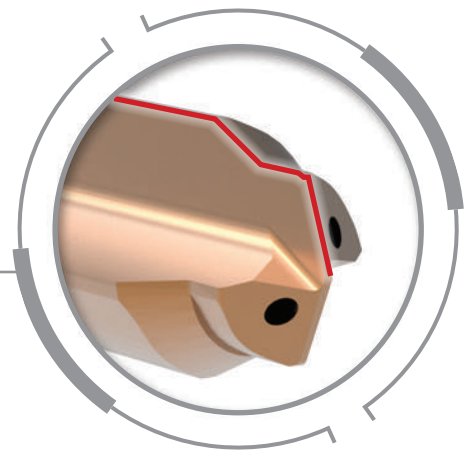


# SOLID CARBIDE SPECIALS

PCD Tooling | Burnishing Drills | Solid Carbide Drills | Carbide / PCD Step Reamers



FORM DRILL



DOUBLE MARGIN



A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS



## 01 PCD DRILLS



Industry Application  
**Aerospace**



Industry Application  
**Automotive**

### Wafer Style

- Wide diameter range of 3mm - 50mm
- Can be designed with multiple steps
- Can be designed with coolant through

### Solid Head Style

- Diameter range of 3mm - 16mm
- Available with PCD to the center of the tool
- Can be reground

### Aerospace

- Solid head PCD tools are used in composite materials (CFRP)
- Wafer tools are used for aluminum applications



## 02 SOLID CARBIDE DRILLS



Industry Application  
**Firearms**



Industry Application  
**Automotive**



Industry Application  
**Aerospace**

### Diameter | 25xD

- Wide diameter range of 3mm - 50mm
- Depth-to-diameter ratio up to 25xD

### Multi-Step

- Can be designed with multiple steps
- Reduces cost per hole by eliminating tool changes

### Automotive | Firearm

- Customized solutions available for the automotive, firearm, and aerospace industries



## 03 BURNISHING DRILLS



Industry Application  
**Aerospace**



Industry Application  
**Automotive**

### Range

- Wide diameter range of 3mm - 50mm

### Design

- Straight flutes, thinned web, four margins
- Available with or without coolant

### Materials

- Specifically designed for cast iron and aluminum applications
- Produces rounder, more consistent holes

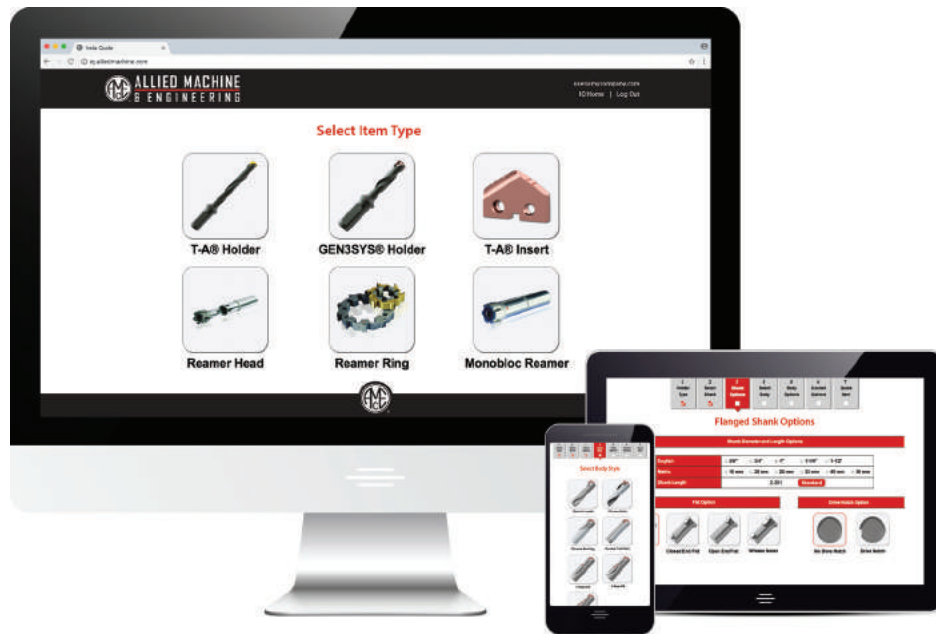
# Insta-Quote™

Design Your Custom Tooling



Design your custom tooling and receive a drawing and quote...all within *minutes*.

[iq.alliedmachine.com](http://iq.alliedmachine.com)



### Design Your Own Solutions

Insta-Quote is an online program that allows you to design and quote your own tooling in a matter of minutes. After you log in, Insta-Quote will guide you through the steps to gather all the necessary information and generate the solution you need. Within the system, you can choose from the following tools to design:

- T-A® Inserts
- T-A® Holders
- GEN3SYS® XT Holders

Along with designing these products as specials, Insta-Quote can also help you create your item number for ALVAN® Reamers. Because reamer item numbers do not follow the same method as Allied Machine's standard products, you must build your reamer item numbers. Insta-Quote can do that for you.

- Replaceable Head Style
- Monobloc Style
- Cutting Ring Style



Design anytime from anywhere.  
Available online 24/7.



# Insta-Quote™

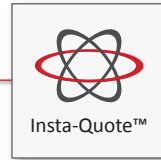
## User Guide



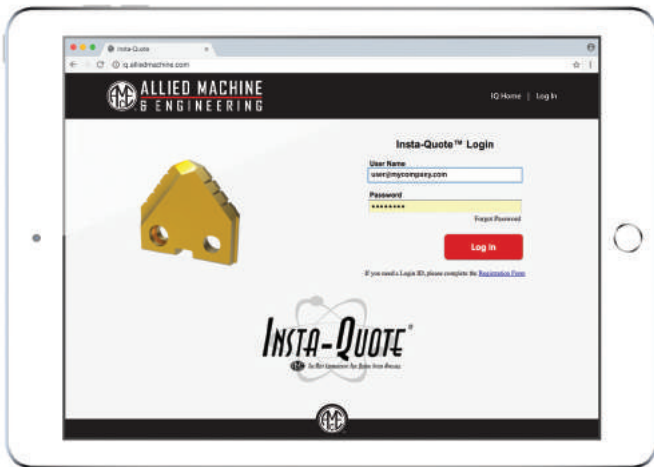
### Where Do I Find Insta-Quote?

There are two ways to get to the Insta-Quote program. You can visit the Allied Machine homepage ([www.alliedmachine.com](http://www.alliedmachine.com)) and click on the Insta-Quote icon under the quick links menu (☰)

Or, you can simply go to [iq.alliedmachine.com](http://iq.alliedmachine.com) to access Insta-Quote directly.



OR [iq.alliedmachine.com](http://iq.alliedmachine.com)



**1**

### Log In

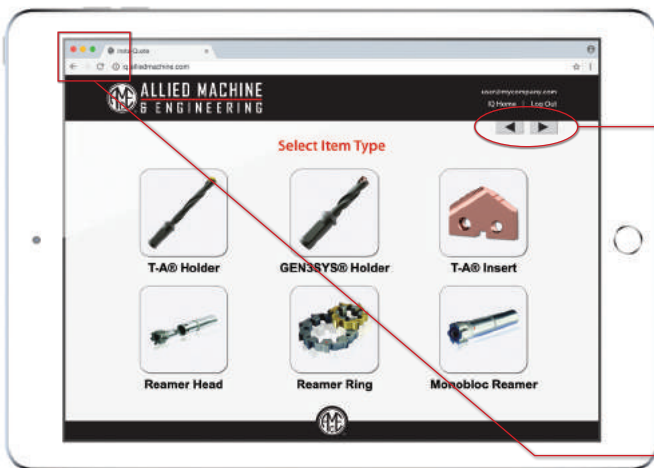
Fill in "User Name" and "Password" and click the login button. If you do not have a login, just click the "Registration Form" option beneath the log in button and submit your registration.



**2**

### Select Activity

On this screen, you can choose to create a new tool, edit a previous tool, update your quote, or copy a previous item.



**3**

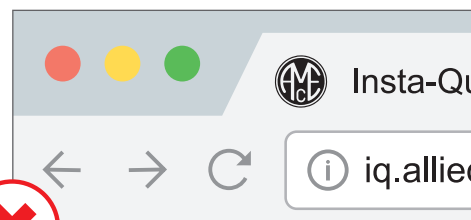
### Select Tool Type

Choose the type of special tool you would like to create. The options include T-A® inserts, T-A® holders, GEN3SYS® holders, replaceable head reamers, monobloc reamers, and cutting ring reamers.



### IMPORTANT:

The right and left arrows will navigate you through each step. **DO NOT** use the web browser's back and forward buttons; doing so may result in loss of progress.



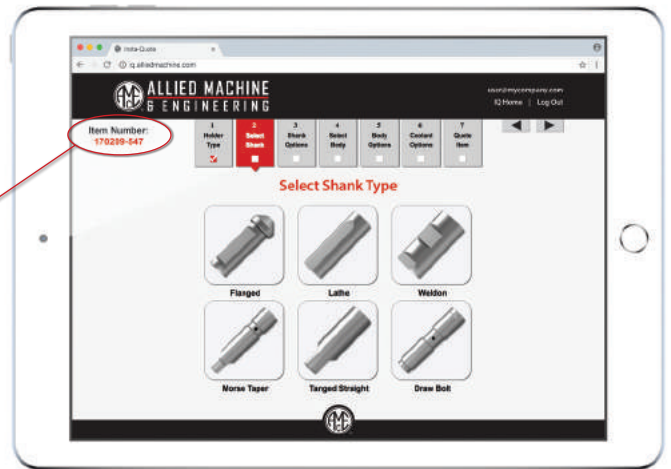
**Do not use the web browser's back and forward arrows**

## What is My Item Number?

As soon as you select the type of product you want to design, Insta-Quote automatically generates the item number for your tool. The item number will appear at the top left-hand side of your screen.

