Now Featuring

Special Tooling Solutions

SPECIALS
Allied Machine & Engineering is a worldwide leader in holemaking and finishing solutions. We are committed to providing practical and dependable solutions to our customers through innovative designs and superior customer and technical support.

We continue to expand our product offering in order to provide new and different solutions. With Field Sales Engineers located around the world, we position ourselves to provide technical support on site, right at your spindle.

Allied Machine & Engineering
120 Deeds Drive
Dover, OH 44622
United States

North America

Allied Machine
120 Deeds Drive
Dover, OH 44622
United States

Allied Machine
485 West 3rd Street
Dover, OH 44622
United States

ThreadMills USA™
4185 Crosstowne Ct #B
Evans, GA 30809
United States

Superion™
1285 S Patton St.
Xenia, OH 45385
United States

Europe

Allied Machine Europe
93 Vantage Point
Pensnett Estate
Kingswinford
West Midlands
DY6 7FR, United Kingdom

Wohlhaupert® GmbH
Maybachstrasse 4
Postfach 1264
72636 Frickenhausen
Germany

Asia

Wohlhaupert® India
B-23, 2nd Floor
B Block Community Centre
Janakpuri, New Delhi - 110058
India
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.

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.

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.

Allied Machine understands that high quality products are only one facet of success. Our customer support is crucial to what we do, and that’s why we make sure the best engineers and customer service associates are in place to assist our customers around the world.

With over 75 years of experience, Allied Machine has encountered the challenges of growth and success. By investing in cutting edge technology and the brightest and sharpest minds, our knowledge and capabilities continue to expand and grow every day.

Steve Stokey
Executive Vice President

William H. Stokey
President and CEO

Mike Stokey
Executive Vice President
**Replaceable Insert Drills**
- Reduce costs by decreasing set-up time and utilizing a single holder for the lives of multiple inserts
- Provide flexibility to quickly switch between inserts with different geometries
- Products:
  - GEN3SYS® XT | GEN3SYS® XT Pro
  - Original T-A® | GEN2 T-A®
  - High Performance | Universal

**Indexable Insert Drills**
- Protect your investment and reduce your inventory with replaceable cartridges that allow the same holder to be used repeatedly
- Indexable inserts increase productivity and tool life while reducing costs
- Products:
  - 4TEX® Drill
  - Revolution Drill®
  - Opening Drill®

**Replaceable / Indexable Insert Drills**
- Allow for higher spindle speeds and take advantage of the power curve on modern CNC machines
- Achieve maximum penetration rates in deep hole drilling applications
- Holders cover a range of sizes with the replaceable heads determining the cutting diameter
- Products:
  - APX™ Drill

**Solid Carbide Drills**
- Offer greater strength and stability when drilling tougher materials
- Available in diameters from 3mm - 20mm
- Can be made-to-order specifically for your application (Superion™ quoted specials)
  - ASC 320®
  - Superion™
• Reduce costs by decreasing set-up time and utilizing a single holder for the lives of multiple inserts
• Provide flexibility to quickly switch between inserts with different geometries

Products:
- GEN3SYS® XT
- GEN3SYS® XT Pro
- Original T-A®
- GEN2 T-A®
- High Performance
- Universal

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Replaceable / Indexable Insert Drills

• Offer greater strength and stability when drilling tougher materials
• Available in diameters from 3mm - 20mm
• Can be made-to-order specifically for your application (Superion™ quoted specials)
- ASC 320®
- Superion™

Solid Carbide Drills

• Deliver outstanding performance and durability in structural steel applications
• Designed to produce optimal results in difficult-to-machine materials
• Available in multiple lengths and diameters
• T-A® style drills have different insert geometry options to improve performance depending on material

Products:
- Original T-A® | GEN2 T-A®
- GEN3SYS® XT Pro

Structural Steel Solutions

• The internal ejection system flushes chips and debris from the hole with no interference to the cutting process
• Utilizes the advantages of the T-A® drill insert
• Designed to significantly increase penetration rates over brazed heads and traditional gun drills

