



# ALLIED MACHINE & ENGINEERING

Holemaking Solutions for Today's Manufacturing



Boring



Reaming



Burnishing



Threading



## AccuPort 432<sup>®</sup>

► **PORTING**

Hydraulic Port Contour Cutters



Specials

## 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

### Wohlhaupter® GmbH

Maybachstrasse 4  
Postfach 1264  
72636 Frickenhausen  
Germany

## Asia

### Wohlhaupter® India

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



Allied Machine & Engineering is a worldwide leader in holmaking 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**

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



# ALLIED MACHINE & ENGINEERING

Holemaking Solutions for Today's Manufacturing

## AccuPort 432®

### 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®

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 People

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.

### The Future

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



**WOHLHAUPTER®**



**SUPERION™**

**CRITERION™**



## 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™





## Structural Steel Solutions

- 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



## BTA (STS) Machining 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



## Hydraulic Port Contour Cutters

- 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®



## 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



## WOHLHAUPTER®

### 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



## 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

## S.C.A.M.I.®

### 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



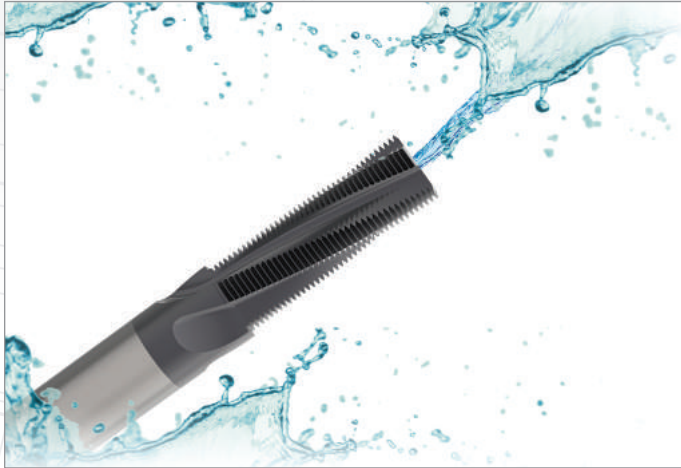
## S.C.A.M.I.®

### 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







## Solid Carbide Thread Mills

- 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



## Replaceable Insert Thread Mills

- 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



## 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.



Insta-Quote™ 



 **SUPERION™**





# AccuPort 432®

Replaceable Insert Port Contour Cutters | J1926 | ISO6149 | AS5202 | JDG173.1



## High Performance Multi-Step Action

Durable and precise, the AccuPort 432 holders provide a strong and rigid platform for the drilling of hydraulic ports. The precision ground insert location on each holder ensures total repeatability and simple, uncomplicated changing of the replaceable inserts.

With the AccuPort technology, you can drill and finish port forms in **ONE** operation. Save time and money with AccuPort.

Single operation hydraulic port cutting system

No pre-drilling required

Replaceable inserts eliminate regrinding and resetting

## Applicable Industries



Aerospace



Agriculture



Automotive



Marine /  
Shipbuilding

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.

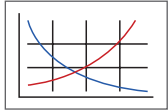
## Reference Icons

The following icons will appear throughout the catalog to help you navigate between products.



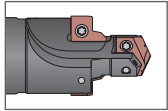
### Setup / Assembly Information

Detailed instructions and information regarding the corresponding part(s)



### Recommended Cutting Data

Speed and feed recommendations for optimum and safe drilling



### AccuPort 432 Holders

Refers to the full details of the holder items included in each kit



### Port and Thread Finishing Kits

Lists the available kits complete with AccuPort tool and AccuThread™ solid carbide thread mill

## Introduction Information

|                      |       |
|----------------------|-------|
| Product Overview     | 2 - 4 |
| Product Nomenclature | 5     |

## Port Specifications

|                                     |         |
|-------------------------------------|---------|
| SAE J-1926 / ISO 11926-1 / MS-16142 | 6 - 11  |
| ISO 6149-1:2006 / SAE J-2244/1      | 12 - 13 |
| SAE AS5202 / AND10050               | 14 - 15 |
| JDS-G173.1                          | 16 - 17 |

## Port and Thread Finishing Kits

|                                     |         |
|-------------------------------------|---------|
| SAE J-1926 / ISO 11926-1 / MS-16142 | 18 - 21 |
| ISO 6149-1:2006 / SAE J-2244/1      | 22 - 25 |
| SAE AS5202 / AND10050               | 26 - 27 |
| JDS-G173.1                          | 28      |

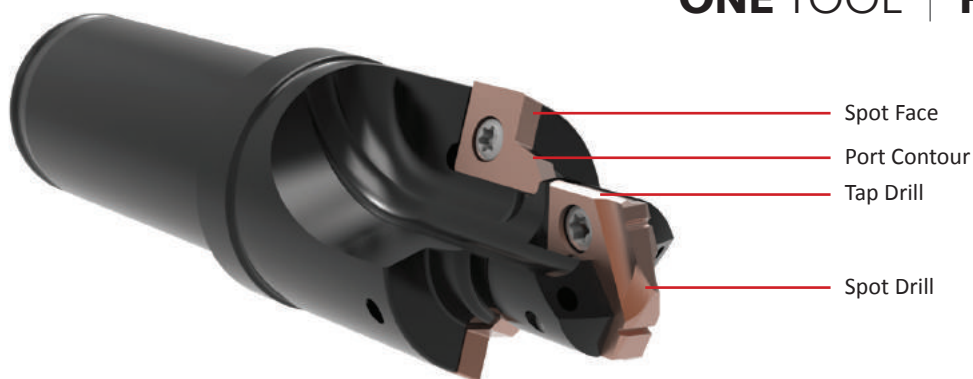
## Recommended Cutting Data (Imperial)

|                    |         |         |
|--------------------|---------|---------|
| Imperial<br>(inch) | HSS     | 30 - 31 |
|                    | Carbide | 32 - 33 |
| Metric<br>(mm)     | HSS     | 34 - 35 |
|                    | Carbide | 36 - 37 |



## Product Overview

### ONE TOOL | FOUR OPERATIONS

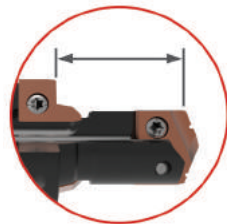


### Advanced Solutions, Outstanding Results

As designers and manufacturing engineers push the limits of production technology to improve productivity and performance, Allied Machine has continued to innovate and develop new solutions like the unique AccuPort 432 hydraulic port contour cutter system. Every product in the AccuPort system is designed to deliver maximum performance in a diverse range of hydraulic port cutting applications and demanding manufacturing environments.

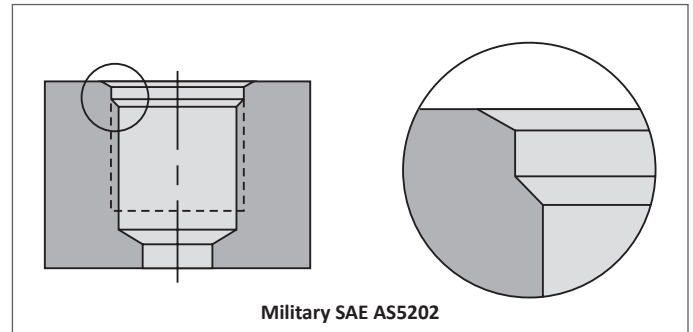
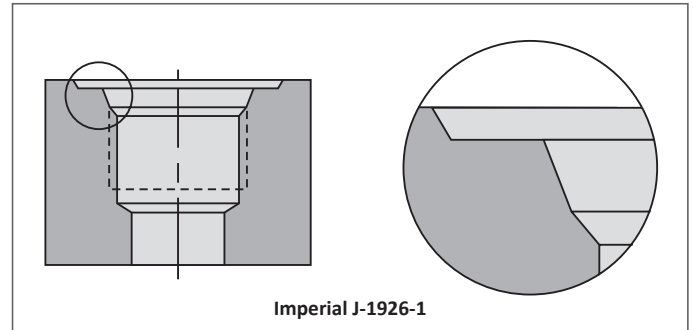
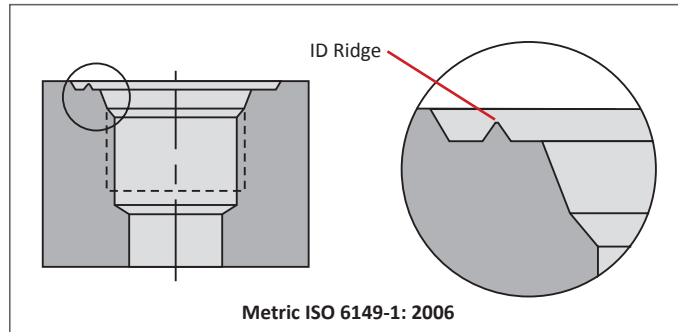
Using precision replaceable inserts for both the drilling and port forming operations, AccuPort eliminates the need for tool regrinding and enables absolute repeatability, excellent surface finish, and reduced cost-per-hole. The AccuPort drills, forms, and precision-finishes the hydraulic port in **one** pass. This replaces up to three separate cutting operations in a single tool to deliver outstanding improvements in productivity, accuracy, and repeatability.

Hydraulic systems are present in an incredibly diverse range of industries. Anywhere a hydraulic port is required, AccuPort can provide a more cost effective and higher performance solution in a fraction of the time taken for traditional methods using separate drills, special forming tools, and spot facers.

| Port Specification                                       | Notes                                                                                                                                                         |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Imperial</b><br>SAE J-1926<br>ISO 11926-1<br>MS-16142 | Extended minor diameter length option also available                     |
| <b>Metric</b><br>ISO 6149-1:2006<br>SAE J-2244/1         | Holders made with ID ridge<br>Utilizes inserts with or without ID ridge  |
| <b>John Deere</b><br>JDS-G173.1                          | Adheres to John Deere port standards                                                                                                                          |
| <b>Military</b><br>SAE AS5202                            | Also conforms to AND10050 specification by using an alternate tap drill size for a UN thread                                                                  |

## Choosing the Right System

Every product in the AccuPort 432 product line is designed to deliver maximum performance in a diverse range of hydraulic port cutting applications and demanding manufacturing environments. The innovative design delivers the best possible range of benefits in terms of productivity, cost-per-hole, and tool life.



## Common Industry Sectors and Components



**Aerospace**  
Pumps  
Landing Gear  
Brake Cylinders  
Manifolds



**Agriculture**  
Pumps  
Manifolds  
Cylinders and Rams  
Gear Pumps



**Automotive**  
Motor Valves  
Relief Valves  
Brake Cylinders  
Power Steering Pumps



**Marine / Shipbuilding**  
Pumps  
Cylinders and Rams  
Motors  
Manifolds

## The Complete Package

Producing fully finished threaded hydraulic ports has never been easier. The Port and Thread Finishing Kit includes the AccuPort 432 contour cutter with a dedicated AccuThread™ solid carbide threadmill in a single kit. You also receive the T-A® inserts and port form inserts needed to complete the assembly.

Port kits incorporate the AccuThread solid carbide threadmills to increase the manufacturing flexibility by allowing hydraulic ports to be produced in just two operations. In addition, where a unique port profile is required, Allied Machine provides a dedicated special tooling solution using our extensive tool design and manufacturing experience to meet precise specifications.





## Replaceable Inserts Overview

## T-A® Drill Insert Grades

**HSS Super Cobalt**  
(Original T-A® / GEN2 T-A®)

Suited for good to rigid machining applications, used for drilling exotic and high alloy materials, or general use when surface speed needs to be increased for use in material hardness up to 350 BHN 121kg.

**Carbide C5 (P40)**  
(Original T-A® only)

Excellent for drilling free machining steel, low/medium carbon steels, alloy steels, high strength steels, tool steels, and hardened steels.

**Carbide C1 (K10)**  
(GEN2 T-A® only)

Excellent for drilling free machining steel, low/medium carbon steels, alloy steels, high strength steels, tool steels, and hardened steels.

**Carbide C3 (K35)**  
(Original T-A® only)

Designed for drilling grey/white cast irons. The special geometry offers substantial increases in penetration rates and provides exceptional edge strength and tool life.

## Port Form Inserts



AM200®



TiAlN

## GEN2 T-A Inserts



AM200®

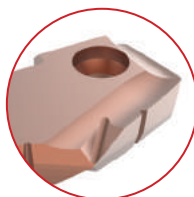
## Original T-A Inserts



TiN

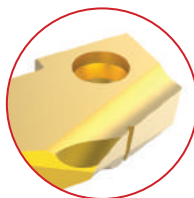
## GEN2 T-A Standard Geometry

- Designed for rigid machining applications, primarily used for drilling exotic and high alloy materials
- Ideal for general use when the surface speed needs to be increased



## Original T-A Standard Geometry

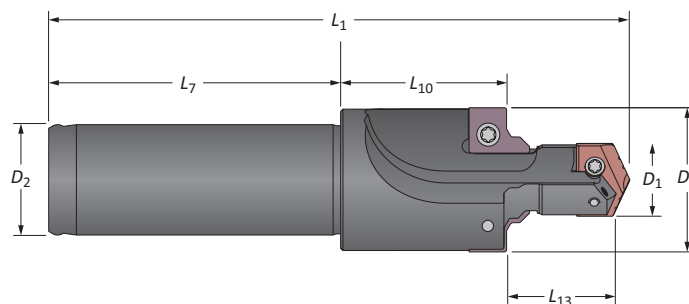
- First choice for machining aluminum
- Enhanced geometry improves chip formation and hole quality
- TiN coating improves heat resistance and extends tool life



## Made-to-Order Tool Specifications

Scan and email a copy of the table below to Allied's Application Engineering Department to receive pricing for a made-to-order AccuPort 432 Port Contour Cutter.

Send emails to [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



| Tube Dash No. | Specification                                | Port Thread Size | D <sub>1</sub> | L <sub>13</sub> | D <sub>5</sub> | L <sub>10</sub> | L <sub>1</sub> | D <sub>2</sub> | L <sub>7</sub> |
|---------------|----------------------------------------------|------------------|----------------|-----------------|----------------|-----------------|----------------|----------------|----------------|
|               | <input type="checkbox"/> J1926               |                  |                |                 |                |                 |                |                |                |
|               | <input type="checkbox"/> ISO 6149            |                  |                |                 |                |                 |                |                |                |
|               | <input type="checkbox"/> ISO 6149 (no ridge) |                  |                |                 |                |                 |                |                |                |
|               | <input type="checkbox"/> JDS-G173.1          |                  |                |                 |                |                 |                |                |                |
|               | <input type="checkbox"/> AS5202              |                  |                |                 |                |                 |                |                |                |

Company Name

Contact Name

Phone

Distributor Name

Fax

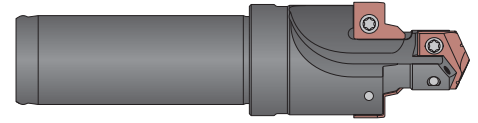




## Product Nomenclature

### AccuPort 432 Holders

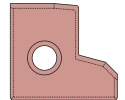
|              |   |           |          |   |             |
|--------------|---|-----------|----------|---|-------------|
| <b>J1926</b> | – | <b>04</b> | <b>Y</b> | – | <b>063F</b> |
| 1            |   | 2         | 3        |   | 4           |



| 1. Port Specifications                                       | 2. Port Tube Dash No. | 3. T-A® Insert Series | 4. Shank Configuration       |                            |
|--------------------------------------------------------------|-----------------------|-----------------------|------------------------------|----------------------------|
| <b>J1926</b> = Imperial - J1926-1                            | <b>04</b> <b>14</b>   | <b>Y</b> = Y series   | <b>Imperial</b>              | <b>Metric</b>              |
| <b>X1926</b> = Imperial - J1926-1<br>(extended minor length) | <b>05</b> <b>16</b>   | <b>Z</b> = Z series   | <b>063F</b> = 5/8" flanged   | <b>16FM</b> = 16mm flanged |
| <b>I6149</b> = Metric (ISO) - 6149-1                         | <b>06</b> <b>18</b>   | <b>0</b> = 0 series   | <b>075F</b> = 3/4" flanged   | <b>20FM</b> = 20mm flanged |
| <b>G1731</b> = John Deere - G173.1                           | <b>08</b> <b>20</b>   | <b>1</b> = 1 series   | <b>100F</b> = 1" flanged     | <b>25FM</b> = 25mm flanged |
| <b>AS5202</b> = Military - AS5202                            | <b>10</b> <b>24</b>   | <b>2</b> = 2 series   | <b>125F</b> = 1-1/4" flanged | <b>32FM</b> = 32mm flanged |
|                                                              | <b>12</b> <b>32</b>   | <b>3</b> = 3 series   | <b>150F</b> = 1-1/2" flanged |                            |
|                                                              |                       | <b>4</b> = 4 series   |                              |                            |

### AccuPort 432 Port Form Inserts

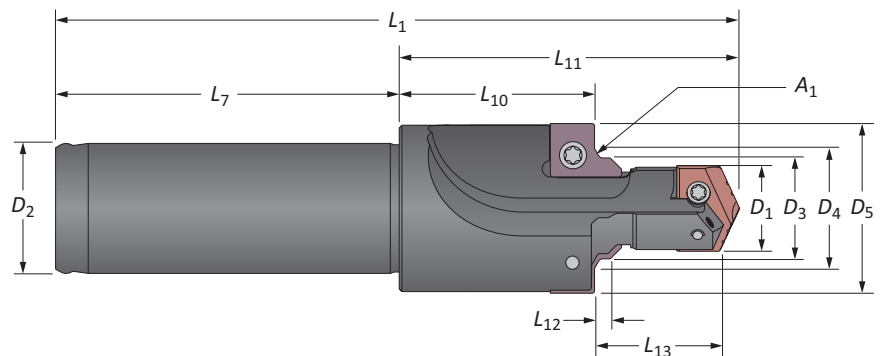
|              |   |           |          |   |           |          |
|--------------|---|-----------|----------|---|-----------|----------|
| <b>J1926</b> | – | <b>02</b> | <b>R</b> | – | <b>C5</b> | <b>A</b> |
| 1            |   | 2         | 3        |   | 4         | 5        |



| 1. Port Specifications                                                                                          | 2. Insert Size                                                                                                                                                                       | 3. Port Specifications                            | 4. Substrate                                     | 5. Coating                            |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------|---------------------------------------|
| <b>J1926</b> = Imperial<br><b>I6149</b> = Metric (ISO)<br><b>G1731</b> = John Deere<br><b>AS5202</b> = Military | <b>02</b> <b>10</b><br><b>03</b> <b>11</b><br><b>04</b> <b>12</b><br><b>05</b> <b>14</b><br><b>06</b> <b>16</b><br><b>07</b> <b>20</b><br><b>08</b> <b>24</b><br><b>09</b> <b>32</b> | <b>Blank</b> = No ID ridge<br><b>R</b> = ID ridge | <b>C5</b> = C5 carbide<br><b>C3</b> = C3 carbide | <b>A</b> = TiAlN<br><b>H</b> = AM200® |

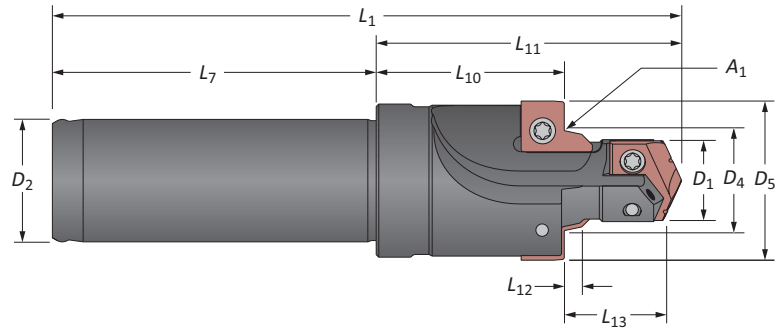
### Reference Key

| Symbol                | Attribute                    |
|-----------------------|------------------------------|
| <b>A<sub>1</sub></b>  | Seal angle                   |
| <b>D<sub>1</sub></b>  | Minor diameter               |
| <b>D<sub>2</sub></b>  | Shank diameter               |
| <b>D<sub>3</sub></b>  | Pilot diameter               |
| <b>D<sub>4</sub></b>  | Seal angle diameter          |
| <b>D<sub>5</sub></b>  | Spot face diameter           |
| <b>L<sub>1</sub></b>  | Overall length               |
| <b>L<sub>7</sub></b>  | Shank length                 |
| <b>L<sub>10</sub></b> | Spot face to shoulder length |
| <b>L<sub>11</sub></b> | Total head length            |
| <b>L<sub>12</sub></b> | Seal angle length            |
| <b>L<sub>13</sub></b> | Minor diameter length        |



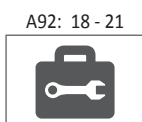
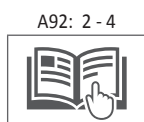
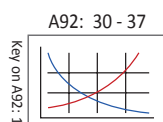
## SAE J-1926 / ISO 11926-1 / MS-16142

## Imperial Shank Holders



| Tube Dash No. | Cutting |            |       | Seal Angle |       |          | Holder   |          |        | Shank |       | Port Thread Size | Part No.       |
|---------------|---------|------------|-------|------------|-------|----------|----------|----------|--------|-------|-------|------------------|----------------|
|               | $D_1$   | $L_{13}^*$ | $D_5$ | $A_1$      | $D_4$ | $L_{12}$ | $L_{11}$ | $L_{10}$ | $L_1$  | $L_7$ | $D_2$ |                  |                |
| -4            | 0.386   | 0.551      | 0.840 | 12°        | 0.490 | 0.106    | 1.527    | 0.896    | 3.402  | 1.875 | 0.625 | 7/16-20 UNF-2B   | J1926-04Y-063F |
| -5            | 0.453   | 0.551      | 0.926 | 12°        | 0.553 | 0.106    | 1.527    | 0.885    | 3.402  | 1.875 | 0.625 | 1/2-20 UNF-2B    | J1926-05Z-063F |
| -6            | 0.512   | 0.610      | 0.989 | 12°        | 0.618 | 0.106    | 1.857    | 1.144    | 3.826  | 1.969 | 0.750 | 9/16-18 UNF-2B   | J1926-060-075F |
| -8            | 0.689   | 0.689      | 1.206 | 15°        | 0.813 | 0.106    | 1.982    | 1.150    | 3.951  | 1.969 | 0.750 | 3/4-16 UNF-2B    | J1926-080-075F |
| -10           | 0.807   | 0.787      | 1.344 | 15°        | 0.945 | 0.106    | 2.140    | 1.185    | 4.421  | 2.281 | 1.000 | 7/8-14 UNF-2B    | J1926-101-100F |
| <b>i</b> -12  | 0.984   | 0.906      | 1.655 | 15°        | 1.150 | 0.138    | 2.640    | 1.530    | 4.921  | 2.281 | 1.250 | 1 1/16-12 UN-2B  | J1926-122-125F |
| -14           | 1.102   | 0.906      | 1.781 | 15°        | 1.276 | 0.138    | 2.640    | 1.504    | 4.921  | 2.281 | 1.250 | 1 3/16-12 UN-2B  | J1926-142-125F |
| -16           | 1.231   | 0.906      | 1.934 | 15°        | 1.400 | 0.138    | 2.640    | 1.477    | 4.921  | 2.281 | 1.250 | 1 5/16-12 UN-2B  | J1926-162-125F |
| -20           | 1.535   | 0.906      | 2.306 | 15°        | 1.715 | 0.138    | 3.062    | 1.835    | 5.750  | 2.688 | 1.500 | 1 5/8-12 UN-2B   | J1926-203-150F |
| -24           | 1.791   | 0.906      | 2.564 | 15°        | 1.965 | 0.138    | 3.062    | 1.778    | 5.750  | 2.688 | 1.500 | 1 7/8-12 UN-2B   | J1926-243-150F |
| -32           | 2.421   | 0.906      | 3.470 | 15°        | 2.589 | 0.138    | 3.812    | 2.393    | 6.500  | 2.688 | 1.500 | 2 1/2-12 UN-2B   | J1926-324-150F |
| <b>m</b> -4   | 9.80    | 14.00      | 21.30 | 12°        | 12.50 | 2.70     | 38.80    | 22.80    | 86.40  | 47.60 | 15.90 | 7/16-20 UNF-2B   | J1926-04Y-063F |
| -5            | 11.50   | 14.00      | 23.50 | 12°        | 14.10 | 2.70     | 38.80    | 22.50    | 86.40  | 47.60 | 15.90 | 1/2-20 UNF-2B    | J1926-05Z-063F |
| -6            | 13.00   | 15.50      | 25.10 | 12°        | 15.70 | 2.70     | 47.20    | 29.00    | 97.20  | 50.00 | 19.10 | 9/16-18 UNF-2B   | J1926-060-075F |
| -8            | 17.50   | 17.50      | 30.60 | 15°        | 20.70 | 2.70     | 50.30    | 29.20    | 100.40 | 50.00 | 19.10 | 3/4-16 UNF-2B    | J1926-080-075F |
| -10           | 20.50   | 20.00      | 34.10 | 15°        | 24.00 | 2.70     | 54.40    | 30.10    | 112.30 | 57.90 | 25.40 | 7/8-14 UNF-2B    | J1926-101-100F |
| <b>m</b> -12  | 25.00   | 23.00      | 42.00 | 15°        | 29.20 | 3.50     | 67.10    | 38.90    | 125.00 | 57.90 | 31.80 | 1 1/16-12 UN-2B  | J1926-122-125F |
| -14           | 28.00   | 23.00      | 45.20 | 15°        | 32.40 | 3.50     | 67.10    | 38.20    | 125.00 | 57.90 | 31.80 | 1 3/16-12 UN-2B  | J1926-142-125F |
| -16           | 31.20   | 23.00      | 49.10 | 15°        | 35.60 | 3.50     | 67.10    | 37.50    | 125.00 | 57.90 | 31.80 | 1 5/16-12 UN-2B  | J1926-162-125F |
| -20           | 39.00   | 23.00      | 58.50 | 15°        | 43.60 | 3.50     | 77.80    | 46.60    | 146.00 | 68.30 | 38.10 | 1 5/8-12 UN-2B   | J1926-203-150F |
| -24           | 45.50   | 23.00      | 65.10 | 15°        | 49.90 | 3.50     | 77.80    | 45.20    | 146.00 | 68.30 | 38.10 | 1 7/8-12 UN-2B   | J1926-243-150F |
| -32           | 61.50   | 23.00      | 88.10 | 15°        | 65.80 | 3.50     | 96.80    | 60.80    | 165.10 | 68.30 | 38.10 | 2 1/2-12 UN-2B   | J1926-324-150F |

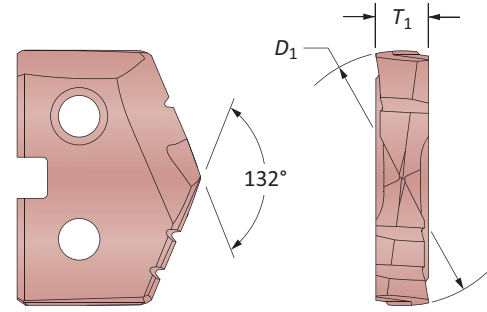
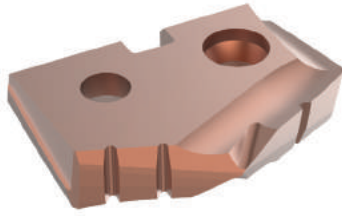
\*Port contour cutters are available with extended pilot length ( $L_{13}$ ). See pages A92: 10-11 for items.