**170209-547**

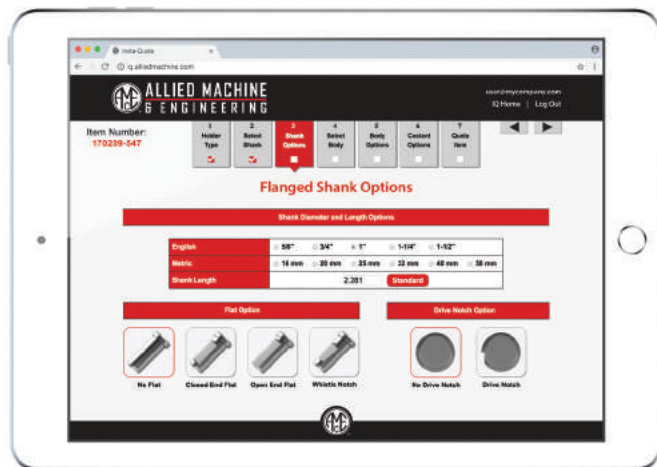
Year    Month    Day    Reference No.



**4**

### Shank Selection

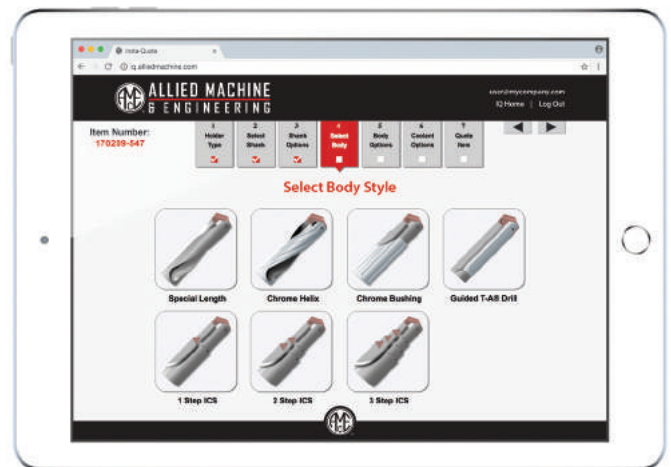
Select the shank type you require and then click the right arrow button ► to proceed.



**5**

### Shank Options

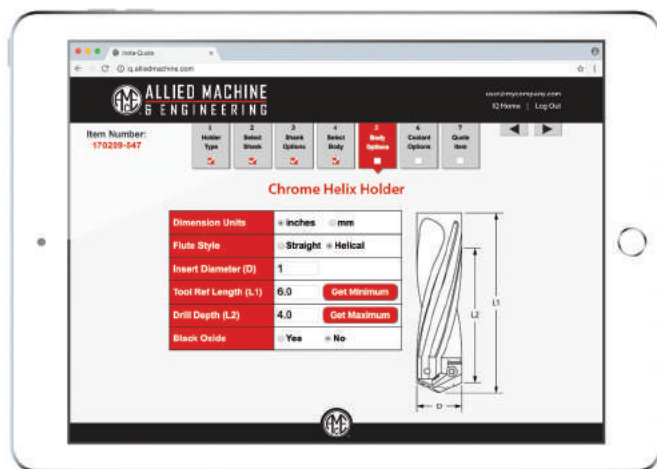
After choosing the shank type, you will be provided with additional shank options (if applicable). Once your selections are made, click the right arrow button ► to proceed.



**6**

### Select Body Style

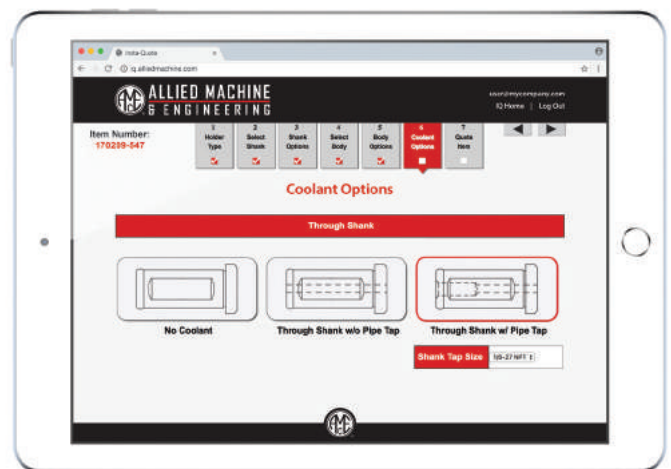
Choose the holder style you need, and then click the right arrow button ► to proceed.



**7**

### Body Options

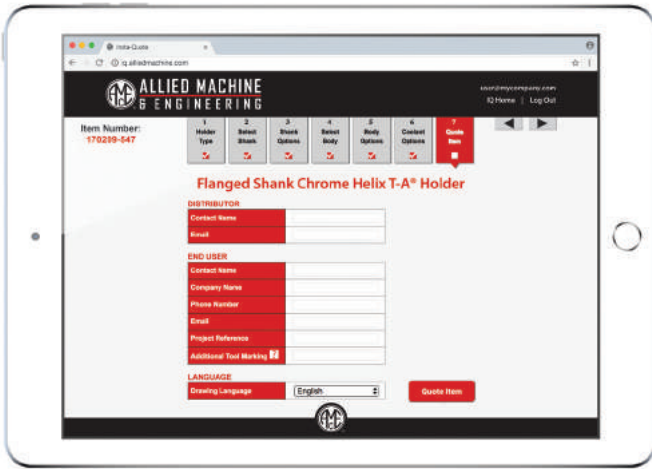
After choosing the holder style, you will be provided with additional holder options (if applicable). Once your selections are made, click the right arrow button ► to proceed.



**8**

### Coolant Options

On this screen you will select your coolant options. When finished, click the right arrow button ► to proceed.



9

**Contact Information**

Complete the contact details and select a language for the drawing. Click the "Quote Item" button to proceed.

10

**Quote Your Item**

Once you have selected "Quote Item," a box will appear to let you know the estimated time remaining before your quote and drawing are created (typical wait time is less than 1 minute).

**NOTE:** Your pop-up blocker must be disabled in order to view the downloaded files.

**ALLIED MACHINE & ENGINEERING**  
120 Deeds Drive, Dover, OH 44622  
P: 1.330.343.4283 F: 1.330.602.3400  
www.alliedmachine.com

Date: 02/09/2017  
Quotation Number: N-012345-678910  
Please reference the above number when placing an order.

Attn: Joe Thomas  
Customer Name: ABC Company  
Customer Contact: Joe Thomas  
Customer Item Reference: N/A  
Email: joe@mycompany.com  
Phone: 3303303300

270801 Customer Account  
123 Holmaking Pkwy Suite 1000 USA  
Dover OH 44622  
Phone: 330-343-4283  
Fax: 330-602-3400  
AMEC Rep: Harold Stokely

This quotation is being offered based on the information that has been provided to AMEC. The price and manufacturability is subject to change based on the final design of the item.

DESCRIPTION	QTY	LIST PRICE EACH (U.S. \$)
#2 Series T-A Chrome Helix Holder With 1.000" Drill Diameter, 5.860" Helical Flute, 4.00" Drill Depth, 1.000" Dia. By 2.281" Long Flanged Shank With No Flat With Through Shank Coolant, Per AMEC 170210-523 Rev. 0	1	\$ 0.00
	2	\$ 0.00
	3	\$ 0.00
	4-5	\$ 0.00
	6-9	\$ 0.00
	10-14	\$ 0.00
	15-24	\$ 0.00
	25-49	\$ 0.00
	50+	\$ 0.00

Allowable Quantity Variance Shipment Table

Order Quantity	Variance Amount	Order Quantity	Variance Amount
1-9	+0/-0	150-299	+0/-3
10-49	+0/-1	300-499	+0/-5
50-149	+0/-2	500+	+0/-10

\* Deviations with approval by the customer

**WARNING For Deep Hole Drilling**  
Tool failure can cause serious injury. To prevent:  
- When using tooling greater than tool support loading, use a straight holder to establish an initial hole that is 2-3 diameters deep.  
- Do not rotate tool more than 10 RPM unless it is engaged with workpiece or tool practice.  
- Do not rotate tool more than 10 RPM unless it is engaged with workpiece or tool practice.  
Follow the Deep Hole Drilling Guidelines in technical reference section of the catalog for best practices for deep hole drilling.  
- In general, use speed & feed multipliers at bottom of speed and feed charts to calculate proper speed & feed recommendations.  
- In cutting, use coolant multiplexers at bottom of coolant charts to calculate proper coolant recommendations.  
- In cutting, use coolant multiplexers at bottom of coolant charts to calculate proper coolant recommendations.  
Visit www.alliedmachine.com/technicalreference for most up-to-date information and assistance.  
Factory technical assistance is also available at (800) 221-2527 or at (330) 602-3483 outside the US and Canada.

PLEASE RESPOND WITHIN 2 DAYS. AMEC DELIVERS ALLOW 2 DAYS FOR DRAWING REVIEW. RESPONSES LONGER THAN 2 DAYS WILL IMPACT QUOTED DELIVERY DATES.

NOTES:  
1. MARK : 170210-523 REV. 0  
2. ALL DIMENSIONS NOT SPECIFIED ARE ALLIED MACHINE AND ENGINEERING CORP. STANDARDS.

THIS DRAWING IS PROVIDED TO ILLUSTRATE CONCEPT AND DIMENSIONS PRIOR TO ANY MANUFACTURING. BY SIGNING YOU ACCEPT RESPONSIBILITY FOR ANY MANUFACTURING TO THE SPECIFICATIONS SHOWN REGARDLESS OF WHERE THEY WERE OBTAINED.