Products:
- BT-A Drill

BTA (STS) Machining Solutions

• Save significant time and money by performing four processes in one step
• Replaceable insert design reduces costs, inventory, and set-up times
• Available in 4 industry specifications:
  - Imperial: SAE J-1926
  - Metric: ISO 6149-1:2006
  - Military: SAE AS5202
  - John Deere: JDS-G173.1

Products:
- AccuPort 432®

Hydraulic Port Contour Cutters

Enhanced Special Drilling Capabilities

• Allied Machine Engineers are available to meet with you to evaluate your application and recommend the best solution for you
• Special drilling solutions can incorporate advanced features such as adjustable diameter locations, multiple steps, additional coolant designs, special lengths and diameters, and more
• Special drills can drastically reduce your cost-per-hole and increase your overall productivity by eliminating multiple processes and increasing tool life

• Enhanced Special Drilling Capabilities
High Precision Boring Systems

- Designs available for high volume applications that increase rigidity to improve performance
- Versatile boring heads that are flexible with changing applications while maintaining excellent performance
- Provides high precision with absolute repeatability to ensure every part is held to tolerance
- Offers an industry leading modular shank connection that maintains rigidity and reduces inventory on your boring system
- Available with both digital and analog settings
- Products:
  - Wohlhaupter® Boring Tools

Expandable Reaming Solutions

- Expandable cutting diameters accommodate for wear, which extends tool life
- Replaceable cutting heads and rings reduce waste and improve production time versus solid high speed steel and carbide reamers
- Hold tight tolerances to ensure processes are performed to accurate specifications
- Reduce tooling costs because many items are available for recondition
- Products:
  - ALVAN® Reamers

Roller Burnishing Solutions

- Produce excellent surface finishes
- Provide accurate size control
- Increase surface hardness
- Solutions for both through hole and blind hole applications
- Products:
  - S.C.A.M.I.® Roller Burnishing Tools

CRITERION®

Modular Boring Systems

- The modular capabilities are ideal for use across multiple different projects
- Offers versatile boring heads suitable for all job shops and tooling rooms
- Provides an economical solution for low volume and/or short-term production applications
- Offers both rough and finish boring solutions
- Products:
  - Criterion® Boring Tools

SPECIAL CAPABILITIES

When it comes to designing and developing special solutions for customers, Allied Machine is the top choice. If your application requires special tooling, give us a call. Our engineered specials are developed by the brightest engineers in the industry. Most of our standard tooling can be altered as specials, or we can create entirely new concepts for particularly unique applications.

One special tooling solution is Insta-Quote®, the online system that allows you to design your own special tooling 24/7. Receive a quote and drawings within minutes just by following the steps.

And with the addition of Superion™ technology and capabilities, we can customize made-to-order solid carbide tools to achieve optimal results for your applications. Whatever your application, Allied Machine has the answer.
• Designs available for high volume applications that increase rigidity to improve performance
• Versatile boring heads that are flexible with changing applications while maintaining excellent performance
• Provides high precision with absolute repeatability to ensure every part is held to tolerance
• Offers an industry leading modular shank connection that maintains rigidity and reduces inventory on your boring system
• Available with coolant through options
• Cover a wide range of thread forms
• Provide optimal solutions for both high production projects and short-run applications
• Products:
  - AccuThread™ 856
  - AccuThread™ T3
  - ThreadMills USA™
• 3 insert lengths are available that cover a wide range of thread forms
• Holders can utilize inserts with different pitches and thread forms
• Repeatability is achieved by both the bolt-in style and the pin style locking systems
• Increase tool life by 25 - 50% with Allied Machine’s AM210® coating
• Products:
  - AccuThread™ 856: Bolt-in Style
  - AccuThread™ 856: Pin Style
• Expandable cutting diameters accommodate for wear, which extends tool life
• Replaceable cutting heads and rings reduce waste and improve production time versus solid high speed steel and carbide reamers
• Hold tight tolerances to ensure processes are performed to accurate specifications
• Reduce tooling costs because many items are available for recondition
• Products:
  - ALVAN® Reamers
• Produce excellent surface finishes
• Provide accurate size control
• Increase surface hardness
• Solutions for both through hole and blind hole applications
• Products:
  - S.C.A.M.I.® Roller Burnishing Tools

When it comes to designing and developing special solutions for customers, Allied Machine is the top choice. If your application requires special tooling, give us a call. Our engineered specials are developed by the brightest engineers in the industry. Most of our standard tooling can be altered as specials, or we can create entirely new concepts for particularly unique applications.