**i** = Imperial (in)  
**m** = Metric (mm)

# SAE J-1926 / ISO 11926-1 / MS-16142

## Inserts



See section A3 for complete T-A insert details

### Original T-A® / GEN2 T-A® Drill Inserts

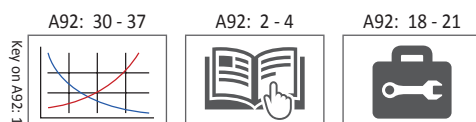
| Tube Dash No. | AccuPort Part No. | T-A® Insert Series | Part No.     |             | Insert Screw | Insert Driver | Admissible Tightening Torque* |
|---------------|-------------------|--------------------|--------------|-------------|--------------|---------------|-------------------------------|
|               |                   |                    | Super Cobalt | Carbide     |              |               |                               |
| -4            | J1926-04Y-063F    | Y                  | 45YH-.386    | 4C1YH-.386  | 724-IP7-1    | 8IP-7         | 7.4 in/lbs (84 N-cm)          |
| -5            | J1926-05Z-063F    | Z                  | 45ZH-11.5    | 4C1ZH-11.5  | 7247-IP7-1   | 8IP-7         | 7.4 in/lbs (84 N-cm)          |
| -6            | J1926-060-075F    | 0                  | 450H-13      | 4C10H-13    | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -8            | J1926-080-075F    | 0                  | 450H-0022    | 4C10H-0022  | 72567-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -10           | J1926-101-100F    | 1                  | 451H-20.5    | 4C11H-20.5  | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)        |
| -12           | J1926-122-125F    | 2                  | 452H-25      | 4C12H-25    | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -14           | J1926-142-125F    | 2                  | 452H-28      | 4C12H-28    | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -16           | J1926-162-125F    | 2                  | 452H-1.231   | 4C12H-1.231 | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -20           | J1926-203-150F    | 3                  | 453H-39      | 1C53A-39    | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)      |
| -24           | J1926-243-150F    | 3                  | 453H-45.5    | 1C53A-45.5  | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)      |
| -32           | J1926-324-150F    | 4                  | 454H-61.5    | -           | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)      |

\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

### Port Form Drill Inserts

| Tube Dash No. | AccuPort Part No. | Part No.            |                    | Insert Screw | Insert Driver | Admissible Tightening Torque* |
|---------------|-------------------|---------------------|--------------------|--------------|---------------|-------------------------------|
|               |                   | C3 Carbide (AM200®) | C5 Carbide (TiAlN) |              |               |                               |
| -4            | J1926-04Y-063F    | J1926-02-C3H        | J1926-02-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -5            | J1926-05Z-063F    | J1926-03-C3H        | J1926-03-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -6            | J1926-060-075F    | J1926-03-C3H        | J1926-03-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -8            | J1926-080-075F    | J1926-07-C3H        | J1926-07-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -10           | J1926-101-100F    | J1926-04-C3H        | J1926-04-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -12           | J1926-122-125F    | J1926-08-C3H        | J1926-08-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -14           | J1926-142-125F    | J1926-08-C3H        | J1926-08-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -16           | J1926-162-125F    | J1926-09-C3H        | J1926-09-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)        |
| -20           | J1926-203-150F    | J1926-10-C3H        | J1926-10-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)        |
| -24           | J1926-243-150F    | J1926-11-C3H        | J1926-11-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)        |
| -32           | J1926-324-150F    | J1926-12-C3H        | J1926-12-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)        |

\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

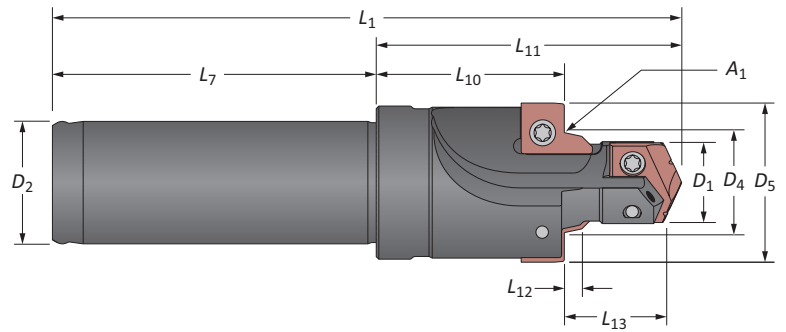


Y - 2 series T-A inserts sold in multiples of 2  
3 - 4 series T-A inserts sold in multiples of 1  
Port form inserts sold in multiples of 2  
Insert screws sold in multiples of 10



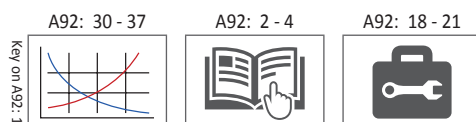
## SAE J-1926 / ISO 11926-1 / MS-16142

## Metric Shank Holders



| Tube Dash No. | Cutting |          |       | Seal Angle |       |          | Holder   |          |        | Shank |       | Port Thread Size | Part No.        |
|---------------|---------|----------|-------|------------|-------|----------|----------|----------|--------|-------|-------|------------------|-----------------|
|               | $D_1$   | $L_{13}$ | $D_5$ | $A_1$      | $D_4$ | $L_{12}$ | $L_{11}$ | $L_{10}$ | $L_1$  | $L_7$ | $D_2$ |                  |                 |
| -4            | 0.386   | 0.551    | 0.840 | 12°        | 0.490 | 0.106    | 1.527    | 0.896    | 3.180  | 1.650 | 0.630 | 7/16-20 UNF-2B   | J1926-04Y-16FM  |
| -5            | 0.453   | 0.551    | 0.926 | 12°        | 0.553 | 0.106    | 1.527    | 0.885    | 3.650  | 1.650 | 0.630 | 1/2-20 UNF-2B    | J1926-05Z-16FM  |
| -6            | 0.512   | 0.610    | 0.989 | 12°        | 0.618 | 0.106    | 1.857    | 1.144    | 3.510  | 1.650 | 0.787 | 9/16-18 UNF-2B   | J1926-060-20FM  |
| -8            | 0.689   | 0.689    | 1.206 | 15°        | 0.813 | 0.106    | 1.982    | 1.150    | 3.630  | 1.650 | 0.787 | 3/4-16 UNF-2B    | J1926-080-20FM  |
| -10           | 0.807   | 0.787    | 1.344 | 15°        | 0.945 | 0.106    | 2.140    | 1.185    | 4.230  | 2.091 | 0.984 | 7/8-14 UNF-2B    | J1926-101-25FM  |
| i -12         | 0.984   | 0.906    | 1.655 | 15°        | 1.150 | 0.138    | 2.640    | 1.530    | 4.920  | 2.280 | 1.260 | 1 1/16-12 UN-2B  | J1926-122-32FM  |
| -14           | 1.102   | 0.906    | 1.781 | 15°        | 1.276 | 0.138    | 2.640    | 1.504    | 4.920  | 2.280 | 1.260 | 1 3/16-12 UN-2B  | J1926-142-32FM  |
| -16           | 1.231   | 0.906    | 1.934 | 15°        | 1.400 | 0.138    | 2.640    | 1.477    | 4.920  | 2.280 | 1.260 | 1 5/16-12 UN-2B  | J1926-162-32FM  |
| -20           | 1.535   | 0.906    | 2.306 | 15°        | 1.715 | 0.138    | 3.062    | 1.835    | 5.640  | 2.580 | 1.260 | 1 5/8-12 UN-2B   | J1926-203-32FM* |
| -24           | 1.791   | 0.906    | 2.564 | 15°        | 1.965 | 0.138    | 3.062    | 1.778    | 5.640  | 2.580 | 1.260 | 1 7/8-12 UN-2B   | J1926-243-32FM* |
| -32           | 2.421   | 0.906    | 3.470 | 15°        | 2.589 | 0.138    | 3.812    | 2.393    | 6.390  | 2.580 | 1.260 | 2 1/2-12 UN-2B   | J1926-324-32FM* |
|               |         |          |       |            |       |          |          |          |        |       |       |                  |                 |
| -4            | 9.80    | 14.00    | 21.30 | 12°        | 12.50 | 2.70     | 38.80    | 22.80    | 80.70  | 41.90 | 16.00 | 7/16-20 UNF-2B   | J1926-04Y-16FM  |
| -5            | 11.50   | 14.00    | 23.50 | 12°        | 14.10 | 2.70     | 38.80    | 22.50    | 92.80  | 41.90 | 16.00 | 1/2-20 UNF-2B    | J1926-05Z-16FM  |
| -6            | 13.00   | 15.50    | 25.10 | 12°        | 15.70 | 2.70     | 47.20    | 29.00    | 89.10  | 41.90 | 20.00 | 9/16-18 UNF-2B   | J1926-060-20FM  |
| -8            | 17.50   | 17.50    | 30.60 | 15°        | 20.70 | 2.70     | 50.30    | 29.20    | 92.30  | 41.90 | 20.00 | 3/4-16 UNF-2B    | J1926-080-20FM  |
| -10           | 20.50   | 20.00    | 34.10 | 15°        | 24.00 | 2.70     | 54.40    | 30.10    | 107.40 | 53.10 | 25.00 | 7/8-14 UNF-2B    | J1926-101-25FM  |
| m -12         | 25.00   | 23.00    | 42.00 | 15°        | 29.20 | 3.50     | 67.10    | 38.90    | 125.00 | 57.90 | 32.00 | 1 1/16-12 UN-2B  | J1926-122-32FM  |
| -14           | 28.00   | 23.00    | 45.20 | 15°        | 32.40 | 3.50     | 67.10    | 38.20    | 125.00 | 57.90 | 32.00 | 1 3/16-12 UN-2B  | J1926-142-32FM  |
| -16           | 31.20   | 23.00    | 49.10 | 15°        | 35.60 | 3.50     | 67.10    | 37.50    | 125.00 | 57.90 | 32.00 | 1 5/16-12 UN-2B  | J1926-162-32FM  |
| -20           | 39.00   | 23.00    | 58.50 | 15°        | 43.60 | 3.50     | 77.80    | 46.60    | 143.30 | 65.50 | 32.00 | 1 5/8-12 UN-2B   | J1926-203-32FM* |
| -24           | 45.50   | 23.00    | 65.10 | 15°        | 49.90 | 3.50     | 77.80    | 45.20    | 143.30 | 65.50 | 32.00 | 1 7/8-12 UN-2B   | J1926-243-32FM* |
| -32           | 61.50   | 23.00    | 88.10 | 15°        | 65.80 | 3.50     | 96.80    | 60.80    | 162.30 | 65.50 | 32.00 | 2 1/2-12 UN-2B   | J1926-324-32FM* |

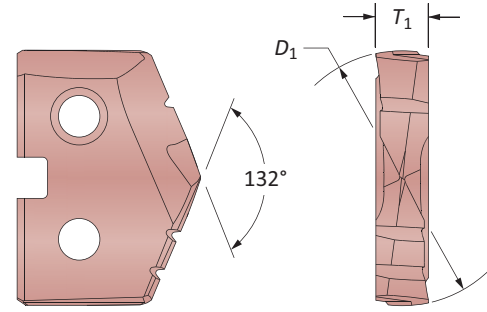
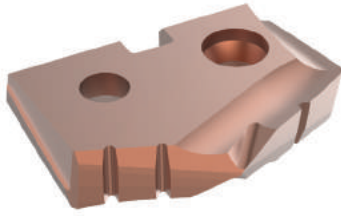
**\*NOTICE:** Due to the cutting forces generated by this tool, a mechanical chuck is required. Please contact Application Engineering with any questions.



i = Imperial (in)  
m = Metric (mm)

## SAE J-1926 / ISO 11926-1 / MS-16142

## Inserts



See section A3 for complete T-A insert details

## Original T-A® / GEN2 T-A® Drill Inserts

| Tube Dash No. | AccuPort Part No. | T-A® Insert Series | Part No.     |             | Insert Screw | Insert Driver | Admissible Tightening Torque** |
|---------------|-------------------|--------------------|--------------|-------------|--------------|---------------|--------------------------------|
|               |                   |                    | Super Cobalt | Carbide     |              |               |                                |
| -4            | J1926-04Y-16FM    | Y                  | 45YH-.386    | 4C1YH-.386  | 724-IP7-1    | 8IP-7         | 7.4 in/lbs (84 N-cm)           |
| -5            | J1926-05Z-16FM    | Z                  | 45ZH-11.5    | 4C1ZH-11.5  | 7247-IP7-1   | 8IP-7         | 7.4 in/lbs (84 N-cm)           |
| -6            | J1926-060-20FM    | 0                  | 450H-13      | 4C10H-13    | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -8            | J1926-080-20FM    | 0                  | 450H-0022    | 4C10H-0022  | 72567-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -10           | J1926-101-25FM    | 1                  | 451H-20.5    | 4C11H-20.5  | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -12           | J1926-122-32FM    | 2                  | 452H-25      | 4C12H-25    | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)         |
| -14           | J1926-142-32FM    | 2                  | 452H-28      | 4C12H-28    | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)         |
| -16           | J1926-162-32FM    | 2                  | 452H-1.231   | 4C12H-1.231 | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)         |
| -20           | J1926-203-32FM*   | 3                  | 453H-39      | 1C53A-39    | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)       |
| -24           | J1926-243-32FM*   | 3                  | 453H-45.5    | 1C53A-45.5  | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)       |
| -32           | J1926-324-32FM*   | 4                  | 454H-61.5    | —           | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)       |

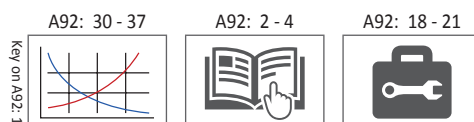
\*NOTICE: Due to the cutting forces generated by this tool, a mechanical chuck is required. Please contact Application Engineering with any questions.

\*\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

## Port Form Drill Inserts

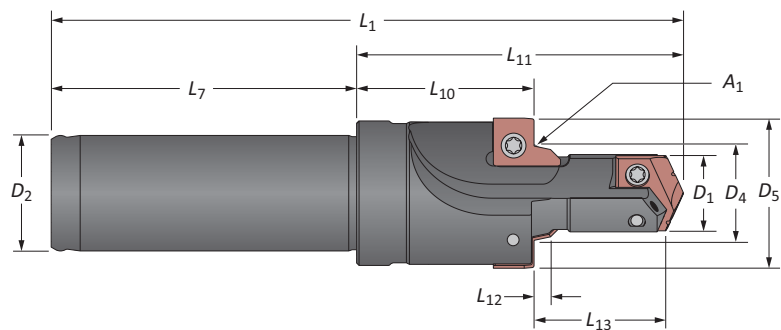
| Tube Dash No. | AccuPort Part No. | Part No.            |                    | Insert Screw | Insert Driver | Admissible Tightening Torque** |
|---------------|-------------------|---------------------|--------------------|--------------|---------------|--------------------------------|
|               |                   | C3 Carbide (AM200®) | C5 Carbide (TiAlN) |              |               |                                |
| -4            | J1926-04Y-16FM    | J1926-02-C3H        | J1926-02-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -5            | J1926-05Z-16FM    | J1926-03-C3H        | J1926-03-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -6            | J1926-060-20FM    | J1926-03-C3H        | J1926-03-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -8            | J1926-080-20FM    | J1926-07-C3H        | J1926-07-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -10           | J1926-101-25FM    | J1926-04-C3H        | J1926-04-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -12           | J1926-122-32FM    | J1926-08-C3H        | J1926-08-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -14           | J1926-142-32FM    | J1926-08-C3H        | J1926-08-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -16           | J1926-162-32FM    | J1926-09-C3H        | J1926-09-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -20           | J1926-203-32FM*   | J1926-10-C3H        | J1926-10-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -24           | J1926-243-32FM*   | J1926-11-C3H        | J1926-11-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -32           | J1926-324-32FM*   | J1926-12-C3H        | J1926-12-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |

\*NOTICE: Due to the cutting forces generated by this tool, a mechanical chuck is required. Please contact Application Engineering with any questions.

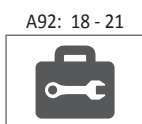
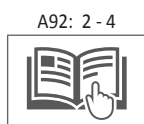
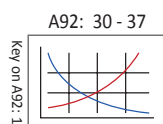
\*\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

Y - 2 series T-A inserts sold in multiples of 2  
 3 - 4 series T-A inserts sold in multiples of 1  
 Port form inserts sold in multiples of 2  
 Insert screws sold in multiples of 10

# SAE J-1926 / ISO 11926-1 / MS-16142

Imperial Shank Holders | Extended Minor Diameter Lengths ( $L_{13}$ )


| Tube Dash No. | Cutting |          |       | Seal Angle |       |          | Holder   |          |        | Shank |       | Port Thread Size | Part No.       |
|---------------|---------|----------|-------|------------|-------|----------|----------|----------|--------|-------|-------|------------------|----------------|
|               | $D_1$   | $L_{13}$ | $D_5$ | $A_1$      | $D_4$ | $L_{12}$ | $L_{11}$ | $L_{10}$ | $L_1$  | $L_7$ | $D_2$ |                  |                |
| -4            | 0.386   | 0.801    | 0.840 | 12°        | 0.490 | 0.106    | 1.777    | 0.896    | 3.650  | 1.875 | 0.625 | 7/16-20 UNF-2B   | X1926-04Y-063F |
| -5            | 0.453   | 0.801    | 0.926 | 12°        | 0.553 | 0.106    | 1.777    | 0.885    | 3.650  | 1.875 | 0.625 | 1/2-20 UNF-2B    | X1926-05Z-063F |
| -6            | 0.512   | 0.860    | 0.989 | 12°        | 0.618 | 0.106    | 2.107    | 1.144    | 4.070  | 1.969 | 0.750 | 9/16-18 UNF-2B   | X1926-060-075F |
| -8            | 0.689   | 0.939    | 1.206 | 15°        | 0.813 | 0.106    | 2.232    | 1.150    | 4.200  | 1.969 | 0.750 | 3/4-16 UNF-2B    | X1926-080-075F |
| -10           | 0.807   | 1.037    | 1.344 | 15°        | 0.945 | 0.106    | 2.390    | 1.185    | 4.670  | 2.281 | 1.000 | 7/8-14 UNF-2B    | X1926-101-100F |
| i -12         | 0.984   | 1.156    | 1.655 | 15°        | 1.150 | 0.138    | 2.890    | 1.530    | 5.170  | 2.281 | 1.250 | 1 1/16-12 UN-2B  | X1926-122-125F |
| -14           | 1.102   | 1.156    | 1.781 | 15°        | 1.276 | 0.138    | 2.890    | 1.504    | 5.170  | 2.281 | 1.250 | 1 3/16-12 UN-2B  | X1926-142-125F |
| -16           | 1.231   | 1.156    | 1.934 | 15°        | 1.400 | 0.138    | 2.890    | 1.477    | 5.170  | 2.281 | 1.250 | 1 5/16-12 UN-2B  | X1926-162-125F |
| -20           | 1.535   | 1.156    | 2.306 | 15°        | 1.715 | 0.138    | 3.312    | 1.835    | 6.000  | 2.688 | 1.500 | 1 5/8-12 UN-2B   | X1926-203-150F |
| -24           | 1.791   | 1.156    | 2.564 | 15°        | 1.965 | 0.138    | 3.312    | 1.778    | 6.000  | 2.688 | 1.500 | 1 7/8-12 UN-2B   | X1926-243-150F |
| -32           | 2.421   | 1.156    | 3.470 | 15°        | 2.589 | 0.138    | 4.062    | 2.393    | 6.750  | 2.688 | 1.500 | 2 1/2-12 UN-2B   | X1926-324-150F |
| m -4          | 9.80    | 20.30    | 21.30 | 12°        | 12.50 | 2.70     | 45.10    | 22.80    | 92.80  | 47.60 | 15.90 | 7/16-20 UNF-2B   | X1926-04Y-063F |
| -5            | 11.50   | 20.30    | 23.50 | 12°        | 14.10 | 2.70     | 45.10    | 22.50    | 92.80  | 47.60 | 15.90 | 1/2-20 UNF-2B    | X1926-05Z-063F |
| -6            | 13.00   | 21.80    | 25.10 | 12°        | 15.70 | 2.70     | 53.50    | 29.00    | 103.50 | 50.00 | 19.10 | 9/16-18 UNF-2B   | X1926-060-075F |
| -8            | 17.50   | 23.80    | 30.60 | 15°        | 20.70 | 2.70     | 56.70    | 29.20    | 106.70 | 50.00 | 19.10 | 3/4-16 UNF-2B    | X1926-080-075F |
| -10           | 20.50   | 26.30    | 34.10 | 15°        | 24.00 | 2.70     | 60.70    | 30.10    | 118.60 | 57.90 | 25.40 | 7/8-14 UNF-2B    | X1926-101-100F |
| m -12         | 25.00   | 29.30    | 42.00 | 15°        | 29.20 | 3.50     | 73.40    | 38.90    | 131.30 | 57.90 | 31.80 | 1 1/16-12 UN-2B  | X1926-122-125F |
| -14           | 28.00   | 29.30    | 45.20 | 15°        | 32.40 | 3.50     | 73.40    | 38.20    | 131.30 | 57.90 | 31.80 | 1 3/16-12 UN-2B  | X1926-142-125F |
| -16           | 31.20   | 29.30    | 49.10 | 15°        | 35.60 | 3.50     | 73.40    | 37.50    | 131.30 | 57.90 | 31.80 | 1 5/16-12 UN-2B  | X1926-162-125F |
| -20           | 39.00   | 29.30    | 58.50 | 15°        | 43.60 | 3.50     | 84.10    | 46.60    | 152.40 | 68.30 | 38.10 | 1 5/8-12 UN-2B   | X1926-203-150F |
| -24           | 45.50   | 29.30    | 65.10 | 15°        | 49.90 | 3.50     | 84.10    | 45.20    | 152.40 | 68.30 | 38.10 | 1 7/8-12 UN-2B   | X1926-243-150F |
| -32           | 61.50   | 29.30    | 88.10 | 15°        | 65.80 | 3.50     | 103.20   | 60.80    | 171.40 | 68.30 | 38.10 | 2 1/2-12 UN-2B   | X1926-324-150F |

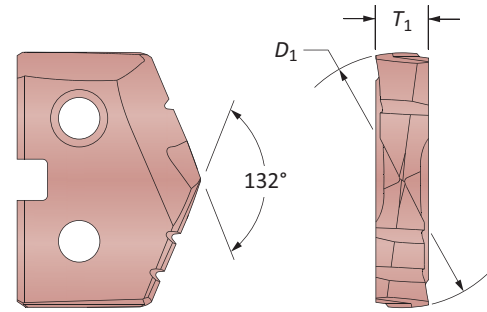
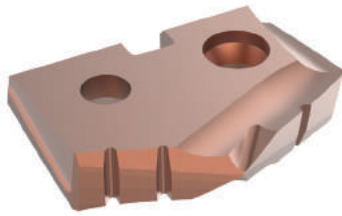


i = Imperial (in)  
m = Metric (mm)



## SAE J-1926 / ISO 11926-1 / MS-16142

## Inserts



See section A3 for complete T-A insert details

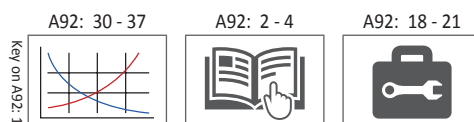
## Original T-A® / GEN2 T-A® Drill Inserts

| Tube Dash No. | AccuPort Part No. | T-A® Insert Series | Part No.     |             | Insert Screw | Insert Driver | Admissible Tightening Torque* |
|---------------|-------------------|--------------------|--------------|-------------|--------------|---------------|-------------------------------|
|               |                   |                    | Super Cobalt | Carbide     |              |               |                               |
| -4            | X1926-04Y-063F    | Y                  | 45YH-.386    | 4C1YH-.386  | 724-IP7-1    | 8IP-7         | 7.4 in/lbs (84 N-cm)          |
| -5            | X1926-05Z-063F    | Z                  | 45ZH-11.5    | 4C1ZH-11.5  | 7247-IP7-1   | 8IP-7         | 7.4 in/lbs (84 N-cm)          |
| -6            | X1926-060-075F    | 0                  | 450H-13      | 4C10H-13    | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -8            | X1926-080-075F    | 0                  | 450H-0022    | 4C10H-0022  | 72567-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -10           | X1926-101-100F    | 1                  | 451H-20.5    | 4C11H-20.5  | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)        |
| -12           | X1926-122-125F    | 2                  | 452H-25      | 4C12H-25    | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -14           | X1926-142-125F    | 2                  | 452H-28      | 4C12H-28    | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -16           | X1926-162-125F    | 2                  | 452H-1.231   | 4C12H-1.231 | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -20           | X1926-203-150F    | 3                  | 453H-39      | 1C53A-39    | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)      |
| -24           | X1926-243-150F    | 3                  | 453H-45.5    | 1C53A-45.5  | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)      |
| -32           | X1926-324-150F    | 4                  | 454H-61.5    | —           | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)      |