DEVELOPED FOR DISTRIBUTOR : ABC Company  
CONTACT : Joe Thomas

DO NOT SCALE FOR DIMENSIONS

GENERAL TOLERANCES	
DIM. < .125	.XX
DEC. .125 TO .375	.XXX
FRAC. .375 TO .625	.XXX
FRAC. .625 TO 1.0000	.XXX
FINISH	AS SHOWN
WGT.	AS SHOWN
DRYING	AS SHOWN
DATE	02/10/2017

**ALLIED MACHINE & ENGINEERING**  
#2 SERIES T-A CHROME HELIX HOLDER WITH 1 IN DIA FLANGED SHANK WITH THROUGH SHANK COOLANT  
170209-547

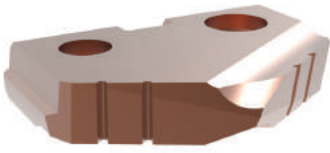
THIS DOCUMENT WILL SERVE AS OUR OFFICIAL RESPONSE. Please notify us if additional copies should be mailed.

- This quote is valid until 12/31/2018 unless you are sent a specific notification to the contrary.
- Scheduled lead time is based on availability of material at time of order. You will be notified within 1 business days of receipt of order, if a lead time change is required.
- Scheduled lead time starts upon receipt of order as well as customer approved AMEC when appropriate.
- All special order cancellations are subject to a minimum of 10% cancellation charge. AMEC reserves the right to increase the cancellation charge as deemed necessary to cover costs associated with items being cancelled.

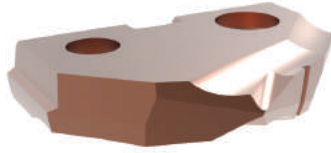
**ALLIED MACHINE & ENGINEERING CORP**  
This quote prepared by: Insta-Quote

# Insta-Quote™ Custom Tooling

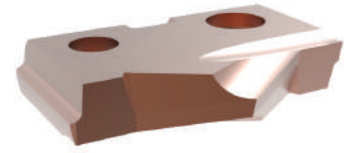
T-A® Inserts



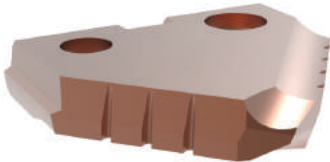
Special Angle



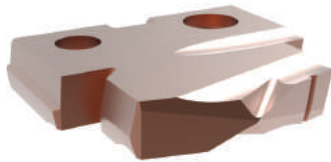
Double Angle



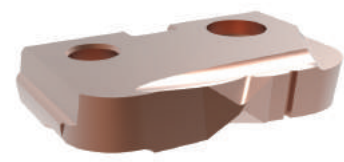
Spur Point



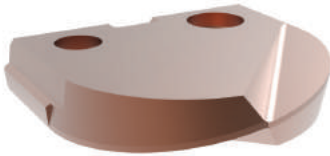
Spot and Chamfer



Step Insert

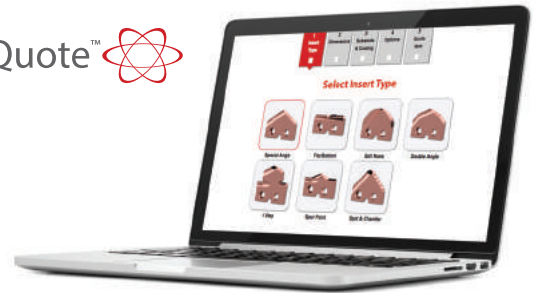


Flat Bottom



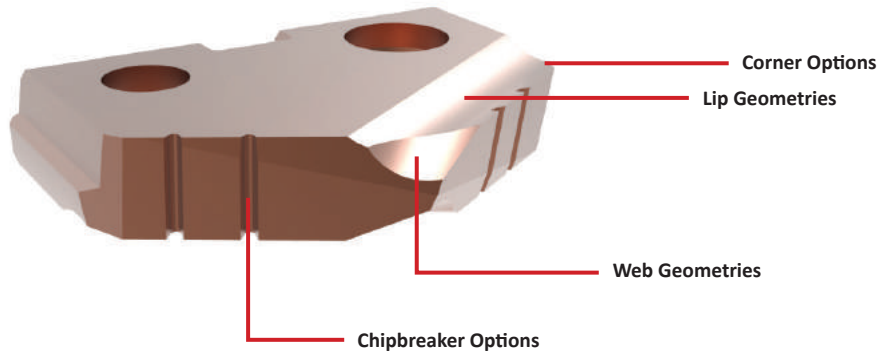
Ball Nose

Insta-Quote™ 



## Additional Features

Insta-Quote provides multiple options to enhance different areas of the insert. If you have questions about which options would most benefit your application, just give us a call. We'll be happy to provide in-depth explanations about how certain options can optimize your results.



### Substrate Options

**HSS:**  
Super Cobalt, Premium Cobalt

**Carbide:**  
C1, C2, C3, C5

### Coating Options

AM200®

TiN

TiAlN

TiCN



A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS



## Insta-Quote™ Custom Tooling

### T-A® Holders



Chrome Helix



Chrome Bushing



 Guided Holder



One Step ICS



Two Step ICS

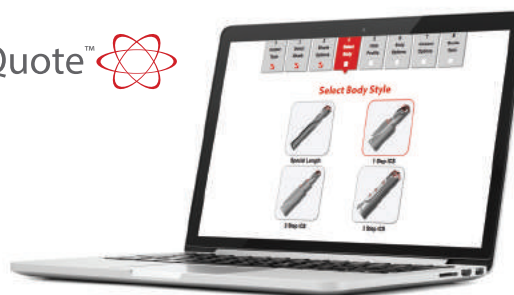


Three Step ICS



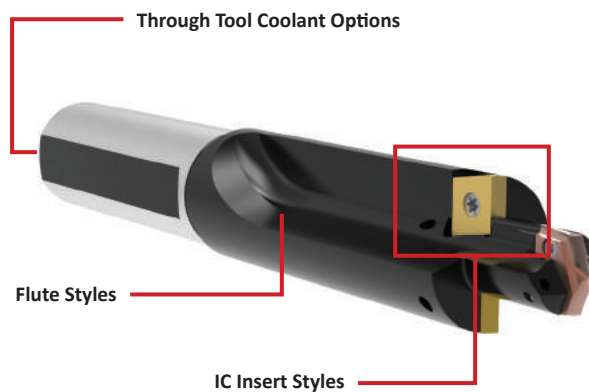
 Special Length

Insta-Quote™ 



### Additional Features

Insta-Quote provides multiple options to enhance different parts of the holder. If you have questions about which options would most benefit your application, just give us a call. We'll be happy to provide in-depth explanations about how certain options can optimize your results.



**WARNING** Refer to Speed and Feed charts for recommended adjustments to speeds and feeds. Refer to page X: 26 for deep hole drilling guidelines in this section of the catalog. Visit [www.alliedmachine.com/DeepHoleGuidelines](http://www.alliedmachine.com/DeepHoleGuidelines) for the most up-to-date information and procedures. Factory technical assistance is available for your specific applications through our Application Engineering Team.

# Insta-Quote™ Custom Tooling

## GEN3SYS® XT Holders

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS



Chrome Helix



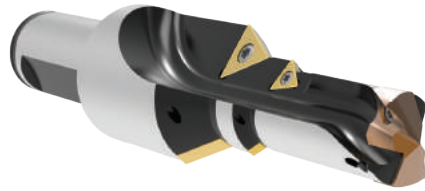
Chrome Bushing



⚠ Special Length



One Step ICS



Two Step ICS

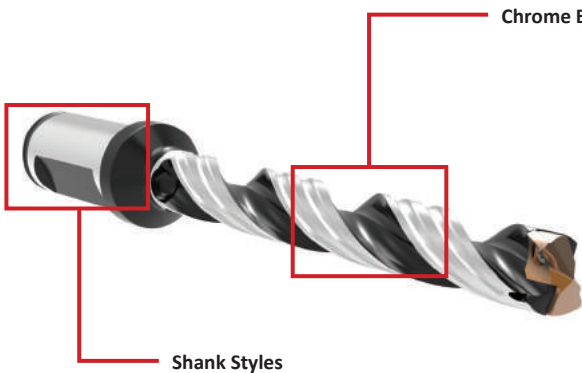
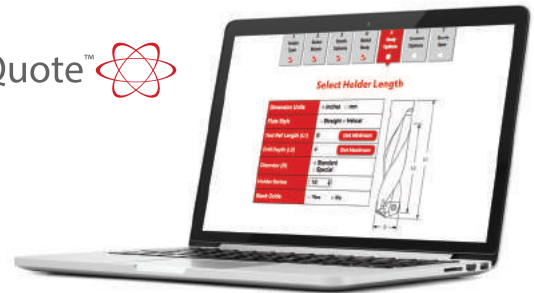


Three Step ICS

### Additional Features

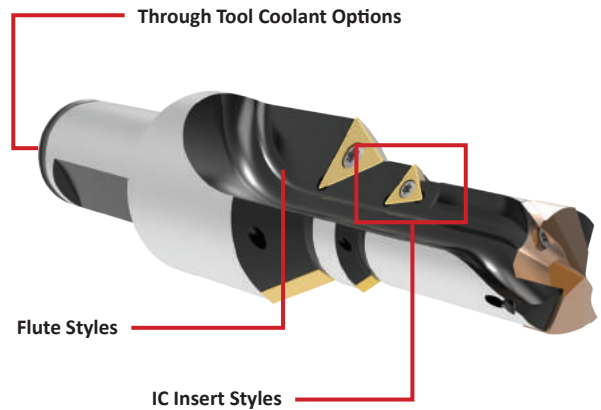
Insta-Quote provides multiple options to enhance different parts of the holder. If you have questions about which options would most benefit your application, just give us a call. We'll be happy to provide in-depth explanations about how certain options can optimize your results.