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And with the addition of Superior™ technology and capabilities, we can customize made-to-order solid carbide tools to achieve optimal results for your applications.

Whatever your application, Allied Machine has the answer.
Find the right Wohlhaupter® solution for your application.

• Configure your complete tool assembly
• Compile an order list to be quoted
• Search and quickly find components using various criteria
• Adjust your language and measurement preferences

Tool-Architect
iq.alliedmachine.com

Eliminate the wait. Get your program now.

Increase the production and success of your applications today.

• Offers direct access to 2D drawings and 3D models
• Assemble and view tool images in your browser
• Download drawings for use in most machining software programs
• Browse products, search item numbers, and save assemblies for future use

Wohlhaupter® Tool-Architect

Find the right Wohlhaupter® solution for your application.

Tool-Architect
iq.alliedmachine.com

Insta-Quote®

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

• Design and quote your own tooling
• Guides you through steps to generate the solution you need
• Features the following products
  - T-A® Inserts
  - T-A® Holders
  - GEN3SYS® XT Holders
  - ALVAN® Reamers

Insta-Code®

Boring Insert Selector

• Generate the correct boring insert for your job in just six easy steps
• Choose type, shape, substrate, insert form, nose radius, and material
• Easily order by adding the item to your cart

Insta-Code also has a Cycle Time Calculator

alliedmachine.com/InstaCode

Product Selector Machinist Tool App
www.alliedmachine.com/productselector

www.alliedmachine.com/bis

Quickly convert cutting tool parameters for the machine inputs you need.

• Input data to calculate the RPM and speed and feed rates
• Also features the Boring Insert Selector
• Access product literature right at your fingertips

Insta-Quote®

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

• Design and quote your own tooling
• Guides you through steps to generate the solution you need
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  - T-A® Inserts
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  - ALVAN® Reamers

iq.alliedmachine.com
Find the right Wohlhaupter® solution for your application.

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

Tool-Architect
iq.alliedmachine.com

Eliminate the wait. Get your program now.

- Choose the best thread mill for your application
- Create program code for your machine
- Available as a PC download app (that can be used offline)
- Website app available 24/7

Insta-Code also has a Cycle Time Calculator

www.alliedmachine.com/InstaCode

WOHLHAUPTER®
Boring Insert Selector

Find the best insert for your application.

- Generate the correct boring insert for your job in just six easy steps
- Choose type, shape, substrate, insert form, nose radius, and material
- Easily order by adding the item to your cart

www.alliedmachine.com/bis

Product Selector
Use the product selector to find the right tool for your application.

- Guides you through steps to generate the right tool for your application
- Learn about your recommended tool and how to maximize its performance

www.alliedmachine.com/productselector

Machinist Tool App
Quickly convert cutting tool parameters for the machine inputs you need.

- Input data to calculate the RPM and speed and feed rates
- Also features the Boring Insert Selector
- Access product literature right at your fingertips
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** (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 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
- Step Drills / PCD Step Reamers

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

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: 6 - 13

See pages X: 18 - 19
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.

COMPLEX SOLUTIONS

INNOVATIVE SOLUTIONS

LONG SOLUTIONS

EVERY PROBLEM HAS A SOLUTION
**Superion™**

Solid Carbide and PCD Tooling Solutions

---

**WHAT IS SUPERION?**

Superion capabilities provide cutting edge solutions in both solid carbide and PCD tooling.

**WHY SHOULD YOU USE SUPERION?**

- State of the art manufacturing automation allows for high repeatability and consistency, regardless of the quantity you need.
- Superion provides application-specific solutions tailored to meet your toughest demands.
- Superion tooling excels in difficult and unique material applications.
- Our goal is to provide you a quality solution to exceed your need on a schedule that satisfies.

**WHEN SHOULD YOU USE SUPERION?**

- When finish is critical and tolerances are tight, Superion can maintain your tolerances.
- When regrinds and re-manufacturability are critical for tooling budgets, Superion tackles your needs.
- If you’re dealing with CFRP or other unique materials, Superion tooling is the right solution.