\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

## Port Form Drill Inserts

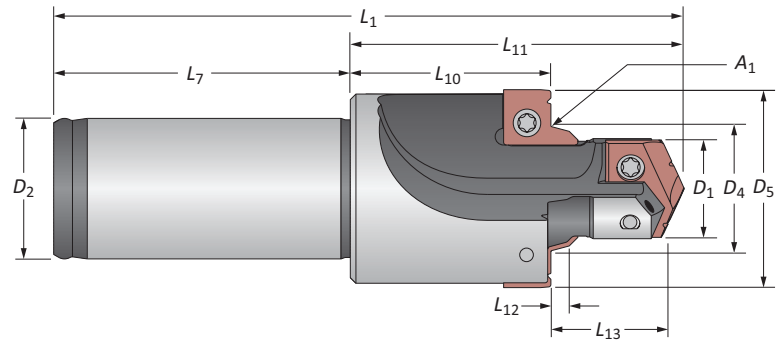
| Tube Dash No. | AccuPort Part No. | Part No.            |                    | Insert Screw | Insert Driver | Admissible Tightening Torque* |
|---------------|-------------------|---------------------|--------------------|--------------|---------------|-------------------------------|
|               |                   | C3 Carbide (AM200®) | C5 Carbide (TiAlN) |              |               |                               |
| -4            | X1926-04Y-063F    | J1926-02-C3H        | J1926-02-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -5            | X1926-05Z-063F    | J1926-03-C3H        | J1926-03-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -6            | X1926-060-075F    | J1926-03-C3H        | J1926-03-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -8            | X1926-080-075F    | J1926-07-C3H        | J1926-07-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -10           | X1926-101-100F    | J1926-04-C3H        | J1926-04-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -12           | X1926-122-125F    | J1926-08-C3H        | J1926-08-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -14           | X1926-142-125F    | J1926-08-C3H        | J1926-08-C5A       | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -16           | X1926-162-125F    | J1926-09-C3H        | J1926-09-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)        |
| -20           | X1926-203-150F    | J1926-10-C3H        | J1926-10-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)        |
| -24           | X1926-243-150F    | J1926-11-C3H        | J1926-11-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)        |
| -32           | X1926-324-150F    | J1926-12-C3H        | J1926-12-C5A       | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)        |

\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

Y - 2 series T-A inserts sold in multiples of 2  
 3 - 4 series T-A inserts sold in multiples of 1  
 Port form inserts sold in multiples of 2  
 Insert screws sold in multiples of 10

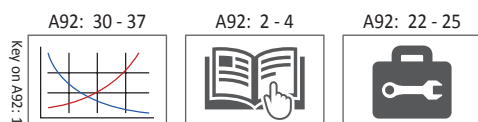
# ISO 6149-1:2006 / SAE J-2244/1

## Metric Shank Holders



| Tube Dash No. | Cutting        |                 |                | Seal Angle     |                |                 | Holder          |                 |                | Shank          |                | Port Thread Size | Part No.         |
|---------------|----------------|-----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|------------------|------------------|
|               | D <sub>1</sub> | L <sub>13</sub> | D <sub>5</sub> | A <sub>1</sub> | D <sub>4</sub> | L <sub>12</sub> | L <sub>11</sub> | L <sub>10</sub> | L <sub>1</sub> | L <sub>7</sub> | D <sub>2</sub> |                  |                  |
| -4            | 0.413          | 0.556           | 0.945          | 15°            | 0.544          | 0.102           | 1.527           | 0.876           | 3.180          | 1.650          | 0.630          | M12 X 1.5        | I6149-04RY-16FM  |
| -5            | 0.492          | 0.556           | 1.024          | 15°            | 0.623          | 0.102           | 1.527           | 0.858           | 3.180          | 1.650          | 0.630          | M14 X 1.5        | I6149-05RZ-16FM  |
| -6            | 0.571          | 0.615           | 1.102          | 15°            | 0.702          | 0.102           | 1.857           | 1.116           | 3.510          | 1.650          | 0.787          | M16 X 1.5        | I6149-06R0-20FM  |
| -8            | 0.650          | 0.674           | 1.181          | 15°            | 0.781          | 0.102           | 1.982           | 1.164           | 3.630          | 1.650          | 0.787          | M18 X 1.5        | I6149-08R0-20FM  |
| -10           | 0.807          | 0.717           | 1.339          | 15°            | 0.938          | 0.102           | 2.140           | 1.246           | 4.230          | 2.091          | 0.984          | M22 X 1.5        | I6149-10R1-25FM  |
| i -12         | 0.984          | 0.874           | 1.575          | 15°            | 1.159          | 0.130           | 2.640           | 1.552           | 4.920          | 2.280          | 1.260          | M27 X 2          | I6149-12R2-32FM  |
| -14           | 1.102          | 0.874           | 1.733          | 15°            | 1.277          | 0.130           | 2.640           | 1.526           | 4.920          | 2.280          | 1.260          | M30 X 2          | I6149-14R2-32FM  |
| -16           | 1.220          | 0.874           | 1.929          | 15°            | 1.395          | 0.130           | 2.640           | 1.499           | 4.920          | 2.280          | 1.260          | M33 X 2          | I6149-16R2-32FM  |
| -20           | 1.575          | 0.895           | 2.362          | 15°            | 1.749          | 0.130           | 3.062           | 1.828           | 5.640          | 2.580          | 1.260          | M42 X 2          | I6149-20R3-32FM* |
| -24           | 1.811          | 0.993           | 2.602          | 15°            | 1.985          | 0.130           | 3.062           | 1.676           | 5.640          | 2.580          | 1.260          | M48 X 2          | I6149-24R3-32FM* |
| -32           | 2.283          | 1.092           | 2.992          | 15°            | 2.458          | 0.130           | 3.812           | 2.228           | 6.390          | 2.580          | 1.260          | M60 X 2          | I6149-32R4-32FM* |
|               |                |                 |                |                |                |                 |                 |                 |                |                |                |                  |                  |
| -4            | 10.50          | 14.10           | 24.00          | 15°            | 13.81          | 2.60            | 38.80           | 22.20           | 80.70          | 41.90          | 16.00          | M12 X 1.5        | I6149-04RY-16FM  |
| -5            | 12.50          | 14.10           | 26.00          | 15°            | 15.80          | 2.60            | 38.80           | 21.80           | 80.70          | 41.90          | 16.00          | M14 X 1.5        | I6149-05RZ-16FM  |
| -6            | 14.50          | 15.60           | 28.00          | 15°            | 17.80          | 2.60            | 47.20           | 28.30           | 89.10          | 41.90          | 20.00          | M16 X 1.5        | I6149-06R0-20FM  |
| -8            | 16.50          | 17.10           | 30.00          | 15°            | 19.80          | 2.60            | 50.30           | 29.60           | 92.20          | 41.90          | 20.00          | M18 X 1.5        | I6149-08R0-20FM  |
| -10           | 20.50          | 18.20           | 34.00          | 15°            | 23.80          | 2.60            | 54.40           | 31.60           | 107.50         | 53.10          | 25.00          | M22 X 1.5        | I6149-10R1-25FM  |
| m -12         | 25.00          | 22.20           | 40.00          | 15°            | 29.40          | 3.30            | 67.10           | 39.40           | 125.00         | 57.90          | 32.00          | M27 X 2          | I6149-12R2-32FM  |
| -14           | 28.00          | 22.20           | 44.00          | 15°            | 32.40          | 3.30            | 67.10           | 38.80           | 125.00         | 57.90          | 32.00          | M30 X 2          | I6149-14R2-32FM  |
| -16           | 31.00          | 22.20           | 49.00          | 15°            | 35.40          | 3.30            | 67.10           | 38.10           | 125.00         | 57.90          | 32.00          | M33 X 2          | I6149-16R2-32FM  |
| -20           | 40.00          | 22.70           | 60.00          | 15°            | 44.40          | 3.30            | 77.80           | 46.40           | 143.30         | 65.50          | 32.00          | M42 X 2          | I6149-20R3-32FM* |
| -24           | 46.00          | 25.20           | 66.10          | 15°            | 50.40          | 3.30            | 77.80           | 42.60           | 143.30         | 65.50          | 32.00          | M48 X 2          | I6149-24R3-32FM* |
| -32           | 58.00          | 27.70           | 76.00          | 15°            | 62.40          | 3.30            | 96.80           | 56.60           | 162.30         | 65.50          | 32.00          | M60 X 2          | I6149-32R4-32FM* |

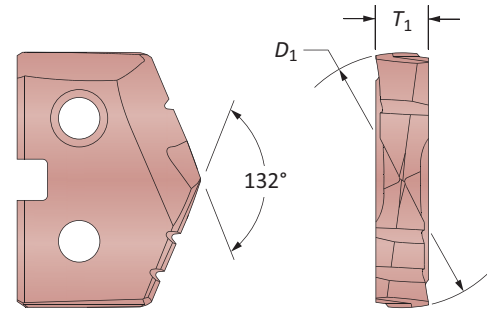
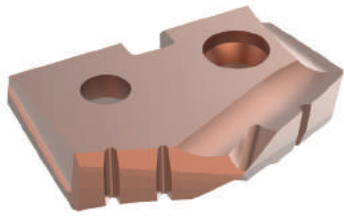
**\*NOTICE:** Due to the cutting forces generated by this tool, a mechanical chuck is required. Please contact Application Engineering with any questions.



i = Imperial (in)  
m = Metric (mm)

## ISO 6149-1:2006 / SAE J-2244/1

## Inserts



See section A3 for complete T-A insert details

## Original T-A® / GEN2 T-A® Drill Inserts

| Tube Dash No. | AccuPort Part No. | T-A® Insert Series | Part No.     |            | Insert Screw | Insert Driver | Admissible Tightening Torque** |
|---------------|-------------------|--------------------|--------------|------------|--------------|---------------|--------------------------------|
|               |                   |                    | Super Cobalt | Carbide    |              |               |                                |
| -4            | I6149-04RY-16FM   | Y                  | 45YH-10.5    | 4C1YH-10.5 | 724-IP7-1    | 8IP-7         | 7.4 in/lbs (84 N-cm)           |
| -5            | I6149-05RZ-16FM   | Z                  | 45ZH-12.5    | 4C1ZH-12.5 | 7247-IP7-1   | 8IP-7         | 7.4 in/lbs (84 N-cm)           |
| -6            | I6149-06R0-20FM   | 0                  | 450H-14.5    | 4C10H-14.5 | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -8            | I6149-08R0-20FM   | 0                  | 450H-16.5    | 4C10H-16.5 | 72567-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -10           | I6149-10R1-25FM   | 1                  | 451H-20.5    | 4C11H-20.5 | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -12           | I6149-12R2-32FM   | 2                  | 452H-25      | 4C12H-25   | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)         |
| -14           | I6149-14R2-32FM   | 2                  | 452H-28      | 4C12H-28   | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)         |
| -16           | I6149-16R2-32FM   | 2                  | 452H-31      | 4C12H-31   | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)         |
| -20           | I6149-20R3-32FM*  | 3                  | 453H-40      | 1C53A-40   | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)       |
| -24           | I6149-24R3-32FM*  | 3                  | 453H-46      | 1C53A-46   | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)       |
| -32           | I6149-32R4-32FM*  | 4                  | 454H-58      | —          | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)       |

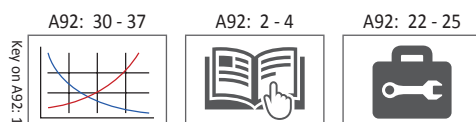
\*NOTICE: Due to the cutting forces generated by this tool, a mechanical chuck is required. Please contact Application Engineering with any questions.

\*\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

## Port Form Drill Inserts

| Tube Dash No. | AccuPort Part No. | Part No. - C3 Carbide (AM200®) |              | Part No. - C5 Carbide (TiAlN) |              | Insert Screw | Insert Driver | Admissible Tightening Torque** |
|---------------|-------------------|--------------------------------|--------------|-------------------------------|--------------|--------------|---------------|--------------------------------|
|               |                   | ID Ridge                       | No ID Ridge  | ID Ridge                      | No ID Ridge  |              |               |                                |
| -4            | I6149-04RY-16FM   | I6149-04R-C3H                  | I6149-04-C3H | I6149-04R-C5A                 | I6149-04-C5A | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -5            | I6149-05RZ-16FM   | I6149-04R-C3H                  | I6149-04-C3H | I6149-04R-C5A                 | I6149-04-C5A | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -6            | I6149-06R0-20FM   | I6149-06R-C3H                  | I6149-06-C3H | I6149-06R-C5A                 | I6149-06-C5A | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -8            | I6149-08R0-20FM   | I6149-06R-C3H                  | I6149-06-C3H | I6149-06R-C5A                 | I6149-06-C5A | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -10           | I6149-10R1-25FM   | I6149-04R-C3H                  | I6149-04-C3H | I6149-04R-C5A                 | I6149-04-C5A | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -12           | I6149-12R2-32FM   | I6149-12R-C3H                  | I6149-12-C3H | I6149-12R-C5A                 | I6149-12-C5A | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -14           | I6149-14R2-32FM   | I6149-14R-C3H                  | I6149-14-C3H | I6149-14R-C5A                 | I6149-14-C5A | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -16           | I6149-16R2-32FM   | I6149-16R-C3H                  | I6149-16-C3H | I6149-16R-C5A                 | I6149-16-C5A | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -20           | I6149-20R3-32FM*  | I6149-20R-C3H                  | I6149-20-C3H | I6149-20R-C5A                 | I6149-20-C5A | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -24           | I6149-24R3-32FM*  | I6149-24R-C3H                  | I6149-24-C3H | I6149-24R-C5A                 | I6149-24-C5A | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -32           | I6149-32R4-32FM*  | I6149-32R-C3H                  | I6149-32-C3H | I6149-32R-C5A                 | I6149-32-C5A | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |

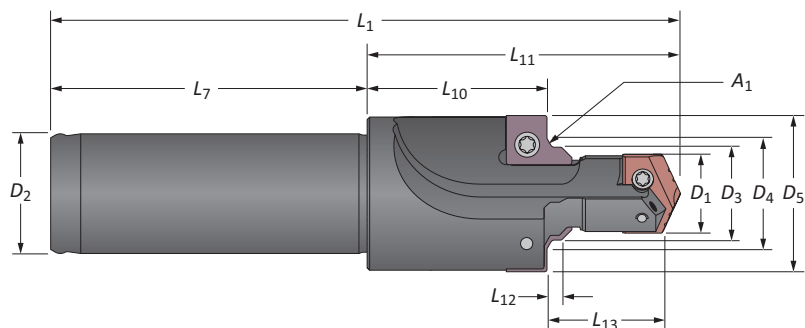
\*NOTICE: Due to the cutting forces generated by this tool, a mechanical chuck is required. Please contact Application Engineering with any questions.

\*\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

Y - 2 series T-A inserts sold in multiples of 2  
 3 - 4 series T-A inserts sold in multiples of 1  
 Port form inserts sold in multiples of 2  
 Insert screws sold in multiples of 10

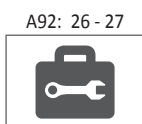
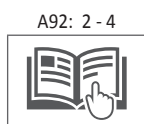
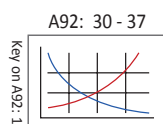
# SAE AS5202 / AND10050

## Imperial Shank Holders



| Tube Dash No. | Cutting        |                  |                 |                | Seal Angle     |                |                 | Holder         |                 |                 |                | Shank          |                | Port Thread Size | Port Thread Size* | Part No.        |
|---------------|----------------|------------------|-----------------|----------------|----------------|----------------|-----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|------------------|-------------------|-----------------|
|               | D <sub>1</sub> | D <sub>1</sub> * | L <sub>13</sub> | D <sub>5</sub> | A <sub>1</sub> | D <sub>4</sub> | L <sub>12</sub> | D <sub>3</sub> | L <sub>11</sub> | L <sub>10</sub> | L <sub>1</sub> | L <sub>7</sub> | D <sub>2</sub> |                  |                   |                 |
| -4            | 0.390          | 0.386            | 0.661           | 0.875          | 60°            | 0.564          | 0.083           | 0.454          | 1.637           | 0.896           | 3.510          | 1.875          | 0.625          | 7/16-20 UNJF-3B  | 7/16-20 UNF-3B    | AS5202-04Y-063F |
| -5            | 0.453          | 0.451            | 0.661           | 0.916          | 60°            | 0.625          | 0.083           | 0.517          | 1.637           | 0.882           | 3.510          | 1.875          | 0.625          | 1/2-20 UNJF-3B   | 1/2-20 UNF-3B     | AS5202-05Z-063F |
| -6            | 0.510          | 0.506            | 0.714           | 0.979          | 60°            | 0.688          | 0.083           | 0.580          | 1.940           | 1.119           | 3.910          | 1.969          | 0.750          | 9/16-18 UNJF-3B  | 9/16-18 UNF-3B    | AS5202-06Z-075F |
| -8            | 0.689          | 0.688            | 0.839           | 1.198          | 60°            | 0.875          | 0.094           | 0.769          | 2.107           | 1.125           | 4.080          | 1.969          | 0.750          | 3/4-16 UNJF-3B   | 3/4-16 UNF-3B     | AS5202-080-075F |
| -10           | 0.807          | 0.801            | 0.935           | 1.354          | 60°            | 1.002          | 0.107           | 0.896          | 2.290           | 1.189           | 4.570          | 2.281          | 1.000          | 7/8-14 UNJF-3B   | 7/8-14 UNF-3B     | AS5202-101-100F |
| i -12         | 0.984          | 0.976            | 1.069           | 1.635          | 60°            | 1.237          | 0.125           | 1.086          | 2.765           | 1.494           | 5.050          | 2.281          | 1.250          | 1 1/16-12 UNJ-3B | 1 1/16-12 UN-3B   | AS5202-122-125F |
| -14           | 1.109          | 1.102            | 1.069           | 1.775          | 60°            | 1.363          | 0.125           | 1.211          | 2.765           | 1.465           | 5.050          | 2.281          | 1.250          | 1 3/16-12 UNJ-3B | 1 3/16-12 UN-3B   | AS5202-142-125F |
| -16           | 1.234          | 1.226            | 1.069           | 1.920          | 60°            | 1.487          | 0.125           | 1.336          | 2.765           | 1.437           | 5.050          | 2.281          | 1.250          | 1 5/16-12 UNJ-3B | 1 5/16-12 UN-3B   | AS5202-162-125F |
| -20           | 1.547          | 1.535            | 1.121           | 2.280          | 60°            | 1.799          | 0.125           | 1.648          | 3.187           | 1.745           | 5.880          | 2.688          | 1.500          | 1 5/8-12 UNJ-3B  | 1 5/8-12 UN-3B    | AS5202-203-150F |
| -24           | 1.797          | 1.791            | 1.132           | 2.570          | 60°            | 2.050          | 0.125           | 1.898          | 3.187           | 1.676           | 5.880          | 2.688          | 1.500          | 1 7/8-12 UNJ-3B  | 1 7/8-12 UN-3B    | AS5202-243-150F |
| -32           | 2.421          | 2.413            | 1.373           | 3.490          | 60°            | 2.676          | 0.125           | 2.524          | 3.687           | 1.802           | 6.380          | 2.688          | 1.500          | 2 1/2-12 UNJ-3B  | 2 1/2-12 UN-3B    | AS5202-324-150F |
| -4            | 9.90           | 9.80             | 16.79           | 22.23          | 60°            | 14.34          | 2.11            | 11.53          | 41.58           | 22.76           | 89.20          | 47.63          | 15.88          | 7/16-20 UNJF-3B  | 7/16-20 UNF-3B    | AS5202-04Y-063F |
| -5            | 11.50          | 11.45            | 16.79           | 23.27          | 60°            | 15.88          | 2.11            | 13.13          | 41.58           | 22.39           | 89.20          | 47.63          | 15.88          | 1/2-20 UNJF-3B   | 1/2-20 UNF-3B     | AS5202-05Z-063F |
| -6            | 12.95          | 12.85            | 18.14           | 24.87          | 60°            | 17.46          | 2.11            | 14.73          | 49.28           | 28.43           | 99.29          | 50.01          | 19.05          | 9/16-18 UNJF-3B  | 9/16-18 UNF-3B    | AS5202-06Z-075F |
| -8            | 17.50          | 17.46            | 21.31           | 30.43          | 60°            | 22.23          | 2.39            | 19.53          | 53.52           | 28.57           | 103.53         | 50.01          | 19.05          | 3/4-16 UNJF-3B   | 3/4-16 UNF-3B     | AS5202-080-075F |
| -10           | 20.50          | 20.35            | 23.75           | 34.39          | 60°            | 25.46          | 2.72            | 22.76          | 58.17           | 30.19           | 116.10         | 57.94          | 25.40          | 7/8-14 UNJF-3B   | 7/8-14 UNF-3B     | AS5202-101-100F |
| m -12         | 25.00          | 24.80            | 27.15           | 41.53          | 60°            | 31.42          | 3.18            | 27.58          | 70.23           | 37.94           | 128.17         | 57.94          | 31.75          | 1 1/16-12 UNJ-3B | 1 1/16-12 UN-3B   | AS5202-122-125F |
| -14           | 28.17          | 28.00            | 27.15           | 45.09          | 60°            | 34.61          | 3.18            | 30.76          | 70.23           | 37.22           | 128.17         | 57.94          | 31.75          | 1 3/16-12 UNJ-3B | 1 3/16-12 UN-3B   | AS5202-142-125F |
| -16           | 31.34          | 31.15            | 27.15           | 48.77          | 60°            | 37.77          | 3.18            | 33.93          | 70.23           | 36.51           | 128.17         | 57.94          | 31.75          | 1 5/16-12 UNJ-3B | 1 5/16-12 UN-3B   | AS5202-162-125F |
| -20           | 39.29          | 39.00            | 28.47           | 57.91          | 60°            | 45.69          | 3.18            | 41.86          | 80.95           | 44.32           | 149.23         | 68.28          | 38.10          | 1 5/8-12 UNJ-3B  | 1 5/8-12 UN-3B    | AS5202-203-150F |
| -24           | 45.64          | 45.50            | 28.75           | 65.28          | 60°            | 52.07          | 3.18            | 48.21          | 80.95           | 42.58           | 149.23         | 68.28          | 38.10          | 1 7/8-12 UNJ-3B  | 1 7/8-12 UN-3B    | AS5202-243-150F |
| -32           | 61.49          | 61.30            | 34.87           | 88.65          | 60°            | 67.97          | 3.18            | 64.11          | 93.65           | 45.78           | 161.93         | 68.28          | 38.10          | 2 1/2-12 UNJ-3B  | 2 1/2-12 UN-3B    | AS5202-324-150F |

\*AND10050 specifications shown in red

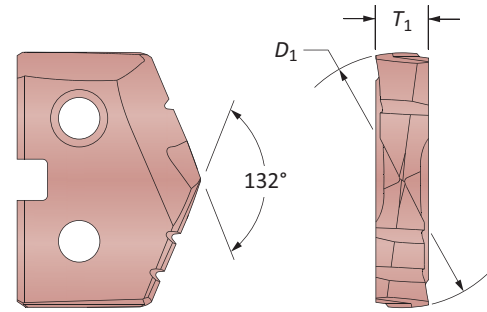
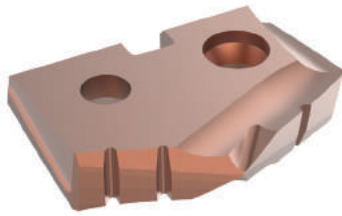


i = Imperial (in)  
m = Metric (mm)



## SAE AS5202 / AND10050

## Inserts



See section A3 for complete T-A insert details

## Original T-A® / GEN2 T-A® Drill Inserts

| Tube Dash No. | AccuPort Part No. | T-A® Insert Series | Part No.                                                                                       |                                                                                           |             |             |  Insert Screw |  Insert Driver | Admissible Tightening Torque* |
|---------------|-------------------|--------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------|-------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------|
|               |                   |                    |  Super Cobalt |  Carbide |             |             |                                                                                                  |                                                                                                   |                               |
| -4            | AS5202-04Y-063F   | Y                  | 45YH-.390                                                                                      | 45YH-.386                                                                                 | 4C1YH-.390  | 4C1YH-.386  | 724-IP7-1                                                                                        | 8IP-7                                                                                             | 7.4 in/lbs (84 N-cm)          |
| -5            | AS5202-05Z-063F   | Z                  | 45ZH-11.5                                                                                      | 45ZH-.451                                                                                 | 4C1ZH-11.5  | 4C1ZH-.451  | 7247-IP7-1                                                                                       | 8IP-7                                                                                             | 7.4 in/lbs (84 N-cm)          |
| -6            | AS5202-06Z-075F   | Z                  | 45ZH-.510                                                                                      | 45ZH-.506                                                                                 | 4C1ZH-.510  | 4C1ZH-.506  | 72567-IP8-1                                                                                      | 8IP-8                                                                                             | 15.5 in/lbs (175 N-cm)        |
| -8            | AS5202-080-075F   | 0                  | 450H-17.5                                                                                      | 450H-0022                                                                                 | 4C10H-17.5  | 4C10H-0022  | 72567-IP8-1                                                                                      | 8IP-8                                                                                             | 15.5 in/lbs (175 N-cm)        |
| -10           | AS5202-101-100F   | 1                  | 451H-20.5                                                                                      | 451H-.801                                                                                 | 4C11H-20.5  | 4C11H-.801  | 739-IP9-1                                                                                        | 8IP-9                                                                                             | 27.0 in/lbs (305 N-cm)        |
| -12           | AS5202-122-125F   | 2                  | 452H-25                                                                                        | 452H-.976                                                                                 | 4C12H-25    | 4C12H-.976  | 7495-IP15-1                                                                                      | 8IP-15                                                                                            | 61.0 in/lbs (690 N-cm)        |
| -14           | AS5202-142-125F   | 2                  | 452H-1.109                                                                                     | 452H-28                                                                                   | 4C12H-1.109 | 4C12H-28    | 7495-IP15-1                                                                                      | 8IP-15                                                                                            | 61.0 in/lbs (690 N-cm)        |
| -16           | AS5202-162-125F   | 2                  | 452H-1.234                                                                                     | 452H-1.226                                                                                | 4C12H-1.234 | 4C12H-1.226 | 7495-IP15-1                                                                                      | 8IP-15                                                                                            | 61.0 in/lbs (690 N-cm)        |
| -20           | AS5202-203-150F   | 3                  | 453H-1.547                                                                                     | 453H-39                                                                                   | 1C53A-1.547 | 1C53A-39    | 7514-IP20-1                                                                                      | 8IP-20                                                                                            | 121.3 in/lbs (1370 N-cm)      |
| -24           | AS5202-243-150F   | 3                  | 453H-1.797                                                                                     | 453H-45.5                                                                                 | 1C53A-1.797 | 1C53A-45.5  | 7514-IP20-1                                                                                      | 8IP-20                                                                                            | 121.3 in/lbs (1370 N-cm)      |
| -32           | AS5202-324-150F   | 4                  | 454H-2.421                                                                                     | 454H-2.413                                                                                | —           | —           | 7514-IP20-1                                                                                      | 8IP-20                                                                                            | 121.3 in/lbs (1370 N-cm)      |

\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

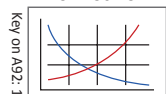
NOTE: AND10050 specifications shown in red