Insta-Quote™



Chrome Bearing Areas

Shank Styles



Through Tool Coolant Options

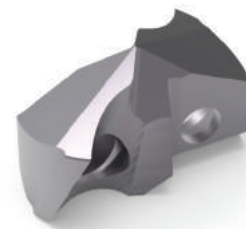
Flute Styles

IC Insert Styles

### Where are the Inserts?

Though Insta-Quote incorporates special designs for GEN3SYS XT holders, it does not include options for designing special GEN3SYS XT inserts. GEN3SYS XT holders utilize standard GEN3SYS XT inserts, which can be found in Section A20 of the product catalog.

If you need a special insert, or would simply like to discuss options for designing one to fit your application, please contact us and we can create a special design as an engineered special.



**Engineered Special**  
GEN3SYS XT insert designed for specific aerospace application

**⚠ WARNING** Refer to Speed and Feed charts for recommended adjustments to speeds and feeds. Refer to page X: 26 for deep hole drilling guidelines in this section of the catalog. Visit [www.alliedmachine.com/DeepHoleGuidelines](http://www.alliedmachine.com/DeepHoleGuidelines) for the most up-to-date information and procedures. Factory technical assistance is available for your specific applications through our Application Engineering Team.

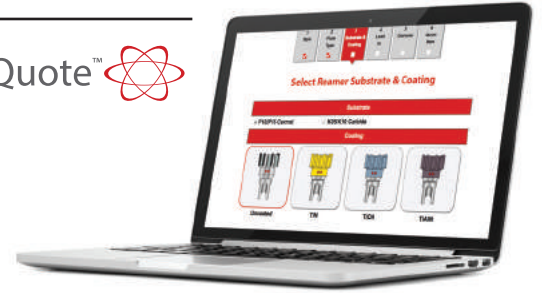
## Insta-Quote™ Custom Tooling

### ALVAN® Reamers

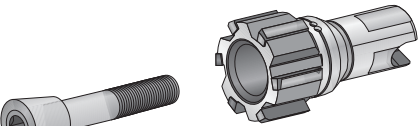
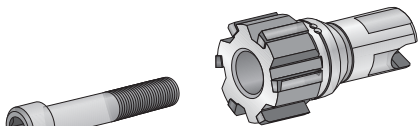
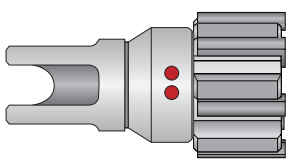
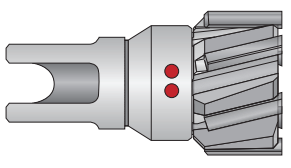




#### Use Insta-Quote to Build Your Part Numbers

Insta-Quote can help you find or build the ALVAN® Reamer item numbers you need along with the price and delivery of the items. It can also give you the recondition item and delivery. Just follow the steps, and Insta-Quote will guide you through the process.

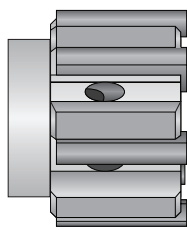
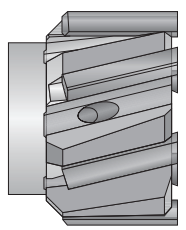




Insta-Quote™ 



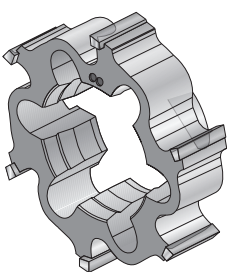
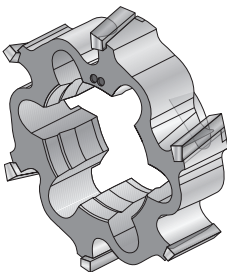




#### Replaceable Head Style

Diameter Options	Flute Options	Coating Options
 <p>Expandable Diameter</p>  <p>Fixed Diameter</p>	<p>Straight Flute</p>  <p>Left Hand Helical Flute</p> 	<p>Uncoated</p>  <p>TiN</p>  <p>TiAlN</p>  <p>TiCN</p> 

#### Monobloc Style

Flute Options	Coating Options
 <p>Straight Flute</p>  <p>Left Hand Helical Flute</p>	<p>Uncoated</p>  <p>TiN</p>  <p>TiAlN</p>  <p>TiCN</p> 

#### Cutting Ring Style

Flute Options	Coating Options
 <p>Straight Flute</p>  <p>Left Hand Helical Flute</p>	<p>Uncoated</p>  <p>TiN</p>  <p>TiAlN</p>  <p>TiCN</p> 

## Engineered Specials

### Insert Designs

#### Infinite Solutions

Though Insta-Quote™ and i-Form are incredible special tooling systems, some applications require a deeper level of engineering to accomplish the optimal results. No matter what the application may be, Allied Machine engineers have the knowledge, experience, and expertise to design and develop a special product to exceed your expectations.

Engineered Specials are not limited to T-A® or GEN3SYS® XT products. In fact, Engineered Specials can be created for most products offered by Allied Machine, including APX Drill, Opening Drill®, ASC 320®, AccuThread™ 856, Wohlhaupter® boring products, and many other product families.



Multiple Step



Special Point



Non-Center Cutting and Chamfer



Back Chamfer



Back Chamfer with Chipbreakers



Flat Fottom with Pilot, Corner Radius, and Chamfer



Special Step



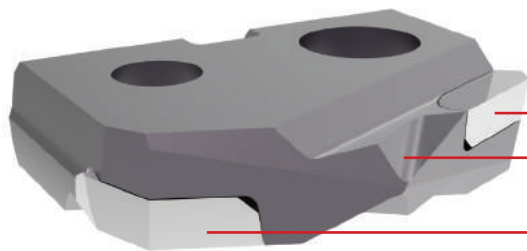
Non-Center Cutting and Chamfer



Back chamfer



Non-Center Cutting and Chamfer



PCD Tip

Notch Point® Geometry

PCD Tip

#### The Proof is in the Numbers

See the following results from a customer who was experiencing difficulty when drilling CFRP material:

- The fibers are characterized by high strength
- The material is difficult to cut, which wears down the cutting tool and causes splintering and/or fraying
- The plastic matrix is sensitive to heat and will melt
- The structure is built up by layers of material, which results in delamination upon exit

**INCREASED** tool life by **80%**

#### T-A® PCD Diamond Tipped Insert: Why PCD?

What allows the PCD (polycrystalline diamond) insert to generate such great success is the sharp cutting edge made for extreme wear resistance. While other tools encounter massive tearing when exiting, the PCD insert geometry, along with precise OD corner prep and Notch Point® technology, encounters minimal delamination. This produces an almost perfect tight tolerance and smooth hole.

#### Insert Highlights

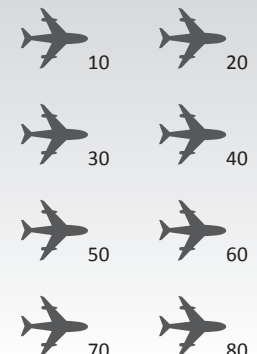
- C3 carbide substrate increases tool life
- PCD tip is designed for carbon fiber reinforced polymer (CFRP) material
- Notch Point® geometry, special corner clip, and drill point angle help minimize delamination upon exiting the hole



#### Number of Holes Drilled: ONE Competing Insert



#### Number of Holes Drilled: ONE PCD Tipped T-A Insert



## Engineered Specials

Featured Design | GEN3SYS® XT Vacuum Drill

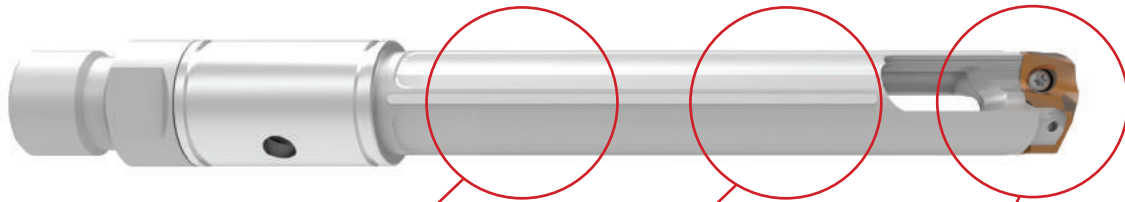


### Vacuum Drill Highlights

- Keeps material contained in a sealed vacuum system
- Provides mobile ability to perform operations away from a stationary machine tool
- Eliminates operation limitations
- There is a range of diameters per holder
- The same holder can be used for different material specific inserts



Industry Application  
**Aerospace**



Tight tolerance body diameter to run through a drill bushing

Spent coolant and chips are evacuated through an internal flute

Replaceable insert for quick and easy changes

### Carbon-Fiber-Reinforced Polymers (CFRP)

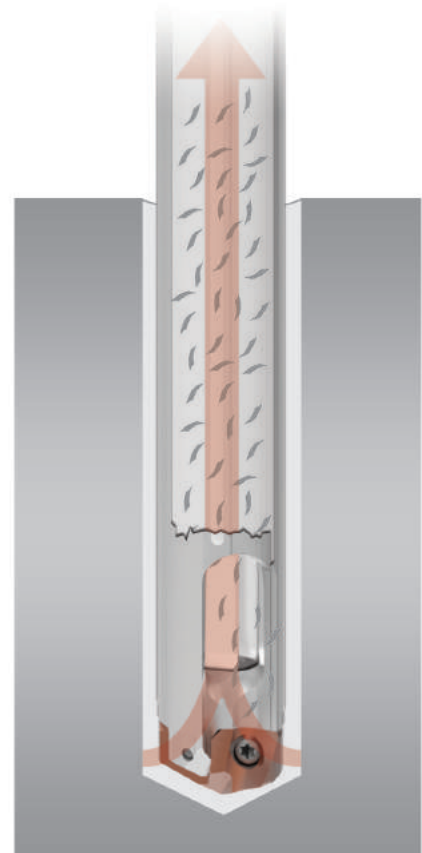
These are composite materials consisting of two parts: a matrix and a reinforcement (carbon fiber). Unlike isotropic materials like steel and aluminum, CFRP has directional strength properties, which depend on the layouts of the carbon fiber and the proportion of the carbon fibers in relation to the polymer.