---

**SOLID CARBIDE TOOLING**

- Ø 3 - 20mm
- Designs with up to 3 steps
- Lengths up to 20xD
- Coolant through options
- Different geometry options to optimize your specific application
- Regrinds are available

---

**SOLID CARBIDE PCD TOOLING**

- Ø 3 - 20mm
- Brazed wafer to carbide body
- Ideal for CFRP and other unique materials
- Nib-style drills, end mills, and reamers
- Regrinds and PCD remanufactures are available
Superion™
Solid Carbide and PCD Tooling Solutions

From Concept to Reality

Allied’s team of engineers is ready to assist you with your tooling design. We’ll gather all the information we need about your application and turn your concept into reality. Give us a call today and watch as we collaborate with you and listen to the need, formulate a concept, develop the model, and build the solution.

The Challenge of CFRP Materials

Carbon fiber material is ideal for industries that require components with high strength and rigidity without increasing weight. In other words, these products need to be really strong and sturdy but also really light. For example, the aerospace industry revolves around aerodynamics, which is why carbon fiber is utilized to increase the quality of aerospace components without increasing the weight.

Many other metals are composed of uniform properties that are the same in every direction. Carbon fiber, on the other hand, is made of fabrics that are specifically positioned in different directions. This configuration increases the strength and rigidity of the material, but it also makes carbon fiber much more difficult to drill.

Results When Drilling Aerospace-Grade Carbon Fiber

Just Look at That!

These images tell the whole story. Check out the holes drilled by the PCD tooling versus the CVD insert. Notice the excessive delamination on the first group of holes. The PCD tooling avoids most delamination, resulting in an excellent hole in the difficult-to-drill carbon fiber material.

Carbon fiber has high strength that causes:
- Wear on the cutting tool
- Splintering/fraying of the hole

As you can see, the first test experienced these problems. The PCD tooling, however, successfully drilled clean holes.
Insta-Quote™
Design Your Custom Tooling

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

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) and click on the Insta-Quote icon under the quick links menu.

Or, you can simply go to iq.alliedmachine.com to access Insta-Quote directly.

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.

First Part of the Item Number:
This represents the date you began designing your tool (ex. 170209 = February 9, 2017).

Second Part of the Item Number:
This is the reference number for that specific item. If you begin designing another tool on the same day, the first part of the new item number would be the same, but the reference number would be unique to that new item.

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

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

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.

The drawing contains all relevant dimensions. It must be signed before manufacturing can begin.

NOTE: The drawing is a generic representation and is not to scale.
Insta-Quote™ Custom Tooling

T-A® Inserts

Special Angle  Double Angle  Spur Point
Spot and Chamfer  Step Insert  Flat Bottom

Ball Nose

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.

<table>
<thead>
<tr>
<th>Substrate Options</th>
<th>Coating Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HSS:</strong> HSS, Super Cobalt, Premium Cobalt</td>
<td>AM200®</td>
</tr>
<tr>
<td><strong>Carbide:</strong> C1, C2, C3, C5</td>
<td>TiN</td>
</tr>
<tr>
<td></td>
<td>TiAIN</td>
</tr>
<tr>
<td></td>
<td>TiCN</td>
</tr>
</tbody>
</table>
Insta-Quote™ Custom Tooling
T-A® Holders

Chrome Helix
Chrome Bushing
Guided Holder
One Step ICS
Two Step ICS
Three Step ICS
Special Length

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.

Chrome Bearing Areas
Through Tool Coolant Options

Shank Styles
Flute Styles
IC Insert Styles

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 for the most up-to-date information and procedures. Factory technical assistance is available for your specific applications through our Application Engineering Team.

www.alliedmachine.com | 1.330.343.4283
Insta-Quote™ Custom Tooling

GEN3SYS® XT Holders

Chrome Helix

Chrome Bushing

Special Length

One Step ICS

Two Step ICS

Three Step ICS

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.

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.

Additional Features

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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 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.