## Port Form Drill Inserts

| Tube Dash No. | AccuPort Part No. | Part No.           |  | Insert Screw | Insert Driver | Admissible Tightening Torque* |
|---------------|-------------------|--------------------|--|--------------|---------------|-------------------------------|
|               |                   | C5 Carbide (TiAlN) |  |              |               |                               |
| -4            | AS5202-04Y-063F   | AS5202-04-C5A      |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -5            | AS5202-05Z-063F   | AS5202-05-C5A      |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -6            | AS5202-06Z-075F   | AS5202-06-C5A      |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -8            | AS5202-080-075F   | AS5202-08-C5A      |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)        |
| -10           | AS5202-101-100F   | AS5202-10-C5A      |  | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -12           | AS5202-122-125F   | AS5202-12-C5A      |  | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -14           | AS5202-142-125F   | AS5202-14-C5A      |  | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -16           | AS5202-162-125F   | AS5202-16-C5A      |  | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -20           | AS5202-203-150F   | AS5202-20-C5A      |  | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -24           | AS5202-243-150F   | AS5202-24-C5A      |  | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |
| -32           | AS5202-324-150F   | AS5202-32-C5A      |  | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)        |

\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

A92: 30 - 37



A92: 2 - 4



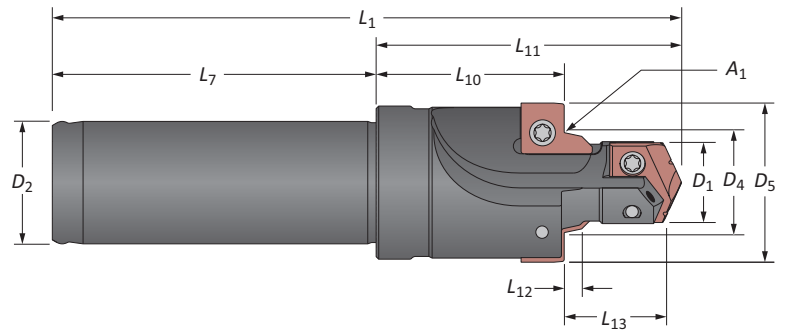
A92: 26 - 27



Y - 2 series T-A inserts sold in multiples of 2  
 3 - 4 series T-A inserts sold in multiples of 1  
 Port form inserts sold in multiples of 2  
 Insert screws sold in multiples of 10

# JDS-G173.1

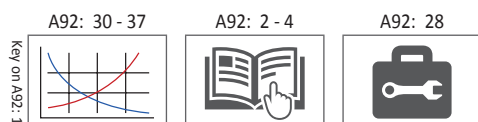
## Metric Shank Holders



| Tube Dash No. | Cutting        |                 |                | Seal Angle     |                |                 | Holder          |                 |                | Shank          |                | Port Thread Size | Part No.        |
|---------------|----------------|-----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|------------------|-----------------|
|               | D <sub>1</sub> | L <sub>13</sub> | D <sub>5</sub> | A <sub>1</sub> | D <sub>4</sub> | L <sub>12</sub> | L <sub>11</sub> | L <sub>10</sub> | L <sub>1</sub> | L <sub>7</sub> | D <sub>2</sub> |                  |                 |
| -4            | 0.413          | 0.709           | 0.945          | 15°            | 0.547          | 0.104           | 1.670           | 0.875           | 3.320          | 1.650          | 0.630          | M12 X 1.5        | G1731-04Y-16FM  |
| -5            | 0.492          | 0.709           | 1.024          | 15°            | 0.626          | 0.104           | 1.670           | 0.858           | 3.320          | 1.650          | 0.630          | M14 X 1.5        | G1731-05Z-16FM  |
| -6            | 0.571          | 0.748           | 1.142          | 15°            | 0.705          | 0.104           | 1.977           | 1.117           | 3.630          | 1.650          | 0.787          | M16 X 1.5        | G1731-060-20FM  |
| -8            | 0.650          | 0.827           | 1.220          | 15°            | 0.783          | 0.104           | 2.127           | 1.161           | 3.770          | 1.650          | 0.787          | M18 X 1.5        | G1731-080-20FM  |
| -10           | 0.807          | 0.866           | 1.378          | 15°            | 0.941          | 0.104           | 2.280           | 1.246           | 4.370          | 2.090          | 0.984          | M22 X 1.5        | G1731-101-25FM  |
| -12           | 0.984          | 1.063           | 1.614          | 15°            | 1.161          | 0.132           | 2.820           | 1.553           | 5.100          | 2.280          | 1.260          | M27 X 2          | G1731-122-32FM  |
| -14           | 1.102          | 1.063           | 1.732          | 15°            | 1.280          | 0.132           | 2.820           | 1.526           | 5.100          | 2.280          | 1.260          | M30 X 2          | G1731-142-32FM  |
| -16           | 1.221          | 1.063           | 1.969          | 15°            | 1.398          | 0.132           | 2.820           | 1.500           | 5.100          | 2.280          | 1.260          | M33 X 2          | G1731-162-32FM  |
| -18           | 1.417          | 1.063           | 2.165          | 15°            | 1.594          | 0.132           | 3.207           | 1.844           | 5.780          | 2.580          | 1.260          | M38 X 2          | G1731-183-32FM* |
| -20           | 1.575          | 1.063           | 2.402          | 15°            | 1.752          | 0.132           | 3.207           | 1.809           | 5.780          | 2.580          | 1.260          | M42 X 2          | G1731-203-32FM* |
| -24           | 1.811          | 1.142           | 2.638          | 15°            | 1.988          | 0.132           | 3.207           | 1.687           | 5.780          | 2.580          | 1.260          | M48 X 2          | G1731-243-32FM* |
| -32           | 2.284          | 1.260           | 3.031          | 15°            | 2.461          | 0.132           | 3.967           | 2.300           | 6.550          | 2.580          | 1.260          | M60 X 2          | G1731-324-32FM* |
| C**           | 0.728          | 0.787           | 1.299          | 15°            | 0.862          | 0.104           | 2.140           | 1.281           | 4.230          | 2.090          | 0.984          | M20 X 1.5        | G1731-CV1-25FM  |
| -4            | 10.50          | 18.00           | 24.00          | 15°            | 13.90          | 2.65            | 42.42           | 22.20           | 84.50          | 41.90          | 16.00          | M12 X 1.5        | G1731-04Y-16FM  |
| -5            | 12.50          | 18.00           | 26.00          | 15°            | 15.90          | 2.65            | 42.42           | 21.80           | 84.50          | 41.90          | 16.00          | M14 X 1.5        | G1731-05Z-16FM  |
| -6            | 14.50          | 19.00           | 29.00          | 15°            | 17.90          | 2.65            | 50.22           | 28.40           | 92.20          | 41.90          | 20.00          | M16 X 1.5        | G1731-060-20FM  |
| -8            | 16.50          | 21.00           | 31.00          | 15°            | 19.90          | 2.65            | 54.03           | 29.50           | 95.80          | 41.90          | 20.00          | M18 X 1.5        | G1731-080-20FM  |
| -10           | 20.50          | 22.00           | 35.00          | 15°            | 23.90          | 2.65            | 57.91           | 31.60           | 111.00         | 53.10          | 25.00          | M22 X 1.5        | G1731-101-25FM  |
| -12           | 25.00          | 27.00           | 41.00          | 15°            | 29.50          | 3.35            | 71.63           | 39.40           | 129.60         | 57.90          | 32.00          | M27 X 2          | G1731-122-32FM  |
| -14           | 28.00          | 27.00           | 44.00          | 15°            | 32.50          | 3.35            | 71.63           | 39.70           | 129.60         | 57.90          | 32.00          | M30 X 2          | G1731-142-32FM  |
| -16           | 31.00          | 27.00           | 50.00          | 15°            | 35.50          | 3.35            | 71.63           | 38.10           | 129.60         | 57.90          | 32.00          | M33 X 2          | G1731-162-32FM  |
| -18           | 36.00          | 27.00           | 55.00          | 15°            | 40.50          | 3.35            | 81.46           | 46.80           | 146.80         | 65.50          | 32.00          | M38 X 2          | G1731-183-32FM* |
| -20           | 40.00          | 27.00           | 61.00          | 15°            | 44.50          | 3.35            | 81.46           | 45.90           | 146.80         | 65.50          | 32.00          | M42 X 2          | G1731-203-32FM* |
| -24           | 46.00          | 29.00           | 67.00          | 15°            | 50.50          | 3.35            | 81.46           | 42.80           | 146.80         | 65.50          | 32.00          | M48 X 2          | G1731-243-32FM* |
| -32           | 58.00          | 32.00           | 77.00          | 15°            | 62.50          | 3.35            | 100.76          | 58.40           | 166.40         | 65.50          | 32.00          | M60 X 2          | G1731-324-32FM* |
| C**           | 18.50          | 20.00           | 33.00          | 15°            | 21.90          | 2.65            | 54.36           | 32.50           | 107.40         | 53.10          | 25.00          | M20 X 1.5        | G1731-CV1-25FM  |

**\*NOTICE:** Due to the cutting forces generated by this tool, a mechanical chuck is required. Please contact Application Engineering with any questions.

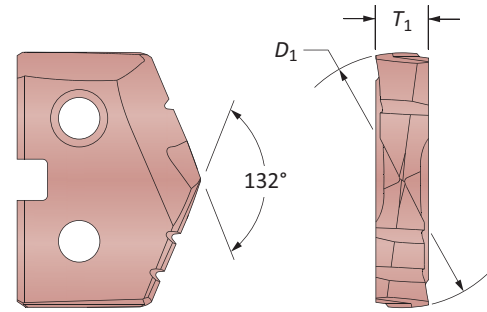
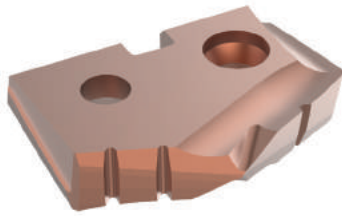
**\*\*Cartridge cavity**



**i** = Imperial (in)  
**m** = Metric (mm)

## JDS-G173.1

## Inserts



See section A3 for complete T-A insert details

## GEN2 T-A® Drill Inserts

| Tube Dash No. | AccuPort Part No. | T-A® Insert Series | Part No.     |            | Insert Screw | Insert Driver | Admissible Tightening Torque** |
|---------------|-------------------|--------------------|--------------|------------|--------------|---------------|--------------------------------|
|               |                   |                    | Super Cobalt | Carbide    |              |               |                                |
| -4            | G1731-04Y-16FM    | Y                  | 45YH-10.5    | 4C2YH-10.5 | 724-IP7-1    | 8IP-7         | 7.4 in/lbs (84 N-cm)           |
| -5            | G1731-05Z-16FM    | Z                  | 45ZH-12.5    | 4C2ZH-12.5 | 7247-IP7-1   | 8IP-7         | 7.4 in/lbs (84 N-cm)           |
| -6            | G1731-060-20FM    | 0                  | 450H-14.5    | 4C20H-14.5 | 72567-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -8            | G1731-080-20FM    | 0                  | 450H-16.5    | 4C20H-16.5 | 72567-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -10           | G1731-101-25FM    | 1                  | 451H-20.5    | 4C21H-20.5 | 739-IP9-1    | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -12           | G1731-122-32FM    | 2                  | 452H-25      | 4C22H-25   | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)         |
| -14           | G1731-142-32FM    | 2                  | 452H-28      | 4C22H-28   | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)         |
| -16           | G1731-162-32FM    | 2                  | 452H-31      | 4C22H-31   | 7495-IP15-1  | 8IP-15        | 61.0 in/lbs (690 N-cm)         |
| -18           | G1731-183-32FM*   | 3                  | 453H-36      | —          | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)       |
| -20           | G1731-203-32FM*   | 3                  | 453H-40      | —          | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)       |
| -24           | G1731-243-32FM*   | 3                  | 453H-46      | —          | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)       |
| -32           | G1731-324-32FM*   | 4                  | 454H-58      | —          | 7514-IP20-1  | 8IP-20        | 121.3 in/lbs (1370 N-cm)       |
| C***          | G1731-CV1-25FM    | 1                  | 451H-18.5    | 4C21H-18.5 | 739-IP9-1    | 8IP-9         | 27.0 in/lbs (305 N-cm)         |

\*NOTICE: Due to the cutting forces generated by this tool, a mechanical chuck is required. Please contact Application Engineering with any questions.

\*\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

\*\*\*Cartridge cavity

## Port Form Drill Inserts

| Tube Dash No. | AccuPort Part No. | Part No.            |  | Insert Screw | Insert Driver | Admissible Tightening Torque** |
|---------------|-------------------|---------------------|--|--------------|---------------|--------------------------------|
|               |                   | C3 Carbide (AM200®) |  |              |               |                                |
| -4            | G1731-04Y-16FM    | G1731-01-C3H        |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -5            | G1731-05Z-16FM    | G1731-01-C3H        |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -6            | G1731-060-20FM    | G1731-02-C3H        |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -8            | G1731-080-20FM    | G1731-02-C3H        |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -10           | G1731-101-25FM    | G1731-02-C3H        |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -12           | G1731-122-32FM    | G1731-03-C3H        |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -14           | G1731-142-32FM    | G1731-03-C3H        |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |
| -16           | G1731-162-32FM    | G1731-04-C3H        |  | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -18           | G1731-183-32FM*   | G1731-04-C3H        |  | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -20           | G1731-203-32FM*   | G1731-05-C3H        |  | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -24           | G1731-243-32FM*   | G1731-05-C3H        |  | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| -32           | G1731-324-32FM*   | G1731-06-C3H        |  | 7375-IP9-1   | 8IP-9         | 27.0 in/lbs (305 N-cm)         |
| C***          | G1731-CV1-25FM    | G1731-02-C3H        |  | 72556-IP8-1  | 8IP-8         | 15.5 in/lbs (175 N-cm)         |

\*NOTICE: Due to the cutting forces generated by this tool, a mechanical chuck is required. Please contact Application Engineering with any questions.

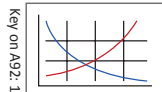
\*\*Tightening torques are calculated with a friction coefficient of  $\mu = 0.14$  and develop 90% of ultimate yield strength

\*\*\*Cartridge cavity

A92: 30 - 37

A92: 2 - 4

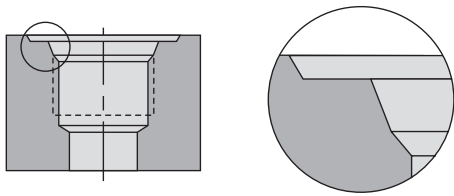
A92: 28



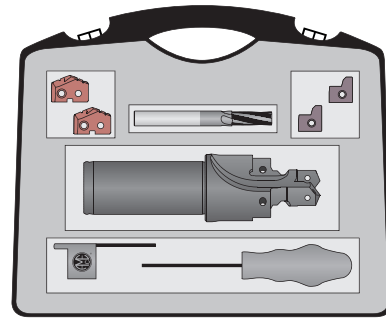
Y - 2 series T-A inserts sold in multiples of 2  
 3 - 4 series T-A inserts sold in multiples of 1  
 Port form inserts sold in multiples of 2  
 Insert screws sold in multiples of 10

## Port and Thread Finishing Kits

J1926 | Imperial | Ferrous Materials

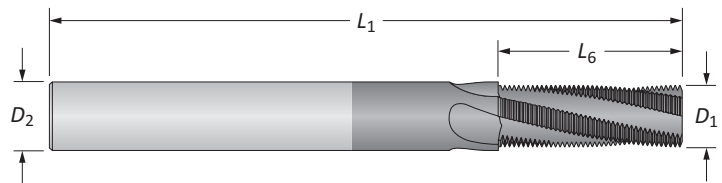


SAE J-1926-1 / ISO 11926-1



### Port and Thread Finishing Kits

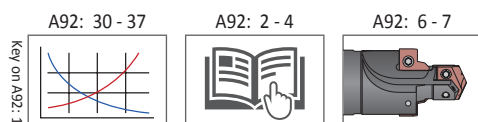
| Tube Dash No. | AccuPort 432   |                  |     | GEN2 T-A® Insert      |     | Port Form Insert   |     | AccuThread™ Thread Mill |     | Kit Part No. |
|---------------|----------------|------------------|-----|-----------------------|-----|--------------------|-----|-------------------------|-----|--------------|
|               | Part No.       | Port Thread Size | Qty | Super Cobalt (AM200®) | Qty | C5 Carbide (TiAlN) | Qty | Part No. (AM210®)       | Qty |              |
| -4            | J1926-04Y-063F | 7/16-20 UNF-2B   | 1   | 45YH-.386             | 2   | J1926-02-C5A       | 2   | TMAK0438-20             | 1   | ATKK04-1926  |
| -5            | J1926-05Z-063F | 1/2-20 UNF-2B    | 1   | 45ZH-11.5             | 2   | J1926-03-C5A       | 2   | TMAK0438-20             | 1   | ATKK05-1926  |
| -6            | J1926-060-075F | 9/16-18 UNF-2B   | 1   | 450H-13               | 2   | J1926-03-C5A       | 2   | TMAK0563-18             | 1   | ATKK06-1926  |
| -8            | J1926-080-075F | 3/4-16 UNF-2B    | 1   | 450H-0022             | 2   | J1926-07-C5A       | 2   | TMAK0750-16             | 1   | ATKK08-1926  |
| -10           | J1926-101-100F | 7/8-14 UNF-2B    | 1   | 451H-20.5             | 2   | J1926-04-C5A       | 2   | TMAK0875-14             | 1   | ATKK10-1926  |
| -12           | J1926-122-125F | 1-1/16-12 UN-2B  | 1   | 452H-25               | 2   | J1926-08-C5A       | 2   | TMAK1063-12             | 1   | ATKK12-1926  |
| -14           | J1926-142-125F | 1-3/16-12 UN-2B  | 1   | 452H-28               | 2   | J1926-08-C5A       | 2   | TMAK1063-12             | 1   | ATKK14-1926  |
| -16           | J1926-162-125F | 1-5/16-12 UN-2B  | 1   | 452H-1.231            | 2   | J1926-09-C5A       | 2   | TMAK1063-12             | 1   | ATKK16-1926  |
| -20           | J1926-203-150F | 1-5/8-12 UN-2B   | 1   | 453H-39               | 1   | J1926-10-C5A       | 2   | TMAK1063-12             | 1   | ATKK20-1926  |
| -24           | J1926-243-150F | 1-7/8-12 UN-2B   | 1   | 453H-45.5             | 1   | J1926-11-C5A       | 2   | TMAK1063-12             | 1   | ATKK24-1926  |
| -32           | J1926-324-150F | 2-1/2-12 UN-2B   | 1   | 454H-61.5             | 1   | J1926-12-C5A       | 2   | TMAK1063-12             | 1   | ATKK32-1926  |



### AccuThread™ Port Specific Solid Carbide Thread Mills

| Port Size  | Pitch | Thread Mill    |                |                |                | Flutes | Part No.    |
|------------|-------|----------------|----------------|----------------|----------------|--------|-------------|
|            |       | D <sub>1</sub> | L <sub>6</sub> | D <sub>2</sub> | L <sub>1</sub> |        |             |
| -4 to -5   | 20    | 0.335          | 0.600          | 0.375          | 3.5            | 4      | TMAK0438-20 |
| -6         | 18    | 0.370          | 0.666          | 0.375          | 3.5            | 4      | TMAK0563-18 |
| -8         | 16    | 0.495          | 0.750          | 0.500          | 3.5            | 4      | TMAK0750-16 |
| -10        | 14    | 0.495          | 0.857          | 0.500          | 3.5            | 4      | TMAK0875-14 |
| -12 to -32 | 12    | 0.495          | 0.917          | 0.500          | 3.5            | 4      | TMAK1063-12 |

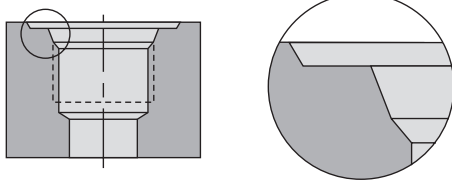
AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE AS5202 port form specifications.



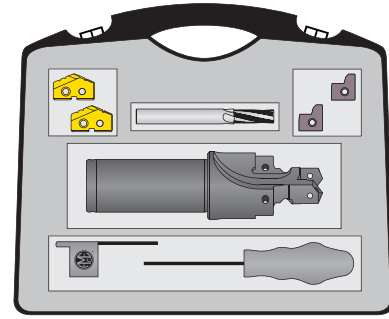


## Port and Thread Finishing Kits

J1926 | Imperial | Non-Ferrous Materials

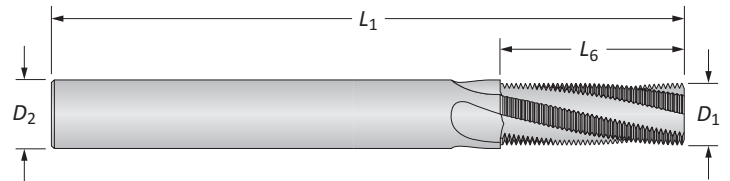


SAE J-1926-1 / ISO 11926-1



### Port and Thread Finishing Kits

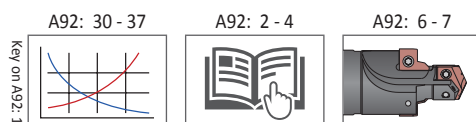
| Tube Dash No. | AccuPort 432   |                  |     | Original T-A® Insert                                                                                 |     | Port Form Insert                                                                                     |     | AccuThread™ Thread Mill                                                                                 |     | Kit Part No. |
|---------------|----------------|------------------|-----|------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------------------------|-----|--------------|
|               | Part No.       | Port Thread Size | Qty |  Super Cobalt (TiN) | Qty |  C5 Carbide (TiAlN) | Qty |  Part No. (Uncoated) | Qty |              |
| -4            | J1926-04Y-063F | 7/16-20 UNF-2B   | 1   | 15YT-.386                                                                                            | 2   | J1926-02-C5A                                                                                         | 2   | TMAU0438-20                                                                                             | 1   | ATKU04-1926  |
| -5            | J1926-05Z-063F | 1/2-20 UNF-2B    | 1   | 15ZT-11.5                                                                                            | 2   | J1926-03-C5A                                                                                         | 2   | TMAU0438-20                                                                                             | 1   | ATKU05-1926  |
| -6            | J1926-060-075F | 9/16-18 UNF-2B   | 1   | 150T-13                                                                                              | 2   | J1926-03-C5A                                                                                         | 2   | TMAU0563-18                                                                                             | 1   | ATKU06-1926  |
| -8            | J1926-080-075F | 3/4-16 UNF-2B    | 1   | 150T-0022                                                                                            | 2   | J1926-07-C5A                                                                                         | 2   | TMAU0750-16                                                                                             | 1   | ATKU08-1926  |
| -10           | J1926-101-100F | 7/8-14 UNF-2B    | 1   | 151T-20.5                                                                                            | 2   | J1926-04-C5A                                                                                         | 2   | TMAU0875-14                                                                                             | 1   | ATKU10-1926  |
| -12           | J1926-122-125F | 1-1/16-12 UN-2B  | 1   | 152T-25                                                                                              | 2   | J1926-08-C5A                                                                                         | 2   | TMAU1063-12                                                                                             | 1   | ATKU12-1926  |
| -14           | J1926-142-125F | 1-3/16-12 UN-2B  | 1   | 152T-28                                                                                              | 2   | J1926-08-C5A                                                                                         | 2   | TMAU1063-12                                                                                             | 1   | ATKU14-1926  |
| -16           | J1926-162-125F | 1-5/16-12 UN-2B  | 1   | 152T-1.231                                                                                           | 2   | J1926-09-C5A                                                                                         | 2   | TMAU1063-12                                                                                             | 1   | ATKU16-1926  |
| -20           | J1926-203-150F | 1-5/8-12 UN-2B   | 1   | 453T-39                                                                                              | 1   | J1926-10-C5A                                                                                         | 2   | TMAU1063-12                                                                                             | 1   | ATKU20-1926  |
| -24           | J1926-243-150F | 1-7/8-12 UN-2B   | 1   | 453T-45.5                                                                                            | 1   | J1926-11-C5A                                                                                         | 2   | TMAU1063-12                                                                                             | 1   | ATKU24-1926  |
| -32           | J1926-324-150F | 2-1/2-12 UN-2B   | 1   | 454T-61.5                                                                                            | 1   | J1926-12-C5A                                                                                         | 2   | TMAU1063-12                                                                                             | 1   | ATKU32-1926  |



### AccuThread™ Port Specific Solid Carbide Thread Mills

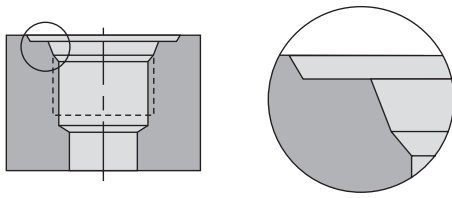
| Port Size  | Pitch | Thread Mill |       |       |       | Flutes | Part No.    |
|------------|-------|-------------|-------|-------|-------|--------|-------------|
|            |       | $D_1$       | $L_6$ | $D_2$ | $L_1$ |        |             |
| -4 to -5   | 20    | 0.335       | 0.600 | 0.375 | 3.5   | 4      | TMAU0438-20 |
| -6         | 18    | 0.370       | 0.666 | 0.375 | 3.5   | 4      | TMAU0563-18 |
| -8         | 16    | 0.495       | 0.750 | 0.500 | 3.5   | 4      | TMAU0750-16 |
| -10        | 14    | 0.495       | 0.857 | 0.500 | 3.5   | 4      | TMAU0875-14 |
| -12 to -32 | 12    | 0.495       | 0.917 | 0.500 | 3.5   | 4      | TMAU1063-12 |

AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE A55202 port form specifications.