#### Drilling in CFRP

- These applications are run with the vacuum only, no coolant
- Can be run with or without a micro peck cycle

#### Drilling in Metal

- These applications are run with the vacuum and coolant or mist
- Recommended to be run with a micro peck cycle



## Engineered Specials

Featured Design | T-A® Stealth Drill

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS



### T-A Stealth Drill Highlights

- 2 adjustable Torx® PLUS screw pins allow for diameter adjustment to reduce TIR
- Provides improved tool life and hole finish
- Guided wear pads improve hole straightness
- Coolant through design with multiple coolant outlets along the drill holder provides stability in deep hole drilling applications and also improves chip evacuation



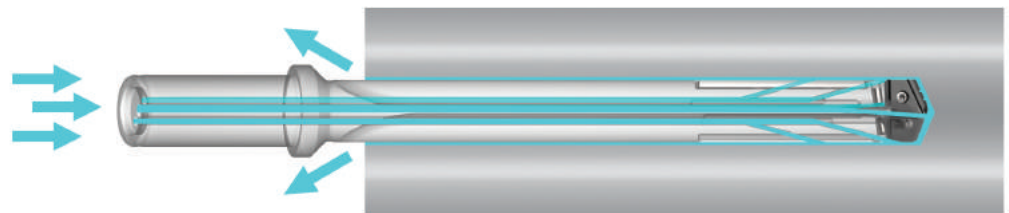
Industry Application  
**Automotive**



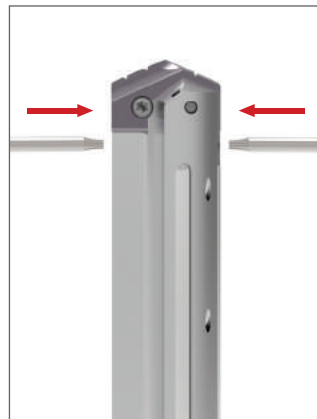
Industry Application  
**Aerospace**

### Triple Coolant Outlets

- Additional coolant outlets help keep the holder straight and precise
- Longer holders experience and maintain increased stability in deeper holes



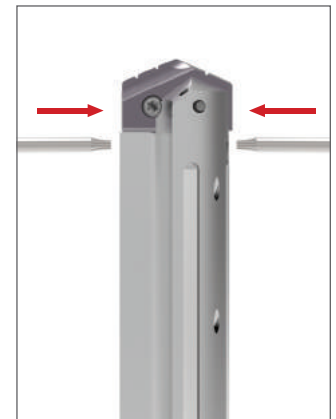
Locate the 2 adjustable Torx® PLUS screws (one on each side).



Loosen each screw.



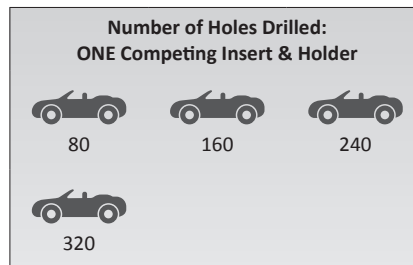
Adjust insert position.



Tighten each screw.

### The Proof is in the Numbers

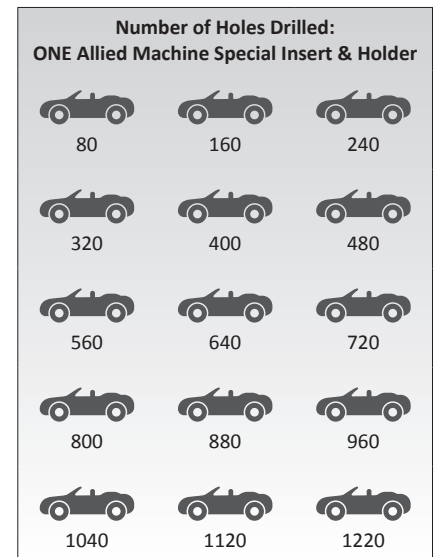
The following results came from a real-life application that utilized the T-A Stealth Drill. The customer was experiencing a high scrap rate and needed to find a solution to eliminate the problem.



#### In this application, Allied Machine:

- Eliminated **\$240,000** in scrap per year
- Optimized the chip formation
- Enhanced the chip evacuation
- Provided excellent surface finish

**INCREASED** tool life by  
**280%**



## Engineered Specials

### Success Stories

#### Real-Life Results

Below are five brief success stories. Each one provides an overview of specific situations when our special tooling achieved top-quality performance for our customers. For more success stories, or to read full in-depth case studies, go to [www.alliedmachine.com/RealLifeResults](http://www.alliedmachine.com/RealLifeResults).



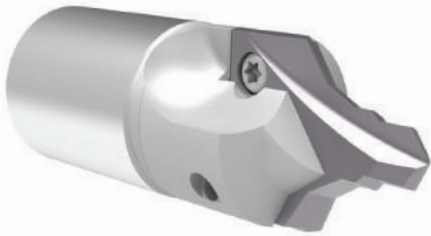
Industry Application

#### Oil & Gas

##### Special AccuPort 432® Port Contour Cutter

*Hydraulic Manifolds*

- Eliminated multiple tools in the process
- Eliminated regrinds
- Improved performance in cross hole applications



Industry Application

#### Heavy Equipment

##### Special T-A® Holder & Insert

*Axle Shafts*

- 100% increase in tool life
- \$7,500 reduction in set-up costs
- Eliminated scrap that was caused by set-up issues



Industry Application

#### Firearms

##### i-Form Drill

*Barrel Nut*

- Eliminated three tools in the process
- Reduced cycle time by 25%
- Improved chip formation



Industry Application

#### Automotive

##### T-A® Rim Drill

*Aluminum Wheels*

- 50% increase in penetration rates
- 50% increase in tool life
- Eliminated regrinds



Industry Application

#### Aerospace

##### Special Carbide Clad T-A® Holder with Diamond Coated Insert

*Carbon Fiber Landing Arm*

- Eliminated delamination of carbon fiber
- 7x more tool life
- Special shank threads directly into drill unit for easy tool change



## Engineered Specials

### i-Form Custom Indexable Drill / Form Tool System

#### Any Way You Want It

What if you could utilize complex forms that only seem to be available as brazed or solid carbide tools? Allied Machine's i-Form custom indexable drill/form tool system allows for complex designs with a replaceable cutting edge. This will reduce set-up times and eliminate regrinds, allowing you to increase your productivity and reduce costs. Don't settle for being good when the possibility of being great is right in front of you.

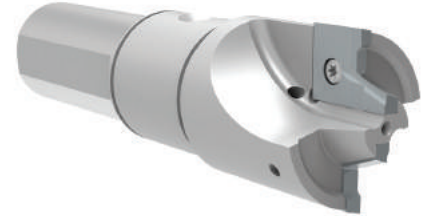
This is just a small sample of what you can do.



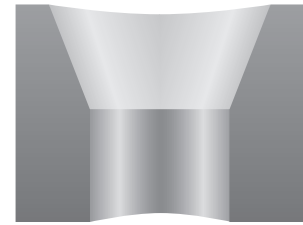
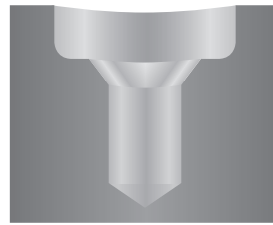
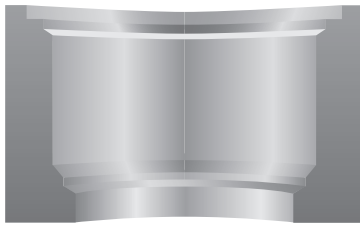
**i-Form Holder  
with i-Form Inserts**



**Lug Hole T-A® Drill  
with i-Form Inserts**



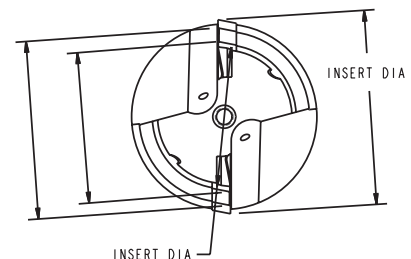
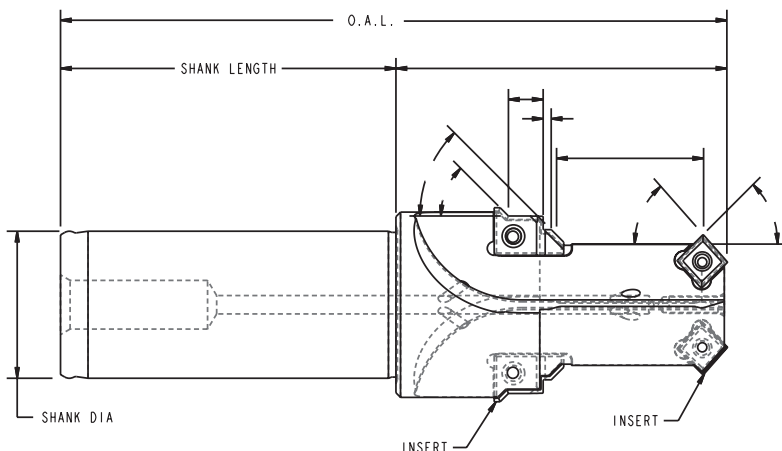
**i-Form Drill for Facing Operations  
with ID-OD Chamfer**



#### Design Complex Forms for ANY Hole Style

i-Form allows you to design complex forms for any style hole with increased productivity. The i-Form product line - both pilot inserts and form inserts - creates custom engineered forms that provide complex designs with replaceable cutting edges and improved consistency, all while outperforming brazed and solid carbide tooling. i-Form tools will increase your productivity, minimize set-up times, and eliminate regrind tool float and inconsistency.