Replaceable Head Style

<table>
<thead>
<tr>
<th>Diameter Options</th>
<th>Flute Options</th>
<th>Coating Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expandable Diameter</td>
<td>Straight Flute</td>
<td>Uncoated, TiN</td>
</tr>
<tr>
<td>Fixed Diameter</td>
<td>Left Hand Helical Flute</td>
<td>TiAIN, TiCN</td>
</tr>
</tbody>
</table>

Monobloc Style

<table>
<thead>
<tr>
<th>Flute Options</th>
<th>Coating Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight Flute</td>
<td>Uncoated, TiN, TiAIN, TiCN</td>
</tr>
<tr>
<td>Left Hand Helical Flute</td>
<td></td>
</tr>
</tbody>
</table>

Cutting Ring Style

<table>
<thead>
<tr>
<th>Flute Options</th>
<th>Coating Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight Flute</td>
<td>Uncoated, TiN, TiAIN, TiCN</td>
</tr>
<tr>
<td>Left Hand Helical Flute</td>
<td></td>
</tr>
</tbody>
</table>
Engineered Specials
Insert Designs

OUR SOLUTION

T-A® PCD Drill Insert

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

YOUR ADVANTAGE

Take control of carbon fiber reinforced polymer applications. The T-A PCD drill insert can provide the hole quality you need to produce successful quality parts and reduce scrap.

The Proof is in the Numbers

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

INCREASED tool life by 80%

Polycrystalline Diamond Insert

What allows the polycrystalline diamond (PCD) insert to generate such high success in aerospace carbon fiber is the sharp cutting edge that provides clearance cutting and reduces delamination. The PCD wafers improve the wear resistance.

While other tools encounter massive tearing when exiting the hole in carbon fiber, the PCD insert geometry, along with precise OD corner prep and Notch Point® technology, encounters minimal delamination. This produces a near-perfect, tight tolerance and smooth hole (see the images below).

The Proof is in the Numbers

<table>
<thead>
<tr>
<th>Number of Holes Drilled:</th>
<th>ONE Competing Insert</th>
<th>ONE PCD Tipped T-A Insert</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
<td>10 20 30 40</td>
</tr>
<tr>
<td>50 60 70 80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
The GEN3SYS XT® Vacuum Drill allows you to reap the productivity benefits of the GEN3SYS® XT outside of a fixed-position machine tool. The Vacuum Drill technology attaches to a hose to remove material that flows up through the internal flute of the drill. This versatile ability allows the drilling process to move from location to location, performing operations on large components.

The design of the GEN3SYS® XT insert increases penetration rates, which can lower your production time and decrease operation costs. Available in multiple material-specific geometries, the GEN3SYS® XT has a solution for most applications.

- **OUR SOLUTION**
  **GEN3SYS® XT Vacuum Drill**

  - Spent coolant and chips are evacuated through an internal flute
  - Guided body diameter to run through a drill bushing
  - Replaceable tip for quick and easy insert change

- **YOUR ADVANTAGE**
  The sealed vacuum system lets you move your drilling operations outside the confines of a machine, allowing you to increase productivity on massive components.

- **MATERIAL TIPS**
  **Drilling in CFRP (Carbon Fiber Reinforced Polymer)**
  - 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

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

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%

Number of Holes Drilled: ONE Competing Insert & Holder
80 160 240
320

Number of Holes Drilled: ONE Allied Machine Special Insert & Holder
80 160 240
80 160 240
320 400 480
560 640 720
800 880 960
1040 1120 1220
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.

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
Engineered Specials
Special Designs | T-A® Products

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

www.alliedmachine.com | 1.330.343.4283
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

www.alliedmachine.com  |  1.330.343.4283
# QDSI 34° Inserts

## 80° Diamond

### 80° Diamond Inserts

<table>
<thead>
<tr>
<th>Imperial (inch)</th>
<th>Metric (mm)</th>
<th>Part No.</th>
<th>ANSI Designation</th>
<th>Torx Screw</th>
<th>Torx Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC</td>
<td>L₁</td>
<td>T₁</td>
<td>R₁</td>
<td>IC</td>
<td>L₁</td>
</tr>
<tr>
<td>0.250</td>
<td>0.249</td>
<td>0.094</td>
<td>0.008</td>
<td>6.35</td>
<td>6.32</td>
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<tr>
<td>0.250</td>
<td>0.247</td>
<td>0.094</td>
<td>0.016</td>
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<td>6.28</td>
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<tr>
<td>0.250</td>
<td>0.244</td>
<td>0.094</td>
<td>0.031</td>
<td>6.35</td>
<td>6.21</td>
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<tr>
<td>0.375</td>
<td>0.374</td>
<td>0.156</td>
<td>0.031</td>
<td>6.35</td>
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<tr>
<td>0.375</td>
<td>0.372</td>
<td>0.156</td>
<td>0.016</td>
<td>6.35</td>
<td>6.21</td>
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<tr>
<td>0.500</td>
<td>0.497</td>
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<td>0.031</td>
<td>6.35</td>
<td>6.21</td>
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</table>