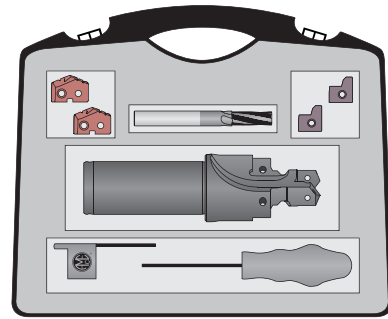


## Port and Thread Finishing Kits

J1926 | Metric | Ferrous Materials

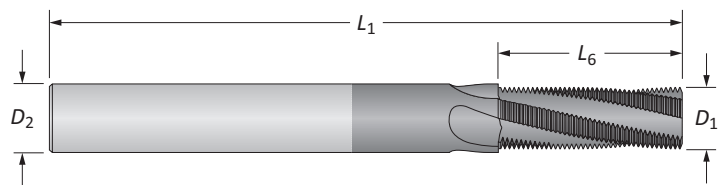


SAE J-1926-1 / ISO 11926-1



### Port and Thread Finishing Kits

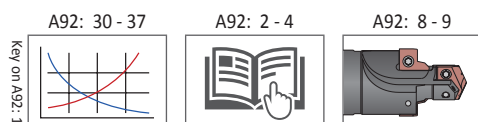
| Tube Dash No. | AccuPort 432   |                  |     | GEN2 T-A® Insert                                                                                        |     | Port Form Insert                                                                                     |     | AccuThread™ Thread Mill                                                                               |     | Kit Part No. |
|---------------|----------------|------------------|-----|---------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------|-----|--------------|
|               | Part No.       | Port Thread Size | Qty |  Super Cobalt (AM200®) | Qty |  C5 Carbide (TiAlN) | Qty |  Part No. (AM210®) | Qty |              |
| -4            | J1926-04Y-16FM | 7/16-20 UNF-2B   | 1   | 45YH-.386                                                                                               | 2   | J1926-02-C5A                                                                                         | 2   | TMAK0438-20M                                                                                          | 1   | ATKK04-1926M |
| -5            | J1926-05Z-16FM | 1/2-20 UNF-2B    | 1   | 45ZH-11.5                                                                                               | 2   | J1926-03-C5A                                                                                         | 2   | TMAK0438-20M                                                                                          | 1   | ATKK05-1926M |
| -6            | J1926-060-20FM | 9/16-18 UNF-2B   | 1   | 450H-13                                                                                                 | 2   | J1926-03-C5A                                                                                         | 2   | TMAK0563-18M                                                                                          | 1   | ATKK06-1926M |
| -8            | J1926-080-20FM | 3/4-16 UNF-2B    | 1   | 450H-0022                                                                                               | 2   | J1926-07-C5A                                                                                         | 2   | TMAK0750-16M                                                                                          | 1   | ATKK08-1926M |
| -10           | J1926-101-25FM | 7/8-14 UNF-2B    | 1   | 451H-20.5                                                                                               | 2   | J1926-04-C5A                                                                                         | 2   | TMAK0875-14M                                                                                          | 1   | ATKK10-1926M |
| -12           | J1926-122-32FM | 1-1/16-12 UN-2B  | 1   | 452H-25                                                                                                 | 2   | J1926-08-C5A                                                                                         | 2   | TMAK1063-12M                                                                                          | 1   | ATKK12-1926M |
| -14           | J1926-142-32FM | 1-3/16-12 UN-2B  | 1   | 452H-28                                                                                                 | 2   | J1926-08-C5A                                                                                         | 2   | TMAK1063-12M                                                                                          | 1   | ATKK14-1926M |
| -16           | J1926-162-32FM | 1-5/16-12 UN-2B  | 1   | 452H-1.231                                                                                              | 2   | J1926-09-C5A                                                                                         | 2   | TMAK1063-12M                                                                                          | 1   | ATKK16-1926M |
| -20           | J1926-203-32FM | 1-5/8-12 UN-2B   | 1   | 453H-39                                                                                                 | 1   | J1926-10-C5A                                                                                         | 2   | TMAK1063-12M                                                                                          | 1   | ATKK20-1926M |
| -24           | J1926-243-32FM | 1-7/8-12 UN-2B   | 1   | 453H-45.5                                                                                               | 1   | J1926-11-C5A                                                                                         | 2   | TMAK1063-12M                                                                                          | 1   | ATKK24-1926M |
| -32           | J1926-324-32FM | 2-1/2-12 UN-2B   | 1   | 454H-61.5                                                                                               | 1   | J1926-12-C5A                                                                                         | 2   | TMAK1063-12M                                                                                          | 1   | ATKK32-1926M |



### AccuThread™ Port Specific Solid Carbide Thread Mills

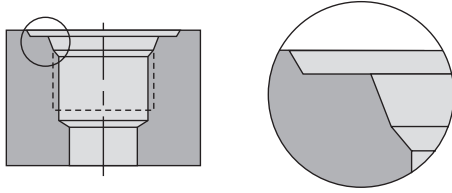
| Port Size  | Pitch | Thread Mill |       |       |       | Flutes | Part No.     |
|------------|-------|-------------|-------|-------|-------|--------|--------------|
|            |       | $D_1$       | $L_6$ | $D_2$ | $L_1$ |        |              |
| -4 to -5   | 20    | 8.51        | 15.24 | 10.00 | 73.00 | 4      | TMAK0438-20M |
| -6         | 18    | 9.40        | 16.92 | 10.00 | 73.00 | 4      | TMAK0563-18M |
| -8         | 16    | 11.94       | 19.05 | 12.00 | 84.00 | 4      | TMAK0750-16M |
| -10        | 14    | 11.94       | 21.77 | 12.00 | 84.00 | 4      | TMAK0875-14M |
| -12 to -32 | 12    | 11.94       | 23.29 | 12.00 | 84.00 | 4      | TMAK1063-12M |

AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE AS5202 port form specifications.

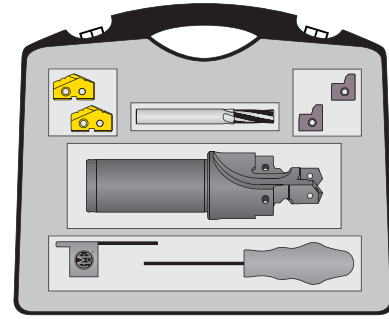


## Port and Thread Finishing Kits

J1926 | Metric | Non-Ferrous Materials

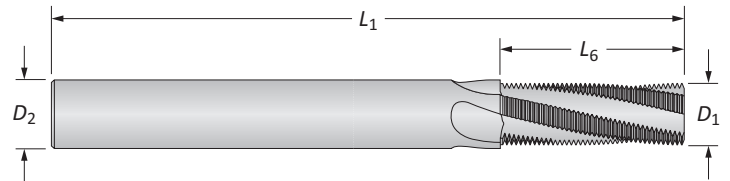


SAE J-1926-1 / ISO 11926-1



### Port and Thread Finishing Kits

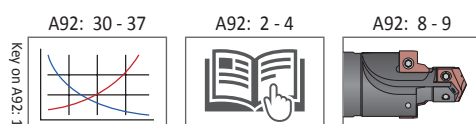
| Tube Dash No. | AccuPort 432   |                  |     | Original T-A® Insert |     | Port Form Insert   |     | AccuThread™ Thread Mill |     | Kit Part No. |
|---------------|----------------|------------------|-----|----------------------|-----|--------------------|-----|-------------------------|-----|--------------|
|               | Part No.       | Port Thread Size | Qty | Super Cobalt (TiN)   | Qty | C5 Carbide (TiAlN) | Qty | Part No. (Uncoated)     | Qty |              |
| -4            | J1926-04Y-16FM | 7/16-20 UNF-2B   | 1   | 15YT-.386            | 2   | J1926-02-C5A       | 2   | TMAU0438-20M            | 1   | ATKU04-1926M |
| -5            | J1926-05Z-16FM | 1/2-20 UNF-2B    | 1   | 15ZT-11.5            | 2   | J1926-03-C5A       | 2   | TMAU0438-20M            | 1   | ATKU05-1926M |
| -6            | J1926-060-20FM | 9/16-18 UNF-2B   | 1   | 150T-13              | 2   | J1926-03-C5A       | 2   | TMAU0563-18M            | 1   | ATKU06-1926M |
| -8            | J1926-080-20FM | 3/4-16 UNF-2B    | 1   | 150T-0022            | 2   | J1926-07-C5A       | 2   | TMAU0750-16M            | 1   | ATKU08-1926M |
| -10           | J1926-101-25FM | 7/8-14 UNF-2B    | 1   | 151T-20.5            | 2   | J1926-04-C5A       | 2   | TMAU0875-14M            | 1   | ATKU10-1926M |
| -12           | J1926-122-32FM | 1-1/16-12 UN-2B  | 1   | 152T-25              | 2   | J1926-08-C5A       | 2   | TMAU1063-12M            | 1   | ATKU12-1926M |
| -14           | J1926-142-32FM | 1-3/16-12 UN-2B  | 1   | 152T-28              | 2   | J1926-08-C5A       | 2   | TMAU1063-12M            | 1   | ATKU14-1926M |
| -16           | J1926-162-32FM | 1-5/16-12 UN-2B  | 1   | 152T-1.231           | 2   | J1926-09-C5A       | 2   | TMAU1063-12M            | 1   | ATKU16-1926M |
| -20           | J1926-203-32FM | 1-5/8-12 UN-2B   | 1   | 453T-39              | 1   | J1926-10-C5A       | 2   | TMAU1063-12M            | 1   | ATKU20-1926M |
| -24           | J1926-243-32FM | 1-7/8-12 UN-2B   | 1   | 453T-45.5            | 1   | J1926-11-C5A       | 2   | TMAU1063-12M            | 1   | ATKU24-1926M |
| -32           | J1926-324-32FM | 2-1/2-12 UN-2B   | 1   | 454T-61.5            | 1   | J1926-12-C5A       | 2   | TMAU1063-12M            | 1   | ATKU32-1926M |



### AccuThread™ Port Specific Solid Carbide Thread Mills

| Port Size  | Pitch | Thread Mill |       |       |       | Flutes | Part No.     |
|------------|-------|-------------|-------|-------|-------|--------|--------------|
|            |       | $D_1$       | $L_6$ | $D_2$ | $L_1$ |        |              |
| -4 to -5   | 20    | 8.51        | 15.24 | 10.00 | 73.00 | 4      | TMAU0438-20M |
| -6         | 18    | 9.40        | 16.92 | 10.00 | 73.00 | 4      | TMAU0563-18M |
| -8         | 16    | 11.94       | 19.05 | 12.00 | 84.00 | 4      | TMAU0750-16M |
| -10        | 14    | 11.94       | 21.77 | 12.00 | 84.00 | 4      | TMAU0875-14M |
| -12 to -32 | 12    | 11.94       | 23.29 | 12.00 | 84.00 | 4      | TMAU1063-12M |

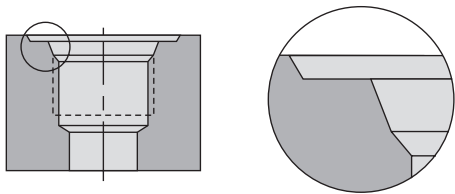
AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE A5202 port form specifications.



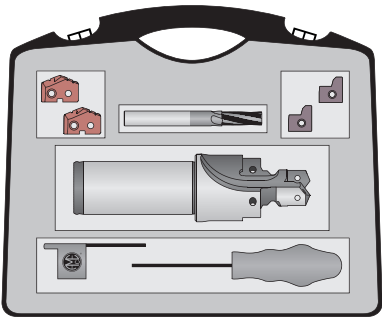
A DRILLING

## Port and Thread Finishing Kits

I6149 | No ID Ridge | Ferrous Materials



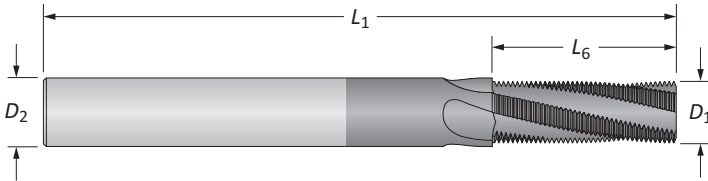
ISO 6149-1:2006 / SAE J-2244/1



B BORING

## Port and Thread Finishing Kits

| Tube Dash No. | AccuPort 432    |                  |     | GEN2 T-A® Insert                                                                                        |     | Port Form Insert                                                                                     |     | AccuThread™ Thread Mill                                                                               |     | Kit Part No. |
|---------------|-----------------|------------------|-----|---------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------|-----|--------------|
|               | Part No.        | Port Thread Size | Qty |  Super Cobalt (AM200®) | Qty |  C5 Carbide (TiAlN) | Qty |  Part No. (AM210®) | Qty |              |
| -4            | I6149-04RY-16FM | M12 X 1.5        | 1   | 45YH-10.5                                                                                               | 2   | I6149-04-C5A                                                                                         | 2   | TMMK1000-150M                                                                                         | 1   | ATKK04-6149  |
| -5            | I6149-05RZ-16FM | M14 X 1.5        | 1   | 45ZH-12.5                                                                                               | 2   | I6149-04-C5A                                                                                         | 2   | TMMK1400-150M                                                                                         | 1   | ATKK05-6149  |
| -6            | I6149-06R0-20FM | M16 X 1.5        | 1   | 450H-14.5                                                                                               | 2   | I6149-06-C5A                                                                                         | 2   | TMMK1400-150M                                                                                         | 1   | ATKK06-6149  |
| -8            | I6149-08R0-20FM | M18 X 1.5        | 1   | 450H-16.5                                                                                               | 2   | I6149-06-C5A                                                                                         | 2   | TMMK1800-150M                                                                                         | 1   | ATKK08-6149  |
| -10           | I6149-10R1-25FM | M22 X 1.5        | 1   | 451H-20.5                                                                                               | 2   | I6149-04-C5A                                                                                         | 2   | TMMK1800-150M                                                                                         | 1   | ATKK10-6149  |
| -12           | I6149-12R2-32FM | M27 X 2          | 1   | 452H-25                                                                                                 | 2   | I6149-12-C5A                                                                                         | 2   | TMMK2000-200M                                                                                         | 1   | ATKK12-6149  |
| -14           | I6149-14R2-32FM | M30 X 2          | 1   | 452H-28                                                                                                 | 2   | I6149-14-C5A                                                                                         | 2   | TMMK2000-200M                                                                                         | 1   | ATKK14-6149  |
| -16           | I6149-16R2-32FM | M33 X 2          | 1   | 452H-31                                                                                                 | 2   | I6149-16-C5A                                                                                         | 2   | TMMK2000-200M                                                                                         | 1   | ATKK16-6149  |
| -20           | I6149-20R3-32FM | M42 X 2          | 1   | 453H-40                                                                                                 | 1   | I6149-20-C5A                                                                                         | 2   | TMMK2000-200M                                                                                         | 1   | ATKK20-6149  |
| -24           | I6149-24R3-32FM | M48 X 2          | 1   | 453H-46                                                                                                 | 1   | I6149-24-C5A                                                                                         | 2   | TMMK2000-200M                                                                                         | 1   | ATKK24-6149  |
| -32           | I6149-32R4-32FM | M60 X 2          | 1   | 454H-58                                                                                                 | 1   | I6149-32-C5A                                                                                         | 2   | TMMK2000-200M                                                                                         | 1   | ATKK32-6149  |



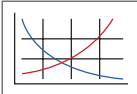
E THREADING

## AccuThread™ Port Specific Solid Carbide Thread Mills

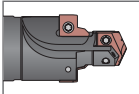
| Port Size  | Pitch | Thread Mill |       |       |       | Flutes | Part No.      |
|------------|-------|-------------|-------|-------|-------|--------|---------------|
|            |       | $D_1$       | $L_6$ | $D_2$ | $L_1$ |        |               |
| -4         | 1.50  | 7.40        | 19.50 | 8.00  | 64.00 | 4      | TMMK1000-150M |
| -5 to -6   | 1.50  | 10.90       | 27.00 | 12.00 | 84.00 | 4      | TMMK1400-150M |
| -8 to -10  | 1.50  | 11.90       | 31.50 | 12.00 | 84.00 | 4      | TMMK1800-150M |
| -12 to -32 | 2.00  | 11.95       | 30.00 | 12.00 | 84.00 | 4      | TMMK2000-200M |

AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE AS5202 port form specifications.

X SPECIALS

A92: 30 - 37


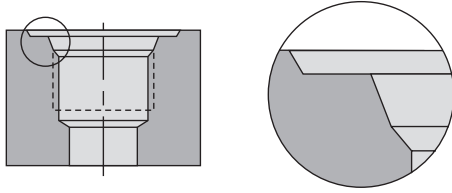
A92: 2 - 4


A92: 12 - 13


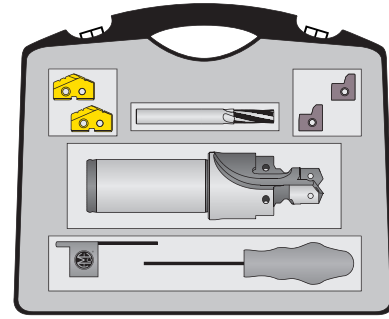


## Port and Thread Finishing Kits

I6149 | No ID Ridge | Non-Ferrous Materials

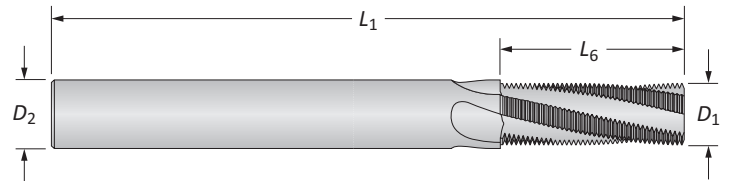


ISO 6149-1:2006 / SAE J-2244/1



### Port and Thread Finishing Kits

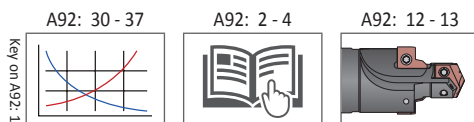
| Tube Dash No. | AccuPort 432    |                  |     | Original T-A® Insert |     | Port Form Insert   |     | AccuThread™ Thread Mill |     | Kit Part No. |
|---------------|-----------------|------------------|-----|----------------------|-----|--------------------|-----|-------------------------|-----|--------------|
|               | Part No.        | Port Thread Size | Qty | Super Cobalt (TiN)   | Qty | C5 Carbide (TiAlN) | Qty | Part No. (Uncoated)     | Qty |              |
| -4            | I6149-04RY-16FM | M12 X 1.5        | 1   | 15YT-10.5            | 2   | I6149-04-C5A       | 2   | TMMU1000-150M           | 1   | ATKU04-6149  |
| -5            | I6149-05RZ-16FM | M14 X 1.5        | 1   | 15ZT-12.5            | 2   | I6149-04-C5A       | 2   | TMMU1400-150M           | 1   | ATKU05-6149  |
| -6            | I6149-06R0-20FM | M16 X 1.5        | 1   | 150T-14.5            | 2   | I6149-06-C5A       | 2   | TMMU1400-150M           | 1   | ATKU06-6149  |
| -8            | I6149-08R0-20FM | M18 X 1.5        | 1   | 150T-16.5            | 2   | I6149-06-C5A       | 2   | TMMU1800-150M           | 1   | ATKU08-6149  |
| -10           | I6149-10R1-25FM | M22 X 1.5        | 1   | 151T-20.5            | 2   | I6149-04-C5A       | 2   | TMMU1800-150M           | 1   | ATKU10-6149  |
| -12           | I6149-12R2-32FM | M27 X 2          | 1   | 152T-25              | 2   | I6149-12-C5A       | 2   | TMMU2000-200M           | 1   | ATKU12-6149  |
| -14           | I6149-14R2-32FM | M30 X 2          | 1   | 152T-28              | 2   | I6149-14-C5A       | 2   | TMMU2000-200M           | 1   | ATKU14-6149  |
| -16           | I6149-16R2-32FM | M33 X 2          | 1   | 152T-31              | 2   | I6149-16-C5A       | 2   | TMMU2000-200M           | 1   | ATKU16-6149  |
| -20           | I6149-20R3-32FM | M42 X 2          | 1   | 453T-40              | 1   | I6149-20-C5A       | 2   | TMMU2000-200M           | 1   | ATKU20-6149  |
| -24           | I6149-24R3-32FM | M48 X 2          | 1   | 453T-46              | 1   | I6149-24-C5A       | 2   | TMMU2000-200M           | 1   | ATKU24-6149  |
| -32           | I6149-32R4-32FM | M60 X 2          | 1   | 454T-58              | 1   | I6149-32-C5A       | 2   | TMMU2000-200M           | 1   | ATKU32-6149  |



### AccuThread™ Port Specific Solid Carbide Thread Mills

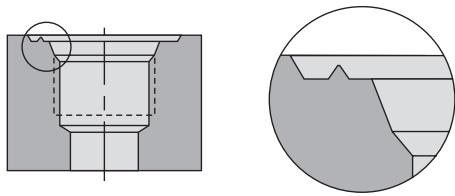
| Port Size  | Pitch | Thread Mill |       |       |       | Flutes | Part No.      |
|------------|-------|-------------|-------|-------|-------|--------|---------------|
|            |       | $D_1$       | $L_6$ | $D_2$ | $L_1$ |        |               |
| -4         | 1.50  | 7.40        | 19.50 | 8.00  | 64.00 | 4      | TMMU1000-150M |
| -5 to -6   | 1.50  | 10.90       | 27.00 | 12.00 | 84.00 | 4      | TMMU1400-150M |
| -8 to -10  | 1.50  | 11.90       | 31.50 | 12.00 | 84.00 | 4      | TMMU1800-150M |
| -12 to -32 | 2.00  | 11.95       | 30.00 | 12.00 | 84.00 | 4      | TMMU2000-200M |

AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE A5202 port form specifications.

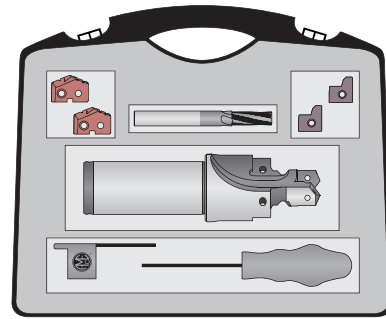


## Port and Thread Finishing Kits

I6149 | ID Ridge | Ferrous Materials

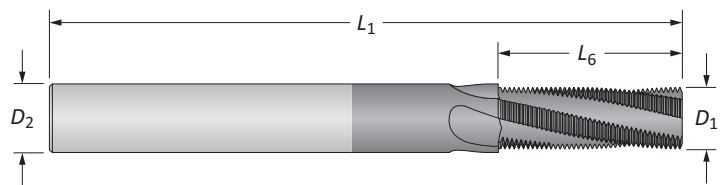


ISO 6149-1:2006 / SAE J-2244/1



### Port and Thread Finishing Kits

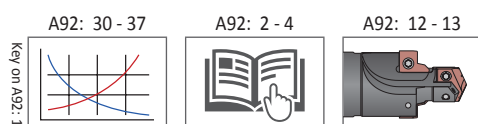
| Tube Dash No. | AccuPort 432    |                  |     | GEN2 T-A® Insert      |     | Port Form Insert   |     | AccuThread™ Thread Mill |     | Kit Part No. |
|---------------|-----------------|------------------|-----|-----------------------|-----|--------------------|-----|-------------------------|-----|--------------|
|               | Part No.        | Port Thread Size | Qty | Super Cobalt (AM200®) | Qty | C5 Carbide (TiAlN) | Qty | Part No. (AM210®)       | Qty |              |
| -4            | I6149-04RY-16FM | M12 X 1.5        | 1   | 45YH-10.5             | 2   | I6149-04R-C5A      | 2   | TMMK1000-150M           | 1   | ATKK04R-6149 |
| -5            | I6149-05RZ-16FM | M14 X 1.5        | 1   | 45ZH-12.5             | 2   | I6149-04R-C5A      | 2   | TMMK1400-150M           | 1   | ATKK05R-6149 |
| -6            | I6149-06R0-20FM | M16 X 1.5        | 1   | 450H-14.5             | 2   | I6149-06R-C5A      | 2   | TMMK1400-150M           | 1   | ATKK06R-6149 |
| -8            | I6149-08R0-20FM | M18 X 1.5        | 1   | 450H-16.5             | 2   | I6149-06R-C5A      | 2   | TMMK1800-150M           | 1   | ATKK08R-6149 |
| -10           | I6149-10R1-25FM | M22 X 1.5        | 1   | 451H-20.5             | 2   | I6149-04R-C5A      | 2   | TMMK1800-150M           | 1   | ATKK10R-6149 |
| -12           | I6149-12R2-32FM | M27 X 2          | 1   | 452H-25               | 2   | I6149-12R-C5A      | 2   | TMMK2000-200M           | 1   | ATKK12R-6149 |
| -14           | I6149-14R2-32FM | M30 X 2          | 1   | 452H-28               | 2   | I6149-14R-C5A      | 2   | TMMK2000-200M           | 1   | ATKK14R-6149 |
| -16           | I6149-16R2-32FM | M33 X 2          | 1   | 452H-31               | 2   | I6149-16R-C5A      | 2   | TMMK2000-200M           | 1   | ATKK16R-6149 |
| -20           | I6149-20R3-32FM | M42 X 2          | 1   | 453H-40               | 1   | I6149-20R-C5A      | 2   | TMMK2000-200M           | 1   | ATKK20R-6149 |
| -24           | I6149-24R3-32FM | M48 X 2          | 1   | 453H-46               | 1   | I6149-24R-C5A      | 2   | TMMK2000-200M           | 1   | ATKK24R-6149 |
| -32           | I6149-32R4-32FM | M60 X 2          | 1   | 454H-58               | 1   | I6149-32R-C5A      | 2   | TMMK2000-200M           | 1   | ATKK32R-6149 |



### AccuThread™ Port Specific Solid Carbide Thread Mills

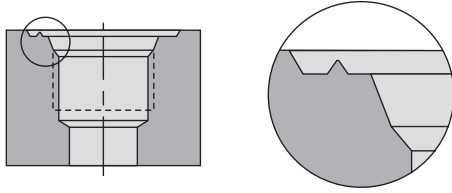
| Port Size  | Pitch | Thread Mill |       |       |       | Flutes | Part No.      |
|------------|-------|-------------|-------|-------|-------|--------|---------------|
|            |       | $D_1$       | $L_6$ | $D_2$ | $L_1$ |        |               |
| -4         | 1.50  | 7.40        | 19.50 | 8.00  | 64.00 | 4      | TMMK1000-150M |
| -5 to -6   | 1.50  | 10.90       | 27.00 | 12.00 | 84.00 | 4      | TMMK1400-150M |
| -8 to -10  | 1.50  | 11.90       | 31.50 | 12.00 | 84.00 | 4      | TMMK1800-150M |
| -12 to -32 | 2.00  | 11.95       | 30.00 | 12.00 | 84.00 | 4      | TMMK2000-200M |

AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE AS5202 port form specifications.

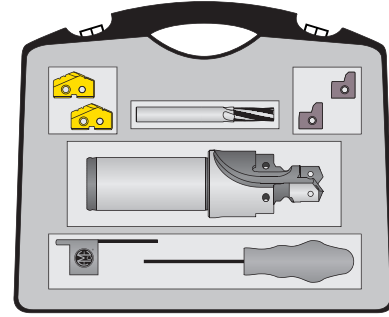


## Port and Thread Finishing Kits

I6149 | ID Ridge | Non-Ferrous Materials

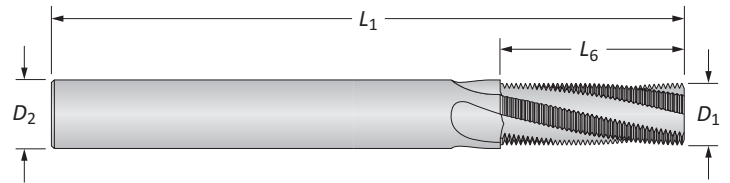


ISO 6149-1:2006 / SAE J-2244/1



### Port and Thread Finishing Kits

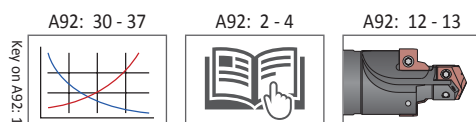
| Tube Dash No. | AccuPort 432    |                  |     | Original T-A® Insert |     | Port Form Insert   |     | AccuThread™ Thread Mill |     | Kit Part No. |
|---------------|-----------------|------------------|-----|----------------------|-----|--------------------|-----|-------------------------|-----|--------------|
|               | Part No.        | Port Thread Size | Qty | Super Cobalt (TiN)   | Qty | C5 Carbide (TiAlN) | Qty | Part No. (Uncoated)     | Qty |              |
| -4            | I6149-04RY-16FM | M12 X 1.5        | 1   | 15YT-10.5            | 2   | I6149-04R-C5A      | 2   | TMMU1000-150M           | 1   | ATKU04R-6149 |
| -5            | I6149-05RZ-16FM | M14 X 1.5        | 1   | 15ZT-12.5            | 2   | I6149-04R-C5A      | 2   | TMMU1400-150M           | 1   | ATKU05R-6149 |
| -6            | I6149-06R0-20FM | M16 X 1.5        | 1   | 150T-14.5            | 2   | I6149-06R-C5A      | 2   | TMMU1400-150M           | 1   | ATKU06R-6149 |
| -8            | I6149-08R0-20FM | M18 X 1.5        | 1   | 150T-16.5            | 2   | I6149-06R-C5A      | 2   | TMMU1800-150M           | 1   | ATKU08R-6149 |
| -10           | I6149-10R1-25FM | M22 X 1.5        | 1   | 151T-20.5            | 2   | I6149-04R-C5A      | 2   | TMMU1800-150M           | 1   | ATKU10R-6149 |
| -12           | I6149-12R2-32FM | M27 X 2          | 1   | 152T-25              | 2   | I6149-12R-C5A      | 2   | TMMU2000-200M           | 1   | ATKU12R-6149 |
| -14           | I6149-14R2-32FM | M30 X 2          | 1   | 152T-28              | 2   | I6149-14R-C5A      | 2   | TMMU2000-200M           | 1   | ATKU14R-6149 |
| -16           | I6149-16R2-32FM | M33 X 2          | 1   | 152T-31              | 2   | I6149-16R-C5A      | 2   | TMMU2000-200M           | 1   | ATKU16R-6149 |
| -20           | I6149-20R3-32FM | M42 X 2          | 1   | 453T-40              | 1   | I6149-20R-C5A      | 2   | TMMU2000-200M           | 1   | ATKU20R-6149 |
| -24           | I6149-24R3-32FM | M48 X 2          | 1   | 453T-46              | 1   | I6149-24R-C5A      | 2   | TMMU2000-200M           | 1   | ATKU24R-6149 |
| -32           | I6149-32R4-32FM | M60 X 2          | 1   | 454T-58              | 1   | I6149-32R-C5A      | 2   | TMMU2000-200M           | 1   | ATKU32R-6149 |



### AccuThread™ Port Specific Solid Carbide Thread Mills

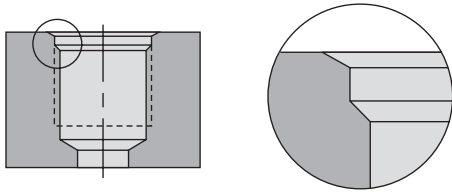
| Port Size  | Pitch | Thread Mill |       |       |       | Flutes | Part No.      |
|------------|-------|-------------|-------|-------|-------|--------|---------------|
|            |       | $D_1$       | $L_6$ | $D_2$ | $L_1$ |        |               |
| -4         | 1.50  | 7.40        | 19.50 | 8.00  | 64.00 | 4      | TMMU1000-150M |
| -5 to -6   | 1.50  | 10.90       | 27.00 | 12.00 | 84.00 | 4      | TMMU1400-150M |
| -8 to -10  | 1.50  | 11.90       | 31.50 | 12.00 | 84.00 | 4      | TMMU1800-150M |
| -12 to -32 | 2.00  | 11.95       | 30.00 | 12.00 | 84.00 | 4      | TMMU2000-200M |

AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE A55202 port form specifications.

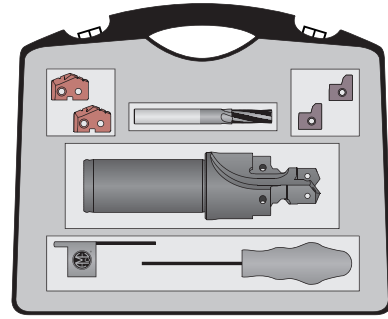


## Port and Thread Finishing Kits

AS5202 | Ferrous Materials

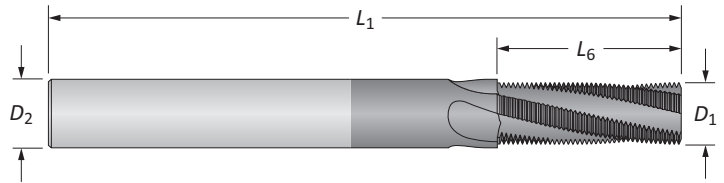


SAE AS5202



### Port and Thread Finishing Kits

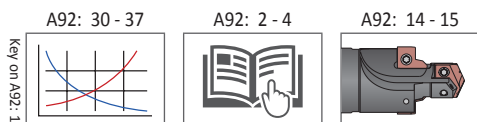
| Tube Dash No. | AccuPort 432    |                  |     | GEN2 T-A® Insert      |     | Port Form Insert   |     | AccuThread™ Thread Mill |     | Kit Part No. |
|---------------|-----------------|------------------|-----|-----------------------|-----|--------------------|-----|-------------------------|-----|--------------|
|               | Part No.        | Port Thread Size | Qty | Super Cobalt (AM200®) | Qty | C5 Carbide (TiAlN) | Qty | Part No. (AM210®)       | Qty |              |
| -4            | AS5202-04Y-063F | 7/16-20 UNJF-3B  | 1   | 45YH-.390             | 2   | AS5202-04-C5A      | 2   | TMAK0438-20             | 1   | ATKK04-5202  |
| -5            | AS5202-05Z-063F | 1/2-20 UNJF-3B   | 1   | 45ZH-11.5             | 2   | AS5202-05-C5A      | 2   | TMAK0438-20             | 1   | ATKK05-5202  |
| -6            | AS5202-06Z-075F | 9/16-18 UNJF-3B  | 1   | 45ZH-.510             | 2   | AS5202-06-C5A      | 2   | TMAK0563-18             | 1   | ATKK06-5202  |
| -8            | AS5202-080-075F | 3/4-16 UNJF-3B   | 1   | 450H-17.5             | 2   | AS5202-08-C5A      | 2   | TMAK0750-16             | 1   | ATKK08-5202  |
| -10           | AS5202-101-100F | 7/8-14 UNJF-3B   | 1   | 451H-20.5             | 2   | AS5202-10-C5A      | 2   | TMAK0875-14             | 1   | ATKK10-5202  |
| -12           | AS5202-122-125F | 1-1/16-12 UNJ-3B | 1   | 452H-25               | 2   | AS5202-12-C5A      | 2   | TMAK1063-12             | 1   | ATKK12-5202  |
| -14           | AS5202-142-125F | 1-3/16-12 UNJ-3B | 1   | 452H-1.109            | 2   | AS5202-14-C5A      | 2   | TMAK1063-12             | 1   | ATKK14-5202  |
| -16           | AS5202-162-125F | 1-5/16-12 UNJ-3B | 1   | 452H-1.234            | 2   | AS5202-16-C5A      | 2   | TMAK1063-12             | 1   | ATKK16-5202  |
| -20           | AS5202-203-150F | 1-5/8-12 UNJ-3B  | 1   | 453H-1.547            | 1   | AS5202-20-C5A      | 2   | TMAK1063-12             | 1   | ATKK20-5202  |
| -24           | AS5202-243-150F | 1-7/8-12 UNJ-3B  | 1   | 453H-1.797            | 1   | AS5202-24-C5A      | 2   | TMAK1063-12             | 1   | ATKK24-5202  |
| -32           | AS5202-324-150F | 2-1/2-12 UNJ-3B  | 1   | 454H-61.5             | 1   | AS5202-32-C5A      | 2   | TMAK1063-12             | 1   | ATKK32-5202  |



### AccuThread™ Port Specific Solid Carbide Thread Mills

| Port Size  | Pitch | Thread Mill    |                |                |                | Flutes | Part No.    |
|------------|-------|----------------|----------------|----------------|----------------|--------|-------------|
|            |       | D <sub>1</sub> | L <sub>6</sub> | D <sub>2</sub> | L <sub>1</sub> |        |             |
| -4 to -5   | 20    | 0.335          | 0.600          | 0.375          | 3.5            | 4      | TMAK0438-20 |
| -6         | 18    | 0.370          | 0.666          | 0.375          | 3.5            | 4      | TMAK0563-18 |
| -8         | 16    | 0.495          | 0.750          | 0.500          | 3.5            | 4      | TMAK0750-16 |
| -10        | 14    | 0.495          | 0.857          | 0.500          | 3.5            | 4      | TMAK0875-14 |
| -12 to -32 | 12    | 0.495          | 0.917          | 0.500          | 3.5            | 4      | TMAK1063-12 |

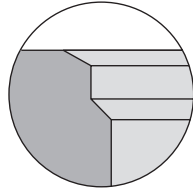
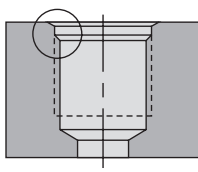
AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE AS5202 port form specifications.



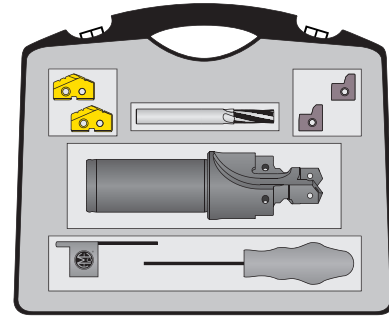


## Port and Thread Finishing Kits

AS5202 | Non-Ferrous Materials

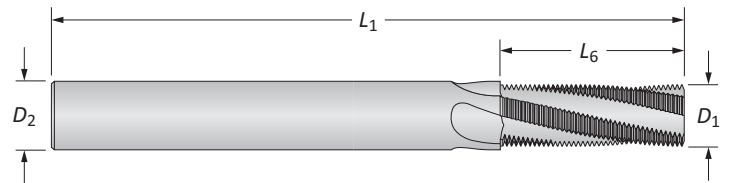


SAE AS5202



### Port and Thread Finishing Kits

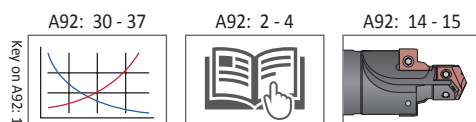
| Tube Dash No. | AccuPort 432    |                  |     | Original T-A® Insert                                                                                 |     | Port Form Insert                                                                                     |     | AccuThread™ Thread Mill                                                                                 |     | Kit Part No. |
|---------------|-----------------|------------------|-----|------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------------------------|-----|--------------|
|               | Part No.        | Port Thread Size | Qty |  Super Cobalt (TiN) | Qty |  C5 Carbide (TiAlN) | Qty |  Part No. (Uncoated) | Qty |              |
| -4            | AS5202-04Y-063F | 7/16-20 UNJF-3B  | 1   | 15YT-.390                                                                                            | 2   | AS5202-04-C5A                                                                                        | 2   | TMAU0438-20                                                                                             | 1   | ATKU04-5202  |
| -5            | AS5202-05Z-063F | 1/2-20 UNJF-3B   | 1   | 15ZT-11.5                                                                                            | 2   | AS5202-05-C5A                                                                                        | 2   | TMAU0438-20                                                                                             | 1   | ATKU05-5202  |
| -6            | AS5202-06Z-075F | 9/16-18 UNJF-3B  | 1   | 15ZT-.510                                                                                            | 2   | AS5202-06-C5A                                                                                        | 2   | TMAU0563-18                                                                                             | 1   | ATKU06-5202  |
| -8            | AS5202-080-075F | 3/4-16 UNJF-3B   | 1   | 150T-17.5                                                                                            | 2   | AS5202-08-C5A                                                                                        | 2   | TMAU0750-16                                                                                             | 1   | ATKU08-5202  |
| -10           | AS5202-101-100F | 7/8-14 UNJF-3B   | 1   | 151T-20.5                                                                                            | 2   | AS5202-10-C5A                                                                                        | 2   | TMAU0875-14                                                                                             | 1   | ATKU10-5202  |
| -12           | AS5202-122-125F | 1-1/16-12 UNJ-3B | 1   | 152T-25                                                                                              | 2   | AS5202-12-C5A                                                                                        | 2   | TMAU1063-12                                                                                             | 1   | ATKU12-5202  |
| -14           | AS5202-142-125F | 1-3/16-12 UNJ-3B | 1   | 152T-1.109                                                                                           | 2   | AS5202-14-C5A                                                                                        | 2   | TMAU1063-12                                                                                             | 1   | ATKU14-5202  |
| -16           | AS5202-162-125F | 1-5/16-12 UNJ-3B | 1   | 152T-1.234                                                                                           | 2   | AS5202-16-C5A                                                                                        | 2   | TMAU1063-12                                                                                             | 1   | ATKU16-5202  |
| -20           | AS5202-203-150F | 1-5/8-12 UNJ-3B  | 1   | 453T-1.547                                                                                           | 1   | AS5202-20-C5A                                                                                        | 2   | TMAU1063-12                                                                                             | 1   | ATKU20-5202  |
| -24           | AS5202-243-150F | 1-7/8-12 UNJ-3B  | 1   | 453T-1.797                                                                                           | 1   | AS5202-24-C5A                                                                                        | 2   | TMAU1063-12                                                                                             | 1   | ATKU24-5202  |
| -32           | AS5202-324-150F | 2-1/2-12 UNJ-3B  | 1   | 454T-61.5                                                                                            | 1   | AS5202-32-C5A                                                                                        | 2   | TMAU1063-12                                                                                             | 1   | ATKU32-5202  |



### AccuThread™ Port Specific Solid Carbide Thread Mills

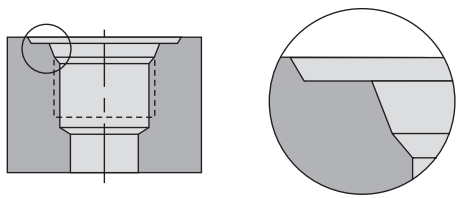
| Port Size  | Pitch | Thread Mill |       |       |       | Flutes | Part No.    |
|------------|-------|-------------|-------|-------|-------|--------|-------------|
|            |       | $D_1$       | $L_6$ | $D_2$ | $L_1$ |        |             |
| -4 to -5   | 20    | 0.335       | 0.600 | 0.375 | 3.5   | 4      | TMAU0438-20 |
| -6         | 18    | 0.370       | 0.666 | 0.375 | 3.5   | 4      | TMAU0563-18 |
| -8         | 16    | 0.495       | 0.750 | 0.500 | 3.5   | 4      | TMAU0750-16 |
| -10        | 14    | 0.495       | 0.857 | 0.500 | 3.5   | 4      | TMAU0875-14 |
| -12 to -32 | 12    | 0.495       | 0.917 | 0.500 | 3.5   | 4      | TMAU1063-12 |

AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE AS5202 port form specifications.

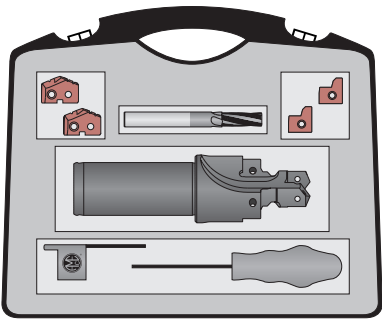


# Port and Thread Finishing Kits

G1731 | Ferrous Materials

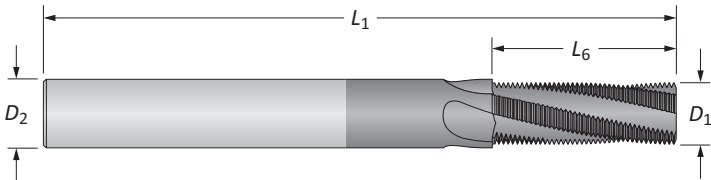


JDS-G173.1



## Port and Thread Finishing Kits

| Tube Dash No. | AccuPort 432   |                  |     | GEN2 T-A® Insert                                                                                        |     | Port Form Insert                                                                                      |     | AccuThread™ Thread Mill                                                                               |     | Kit Part No. |
|---------------|----------------|------------------|-----|---------------------------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------|-----|--------------|
|               | Part No.       | Port Thread Size | Qty |  Super Cobalt (AM200®) | Qty |  C3 Carbide (AM200®) | Qty |  Part No. (AM210®) | Qty |              |
| -4            | G1731-04Y-16FM | M12 X 1.5        | 1   | 45YH-10.5                                                                                               | 2   | G1731-01-C3H                                                                                          | 2   | TMMK1000-150M                                                                                         | 1   | ATKK04-G1731 |
| -5            | G1731-05Z-16FM | M14 X 1.5        | 1   | 45ZH-12.5                                                                                               | 2   | G1731-01-C3H                                                                                          | 2   | TMMK1400-150M                                                                                         | 1   | ATKK05-G1731 |
| -6            | G1731-06O-20FM | M16 X 1.5        | 1   | 45OH-14.5                                                                                               | 2   | G1731-02-C3H                                                                                          | 2   | TMMK1400-150M                                                                                         | 1   | ATKK06-G1731 |
| -8            | G1731-08O-20FM | M18 X 1.5        | 1   | 45OH-16.5                                                                                               | 2   | G1731-02-C3H                                                                                          | 2   | TMMK1800-150M                                                                                         | 1   | ATKK08-G1731 |
| -10           | G1731-10I-25FM | M22 X 1.5        | 1   | 45IH-20.5                                                                                               | 2   | G1731-02-C3H                                                                                          | 2   | TMMK1800-150M                                                                                         | 1   | ATKK10-G1731 |
| -12           | G1731-12Z-32FM | M27 X 2          | 1   | 45ZH-25                                                                                                 | 2   | G1731-03-C3H                                                                                          | 2   | TMMK2000-200M                                                                                         | 1   | ATKK12-G1731 |
| -14           | G1731-14Z-32FM | M30 X 2          | 1   | 45ZH-28                                                                                                 | 2   | G1731-03-C3H                                                                                          | 2   | TMMK2000-200M                                                                                         | 1   | ATKK14-G1731 |
| -16           | G1731-16Z-32FM | M33 X 2          | 1   | 45ZH-31                                                                                                 | 2   | G1731-04-C3H                                                                                          | 2   | TMMK2000-200M                                                                                         | 1   | ATKK16-G1731 |
| -18           | G1731-18Z-32FM | M38 X 2          | 1   | 45ZH-36                                                                                                 | 1   | G1731-04-C3H                                                                                          | 2   | TMMK2000-200M                                                                                         | 2   | ATKK18-G1731 |
| -20           | G1731-20Z-32FM | M42 X 2          | 1   | 45ZH-40                                                                                                 | 1   | G1731-05-C3H                                                                                          | 2   | TMMK2000-200M                                                                                         | 1   | ATKK20-G1731 |
| -24           | G1731-24Z-32FM | M48 X 2          | 1   | 45ZH-46                                                                                                 | 1   | G1731-05-C3H                                                                                          | 2   | TMMK2000-200M                                                                                         | 1   | ATKK24-G1731 |
| -32           | G1731-32Z-32FM | M60 X 2          | 1   | 45ZH-58                                                                                                 | 1   | G1731-06-C3H                                                                                          | 2   | TMMK2000-200M                                                                                         | 1   | ATKK32-G1731 |



## AccuThread™ Port Specific Solid Carbide Thread Mills

| Port Size  | Pitch | Thread Mill    |                |                |                | Flutes | Part No.      |
|------------|-------|----------------|----------------|----------------|----------------|--------|---------------|
|            |       | D <sub>1</sub> | L <sub>6</sub> | D <sub>2</sub> | L <sub>1</sub> |        |               |
| -4         | 1.50  | 7.40           | 19.50          | 8.00           | 64.00          | 4      | TMMK1000-150M |
| -5 to -6   | 1.50  | 10.90          | 27.00          | 12.00          | 84.00          | 4      | TMMK1400-150M |
| -8 to -10  | 1.50  | 11.90          | 31.50          | 12.00          | 84.00          | 4      | TMMK1800-150M |
| -12 to -32 | 2.00  | 11.95          | 30.00          | 12.00          | 84.00          | 4      | TMMK2000-200M |

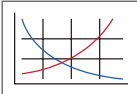
AccuPort 432 specific thread mills - International Unified Series (UN) manufactured specifically for use with AccuPort 432 hydraulic port forms. The length of cut allows full thread with one pass. Conforms with J1926 and SAE AS5202 port form specifications.

A92: 30 - 37

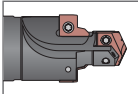
A92: 2 - 4

A92: 16 - 17

Key on A92: 1











## Recommended Drilling Data | Imperial (inch)

HSS

| ISO | Material                                                           | Hardness<br>(BHN) | Grade | Speed (SFM) |       |      |        | Feed Rate (IPR) by Tube Size and T-A® Insert Series |                   |                 |                     |                     |                 |
|-----|--------------------------------------------------------------------|-------------------|-------|-------------|-------|------|--------|-----------------------------------------------------|-------------------|-----------------|---------------------|---------------------|-----------------|
|     |                                                                    |                   |       | TiN         | TiAlN | TiCN | AM200® | Tube No.<br>4 - 5                                   | Tube No.<br>6 - 8 | Tube No.<br>10  | Tube No.<br>12 - 16 | Tube No.<br>20 - 24 | Tube No.<br>32  |
|     |                                                                    |                   |       |             |       |      |        | T-A Series<br>Y - Z                                 | T-A Series<br>0   | T-A Series<br>1 | T-A Series<br>2     | T-A Series<br>3     | T-A Series<br>4 |
| P   | Free Machining Steel<br>1118, 1215, 12L14, etc.                    | 100 - 150         | HSS   | 200         | 280   | 260  | 325    | 0.007                                               | 0.010             | 0.013           | 0.016               | 0.020               | 0.023           |
|     |                                                                    | 150 - 200         | HSS   | 180         | 260   | 235  | 300    | 0.007                                               | 0.010             | 0.013           | 0.016               | 0.020               | 0.023           |
|     |                                                                    | 200 - 250         | HSS   | 160         | 240   | 210  | 280    | 0.006                                               | 0.010             | 0.013           | 0.016               | 0.020               | 0.023           |
|     | Low Carbon Steel<br>1010, 1020, 1025, 1522,<br>1144, etc.          | 85 - 125          | HSS   | 170         | 250   | 220  | 290    | 0.006 ❖                                             | 0.009             | 0.012           | 0.015               | 0.019               | 0.023           |
|     |                                                                    | 125 - 175         | HSS   | 160         | 240   | 210  | 275    | 0.006 ❖                                             | 0.009             | 0.012           | 0.015               | 0.019               | 0.023           |
|     |                                                                    | 175 - 225         | HSS   | 150         | 225   | 195  | 260    | 0.005 ❖                                             | 0.008             | 0.010           | 0.014               | 0.018               | 0.021           |
|     | Medium Carbon Steel<br>1030, 1040, 1050, 1527,<br>1140, 1151, etc. | 225 - 275         | HSS   | 140         | 210   | 180  | 240    | 0.005 ❖                                             | 0.008             | 0.010           | 0.014               | 0.018               | 0.021           |
|     |                                                                    | 125 - 175         | HSS   | 160         | 240   | 210  | 275    | 0.006                                               | 0.009             | 0.012           | 0.015               | 0.019               | 0.023           |
|     |                                                                    | 175 - 225         | HSS   | 150         | 225   | 195  | 260    | 0.005                                               | 0.008             | 0.010           | 0.014               | 0.018               | 0.021           |
|     |                                                                    | 225 - 275         | HSS   | 140         | 210   | 180  | 240    | 0.005                                               | 0.008             | 0.010           | 0.014               | 0.018               | 0.021           |
|     | Alloy Steel<br>4140, 5140, 8640, etc.                              | 275 - 325         | SC    | 130         | 195   | 170  | 225    | 0.004                                               | 0.007             | 0.009           | 0.012               | 0.016               | 0.019           |
|     |                                                                    | 125 - 175         | HSS   | 150         | 210   | 195  | 240    | 0.006                                               | 0.008             | 0.010           | 0.014               | 0.017               | 0.019           |
|     |                                                                    | 175 - 225         | HSS   | 140         | 195   | 180  | 225    | 0.005                                               | 0.008             | 0.010           | 0.014               | 0.017               | 0.019           |
|     |                                                                    | 225 - 275         | HSS   | 130         | 180   | 170  | 210    | 0.005                                               | 0.007             | 0.010           | 0.014               | 0.017               | 0.019           |
|     |                                                                    | 275 - 325         | SC    | 120         | 170   | 155  | 195    | 0.004                                               | 0.006             | 0.009           | 0.012               | 0.015               | 0.017           |
|     | High Strength Alloy<br>4340, 4330V, 300M, etc.                     | 325 - 375         | SC    | 110         | 155   | 145  | 180    | 0.003                                               | 0.006             | 0.009           | 0.012               | 0.015               | 0.017           |
|     |                                                                    | 225 - 300         | SC    | 80          | 110   | 100  | 125    | 0.005 ❖                                             | 0.007             | 0.009           | 0.010               | 0.014               | 0.017           |
|     |                                                                    | 300 - 350         | SC    | 60          | 85    | 80   | 100    | 0.004 ❖                                             | 0.007             | 0.009           | 0.010               | 0.014               | 0.017           |
|     | Structural Steel<br>A36, A285, A516, etc.                          | 350 - 400         | SC    | 50          | 70    | 65   | 80     | 0.003 ❖                                             | 0.006             | 0.008           | 0.009               | 0.012               | 0.015           |
|     |                                                                    | 100 - 150         | HSS   | 140         | 200   | 180  | 235    | 0.006 ❖                                             | 0.010             | 0.012           | 0.014               | 0.018               | 0.021           |
|     |                                                                    | 150 - 250         | HSS   | 120         | 170   | 155  | 190    | 0.005 ❖                                             | 0.009             | 0.010           | 0.012               | 0.016               | 0.019           |
|     | Tool Steel<br>H-13, H-21, A-4, O-2, S-3, etc.                      | 250 - 350         | SC    | 100         | 140   | 130  | 160    | 0.004 ❖                                             | 0.009             | 0.009           | 0.010               | 0.014               | 0.017           |
|     |                                                                    | 150 - 200         | SC    | 80          | 110   | 105  | 125    | 0.004 ❖                                             | 0.006             | 0.008           | 0.010               | 0.014               | 0.015           |
|     | High Temp Alloy<br>Hastelloy B, Inconel 600, etc.                  | 200 - 250         | SC    | 60          | 90    | 85   | 105    | 0.004 ❖                                             | 0.006             | 0.008           | 0.010               | 0.012               | 0.015           |
|     |                                                                    | 140 - 220         | SC    | 30          | 40    | 35   | 45     | 0.003 ❖                                             | 0.007             | 0.008           | 0.010               | 0.012               | 0.015           |
| S   | High Temp Alloy<br>Hastelloy B, Inconel 600, etc.                  | 220 - 310         | SC    | 25          | 35    | 30   | 40     | 0.003 ❖                                             | 0.006             | 0.007           | 0.008               | 0.010               | 0.012           |
|     |                                                                    | 185 - 275         | SC    | 75          | 105   | 95   | 110    | 0.006 ❖                                             | 0.008             | 0.009           | 0.011               | 0.012               | 0.016           |
| M   | Stainless Steel 400 Series<br>416, 420, 303, etc.                  | 275 - 350         | SC    | 60          | 90    | 80   | 100    | 0.005 ❖                                             | 0.007             | 0.008           | 0.010               | 0.012               | 0.014           |
|     |                                                                    | 120 - 150         | HSS   | 170         | 250   | 220  | 290    | 0.007                                               | 0.012             | 0.016           | 0.020               | 0.024               | 0.027           |
| K   | Nodular, Grey, Ductile Cast Iron                                   | 150 - 200         | HSS   | 150         | 225   | 195  | 260    | 0.006                                               | 0.011             | 0.014           | 0.018               | 0.022               | 0.025           |
|     |                                                                    | 200 - 220         | HSS   | 130         | 195   | 170  | 225    | 0.006                                               | 0.009             | 0.012           | 0.016               | 0.018               | 0.021           |
|     |                                                                    | 220 - 260         | SC    | 110         | 165   | 145  | 190    | 0.005                                               | 0.007             | 0.009           | 0.012               | 0.014               | 0.017           |
|     |                                                                    | 260 - 320         | SC    | 90          | 135   | 120  | 155    | 0.004                                               | 0.006             | 0.007           | 0.009               | 0.012               | 0.014           |
|     |                                                                    | 120 - 150         | HSS   | 170         | 250   | 220  | 290    | 0.007                                               | 0.012             | 0.016           | 0.020               | 0.024               | 0.027           |
| N   | Aluminum                                                           | 30                | HSS   | 600         | 850   | 750  | –      | 0.008                                               | 0.013             | 0.016           | 0.020               | 0.022               | 0.025           |
|     |                                                                    | 180               | HSS   | 300         | 450   | 400  | –      | 0.008                                               | 0.013             | 0.016           | 0.018               | 0.022               | 0.025           |

## Formulas

|                                                                                                                                                         |                                                                                                                                                 |                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 1. <b>RPM</b> = (3.82 • SFM) / DIA<br>where:<br>RPM = revolutions per minute (rev/min)<br>SFM = speed (ft/min)<br>DIA = finish diameter of drill (inch) | 2. <b>SFM</b> = RPM • 0.262 • DIA<br>where:<br>SFM = speed (ft/min)<br>RPM = revolutions per minute (rev/min)<br>DIA = diameter of drill (inch) | 3. <b>IPM</b> = RPM • IPR<br>where:<br>IPM = Feed rate<br>RPM = revolutions per minute (rev/min)<br>IPR = feed rate (in/rev) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|

The table and equations on this page are found in the *Machinery's Handbook*. Permission to simplify and print the equations is granted by the Editor of the *Machinery's Handbook*.

**IMPORTANT:** The speeds and feeds listed above are a general starting point for all applications. Refer to the Coolant Recommendation charts for coolant requirements to run at the recommended speeds and feeds. Factory technical assistance is also available through our Application Engineering Team. Due to potential chip formation issues, contact our Application Engineering Team for assistance machining materials marked with a ❖.

## Coolant Recommendations | Imperial (inch)

HSS

| ISO | Material                                                               | Pressure /<br>Flow Rate | Tube No.<br>4 - 5   | Tube No.<br>6 - 8 | Tube No.<br>10  | Tube No.<br>12 - 16 | Tube No.<br>20 - 24 | Tube No.<br>32  |
|-----|------------------------------------------------------------------------|-------------------------|---------------------|-------------------|-----------------|---------------------|---------------------|-----------------|
|     |                                                                        |                         | T-A Series<br>Y - Z | T-A Series<br>0   | T-A Series<br>1 | T-A Series<br>2     | T-A Series<br>3     | T-A Series<br>4 |
| P   | <b>Free Machining Steel</b><br>1118, 1215, 12L14, etc.                 | PSI                     | 175 - 185           | 100 - 120         | 105 - 140       | 80 - 115            | 75 - 100            | 40 - 50         |
|     |                                                                        | GPM                     | 2.5 - 2.6           | 2.8 - 3.0         | 4.4 - 5.2       | 7 - 8               | 12 - 14             | 30 - 33         |
|     | <b>Low Carbon Steel</b><br>1010, 1020, 1025, 1522, 1144, etc.          | PSI                     | 165 - 170           | 75 - 90           | 75 - 95         | 60 - 80             | 55 - 75             | 30 - 40         |
|     |                                                                        | GPM                     | 2.4 - 2.5           | 2.4 - 2.6         | 3.7 - 4.2       | 6 - 7               | 11 - 12             | 26 - 30         |
|     | <b>Medium Carbon Steel</b><br>1030, 1040, 1050, 1527, 1140, 1151, etc. | PSI                     | 160 - 165           | 70 - 85           | 70 - 90         | 55 - 75             | 50 - 70             | 30 - 40         |
|     |                                                                        | GPM                     | 2.3 - 2.4           | 2.3 - 2.6         | 3.7 - 4.2       | 5 - 6               | 10 - 12             | 26 - 30         |
|     | <b>Alloy Steel</b><br>4140, 5140, 8640, etc.                           | PSI                     | 160 - 165           | 65 - 75           | 65 - 80         | 50 - 70             | 45 - 60             | 30 - 35         |
|     |                                                                        | GPM                     | 2.3 - 2.4           | 2.2 - 2.4         | 3.5 - 3.9       | 5 - 6               | 10 - 11             | 26 - 28         |
|     | <b>High Strength Alloy</b><br>4340, 4330V, 300M, etc.                  | PSI                     | 150 - 155           | 55 - 60           | 45 - 50         | 25 - 30             | 25 - 30             | 20 - 25         |
|     |                                                                        | GPM                     | 2.3 - 2.4           | 2.1 - 2.2         | 2.9 - 3.1       | 4 - 5               | 7 - 8               | 21 - 23         |
|     | <b>Structural Steel</b><br>A36, A285, A516, etc.                       | PSI                     | 160 - 165           | 75 - 85           | 65 - 80         | 40 - 55             | 40 - 50             | 25 - 30         |
|     |                                                                        | GPM                     | 2.3 - 2.4           | 2.4 - 2.6         | 3.5 - 3.9       | 5 - 6               | 9 - 10              | 23 - 26         |
| S   | <b>High Temp Alloy</b><br>Hastelloy B, Inconel 600, etc.               | PSI                     | 150 - 155           | 60 - 65           | 50 - 55         | 30 - 35             | 25 - 30             | 25 - 30         |
|     |                                                                        | GPM                     | 2.3 - 2.4           | 2.2 - 2.3         | 3.1 - 3.2       | 4 - 5               | 7 - 8               | 23 - 26         |
| M   | <b>Stainless Steel 400 Series</b><br>416, 420, 303, etc.               | PSI                     | 171                 | 86                | 75              | 55                  | 51                  | 29              |
|     |                                                                        | GPM                     | 3                   | 3                 | 4               | 6                   | 10                  | 26              |
| K   | <b>Nodular, Grey, Ductile Cast Iron</b>                                | PSI                     | 160                 | 65                | 61              | 41                  | 35                  | 29              |
|     |                                                                        | GPM                     | 2                   | 2                 | 3               | 5                   | 9                   | 26              |
| N   | <b>Aluminum</b>                                                        | PSI                     | 210                 | 180               | 230             | 159                 | 125                 | 51              |
|     |                                                                        | GPM                     | 3                   | 4                 | 6               | 9                   | 16                  | 33              |

**IMPORTANT:** The coolant pressure and flow rate recommendations above represent a good approximation to obtain optimum tool life and chip evacuation at Allied's recommended speeds and feeds. If lower coolant capabilities exist in a drilling application, the AccuPort 432 Port Contour Cutter will still function at reduced penetration rates. Contact our Application Engineering Department for a more specific recommendation of coolant requirements and/or speeds and feeds.

A

DRILLING

B

BORING

C

REAMING

D

BURNISHING

E

THREADING

X

SPECIALS





## Recommended Drilling Data | Imperial (inch)

Carbide

| ISO | Material                                                           | Hardness<br>(BHN) | Grade  | Speed (SFM) |       |        | Feed Rate (IPR) by Tube Size and T-A® Insert Series |                   |                 |                     |                     |
|-----|--------------------------------------------------------------------|-------------------|--------|-------------|-------|--------|-----------------------------------------------------|-------------------|-----------------|---------------------|---------------------|
|     |                                                                    |                   |        | TiN         | TiAlN | AM200® | Tube No.<br>4 - 5                                   | Tube No.<br>6 - 8 | Tube No.<br>10  | Tube No.<br>12 - 16 | Tube No.<br>20 - 24 |
|     |                                                                    |                   |        |             |       |        | T-A Series<br>Y - Z                                 | T-A Series<br>0   | T-A Series<br>1 | T-A Series<br>2     | T-A Series<br>3     |
| P   | Free Machining Steel<br>1118, 1215, 12L14, etc.                    | 100 - 150         | C1, C5 | 320         | 420   | 480    | 0.008                                               | 0.012             | 0.015           | 0.018               | 0.021               |
|     |                                                                    | 150 - 200         | C1, C5 | 280         | 360   | 415    | 0.007                                               | 0.011             | 0.014           | 0.016               | 0.019               |
|     |                                                                    | 200 - 250         | C1, C5 | 260         | 340   | 390    | 0.006                                               | 0.010             | 0.013           | 0.015               | 0.017               |
|     | Low Carbon Steel<br>1010, 1020, 1025, 1522,<br>1144, etc.          | 85 - 125          | C1, C5 | 300         | 390   | 450    | 0.008 ❖                                             | 0.010             | 0.013           | 0.017               | 0.019               |
|     |                                                                    | 125 - 175         | C1, C5 | 260         | 340   | 390    | 0.007 ❖                                             | 0.010             | 0.013           | 0.016               | 0.018               |
|     |                                                                    | 175 - 225         | C1, C5 | 240         | 310   | 355    | 0.006 ❖                                             | 0.009             | 0.012           | 0.015               | 0.017               |
|     |                                                                    | 225 - 275         | C1, C5 | 210         | 270   | 310    | 0.005 ❖                                             | 0.009             | 0.012           | 0.015               | 0.017               |
|     | Medium Carbon Steel<br>1030, 1040, 1050, 1527,<br>1140, 1151, etc. | 125 - 175         | C1, C5 | 260         | 340   | 390    | 0.007                                               | 0.010             | 0.013           | 0.016               | 0.018               |
|     |                                                                    | 175 - 225         | C1, C5 | 240         | 310   | 355    | 0.006                                               | 0.009             | 0.012           | 0.015               | 0.017               |
|     |                                                                    | 225 - 275         | C1, C5 | 210         | 270   | 310    | 0.006                                               | 0.009             | 0.012           | 0.015               | 0.017               |
|     |                                                                    | 275 - 325         | C1, C5 | 180         | 230   | 265    | 0.005                                               | 0.008             | 0.011           | 0.014               | 0.016               |
|     | Alloy Steel<br>4140, 5140, 8640, etc.                              | 125 - 175         | C1, C5 | 250         | 325   | 375    | 0.007                                               | 0.010             | 0.013           | 0.016               | 0.018               |
|     |                                                                    | 175 - 225         | C1, C5 | 230         | 300   | 345    | 0.006                                               | 0.009             | 0.012           | 0.015               | 0.017               |
|     |                                                                    | 225 - 275         | C1, C5 | 210         | 270   | 310    | 0.006                                               | 0.009             | 0.012           | 0.015               | 0.017               |
|     |                                                                    | 275 - 325         | C1, C5 | 200         | 250   | 285    | 0.005                                               | 0.008             | 0.011           | 0.014               | 0.016               |
|     |                                                                    | 325 - 375         | C1, C5 | 170         | 220   | 255    | 0.004                                               | 0.007             | 0.010           | 0.013               | 0.015               |
|     | High Strength Alloy<br>4340, 4330V, 300M, etc.                     | 225 - 300         | C1, C5 | 160         | 200   | 230    | 0.006 ❖                                             | 0.009             | 0.010           | 0.012               | 0.015               |
|     |                                                                    | 300 - 350         | C1, C5 | 140         | 180   | 205    | 0.005 ❖                                             | 0.008             | 0.009           | 0.011               | 0.014               |
|     |                                                                    | 350 - 400         | C1, C5 | 120         | 160   | 185    | 0.004 ❖                                             | 0.007             | 0.008           | 0.010               | 0.012               |
|     | Structural Steel<br>A36, A285, A516, etc.                          | 100 - 150         | C1, C5 | 240         | 310   | 355    | 0.008 ❖                                             | 0.011             | 0.014           | 0.016               | 0.018               |
|     |                                                                    | 150 - 250         | C1, C5 | 200         | 250   | 285    | 0.006 ❖                                             | 0.010             | 0.012           | 0.014               | 0.016               |
|     |                                                                    | 250 - 350         | C1, C5 | 180         | 230   | 265    | 0.005 ❖                                             | 0.009             | 0.011           | 0.012               | 0.014               |
|     | Tool Steel<br>H-13, H-21, A-4, O-2, S-3, etc.                      | 150 - 200         | C1, C5 | 160         | 220   | 255    | 0.004 ❖                                             | 0.007             | 0.009           | 0.011               | 0.013               |
|     |                                                                    | 200 - 250         | C1, C5 | 120         | 170   | 195    | 0.004 ❖                                             | 0.007             | 0.009           | 0.011               | 0.013               |
| S   | High Temp Alloy<br>Hastelloy B, Inconel 600, etc.                  | 140 - 220         | C2     | 80          | 105   | 120    | 0.004 ❖                                             | 0.007             | 0.009           | 0.011               | 0.013               |
|     |                                                                    | 220 - 310         | C2     | 60          | 85    | 95     | 0.004 ❖                                             | 0.006             | 0.008           | 0.010               | 0.012               |
| M   | Stainless Steel 400 Series<br>416, 420, 303, etc.                  | 185 - 275         | C2     | 160         | 210   | 240    | 0.007 ❖                                             | 0.009             | 0.012           | 0.014               | 0.016               |
|     |                                                                    | 275 - 350         | C2     | 120         | 160   | 185    | 0.006 ❖                                             | 0.008             | 0.011           | 0.012               | 0.014               |
| K   | Nodular, Grey, Ductile Cast Iron                                   | 120 - 150         | C2, C3 | 320         | 460   | 500    | 0.008                                               | 0.012             | 0.015           | 0.019               | 0.023               |
|     |                                                                    | 150 - 200         | C2, C3 | 270         | 400   | 480    | 0.007                                               | 0.011             | 0.013           | 0.017               | 0.021               |
|     |                                                                    | 200 - 220         | C2, C3 | 240         | 360   | 430    | 0.006                                               | 0.009             | 0.012           | 0.015               | 0.018               |
|     |                                                                    | 220 - 260         | C2, C3 | 210         | 310   | 370    | 0.005                                               | 0.008             | 0.011           | 0.013               | 0.015               |
|     |                                                                    | 260 - 320         | C2, C3 | 180         | 270   | 335    | 0.005                                               | 0.007             | 0.010           | 0.011               | 0.013               |
| N   | Aluminum                                                           | 30                | C2     | 1200        | 1500  | –      | 0.010                                               | 0.015             | 0.018           | 0.020               | 0.022               |
|     |                                                                    | 180               | C2     | 800         | 1000  | –      | 0.009                                               | 0.013             | 0.016           | 0.018               | 0.020               |

## Formulas

|                                                                                                                                                         |                                                                                                                                                 |                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 1. <b>RPM</b> = (3.82 • SFM) / DIA<br>where:<br>RPM = revolutions per minute (rev/min)<br>SFM = speed (ft/min)<br>DIA = finish diameter of drill (inch) | 2. <b>SFM</b> = RPM • 0.262 • DIA<br>where:<br>SFM = speed (ft/min)<br>RPM = revolutions per minute (rev/min)<br>DIA = diameter of drill (inch) | 3. <b>IPM</b> = RPM • IPR<br>where:<br>IPM = Feed rate<br>RPM = revolutions per minute (rev/min)<br>IPR = feed rate (in/rev) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|

The table and equations on this page are found in the *Machinery's Handbook*. Permission to simplify and print the equations is granted by the Editor of the *Machinery's Handbook*.

**IMPORTANT:** The speeds and feeds listed above are a general starting point for all applications. Refer to the Coolant Recommendation charts for coolant requirements to run at the recommended speeds and feeds. Factory technical assistance is also available through our Application Engineering Team. Due to potential chip formation issues, contact our Application Engineering Team for assistance machining materials marked with a ❖.

## Coolant Recommendations | Imperial (inch)

Carbide

| ISO | Material                                 | Pressure /<br>Flow Rate | Tube No.<br>4 - 5   | Tube No.<br>6 - 8 | Tube No.<br>10  | Tube No.<br>12 - 16 | Tube No.<br>20 - 24 |
|-----|------------------------------------------|-------------------------|---------------------|-------------------|-----------------|---------------------|---------------------|
|     |                                          |                         | T-A Series<br>Y - Z | T-A Series<br>0   | T-A Series<br>1 | T-A Series<br>2     | T-A Series<br>3     |
| P   | <b>Free Machining Steel</b>              | PSI                     | 195                 | 140               | 160             | 140                 | 155                 |
|     | 1118, 1215, 12L14, etc.                  | GPM                     | 2.6                 | 3.3               | 5.5             | 9                   | 18                  |
|     | <b>Low Carbon Steel</b>                  | PSI                     | 180                 | 105               | 105             | 110                 | 115                 |
|     | 1010, 1020, 1025, 1522, 1144, etc.       | GPM                     | 2.5                 | 2.9               | 4.4             | 8                   | 15                  |
|     | <b>Medium Carbon Steel</b>               | PSI                     | 175                 | 100               | 90              | 100                 | 75                  |
|     | 1030, 1040, 1050, 1527, 1140, 1151, etc. | GPM                     | 2.5                 | 2.8               | 4.1             | 7                   | 13                  |
|     | <b>Alloy Steel</b>                       | PSI                     | 165                 | 85                | 100             | 75                  | 70                  |
|     | 4140, 5140, 8640, etc.                   | GPM                     | 2.4                 | 2.6               | 4.3             | 6                   | 12                  |
|     | <b>High Strength Alloy</b>               | PSI                     | 160                 | 65                | 55              | 40                  | 35                  |
|     | 4340, 4330V, 300M, etc.                  | GPM                     | 2.4                 | 2.3               | 3.2             | 5                   | 8                   |
|     | <b>Structural Steel</b>                  | PSI                     | 175                 | 115               | 105             | 75                  | 70                  |
|     | A36, A285, A516, etc.                    | GPM                     | 2.5                 | 3                 | 4.4             | 6                   | 12                  |
| S   | <b>Tool Steel</b>                        | PSI                     | 155                 | 60                | 55              | 40                  | 35                  |
|     | H-13, H-21, A-4, O-2, S-3, etc.          | GPM                     | 2.4                 | 2.2               | 3.2             | 5                   | 8                   |
| S   | <b>High Temp Alloy</b>                   | PSI                     | 150 - 155           | 60 - 65           | 50 - 55         | 30 - 35             | 25 - 30             |
|     | Hastelloy B, Inconel 600, etc.           | GPM                     | 2.3 - 2.4           | 2.2 - 2.3         | 3.1 - 3.2       | 4 - 5               | 7 - 8               |
| M   | <b>Stainless Steel 400 Series</b>        | PSI                     | 329                 | 239               | 260             | 250                 | 190                 |
|     | 416, 420, 303, etc.                      | GPM                     | 3                   | 4                 | 7               | 12                  | 20                  |
| K   | <b>Nodular, Grey, Ductile Cast Iron</b>  | PSI                     | 225                 | 104               | 90              | 90                  | 80                  |
|     |                                          | GPM                     | 3                   | 3                 | 4               | 7                   | 13                  |
| N   | <b>Aluminum</b>                          | PSI                     | 350                 | 319               | 315             | 284                 | 200                 |
|     |                                          | GPM                     | 4                   | 5                 | 8               | 12                  | 20                  |

**IMPORTANT:** The coolant pressure and flow rate recommendations above represent a good approximation to obtain optimum tool life and chip evacuation at Allied's recommended speeds and feeds. If lower coolant capabilities exist in a drilling application, the AccuPort 432 Port Contour Cutter will still function at reduced penetration rates. Contact our Application Engineering Department for a more specific recommendation of coolant requirements and/or speeds and feeds.



## Recommended Drilling Data | Metric (mm)

HSS

|           |                                                                    |                                                   |           | Speed (M/min) |       |      |        | Feed Rate (mm/rev) by Tube Size and T-A® Insert Series |                   |                 |                     |                     |                 |
|-----------|--------------------------------------------------------------------|---------------------------------------------------|-----------|---------------|-------|------|--------|--------------------------------------------------------|-------------------|-----------------|---------------------|---------------------|-----------------|
|           |                                                                    |                                                   |           |               |       |      |        | Tube No.<br>4 - 5                                      | Tube No.<br>6 - 8 | Tube No.<br>10  | Tube No.<br>12 - 16 | Tube No.<br>20 - 24 | Tube No.<br>32  |
| ISO       | Material                                                           | Hardness<br>(BHN)                                 | Grade     | TiN           | TiAlN | TiCN | AM200® | T-A Series<br>Y - Z                                    | T-A Series<br>0   | T-A Series<br>1 | T-A Series<br>2     | T-A Series<br>3     | T-A Series<br>4 |
| P         | Free Machining Steel<br>1118, 1215, 12L14, etc.                    | 100 - 150                                         | HSS       | 61            | 85    | 79   | 92     | 0.18                                                   | 0.25              | 0.33            | 0.41                | 0.51                | 0.58            |
|           |                                                                    | 150 - 200                                         | HSS       | 55            | 79    | 72   | 87     | 0.18                                                   | 0.25              | 0.33            | 0.41                | 0.51                | 0.58            |
|           |                                                                    | 200 - 250                                         | HSS       | 49            | 73    | 64   | 81     | 0.15                                                   | 0.25              | 0.33            | 0.41                | 0.51                | 0.58            |
|           | Low Carbon Steel<br>1010, 1020, 1025, 1522,<br>1144, etc.          | 85 - 125                                          | HSS       | 52            | 76    | 67   | 84     | 0.15 ❖                                                 | 0.23              | 0.30            | 0.38                | 0.48                | 0.58            |
|           |                                                                    | 125 - 175                                         | HSS       | 49            | 73    | 64   | 81     | 0.15 ❖                                                 | 0.23              | 0.30            | 0.38                | 0.48                | 0.58            |
|           |                                                                    | 175 - 225                                         | HSS       | 46            | 69    | 59   | 76     | 0.13 ❖                                                 | 0.20              | 0.25            | 0.36                | 0.46                | 0.53            |
|           |                                                                    | 225 - 275                                         | HSS       | 43            | 64    | 55   | 70     | 0.13 ❖                                                 | 0.20              | 0.25            | 0.36                | 0.46                | 0.53            |
|           | Medium Carbon Steel<br>1030, 1040, 1050, 1527,<br>1140, 1151, etc. | 125 - 175                                         | HSS       | 49            | 73    | 64   | 79     | 0.15                                                   | 0.23              | 0.30            | 0.38                | 0.48                | 0.58            |
|           |                                                                    | 175 - 225                                         | HSS       | 46            | 69    | 59   | 75     | 0.13                                                   | 0.20              | 0.25            | 0.36                | 0.46                | 0.53            |
|           |                                                                    | 225 - 275                                         | HSS       | 43            | 64    | 55   | 70     | 0.13                                                   | 0.20              | 0.25            | 0.36                | 0.46                | 0.53            |
|           |                                                                    | 275 - 325                                         | SC        | 40            | 59    | 52   | 66     | 0.10                                                   | 0.18              | 0.23            | 0.30                | 0.41                | 0.48            |
|           | Alloy Steel<br>4140, 5140, 8640, etc.                              | 125 - 175                                         | HSS       | 46            | 64    | 59   | 69     | 0.15                                                   | 0.20              | 0.25            | 0.36                | 0.43                | 0.48            |
|           |                                                                    | 175 - 225                                         | HSS       | 43            | 59    | 55   | 66     | 0.13                                                   | 0.20              | 0.25            | 0.36                | 0.43                | 0.48            |
|           |                                                                    | 225 - 275                                         | HSS       | 40            | 55    | 52   | 60     | 0.13                                                   | 0.18              | 0.25            | 0.36                | 0.43                | 0.48            |
|           |                                                                    | 275 - 325                                         | SC        | 37            | 52    | 47   | 56     | 0.10                                                   | 0.15              | 0.23            | 0.30                | 0.38                | 0.43            |
|           |                                                                    | 325 - 375                                         | SC        | 34            | 47    | 44   | 55     | 0.08                                                   | 0.15              | 0.23            | 0.30                | 0.38                | 0.43            |
|           | High Strength Alloy<br>4340, 4330V, 300M, etc.                     | 225 - 300                                         | SC        | 24            | 34    | 30   | 37     | 0.13 ❖                                                 | 0.18              | 0.23            | 0.25                | 0.36                | 0.43            |
|           |                                                                    | 300 - 350                                         | SC        | 18            | 26    | 24   | 27     | 0.10 ❖                                                 | 0.18              | 0.23            | 0.25                | 0.36                | 0.43            |
|           |                                                                    | 350 - 400                                         | SC        | 15            | 21    | 20   | 23     | 0.08 ❖                                                 | 0.15              | 0.20            | 0.23                | 0.30                | 0.38            |
|           | Structural Steel<br>A36, A285, A516, etc.                          | 100 - 150                                         | HSS       | 43            | 61    | 55   | 67     | 0.15 ❖                                                 | 0.25              | 0.30            | 0.36                | 0.46                | 0.53            |
|           |                                                                    | 150 - 250                                         | HSS       | 37            | 52    | 47   | 56     | 0.13 ❖                                                 | 0.23              | 0.25            | 0.30                | 0.41                | 0.48            |
|           |                                                                    | 250 - 350                                         | SC        | 30            | 43    | 40   | 47     | 0.10 ❖                                                 | 0.20              | 0.23            | 0.25                | 0.36                | 0.43            |
|           | Tool Steel<br>H-13, H-21, A-4, O-2, S-3, etc.                      | 150 - 200                                         | SC        | 24            | 34    | 32   | 37     | 0.10                                                   | 0.15              | 0.20            | 0.25                | 0.30                | 0.38            |
|           |                                                                    | 200 - 250                                         | SC        | 18            | 27    | 26   | 31     | 0.10                                                   | 0.15              | 0.20            | 0.25                | 0.30                | 0.38            |
|           | S                                                                  | High Temp Alloy<br>Hastelloy B, Inconel 600, etc. | 140 - 220 | SC            | 30    | 40   | 35     | 45                                                     | 0.08 ❖            | 0.18            | 0.20                | 0.25                | 0.30            |
| 220 - 310 |                                                                    |                                                   | SC        | 25            | 35    | 30   | 40     | 0.08 ❖                                                 | 0.15              | 0.18            | 0.20                | 0.25                | 0.30            |
| M         | Stainless Steel 400 Series<br>416, 420, 303, etc.                  | 185 - 275                                         | SC        | 23            | 32    | 29   | 33     | 0.15 ❖                                                 | 0.20              | 0.23            | 0.28                | 0.36                | 0.41            |
|           |                                                                    | 275 - 350                                         | SC        | 18            | 27    | 24   | 29     | 0.13 ❖                                                 | 0.18              | 0.20            | 0.25                | 0.30                | 0.36            |
| K         | Nodular, Grey, Ductile Cast Iron                                   | 120 - 150                                         | HSS       | 52            | 76    | 67   | 82     | 0.18                                                   | 0.30              | 0.41            | 0.51                | 0.61                | 0.69            |
|           |                                                                    | 150 - 200                                         | HSS       | 46            | 69    | 59   | 75     | 0.15                                                   | 0.28              | 0.36            | 0.46                | 0.56                | 0.64            |
|           |                                                                    | 200 - 220                                         | HSS       | 40            | 59    | 52   | 66     | 0.15                                                   | 0.23              | 0.30            | 0.41                | 0.46                | 0.53            |
|           |                                                                    | 220 - 260                                         | SC        | 34            | 50    | 44   | 55     | 0.13                                                   | 0.18              | 0.23            | 0.30                | 0.36                | 0.43            |
|           |                                                                    | 260 - 320                                         | SC        | 27            | 41    | 37   | 44     | 0.10                                                   | 0.15              | 0.18            | 0.23                | 0.30                | 0.36            |
| N         | Aluminum                                                           | 30                                                | HSS       | 183           | 259   | 229  | –      | 0.20                                                   | 0.33              | 0.41            | 0.51                | 0.56                | 0.64            |
|           |                                                                    | 180                                               | HSS       | 91            | 137   | 122  | –      | 0.20                                                   | 0.33              | 0.41            | 0.46                | 0.56                | 0.64            |

## Formulas

|                                                                                                                                                            |                                                                                                                                                  |                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| 1. <b>RPM</b> = (318.47 • M/min) / DIA<br>where:<br>RPM = revolutions per minute (rev/min)<br>M/min = speed (M/min)<br>DIA = finish diameter of drill (mm) | 2. <b>M/min</b> = RPM • 0.003 • DIA<br>where:<br>M/min = speed (M/min)<br>RPM = revolutions per minute (rev/min)<br>DIA = diameter of drill (mm) | 3. <b>IPM</b> = RPM • mm/rev<br>where:<br>IPM = feed rate<br>RPM = revolutions per minute (rev/min)<br>mm/rev = feed rate (mm/rev) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|

The table and equations on this page are found in the *Machinery's Handbook*. Permission to simplify and print the equations is granted by the Editor of the *Machinery's Handbook*.

**IMPORTANT:** The speeds and feeds listed above are a general starting point for all applications. Refer to the Coolant Recommendation charts for coolant requirements to run at the recommended speeds and feeds. Factory technical assistance is also available through our Application Engineering Team. Due to potential chip formation issues, contact our Application Engineering Team for assistance machining materials marked with a ❖.

## Coolant Recommendations | Metric (mm)

HSS

| ISO | Material                                                               | Pressure /<br>Flow Rate | Tube No.<br>4 - 5   | Tube No.<br>6 - 8 | Tube No.<br>10  | Tube No.<br>12 - 16 | Tube No.<br>20 - 24 | Tube No.<br>32  |
|-----|------------------------------------------------------------------------|-------------------------|---------------------|-------------------|-----------------|---------------------|---------------------|-----------------|
|     |                                                                        |                         | T-A Series<br>Y - Z | T-A Series<br>0   | T-A Series<br>1 | T-A Series<br>2     | T-A Series<br>3     | T-A Series<br>4 |
| P   | <b>Free Machining Steel</b><br>1118, 1215, 12L14, etc.                 | BAR                     | 12 - 13             | 7 - 8             | 7 - 10          | 6 - 8               | 6 - 7               | 3 - 4           |
|     |                                                                        | LPM                     | 9.5 - 9.8           | 10.6 - 11.4       | 16.7 - 19.7     | 26.5 - 30.3         | 45.4 - 53.0         | 114 - 125       |
|     | <b>Low Carbon Steel</b><br>1010, 1020, 1025, 1522, 1144, etc.          | BAR                     | 11 - 12             | 5 - 6             | 5 - 7           | 4 - 6               | 4 - 5               | 2 - 3           |
|     |                                                                        | LPM                     | 9.1 - 9.5           | 9.1 - 9.8         | 14.0 - 15.9     | 22.7 - 26.5         | 41.6 - 45.4         | 98 - 114        |
|     | <b>Medium Carbon Steel</b><br>1030, 1040, 1050, 1527, 1140, 1151, etc. | BAR                     | 11                  | 5 - 6             | 5 - 6           | 4 - 5               | 3 - 5               | 2 - 3           |
|     |                                                                        | LPM                     | 8.7 - 9.1           | 8.7 - 9.8         | 13.6 - 15.5     | 18.9 - 22.7         | 37.9 - 45.4         | 98 - 114        |
|     | <b>Alloy Steel</b><br>4140, 5140, 8640, etc.                           | BAR                     | 11                  | 5 - 6             | 5               | 3 - 5               | 3 - 4               | 2               |
|     |                                                                        | LPM                     | 8.7 - 9.1           | 13.2 - 14.8       | 8.3 - 9.1       | 18.9 - 22.7         | 34.1 - 37.9         | 87 - 98         |
|     | <b>High Strength Alloy</b><br>4340, 4330V, 300M, etc.                  | BAR                     | 10 - 11             | 4 - 5             | 3 - 4           | 2                   | 2                   | 2               |
|     |                                                                        | LPM                     | 8.7 - 9.1           | 7.9 - 8.3         | 11.0 - 11.7     | 15.1 - 18.9         | 26.5 - 30.3         | 79 - 87         |
|     | <b>Structural Steel</b><br>A36, A285, A516, etc.                       | BAR                     | 11                  | 5 - 6             | 5 - 6           | 3 - 4               | 3                   | 2               |
|     |                                                                        | LPM                     | 8.7 - 9.1           | 9.1 - 9.8         | 13.2 - 14.8     | 18.9 - 22.7         | 34.1 - 37.9         | 87 - 98         |
|     | <b>Tool Steel</b><br>H-13, H-21, A-4, O-2, S-3, etc.                   | BAR                     | 4                   | 10 - 11           | 3               | 2                   | 2                   | 1 - 2           |
|     |                                                                        | LPM                     | 7.9 - 8.3           | 8.7 - 9.1         | 11.0 - 11.7     | 15.1 - 18.9         | 26.5 - 30.3         | 79 - 87         |
| S   | <b>High Temp Alloy</b><br>Hastelloy B, Inconel 600, etc.               | BAR                     | 10 - 11             | 4 - 5             | 3 - 4           | 2                   | 2                   | 2               |
|     |                                                                        | LPM                     | 8.7 - 9.1           | 8.3 - 8.7         | 11.7 - 12.1     | 15.1 - 18.9         | 26.5 - 30.3         | 87 - 98         |
| M   | <b>Stainless Steel 400 Series</b><br>416, 420, 303, etc.               | BAR                     | 11.4 - 11.7         | 4.8 - 5.8         | 4.5 - 5.2       | 2.7 - 3.8           | 2.7 - 3.4           | 1.7 - 2         |
|     |                                                                        | LPM                     | 9.1 - 9.5           | 8.7 - 9.8         | 13.2 - 14       | 18.9 - 22.7         | 34.1 - 37.9         | 87 - 98         |
| K   | <b>Nodular, Grey, Ductile Cast Iron</b>                                | BAR                     | 10.7 - 11.0         | 4.1 - 4.5         | 3.4 - 4.1       | 2 - 2.7             | 2 - 2.4             | 1.7 - 2         |
|     |                                                                        | LPM                     | 8.7 - 9.1           | 8.3 - 8.7         | 11.7 - 12.5     | 15.1 - 18.9         | 30.3 - 34.1         | 87 - 98         |
| N   | <b>Aluminum</b>                                                        | BAR                     | 13.1 - 14.5         | 9.6 - 12.4        | 10.3 - 15.8     | 7.9 - 11            | 6.2 - 8.6           | 2.7 - 3.4       |
|     |                                                                        | LPM                     | 9.8 - 10.2          | 12.5 - 14         | 20.1 - 23.1     | 30.3 - 34.1         | 53 - 60.6           | 114 - 125       |

**IMPORTANT:** The coolant pressure and flow rate recommendations above represent a good approximation to obtain optimum tool life and chip evacuation at Allied's recommended speeds and feeds. If lower coolant capabilities exist in a drilling application, the AccuPort 432 Port Contour Cutter will still function at reduced penetration rates. Contact our Application Engineering Department for a more specific recommendation of coolant requirements and/or speeds and feeds.

A

DRILLING

B

BORING

C

REAMING

D

BURNISHING

E

THREADING

X

SPECIALS



## Recommended Drilling Data | Metric (mm)

Carbide

| ISO | Material                                                           | Hardness<br>(BHN) | Grade    | Speed (M/min) |       |        | Feed Rate (mm/rev) by Tube Size and T-A® Insert Series |                   |                 |                     |                     |
|-----|--------------------------------------------------------------------|-------------------|----------|---------------|-------|--------|--------------------------------------------------------|-------------------|-----------------|---------------------|---------------------|
|     |                                                                    |                   |          | TiN           | TiAlN | AM200® | Tube No.<br>4 - 5                                      | Tube No.<br>6 - 8 | Tube No.<br>10  | Tube No.<br>12 - 16 | Tube No.<br>20 - 24 |
|     |                                                                    |                   |          |               |       |        | T-A Series<br>Y - Z                                    | T-A Series<br>0   | T-A Series<br>1 | T-A Series<br>2     | T-A Series<br>3     |
| P   | Free Machining Steel<br>1118, 1215, 12L14, etc.                    | 100 - 150         | K35, P40 | 98            | 128   | 146    | 0.020                                                  | 0.30              | 0.38            | 0.46                | 0.53                |
|     |                                                                    | 150 - 200         | K35, P40 | 85            | 110   | 126    | 0.18                                                   | 0.28              | 0.36            | 0.41                | 0.48                |
|     |                                                                    | 200 - 250         | K35, P40 | 79            | 104   | 119    | 0.15                                                   | 0.25              | 0.33            | 0.38                | 0.43                |
|     | Low Carbon Steel<br>1010, 1020, 1025, 1522,<br>1144, etc.          | 85 - 125          | K35, P40 | 91            | 119   | 137    | 0.20 ❖                                                 | 0.25              | 0.33            | 0.43                | 0.48                |
|     |                                                                    | 125 - 175         | K35, P40 | 79            | 104   | 119    | 0.18 ❖                                                 | 0.25              | 0.33            | 0.41                | 0.46                |
|     |                                                                    | 175 - 225         | K35, P40 | 73            | 94    | 108    | 0.15 ❖                                                 | 0.23              | 0.30            | 0.38                | 0.43                |
|     |                                                                    | 225 - 275         | K35, P40 | 64            | 82    | 94     | 0.13 ❖                                                 | 0.23              | 0.30            | 0.38                | 0.43                |
|     | Medium Carbon Steel<br>1030, 1040, 1050, 1527,<br>1140, 1151, etc. | 125 - 175         | K35, P40 | 79            | 104   | 119    | 0.18                                                   | 0.25              | 0.33            | 0.41                | 0.46                |
|     |                                                                    | 175 - 225         | K35, P40 | 73            | 94    | 108    | 0.15                                                   | 0.23              | 0.30            | 0.38                | 0.43                |
|     |                                                                    | 225 - 275         | K35, P40 | 64            | 82    | 94     | 0.15                                                   | 0.23              | 0.30            | 0.38                | 0.43                |
|     |                                                                    | 275 - 325         | K35, P40 | 55            | 70    | 81     | 0.13                                                   | 0.20              | 0.28            | 0.36                | 0.41                |
|     | Alloy Steel<br>4140, 5140, 8640, etc.                              | 125 - 175         | K35, P40 | 76            | 99    | 114    | 0.18                                                   | 0.25              | 0.33            | 0.41                | 0.46                |
|     |                                                                    | 175 - 225         | K35, P40 | 70            | 91    | 105    | 0.15                                                   | 0.23              | 0.30            | 0.38                | 0.43                |
|     |                                                                    | 225 - 275         | K35, P40 | 64            | 82    | 94     | 0.15                                                   | 0.23              | 0.30            | 0.38                | 0.43                |
|     |                                                                    | 275 - 325         | K35, P40 | 61            | 76    | 87     | 0.13                                                   | 0.20              | 0.28            | 0.36                | 0.41                |
|     |                                                                    | 325 - 375         | K35, P40 | 52            | 67    | 78     | 0.10                                                   | 0.18              | 0.25            | 0.33                | 0.38                |
|     | High Strength Alloy<br>4340, 4330V, 300M, etc.                     | 225 - 300         | K35, P40 | 49            | 61    | 73     | 0.15 ❖                                                 | 0.23              | 0.25            | 0.30                | 0.38                |
|     |                                                                    | 300 - 350         | K35, P40 | 43            | 55    | 62     | 0.13 ❖                                                 | 0.20              | 0.23            | 0.28                | 0.36                |
|     |                                                                    | 350 - 400         | K35, P40 | 37            | 49    | 56     | 0.10 ❖                                                 | 0.18              | 0.20            | 0.25                | 0.30                |
|     | Structural Steel<br>A36, A285, A516, etc.                          | 100 - 150         | K35, P40 | 73            | 94    | 108    | 0.20 ❖                                                 | 0.28              | 0.36            | 0.41                | 0.46                |
|     |                                                                    | 150 - 250         | K35, P40 | 61            | 76    | 87     | 0.15 ❖                                                 | 0.25              | 0.30            | 0.36                | 0.41                |
|     |                                                                    | 250 - 350         | K35, P40 | 55            | 70    | 81     | 0.13 ❖                                                 | 0.23              | 0.28            | 0.30                | 0.36                |
|     | Tool Steel<br>H-13, H-21, A-4, O-2, S-3, etc.                      | 150 - 200         | K35, P40 | 49            | 67    | 78     | 0.10 ❖                                                 | 0.18              | 0.23            | 0.28                | 0.33                |
|     |                                                                    | 200 - 250         | K35, P40 | 37            | 52    | 59     | 0.10 ❖                                                 | 0.18              | 0.23            | 0.28                | 0.33                |
| S   | High Temp Alloy<br>Hastelloy B, Inconel 600, etc.                  | 140 - 220         | K20      | 24            | 32    | 36     | 0.10 ❖                                                 | 0.18              | 0.23            | 0.28                | 0.33                |
|     |                                                                    | 220 - 310         | K20      | 18            | 26    | 29     | 0.10 ❖                                                 | 0.15              | 0.20            | 0.25                | 0.30                |
| M   | Stainless Steel 400 Series<br>416, 420, 303, etc.                  | 185 - 275         | K20      | 49            | 64    | 73     | 0.18 ❖                                                 | 0.23              | 0.30            | 0.36                | 0.41                |
|     |                                                                    | 275 - 350         | K20      | 37            | 49    | 46     | 0.15 ❖                                                 | 0.20              | 0.28            | 0.30                | 0.36                |
| K   | Nodular, Grey, Ductile Cast Iron                                   | 120 - 150         | K20, K10 | 98            | 140   | 152    | 0.20                                                   | 0.30              | 0.38            | 0.48                | 0.58                |
|     |                                                                    | 150 - 200         | K20, K10 | 82            | 122   | 146    | 0.18                                                   | 0.28              | 0.33            | 0.43                | 0.53                |
|     |                                                                    | 200 - 220         | K20, K10 | 73            | 110   | 131    | 0.15                                                   | 0.23              | 0.30            | 0.38                | 0.46                |
|     |                                                                    | 220 - 260         | K20, K10 | 64            | 94    | 113    | 0.13                                                   | 0.20              | 0.28            | 0.33                | 0.38                |
|     |                                                                    | 260 - 320         | K20, K10 | 55            | 82    | 102    | 0.13                                                   | 0.18              | 0.25            | 0.28                | 0.33                |
| N   | Aluminum                                                           | 30                | K20      | 366           | 457   | –      | 0.25                                                   | 0.38              | 0.46            | 0.51                | 0.56                |
|     |                                                                    | 180               | K20      | 244           | 305   | –      | 0.23                                                   | 0.33              | 0.41            | 0.46                | 0.51                |

## Formulas

|                                                                                                                                                                                  |                                                                                                                                                                              |                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <b>RPM</b> = $(318.47 \bullet \text{M/min}) / \text{DIA}$<br>where:<br>RPM = revolutions per minute (rev/min)<br>M/min = speed (M/min)<br>DIA = finish diameter of drill (mm) | 2. <b>M/min</b> = $\text{RPM} \bullet 0.003 \bullet \text{DIA}$<br>where:<br>M/min = speed (M/min)<br>RPM = revolutions per minute (rev/min)<br>DIA = diameter of drill (mm) | 3. <b>IPM</b> = $\text{RPM} \bullet \text{mm/rev}$<br>where:<br>IPM = feed rate<br>RPM = revolutions per minute (rev/min)<br>mm/rev = feed rate (mm/rev) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|

The table and equations on this page are found in the *Machinery's Handbook*. Permission to simplify and print the equations is granted by the Editor of the *Machinery's Handbook*.

**IMPORTANT:** The speeds and feeds listed above are a general starting point for all applications. Refer to the Coolant Recommendation charts for coolant requirements to run at the recommended speeds and feeds. Factory technical assistance is also available through our Application Engineering Team. Due to potential chip formation issues, contact our Application Engineering Team for assistance machining materials marked with a ❖.



## Coolant Recommendations | Metric (mm)

Carbide

| ISO | Material                                 | Pressure /<br>Flow Rate | Tube No.<br>4 - 5   | Tube No.<br>6 - 8 | Tube No.<br>10  | Tube No.<br>12 - 16 | Tube No.<br>20 - 24 |
|-----|------------------------------------------|-------------------------|---------------------|-------------------|-----------------|---------------------|---------------------|
|     |                                          |                         | T-A Series<br>Y - Z | T-A Series<br>0   | T-A Series<br>1 | T-A Series<br>2     | T-A Series<br>3     |
| P   | <b>Free Machining Steel</b>              | BAR                     | 20                  | 16                | 17              | 15                  | 12                  |
|     | 1118, 1215, 12L14, etc.                  | LPM                     | 12.2                | 16.3              | 25.3            | 41.5                | 71.9                |
|     | <b>Low Carbon Steel</b>                  | BAR                     | 11.4                | 13.3              | 20.6            | 36.5                | 62                  |
|     | 1010, 1020, 1025, 1522, 1144, etc.       | LPM                     | 17                  | 10                | 10              | 10                  | 8                   |
|     | <b>Medium Carbon Steel</b>               | BAR                     | 17                  | 9                 | 10              | 8                   | 7                   |
|     | 1030, 1040, 1050, 1527, 1140, 1151, etc. | LPM                     | 11.1                | 12.3              | 19.3            | 30                  | 55.8                |
|     | <b>Alloy Steel</b>                       | BAR                     | 10.4                | 9.1               | 12.6            | 18.8                | 33.6                |
|     | 4140, 5140, 8640, etc.                   | LPM                     | 16                  | 9                 | 8               | 7                   | 5                   |
|     | <b>High Strength Alloy</b>               | BAR                     | 15                  | 5                 | 5               | 3                   | 3                   |
|     | 4340, 4330V, 300M, etc.                  | LPM                     | 10.4                | 9.1               | 13.6            | 19.7                | 36.5                |
|     | <b>Structural Steel</b>                  | BAR                     | 16                  | 9                 | 8               | 7                   | 5                   |
|     | A36, A285, A516, etc.                    | LPM                     | 10.8                | 12                | 17.5            | 27.8                | 47.1                |
| S   | <b>Tool Steel</b>                        | BAR                     | 15                  | 5                 | 5               | 3                   | 3                   |
|     | H-13, H-21, A-4, O-2, S-3, etc.          | LPM                     | 10.4                | 9.1               | 13.6            | 19.7                | 36.5                |
| S   | <b>High Temp Alloy</b>                   | BAR                     | 17                  | 11.4              | 12.4            | 11                  | 9                   |
|     | Hastelloy B, Inconel 600, etc.           | LPM                     | 11.1                | 13.5              | 21.9            | 35.4                | 62                  |
| M   | <b>Stainless Steel 400 Series</b>        | BAR                     | 22.7                | 16.5              | 17.9            | 17.2                | 13.1                |
|     | 416, 420, 303, etc.                      | LPM                     | 13                  | 16.3              | 26.3            | 44.2                | 75                  |
| K   | <b>Nodular, Grey, Ductile Cast Iron</b>  | BAR                     | 15.5                | 7.2               | 6.2             | 6.2                 | 5.5                 |
|     |                                          | LPM                     | 10.7                | 10.8              | 15.4            | 26.5                | 48.7                |
| N   | <b>Aluminum</b>                          | BAR                     | 24.1                | 22                | 21.7            | 19.6                | 13.8                |
|     |                                          | LPM                     | 13.4                | 18.8              | 29              | 47.2                | 77                  |

**IMPORTANT:** The coolant pressure and flow rate recommendations above represent a good approximation to obtain optimum tool life and chip evacuation at Allied's recommended speeds and feeds. If lower coolant capabilities exist in a drilling application, the AccuPort 432 Port Contour Cutter will still function at reduced penetration rates. Contact our Application Engineering Department for a more specific recommendation of coolant requirements and/or speeds and feeds.



## Notes

A

# DRILLING

B

BORING

C

## REAMING

D

## BURNISHING

E

## THREADING

X

SPECIALS



# Guaranteed Test / Demo Application Form

Distributor PO #

The following must be filled out completely before your test will be considered

## Distributor Information

Company Name: \_\_\_\_\_  
Contact: \_\_\_\_\_  
Account Number: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

## End User Information

Company Name: \_\_\_\_\_  
Contact: \_\_\_\_\_  
Industry: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

**Current Process** List all tooling, coatings, substrates, speeds and feeds, tool life, and any problems you are experiencing

**Test Objective** List what would make this a successful test (i.e. penetration rate, finish, tool life, hole size, etc.)

## Application Information

|                                    |                                                  |                                                    |
|------------------------------------|--------------------------------------------------|----------------------------------------------------|
| Hole Diameter: _____ in/mm         | Tolerance: _____                                 | Material: _____<br>(4150 / A36 / Cast Iron / etc.) |
| Pre-existing Diameter: _____ in/mm | Depth of Cut: _____ in/mm                        | Hardness: _____<br>(BHN / Rc)                      |
| Required Finish: _____ RMS         | State: _____<br>(Casting / Hot rolled / Forging) |                                                    |

## Machine Information

|                                                                                                                         |                                                                                                |                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Machine Type: _____<br>(Lathe / Screw machine / Machine center / etc.)                                                  | Builder: _____<br>(Haas, Mori Seiki, etc.)                                                     | Model #: _____                                                                                             |
| Shank Required: _____<br>(CAT50 / Morse taper, etc.)                                                                    | Power: _____ HP/KW                                                                             |                                                                                                            |
| Rigidity: _____<br><input type="checkbox"/> Excellent<br><input type="checkbox"/> Good<br><input type="checkbox"/> Poor | Orientation: _____<br><input type="checkbox"/> Vertical<br><input type="checkbox"/> Horizontal | Tool Rotating: _____<br><input type="checkbox"/> Yes<br><input type="checkbox"/> No<br>Thrust: _____ lbs/N |

## Coolant Information

|                                                                        |                                   |
|------------------------------------------------------------------------|-----------------------------------|
| Coolant Delivery: _____<br>(Through tool / Flood)                      | Coolant Pressure: _____ PSI / bar |
| Coolant Type: _____<br>(Air mist, oil, synthetic, water soluble, etc.) | Coolant Volume: _____ GPM / LPM   |

## Requested Tooling

| QTY | Item Number |
|-----|-------------|
|     |             |
|     |             |
|     |             |
|     |             |
|     |             |

| QTY | Item Number |
|-----|-------------|
|     |             |
|     |             |
|     |             |
|     |             |
|     |             |



Allied Machine & Engineering  
120 Deeds Drive  
Dover, OH 44622

Telephone: (330) 343-4283  
Toll Free USA & Canada: (800) 321-5537  
Fax: (330) 602-3400

## 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.



Allied Machine & Engineering  
Registered to ISO 9001  
10001329



## United States

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

**Phone:**  
+1.330.343.4283  
  
**Fax:**  
+1.330.602.3400

**Toll Free USA and Canada:**  
800.321.5537  
  
**Toll Free USA and Canada:**  
800.223.5140

**Allied Machine & Engineering**  
485 W Third Street  
Dover OH 44622  
United States

**Phone:**  
+1.330.343.4283  
  
**Fax:**  
+1.330.364.7666  
(Engineering Dept.)

**Toll Free USA and Canada:**  
800.321.5537

## Europe

**Allied Machine & Engineering Co. (Europe) Ltd.**  
93 Vantage Point  
Pensnett Estate  
Kingswinford  
West Midlands  
DY6 7FR England

**Phone:**  
+44 (0) 1384.400900

**Wohlhaupter GmbH**  
Maybachstrasse 4  
Postfach 1264  
72636 Frickenhausen  
Germany

**Phone:**  
+49 (0) 7022.408.0  
  
**Fax:**  
+49 (0) 7022.408.212

## Asia

**Wohlhaupter India Pvt. Ltd.**  
B-23, 2nd Floor  
B Block Community Centre  
Janakpuri, New Delhi - 110058  
India

**Phone:**  
+91 (0) 11.41827044

Your local Allied Machine representative:



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

Allied Machine & Engineering is registered by DQS to ISO 9001 10001329

© 2018 Allied Machine & Engineering  
Available Online Only: A92-ACP  
Publish Date: June 2018