- Holders have coolant through capabilities
- Holders can utilize standard inserts, Insta-Quote™ inserts, and/or special insert designs





## Engineered Specials

### i-Form Custom Indexable Drill / Form Tool System



**GEN3SYS® XT Pilot Insert  
with i-Form Inserts**



**GEN3SYS® XT Pilot Insert  
with i-Form Inserts**



**GEN3SYS® XT Back Chamfer Insert  
with i-Form Inserts**



**T-A® Flat Bottom Form Drill  
with i-Form Inserts**



**T-A® ICS Drill  
with i-Form Inserts**



**T-A® Pilot Insert  
with i-Form Inserts**



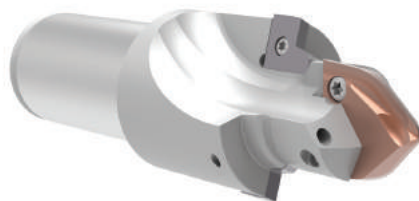
**Square QDSI 34® Inserts  
with i-Form Inserts**



**3 Flute IC Drill  
with i-Form Inserts**



**i-Form Holder  
with i-Form Inserts**



**AccuPort 432® Drill  
with Special T-A® Form Insert**



**T-A 2 Step IC Drill  
with i-Form Inserts**



**Special Core Drill  
with i-Form Inserts**

A

DRILLING

B

BORING

C

REAMING

D

BURNISHING

E

THREADING

X

SPECIALS

## Engineered Specials

Special Designs | T-A® Products

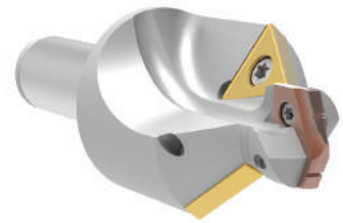
A  
DRILLING  
B  
BORING  
C  
REAMING  
D  
BURNISHING  
E  
THREADING  
X  
SPECIALS



**T-A IC Drill  
with Back Chamfer Insert**



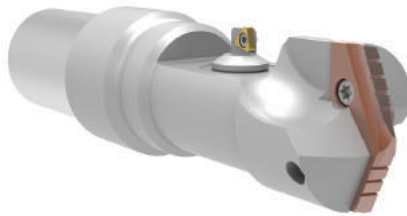
**T-A 1 Step Stub Length**



**T-A IC Drill**



**T-A 2 Step IC Drill**



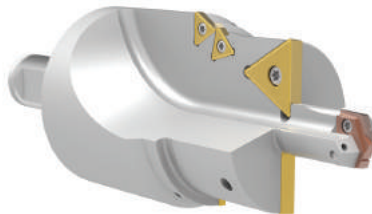
**T-A Counter Bore Tool  
with Micro Adjustable Cartridge**



**T-A Form Drill  
with Adjustable Cartridge**



**T-A Multiple Step Drill  
with Adjustable Cartridge**



**T-A Large Diameter  
Multiple Step IC Drill**



**T-A Deburr Drill**



**T-A IC Drill  
with Customer Defined Shank**



**T-A Deep Hole Drill  
with Customer Defined Design**



**T-A Chrome Bearing Drill  
with Customer Defined Shank**



**T-A 1 Step IC Drill  
with Flat Bottom Insert**



**T-A Form Drill**



**T-A Drill  
with Special Holder and Insert Design**

## Engineered Specials

Special Designs | Other Products



**Special BT-A Drill  
with Internal Thread**



**Special BT-A Drill**



**Special BT-A Drill**



**APX Drill  
with Carbide Clad Guides**



**APX Drill  
with 1 Step Design**



**APX Drill  
with HSK Shank**



**Opening Drill®  
with Special Diameter**



**Special Core Drill  
with 2 Step Design**



**ICS Drill  
with Adjustable Cartridge**



**Superion™ Solid Carbide  
with AM200® Coating**



**AccuThread™ 856  
with Through Coolant**



**AccuPort 432®  
Special Length**



**ALVAN® Ring Style Reamer  
with Special Length**



**GEN3SYS® XT  
with Morse Taper Shank**

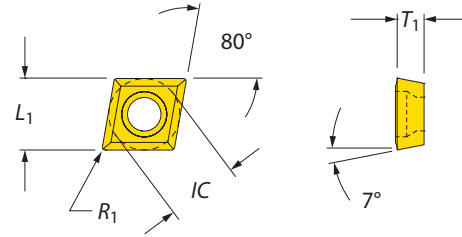


**GEN3SYS® XT  
with IC Inserts and Special Body**




A  
DRILLING  
B  
BORING  
C  
REAMING  
D  
BURNISHING  
E  
THREADING  
X  
SPECIALS

## QDSI 34® Inserts

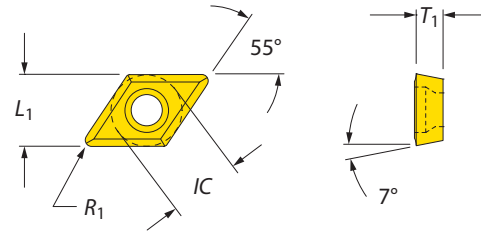
80° Diamond | 55° Diamond






### 80° Diamond Inserts

Imperial (inch)				Metric (mm)					ANSI Designation		
IC	L <sub>1</sub>	T <sub>1</sub>	R <sub>1</sub>	IC	L <sub>1</sub>	T <sub>1</sub>	R <sub>1</sub>				
0.250	0.249	0.094	0.008	6.35	6.32	2.39	0.20	<b>CCGT-060202</b>	CCGT 2(1.5)0.5	7256-IP8-1	8IP-8
0.250	0.247	0.094	0.016	6.35	6.28	2.39	0.40	<b>CCMT-060204</b>	CCMT 2(1.5)1	7256-IP8-1	8IP-8
0.250	0.244	0.094	0.031	6.35	6.21	2.39	0.79	<b>CCMT-060208</b>	CCMT 2(1.5)2	7256-IP8-1	8IP-8
0.250	0.244	0.156	0.031	6.35	6.21	3.96	0.79	<b>CCGT-06T308</b>	CCGT 2(2.5)2	7256-IP8-1	8IP-8
0.375	0.374	0.156	0.008	9.53	9.49	3.96	0.20	<b>CCGT-09T302</b>	CCGT 3(2.5)0.5	7359-IP15-1	8IP-15
0.375	0.372	0.156	0.016	9.53	9.46	3.96	0.40	<b>CCMT-09T304</b>	CCMT 3(2.5)1	7359-IP15-1	8IP-15
0.375	0.369	0.156	0.031	9.53	9.39	3.96	0.79	<b>CCMT-09T308</b>	CCMT 3(2.5)2	7359-IP15-1	8IP-15
0.500	0.497	0.188	0.016	12.70	12.63	4.76	0.40	<b>CCMT-120404</b>	CCMT 431	745105-IP20-1	8IP-20
0.500	0.494	0.188	0.031	12.70	12.56	4.76	0.79	<b>CCMT-120408</b>	CCMT 432	745105-IP20-1	8IP-20

**NOTE:** QDSI 34 inserts are utilized only in special ICS holders. Speeds and feeds for QDSI 34 inserts are determined by drill insert.



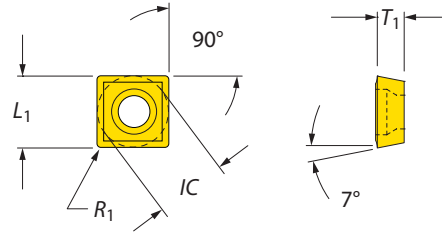
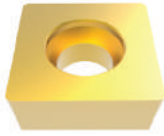
### 55° Diamond Inserts

Imperial (inch)				Metric (mm)					ANSI Designation		
IC	L <sub>1</sub>	T <sub>1</sub>	R <sub>1</sub>	IC	L <sub>1</sub>	T <sub>1</sub>	R <sub>1</sub>				
0.250	0.243	0.094	0.008	6.35	6.18	2.39	0.008	<b>DCGT-070202</b>	DCGT 2(1.5)0.5	7256-IP8-1	8IP-8
0.250	0.237	0.094	0.016	6.35	6.01	2.39	0.016	<b>DCMT-070204</b>	DCMT 2(1.5)1	7256-IP8-1	8IP-8
0.250	0.223	0.094	0.031	6.35	5.67	2.39	0.031	<b>DCMT-070208</b>	DCMT 2(1.5)2	7256-IP8-1	8IP-8
0.375	0.362	0.156	0.016	9.53	9.19	3.96	0.016	<b>DCMT-11T304</b>	DCMT 3(2.5)1	7359-IP15-1	8IP-15
0.375	0.348	0.156	0.031	9.53	8.85	3.96	0.031	<b>DCMT-11T308</b>	DCMT 3(2.5)2	7359-IP15-1	8IP-15




**NOTE:** QDSI 34 inserts are utilized only in special ICS holders. Speeds and feeds for QDSI 34 inserts are determined by drill insert.