**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

<table>
<thead>
<tr>
<th>Imperial (inch)</th>
<th>Metric (mm)</th>
<th>Part No.</th>
<th>ANSI Designation</th>
<th>Torx Screw</th>
<th>Torx Driver</th>
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<tbody>
<tr>
<td>IC</td>
<td>L₁</td>
<td>T₁</td>
<td>R₁</td>
<td>IC</td>
<td>L₁</td>
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<tr>
<td>0.250</td>
<td>0.243</td>
<td>0.094</td>
<td>0.008</td>
<td>6.35</td>
<td>6.18</td>
</tr>
<tr>
<td>0.250</td>
<td>0.237</td>
<td>0.094</td>
<td>0.016</td>
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<td>6.01</td>
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<tr>
<td>0.250</td>
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<td>0.094</td>
<td>0.031</td>
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<td>5.67</td>
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<tr>
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<td>0.362</td>
<td>0.156</td>
<td>0.031</td>
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<td>5.67</td>
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<td>0.375</td>
<td>0.348</td>
<td>0.156</td>
<td>0.031</td>
<td>6.35</td>
<td>8.85</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Imperial (inch)</th>
<th>Metric (mm)</th>
<th>ANSI Designation</th>
<th>Torx Screw</th>
<th>Torx Driver</th>
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</thead>
<tbody>
<tr>
<td>IC L T R L T R</td>
<td>IC L T R L T R</td>
<td>Part No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.375 0.375 0.156 0.016 9.53 9.53 3.96 0.40</td>
<td>SCMT-09T304</td>
<td>SCMT 3[2.5]1</td>
<td>7359-IP15-1</td>
<td>BIP-15</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Imperial (inch)</th>
<th>Metric (mm)</th>
<th>ANSI Designation</th>
<th>Torx Screw</th>
<th>Torx Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC L T R L T R</td>
<td>IC L T R L T R</td>
<td>Part No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.156 0.259 0.078 0.008 3.97 6.58 1.98 0.20</td>
<td>TCGT-06T102</td>
<td>TCGT 1.2[1.2][0.5]</td>
<td>724-IP6-1</td>
<td>BIP-6</td>
</tr>
<tr>
<td>0.156 0.248 0.078 0.016 3.97 6.29 1.98 0.40</td>
<td>TCGT-06T104</td>
<td>TCGT 1.2[1.2][1]</td>
<td>724-IP6-1</td>
<td>BIP-6</td>
</tr>
<tr>
<td>0.156 0.225 0.078 0.031 3.97 5.71 1.98 0.79</td>
<td>TCGT-06T108</td>
<td>TCGT 1.2[1.2][2]</td>
<td>724-IP6-1</td>
<td>BIP-6</td>
</tr>
<tr>
<td>0.219 0.367 0.094 0.008 5.65 9.33 2.39 0.20</td>
<td>TCGT-090202</td>
<td>TCGT 1.8[1.5][0.5]</td>
<td>7225-IP7-1</td>
<td>BIP-7</td>
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<tr>
<td>0.219 0.356 0.094 0.016 5.65 9.04 2.39 0.40</td>
<td>TCGT-090204</td>
<td>TCGT 1.8[1.5][1]</td>
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<tr>
<td>0.219 0.333 0.094 0.031 5.65 8.46 2.39 0.79</td>
<td>TCGT-090208</td>
<td>TCGT 1.8[1.5][2]</td>
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<td>BIP-7</td>
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<tr>
<td>0.250 0.422 0.094 0.008 6.35 10.71 2.39 0.20</td>
<td>TCGT-110202</td>
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<td>0.250 0.410 0.094 0.016 6.35 10.42 2.39 0.40</td>
<td>TCMT-110204</td>
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<td>7256-IP8-1</td>
<td>BIP-8</td>
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<td>0.250 0.387 0.094 0.031 6.35 9.84 2.39 0.79</td>
<td>TCMT-110208</td>
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<tr>
<td>0.375 0.627 0.156 0.016 9.53 15.92 3.96 0.40</td>
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<td>0.375 0.604 0.156 0.031 9.53 15.34 3.96 0.79</td>
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<td>0.500 0.820 0.188 0.031 12.70 20.83 4.76 0.79</td>
<td>TCMT-220408</td>
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<td>74510S-IP20-1</td>
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</table>

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

**Shank 2:** Weldon

**Shank 3:** Flanged

**Shank 4:** Morse Taper

  - **Shank 4A:** Coolant Through Tang End
  - **Shank 4B:** Through Shank Coolant
  - **Shank 4C:** No Coolant

**Shank 5:** Not Sure

**Shank 6:** CAT50

**Shank 7:** Customer Defined Shank Information

---

**Shank** | **SØ** | **S#** | **T** | **RCA**
---|---|---|---|---
4A (EXAMPLE) | – | 4MT | – | YES / NO

---

**Holder Coolant Adapter Area**

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Tool</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>C</th>
<th>DØ</th>
<th>EØ</th>
<th>FØ</th>
<th>G</th>
<th>L</th>
<th>M</th>
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</thead>
<tbody>
<tr>
<td>EXAMPLE</td>
<td>5</td>
<td>30°</td>
<td>–</td>
<td>–</td>
<td>1.00</td>
<td>–</td>
<td>–</td>
<td>0.25</td>
<td>0.620</td>
<td>1.25</td>
<td>–</td>
<td>–</td>
<td>4.50</td>
<td>3.00</td>
</tr>
</tbody>
</table>

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)

1. Pilot Hole
   100% RPM
   100% IPR (mm/rev)
   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.

2. Feed-in
   50 RPM max
   12 IPM (300 mm/min)
   Feed the longer drill within 1/16” (1.5mm) short of the established pilot hole bottom at a maximum of 50 RPM and 12 IPM (300 mm/min) feed rate.

3. Deep Hole Transition Drilling
   50% RPM
   75% IPR (mm/rev)
   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.

4. Deep Hole Drilling - Blind
   100% RPM
   100% IPR (mm/rev)
   Drill to full depth at recommended speed and feed for longer drill according to Allied speed and feed charts. No peck cycle recommended.

5. Deep Hole Drilling - at Breakout
   50% RPM
   75% IPR (mm/rev)
   For through holes only:
   Reduce speed by 50% and feed by 25% prior to breakout.
   Do not break out more than 1/8” (3mm) past the full diameter of the drill.

6. Drill Retract
   50 RPM max
   Reduce speed to a maximum of 50 RPM before retracting from the hole.

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 for the most up-to-date information and procedures. Factory technical assistance is available for your specific applications through our Application Engineering Team.
Notes
Allied Machine & Engineering (“Allied Machine”) warrants to original equipment manufacturers, distributors, industrial and commercial users of its products for one year from the original date of sale that each new product manufactured or supplied by Allied Machine shall be free from defects in material and workmanship.

Allied Machine’s sole and exclusive obligation under this warranty is limited to, at its option, without additional charge, replacing or repairing this product or issuing a credit. For this warranty to be applied, the product must 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 material and workmanship.

Complete information as to operating conditions, machine, setup, and the application of cutting fluid should accompany any product returned for inspection. This warranty shall not apply to any Allied Machine products which have been subjected to misuse, abuse, improper operating conditions, improper machine setup or improper application of cutting fluid or which have been repaired or altered if such repair or alteration, in the judgement of Allied Machine, would adversely affect the 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 for any claim, 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.

Allied Machine shall not be liable in contract or in tort (including, without limitation, negligence, strict liability or otherwise) for economic losses of any kind or for any special, incidental, indirect, consequential, punitive or exemplary damages arising in any way out of the performance of, or failure to perform this agreement.

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Fax: +49 (0) 7022.408.212

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