## QDSI 34® Inserts

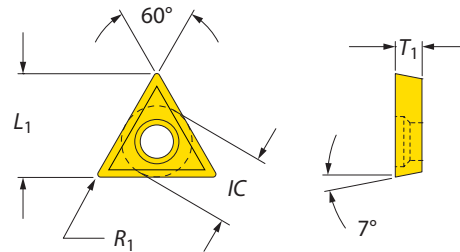
Square | 60° Triangle






### Square Inserts

Imperial (inch)				Metric (mm)					ANSI Designation		
IC	L <sub>1</sub>	T <sub>1</sub>	R <sub>1</sub>	IC	L <sub>1</sub>	T <sub>1</sub>	R <sub>1</sub>	Part No.		Torx Screw	Torx Driver
0.375	0.375	0.156	0.016	9.53	9.53	3.96	0.40	SCMT-09T304	SCMT 3(2.5)1	7359-IP15-1	8IP-15

**NOTE:** QDSI 34 inserts are utilized only in special ICS holders. Speeds and feeds for QDSI 34 inserts are determined by drill insert.



### 60° Triangle Inserts

Imperial (inch)				Metric (mm)					ANSI Designation		
IC	L <sub>1</sub>	T <sub>1</sub>	R <sub>1</sub>	IC	L <sub>1</sub>	T <sub>1</sub>	R <sub>1</sub>	Part No.		Torx Screw	Torx Driver
0.156	0.259	0.078	0.008	3.97	6.58	1.98	0.20	TCGT-06T102	TCGT 1.2(1.2)0.5	724-IP6-1	8IP-6
0.156	0.248	0.078	0.016	3.97	6.29	1.98	0.40	TCGT-06T104	TCGT 1.2(1.2)1	724-IP6-1	8IP-6
0.156	0.225	0.078	0.031	3.97	5.71	1.98	0.79	TCGT-06T108	TCGT 1.2(1.2)2	724-IP6-1	8IP-6
0.219	0.367	0.094	0.008	5.65	9.33	2.39	0.20	TCGT-090202	TCGT 1.8(1.5)0.5	7225-IP7-1	8IP-7
0.219	0.356	0.094	0.016	5.65	9.04	2.39	0.40	TCGT-090204	TCGT 1.8(1.5)1	7225-IP7-1	8IP-7
0.219	0.333	0.094	0.031	5.65	8.46	2.39	0.79	TCGT-090208	TCGT 1.8(1.5)2	7225-IP7-1	8IP-7
0.250	0.422	0.094	0.008	6.35	10.71	2.39	0.20	TCGT-110202	TCGT 2(1.5)0.5	7256-IP8-1	8IP-8
0.250	0.410	0.094	0.016	6.35	10.42	2.39	0.40	TCMT-110204	TCMT 2(1.5)1	7256-IP8-1	8IP-8
0.250	0.387	0.094	0.031	6.35	9.84	2.39	0.79	TCMT-110208	TCMT 2(1.5)2	7256-IP8-1	8IP-8
0.375	0.627	0.156	0.016	9.53	15.92	3.96	0.40	TCMT-16T304	TCMT 3(2.5)1	7359-IP15-1	8IP-15
0.375	0.604	0.156	0.031	9.53	15.34	3.96	0.79	TCMT-16T308	TCMT 3(2.5)2	7359-IP15-1	8IP-15
0.500	0.820	0.188	0.031	12.70	20.83	4.76	0.79	TCGT-220408	TCGT 432	745105-IP20-1	8IP-20

**NOTE:** QDSI 34 inserts are utilized only in special ICS holders. Speeds and feeds for QDSI 34 inserts are determined by drill insert.

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

# Special Tooling

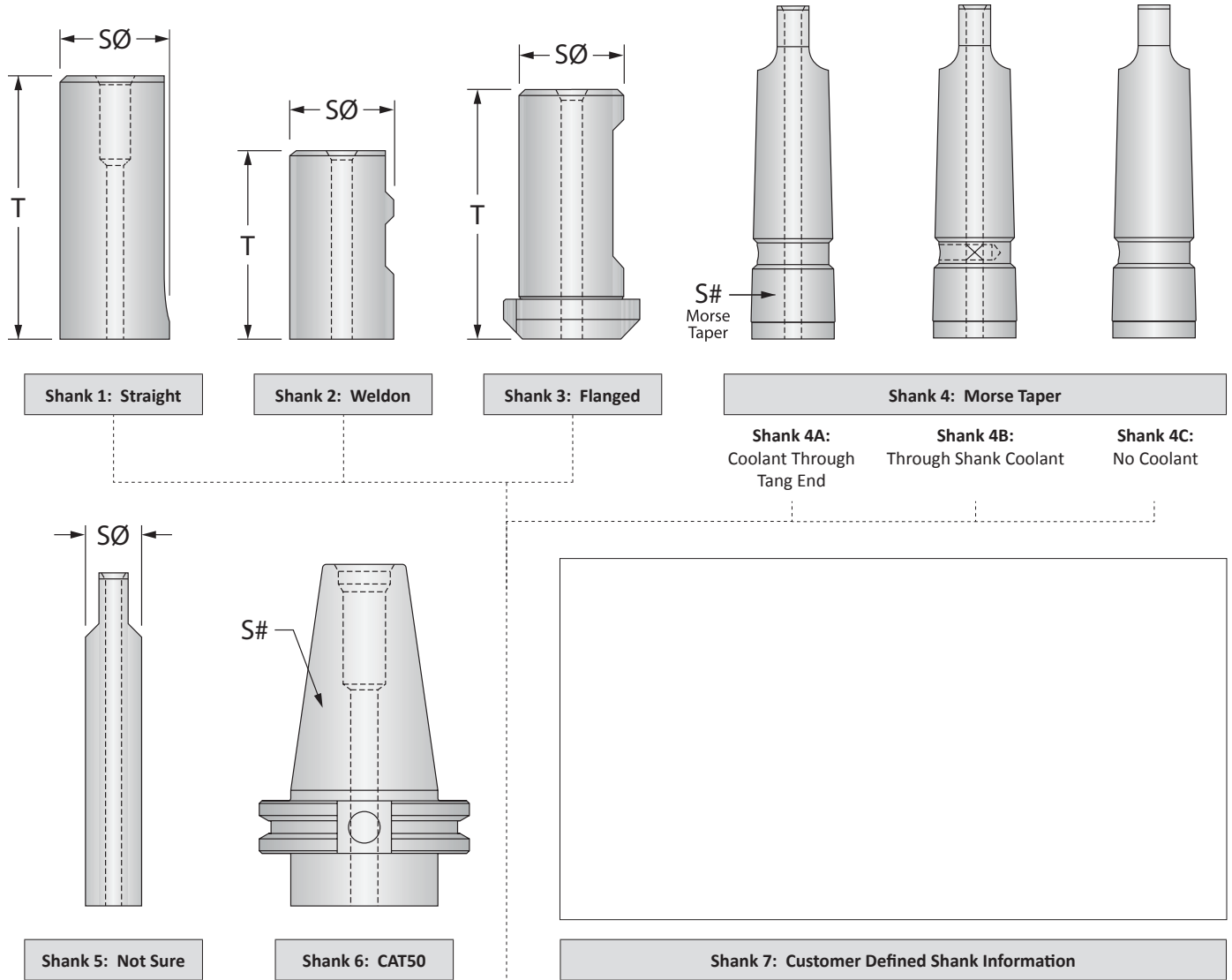
## Complete Your Design

### Show Us What You Need

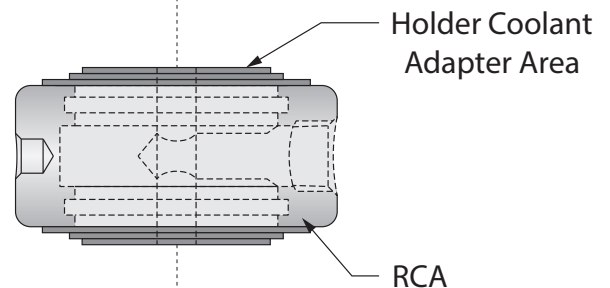
These pages have been included so you can assist us with defining your special tooling requirements.

- Select a Shank (1 - 6), or define Shank 7
- Indicate if the shank will be used with or without a Rotary Coolant Adapter (RCA)

We ask that you define your hole profile and offer an example of a tool form to help us with the design process. Tools 1 - 5 cover only a small portion of our capabilities, so feel free to use your imagination. Please scan these pages, record your information in the boxes on the next page, and email the information for our quickest response.



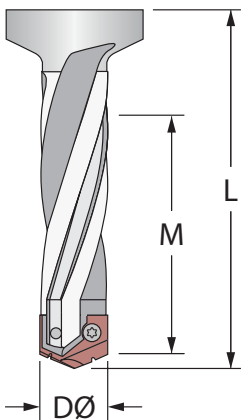
Shank	SØ	S#	T	RCA
4A (EXAMPLE)	-	4MT	-	YES <input checked="" type="radio"/> NO
				YES / NO
				YES / NO
				YES / NO



A  
DRILLING  
B  
BORING  
C  
REAMING  
D  
BURNISHING  
E  
THREADING  
X  
SPECIALS

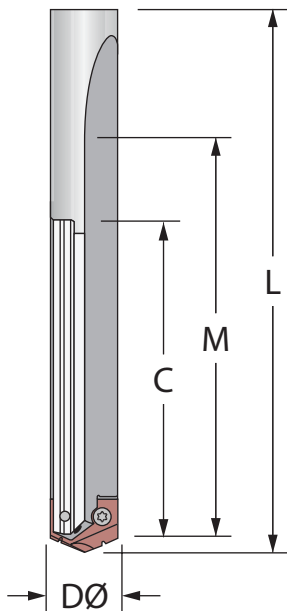
**Tool 1**

- Carbide Clad
- Chrome Plate
- Helical Flute
- Straight Flute



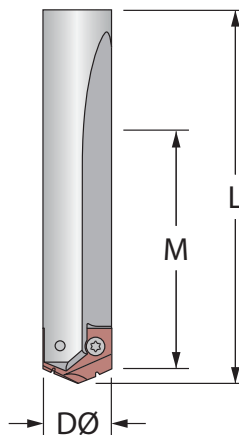
**Tool 2**

- Helical Pilot
- Chrome Pilot



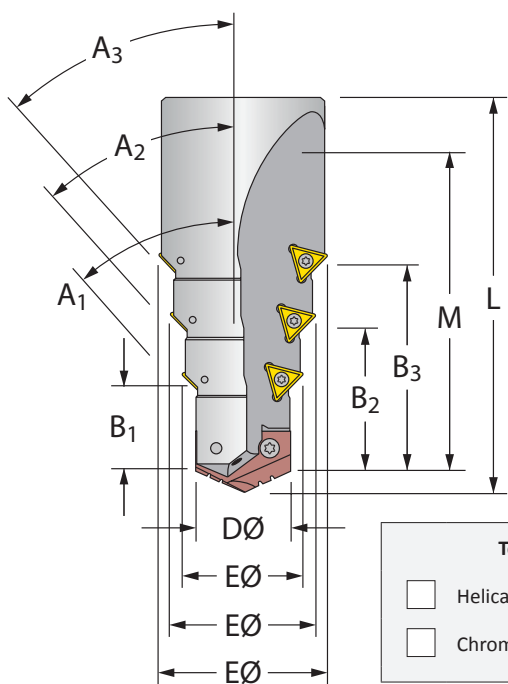
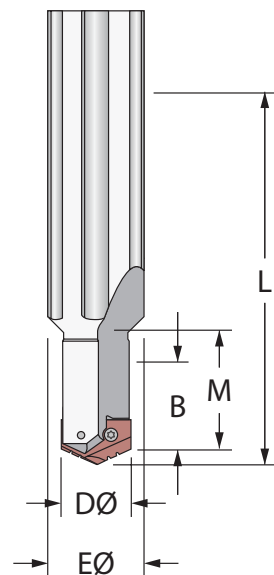
**Tool 3**

- Helical Flute
- Straight Flute



**Tool 4**

- Helical Pilot
- Chrome Pilot



**Tool 5**

- Helical Pilot
- Chrome Pilot



Hole Profile

Please email or fax your design to:  
 Application Engineering Department  
 P: 800.321.5537  
 F: 330.343.7666  
 E: aesupport@alliedmachine.com

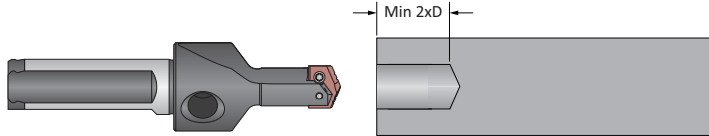
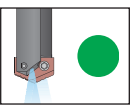
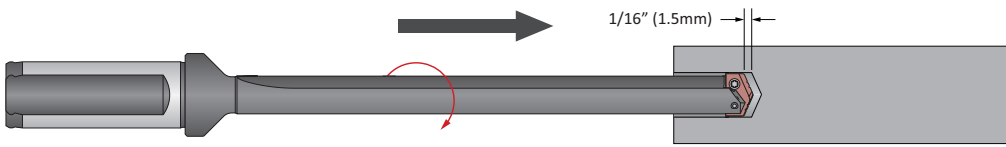
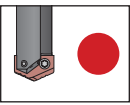
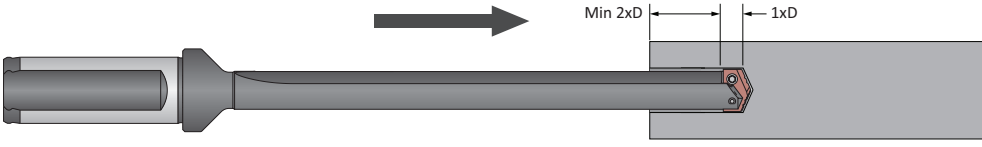
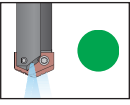
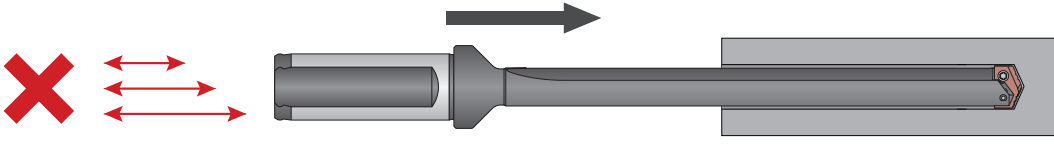
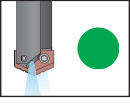
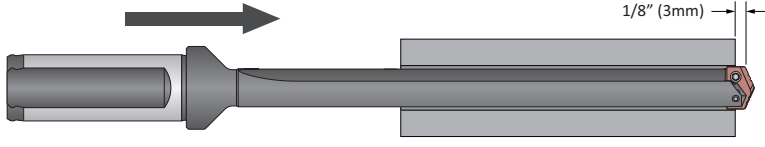
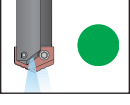
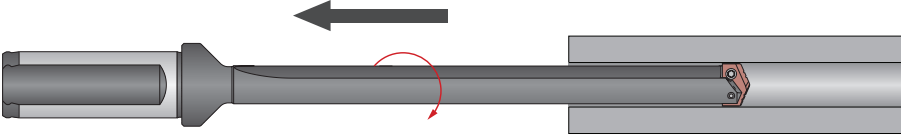
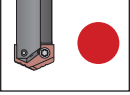
Item	Tool	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	C	D Ø	E Ø	F Ø	G	L	M
EXAMPLE	5	30°	-	-	1.00	-	-	0.25	0.620	1.25	-	-	4.50	3.00

Customer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Please be sure to include shank and coolant information from the previous page when sending tool designs

## Deep Hole Drilling Guidelines

For Lengths Greater Than 9xD (including Extended, Long, XL, 3XL, and Special Length)

A DRILLING	<p><b>1. Pilot Hole</b> 100 % RPM 100% IPR (mm/rev)</p> <p>Establish the pilot hole using the same diameter short drill to a depth of 2xD minimum. Utilize a pilot drill with the same or larger included point angle.</p>  <p><b>Coolant ON</b></p> 
B BORING	<p><b>2. Feed-in</b> 50 RPM max 12 IPM (300 mm/min)</p> <p>Feed the longer drill within 1/16" (1.5mm) short of the established pilot hole bottom at a <b>maximum of 50 RPM</b> and 12 IPM (300 mm/min) feed rate.</p>  <p><b>Coolant OFF</b></p> 
C REAMING	<p><b>3. Deep Hole Transition Drilling</b> 50 % RPM 75% IPR (mm/rev)</p> <p>Drill additional 1xD past the bottom of the pilot hole at 50% reduction of recommended speed and 25% reduction of recommended feed. Minimum of 1 second dwell is required to meet full speed before feeding.</p>  <p><b>Coolant ON</b></p> 
D BURNISHING	<p><b>4. Deep Hole Drilling - Blind</b> 100% RPM 100% IPR (mm/rev)</p> <p>Drill to full depth at recommended speed and feed for longer drill according to Allied speed and feed charts. <b>No peck cycle recommended.</b></p>  <p><b>Coolant ON</b></p> 
E THREADING	<p><b>5. Deep Hole Drilling - at Breakout</b> 50% RPM 75% IPR (mm/rev)</p> <p><b>For through holes only:</b> Reduce speed by 50% and feed by 25% prior to breakout. Do not breakout more than 1/8" (3mm) past the full diameter of the drill.</p>  <p><b>Coolant ON</b></p> 
X SPECIALS	<p><b>6. Drill Retract</b> 50 RPM max</p> <p>Reduce speed to a <b>maximum of 50 RPM</b> before retracting from the hole.</p>  <p><b>Coolant OFF</b></p> 

**1. WARNING** Tool failure can cause serious injury. To prevent:

- When using holders without support bushing, use a short holder to establish an initial hole that is a minimum of 2 diameters deep.
- Do not rotate tool holders more than 50 RPM unless it is engaged with the workpiece or fixture.

Visit [www.alliedmachine.com/DeepHoleGuidelines](http://www.alliedmachine.com/DeepHoleGuidelines) for the most up-to-date information and procedures. Factory technical assistance is available for your specific applications through our Application Engineering Team.



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**A**

DRILLING

**B**

BORING

**C**

REAMING

**D**

BURNISHING

**E**

THREADING

**X**

SPECIALS



# Warranty Information

Allied Machine & Engineering warrants to original equipment manufacturers, distributors, industrial and commercial users of its products that each new product manufactured or supplied by Allied Machine shall be free from defects in material and workmanship.

Allied Machine's obligation under this warranty is limited to furnishing without additional charge a replacement or, at its option repairing or issuing credit for any product which shall within one year from the date of sale be returned freight prepaid to the plant designated by an Allied Machine representative and which upon inspection is determined by Allied Machine to be defective in materials or workmanship.

Complete information as to operating conditions, machine, set-up, and application of cutting fluid should accompany any product returned for inspection. The provisions of this warranty shall not apply to any Allied Machine products which have been subjected to misuse, improper operating conditions, machine set-up or application of cutting fluid or which have been repaired or altered if such repair or alteration in the judgment of Allied Machine would adversely affect performance of the product.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Allied Machine shall have no liability or responsibility on any claim of any kind, whether in contract, tort or otherwise, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery or use of any product sold hereunder, in excess of the cost of replacement or repair as provided herein.

ALL PRICES, DELIVERIES, DESIGNS, AND MATERIALS ARE SUBJECT TO CHANGE WITHOUT NOTICE.



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Your local Allied Machine representative: