ALLIED MACHINE & ENGINEERING | WOHLHAUPTER®

Holemaking Solutions for Today's Manufacturing

Boring

Reaming

Burnishing

Threading

Specials

# Drilling

▶ T-A® Original | GEN2 T-A®

Replaceable Insert Drilling System

# T-A® Drilling System

Replaceable Insert Drilling System | GEN2 T-A® | T-A® Original

▶ **Diameter Range:** 9.50mm - 160.00mm (0.374” - 6.299”)

## This is Not Yesterday’s Spade Drill

The T-A® drilling system is an innovation inspired by the Universal replaceable spade insert drilling system. However, with the development of the GEN2 T-A® insert, along with the countless geometry options for the T-A® Original, this drilling system provides benefits and performance that spade blade inserts of the past never could.

With constant innovations in holder designs, insert geometries and coatings, and coolant dispersion, the T-A® drilling system continues to evolve and become much more productive and powerful than ever before.

| | | |
|---|---|---|
| Excellent hole size and finish | Optimises chip evacuation | Wide range of geometry options available |

### Applicable Industries

Aerospace | Agriculture | Automotive | Firearms | General Machining | Oil & Gas | Renewable Energy

Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. Safety messages follow these words.

**⚠ WARNING**

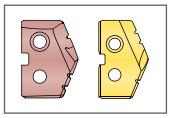
**WARNING** (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

**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.

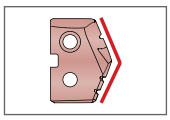
**NOTE** and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

**Visit www.alliedmachine.com for the most up-to-date information and procedures.**

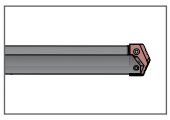
**Reference Icons**
The following icons will appear throughout the catalogue to help you navigate between products.



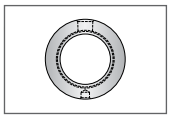
**T-A® Inserts**
Refers to the range of inserts that connect with the corresponding holders



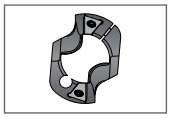
**Available Insert Geometries**
Details for the different geometry options available for each T-A® insert style



**T-A® Holders**
Refers to the range of holders that connect with the corresponding inserts

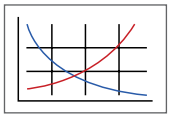


**Rotary Coolant Adapter (RCA) Information**
Detailed instructions and information regarding the corresponding part(s)



**T-ACR-45 Chamfer Rings**
Refers to the range of T-ACR chamfer rings available for the corresponding holders

**Technical Information**
Detailed instructions and information regarding the corresponding part(s)



**Recommended Cutting Data**
Speed and feed recommendations for optimum and safe drilling

| Series | Diameter Range | |
|---|---|---|
| | Metric (mm) | Imperial (inch) |
| Y | 9.50 - 11.07 | 0.374 - 0.436 |
| Z | 11.10 - 12.95 | 0.437 - 0.510 |
| 0 | 12.98 - 17.65 | 0.511 - 0.695 |
| 1 | 17.53 - 24.38 | 0.690 - 0.960 |
| 2 | 24.41 - 35.05 | 0.961 - 1.380 |
| 3 | 34.36 - 47.80 | 1.353 - 1.882 |
| 4 | 46.99 - 65.28 | 1.850 - 2.570 |
| 5 | 62.38 - 76.20 | 2.456 - 3.000 |
| 6 | 76.22 - 89.08 | 3.001 - 3.507 |
| 7 | 89.10 - 101.60 | 3.508 - 4.000 |
| 8 | 101.63 - 160.00 | 4.001 -6.299 |

## T-A® Drilling System Contents

# T-A® Drilling System Overview | Drill Inserts

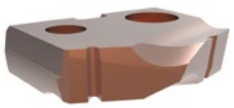
| Series | Y Series | Z Series | 0 Series | 1 Series | 2 Series | 3 Series | 4 Series |
|---|---|---|---|---|---|---|---|
| GEN2 T-A® |  |  |  |  |  |  |  |
| $D_1$ mm | 9.5 - 11.07 | 11.10 - 12.95 | 12.98 - 17.65 | 17.53 - 24.38 | 24.41 - 35.05 | 34.36 - 47.80 | 46.99 - 65.28 |
| $D_1$ inch | 0.374 - 0.436 | 0.437 - 0.510 | 0.511 - 0.695 | 0.690 - 0.960 | 0.961 - 1.380 | 1.353 - 1.882 | 1.850 - 2.570 |
| Half Series Option* | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ |
| HSS Substrates | Super Cobalt | Super Cobalt | Super Cobalt | Super Cobalt | Super Cobalt | HSS<br>Super Cobalt<br>Premium Cobalt | HSS<br>Super Cobalt |
| Carbide Substrates | K35 (C1)<br>K20 (C2) | K35 (C1)<br>K20 (C2) | K35 (C1)<br>K20 (C2) | K35 (C1)<br>K20 (C2) | K35 (C1)<br>K20 (C2) | – | – |
| Coatings | AM200® | AM200® | AM200® | AM200® | AM200® | AM200®<br>TiN | AM200®<br>TiN |

*See page A30: 7 for more information regarding half series options

| Series | Y Series | Z Series | 0 Series | 1 Series | 2 Series | 3 Series | 4 Series |
|---|---|---|---|---|---|---|---|
| T-A® Original |  |  |  |  |  |  |  |
| $D_1$ mm | 9.5 - 11.07 | 11.10 - 12.95 | 12.98 - 17.65 | 17.53 - 24.38 | 24.41 - 35.05 | 34.36 - 47.80 | 46.99 - 65.28 |
| $D_1$ inch | 0.374 - 0.436 | 0.437 - 0.510 | 0.511 - 0.695 | 0.690 - 0.960 | 0.961 - 1.380 | 1.353 - 1.882 | 1.850 - 2.570 |
| Half Series Option* | ✗ | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ |
| HSS Substrates | Super Cobalt<br>Premium Cobalt | Super Cobalt<br>Premium Cobalt | Super Cobalt<br>Premium Cobalt | HSS<br>Super Cobalt<br>Premium Cobalt | HSS<br>Super Cobalt<br>Premium Cobalt | Super Cobalt | Super Cobalt |
| Carbide Substrates | K20 (C2)<br>K10 (C3)<br>P40 (C5)<br>N2 | K20 (C2)<br>K10 (C3)<br>P40 (C5)<br>N2 | K20 (C2)<br>K10 (C3)<br>P40 (C5)<br>N2 | K20 (C2)<br>K10 (C3)<br>P40 (C5)<br>N2 | K20 (C2)<br>K10 (C3)<br>P40 (C5)<br>N2 | K20 (C2)<br>P40 (C5) | – |
| Coatings | TiN<br>TiAlN<br>TiCN | TiN<br>TiAlN<br>TiCN | TiN<br>TiAlN<br>TiCN | TiN<br>TiAlN<br>TiCN | TiN<br>TiAlN<br>TiCN | TiN | TiN |

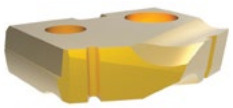
*See page A30: 7 for more information regarding half series options

## Drill Insert Coatings



**AM200®**

- First choice for increased heat resistance over TiN, TiCN, and TiALN with improved wear capabilities
- Allows for improved tool life and higher penetration rates
- Over 20% increase in tool life compared to TiAlN coating
- Colour: copper/bronze



**TiN**

- General purpose coating
- Improved tool life over non-coated inserts
- Excellent choice for Aluminium
- Colour: gold/yellow

**TiAlN**

- Excellent choice for wear resistance over high surface speeds
- Excellent oxidation resistance
- Maximum working temperature 800°C
- Colour: violet/grey

**TiCN**

- Excellent choice for wear resistance over low surface speeds
- High hardness/wear resistance
- Maximum working temperature 400°C
- Hardness HV 3500
- Colour: blue/grey

| 5 Series | 6 Series | 7 Series | 8 Series |
|---|---|---|---|
|  |  |  |  |
| 62.38 - 76.20 | 76.22 - 89.08 | 89.10 - 101.60 | 101.63 - 160.00 |
| 2.456 - 3.000 | 3.001 - 3.507 | 3.508 - 4.000 | 4.001 - 6.299 |
| ✖ | ✖ | ✖ | ✖ |
| HSS<br>Super Cobalt | HSS<br>Super Cobalt | HSS<br>Super Cobalt | HSS<br>Super Cobalt |
| – | – | – | – |
| AM200®<br>TiN | AM200®<br>TiN | AM200®<br>TiN | AM200®<br>TiN |

| 5 Series | 6 Series | 7 Series | 8 Series |
|---|---|---|---|
|  |  |  |  |
| 62.38 - 76.20 | 76.22 - 89.08 | 89.10 - 101.60 | 101.63 - 160.00 |
| 2.456 - 3.000 | 3.001 - 3.507 | 3.508 - 4.000 | 4.001 - 6.299 |
| ✖ | ✖ | ✖ | ✖ |
| HSS | HSS | HSS | HSS |
| – | – | – | – |
| TiN | TiN | TiN | TiN |

| Drill Insert Grades | | | |
|---|---|---|---|
| **HSS** (Original / GEN2)<br>First choice for general purpose use. Suited for difficult machining applications with low rigidity, as well as deep hole drilling. Recommended for drilling most steels, cast irons, and aluminium alloys up to 275 BHN 96kg. | **HSS Super Cobalt** (Original / GEN2)<br>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. | **HSS Premium Cobalt** (Original / GEN2)<br>Suited for rigid machining applications, used for drilling exotic and high alloy materials, or general use when surface speed needs to be increased. For material hardness up to 400 BHN 139kg. | **Carbide P40 (C5)** (Original only)<br>Excellent for drilling free machining steel, low/medium carbon steels, alloy steels, high strength steels, tool steels, and hardened steels. |
| **Carbide K10 (C3)** (Original only)<br>Designed for drilling grey/white cast irons. The special geometry offers substantial increase in penetration rates and provides exceptional edge strength and tool life. | **Carbide K20 (C2)** (Original / GEN2)<br>Excellent for drilling high temperature alloys, titanium alloys, cast aluminium, SG/Nodular cast iron, grey/white iron, aluminium bronze, brass, copper, and certain stainless steels. | **Carbide K35 (C1)** (GEN2 only)<br>Excellent for drilling free machining steel, low/medium carbon steels, alloy steels, high strength steels, tool steels, and hardened steels. | **Carbide N2** (Original only)<br>Allied's N2 carbide is used with CVD diamond coating. This improves the insert's hardness, durability, and performance, which extends tool life between 30 - 50x over uncoated carbide. |

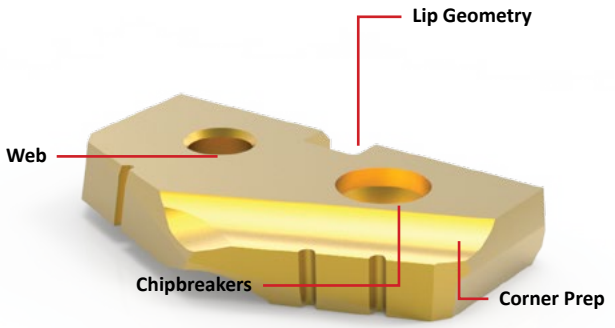
# Insert Geometries

**There's a Geometry for That**

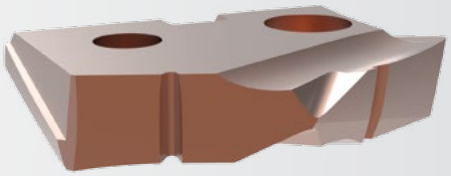
Allied Machine knows there isn't a one-size-fits-all solution when it comes to holemaking. To better accommodate the countless holes our customers drill, we have developed multiple geometry options, with new geometries in development at all times.

If you're unsure which geometry would be best for your application, give our Application Engineers a call. They're standing by, ready to point you in the right direction.

+44 (0)1384 400 900
engineering.eu@alliedmachine.com




## GEN2 T-A® Drill Inserts



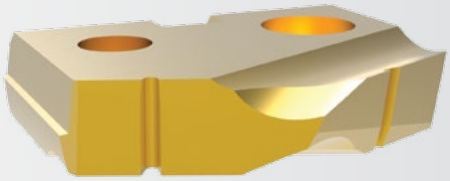
**Standard**

- Offers substantial increases in penetration rates and tool life
- Improves centring, drill stability, chip formation, and lowers drill forces
- Provides smoother break-out on through hole applications

**High Efficiency (-HE)**

- Excellent chip formation in materials with very high elasticity/ductility and poor chip forming conditions
- Effective in lower powered machines
- Material example: low carbon steel (not suitable for stainless steel)

## Original Drill Inserts



**Standard**

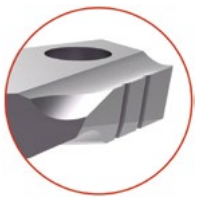
- Offers excellent penetration rates and tool life
- Smooth break-out on through holes
- Increases drill stability and chip formation
- Ideally suited for low-to-high rigidity machining applications

**Tiny Chip (-TC)**

- Unique lip and point design for excellent chip control
- Improves drilling capabilities in long-chipping materials
- Enhanced performance in lower-powered machines

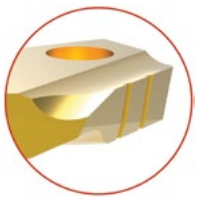
**Corner Radius (-CR)**

- Improves exit burrs
- Excellent surface finish in most applications
- Improves heat dispersion and tool life
- Can be used in addition to other geometries (as a special)



**Special Corner Preparation (-SK)**

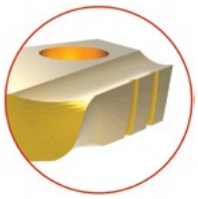
- Ideal for machining cast iron materials
- Larger than a standard corner clip
- Improves heat resistance
- Standard feature on CI, HI, and HR geometries



continued on next page

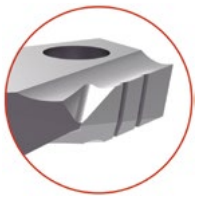
**Cam Point (-CP)**

- Helical cam ground point
- Improves drill stability and centring characteristics
- Reduces bell mouthing when using longer holders
- Target materials: steels, cast/forged steels, cast iron



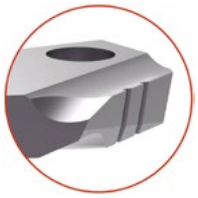
**Notch Point® (-NP)**

- Reduces bell mouth and lead-off
- Increases stability in deep hole applications
- Reduces thrust
- Can be used in addition to other geometries like Cast Iron, High Rake, and High Impact



**High Impact (-HI)**

- Designed for materials with hardness > 700 N/mm$^2$ (200 BHN)
- Enhances chip formation in materials with high elasticity/ductility and poor chip forming characteristics
- SK corner clip improves tool life
- Target materials: structural/cast and forged steels (not suitable for stainless steel)



**High Impact Notch Point® (-IN)**

- Combination of High Impact and Notch Point geometries
- Increases stability in deep hole applications
- Enhances chip formation in materials with high elasticity/ductility and poor chip forming characteristics

**High Rake (-HR)**

- Designed for materials with hardness < 200 BHN (700 N/mm$^2$)
- Improves chip formation in materials with very high elasticity/ductility, extremely poor chip forming characteristics, and low material hardness
- SK corner clip improves tool life
- Target materials: soft steels, steel castings and forgings (not suitable for stainless steel)

**High Rake Notch Point® (-RN)**

- Combination of High Rake and Notch Point geometries
- Reduces bell mouth and lead-off
- Improves chip formation in materials with very high elasticity/ductility, extremely poor chip forming characteristics, and low material hardness

**Cast Iron (-CI)**

- Specifically designed for use in grey and white cast irons
- Exceptional edge strength
- SK2 corner preparation for improved tool life
- Standard geometry on K10 (C3) carbide inserts

**Cast Iron Notch Point® (-CN)**

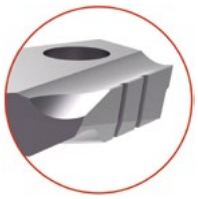
- Combination of Cast Iron and Notch Point geometries
- Increases stability in deep hole applications
- Specifically designed for use in grey and white cast irons

**Aluminium (-AN)**

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

**Brass (-BR)**

- Improves tool life due to the specialised geometry and edge preparation
- Redcues self-feed tendency



**90° Spot and Chamfer (-SP)**

- Centre cutting web design improves stability and strength
- Eliminates the need for a secondary chamfering operation
- Available with chipbreakers (see -SW below)

**Flat Bottom (-FB)**

- Ideal for flattening or squaring the bottom of pre-existing holes with high rigidity
- Includes small 10° point on the nose of the insert
- Available without chipbreakers (see -FN below)

**90° Spot and Chamfer (-SW)**

- Centre cutting web design improves stability and strength
- Eliminates the need for a secondary chamfering operation
- With added chipbreakers

**Flat Bottom (-FN)**

- Ideal for flattening or squaring the bottom of pre-existing holes with high rigidity
- Includes small 10° point on the nose of the insert
- Available with chipbreakers (see -FB above)

## Available Standard Insert Geometries

The following table shows which geometries are available as a standard item (based on insert type and series). If you need a geometry on your insert, but it is not listed as available, please call the Application Engineering department to discuss quoting your insert as a special to include the desired geometry.

Additional lead time and process fees may apply.

| Available Additional Geometries | | GEN2 T-A® | | | T-A® Original | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | HSS Inserts | | | Carbide Inserts | |
| | | Y - 2 Series | 3 - 4 Series | 5 - 8 Series | Y - 2 Series | 3 - 4 Series | 5 - 8 Series | Y - 2 Series | 3 Series |
| -AN | Aluminium | | | | ● | | | ● | |
| -BR | Brass | | ● | ● | ● | ● | ● | ● | ● |
| -CI | Cast Iron | | ● | | ● | ● | | ● | ● |
| -CN | Notch Point® Cast Iron | | | | ● | | | ● | ● |
| -CP | Cam Point | | | | ● | | | ● | |
| -CR | Corner Radius | | ● | ● | ● | ● | ● | ● | ● |
| -HE | High Elasticity | ● | ● | | | | | | |
| -HI | High Impact | | ● | ● | ● | ● | ● | ● | ● |
| -HR | High Rake | | ● | ● | ● | ● | ● | ● | ● |
| -IN | Notch Point® High Impact | | | | ● | | | ● | ● |
| -NC | No Chipbreaker | | ● | ● | ● | ● | ● | ● | ● |
| -NP | Notch Point® | | | | ● | | | ● | ● |
| -RN | Notch Point® High Rake | | | | ● | | | ● | ● |
| -SK | Special Corner Preparation | | ● | ● | ● | ● | ● | ● | ● |
| -TC | Tiny Chip | | | | ● | | | ● | |
| -WC | No Corner Clips | | ● | ● | ● | ● | ● | ● | ● |

## Drill Holders

**Holder Length Options** (for use with both GEN2 and T-A® Original inserts)

**Stub Length** | Series: Y - 3 (straight flute flanged shank only)

**Short Length** | Series: ALL

**Intermediate Length** | Series: ALL

**Standard Length** | Series: ALL

⚠ **Standard Plus Length** | Series: Y - 2 (helical flute flanged shank only)

⚠ **Extended Length** | Series: 0 - 3

⚠ **Long Length** | Series: 0 - 2

⚠ **Long Plus Length** | Series: 0 - 2

⚠ **XL Length** | Series: ALL

⚠ **3XL Length** | Series: ALL

**Holder Shank Options**

**ER Collet Shank**
Series: Y, Z, 0

**Straight Shank**
Series: ALL

**Morse Taper Shank**
Series: ALL

**Flanged Shank**
Series: ALL

**Half Series Holders (0.5, 1.5, 2.5)**

Half series holders are recommended when running carbide inserts toward the upper end of the series drill range, as well as in tougher applications requiring more insert support and holder strength. **NOTE:** Only specified half series inserts should be used with half series holders.

Standard Series Insert +
Standard Series Holder

Half Series Insert +
Standard Series Holder

Half Series Insert +
Half Series Holder

Standard Series Insert +
Half Series Holder

⚠ **WARNING** Refer to Speed and Feed charts for recommended adjustments to speeds and feeds. Refer to page A30: 150 for deep hole drilling guidelines in this section of the catalog. Visit **www.alliedmachine.com** for the most up-to-date information and procedures. Factory technical assistance is available for your specific applications through our Application Engineering Team.

# Technical Information

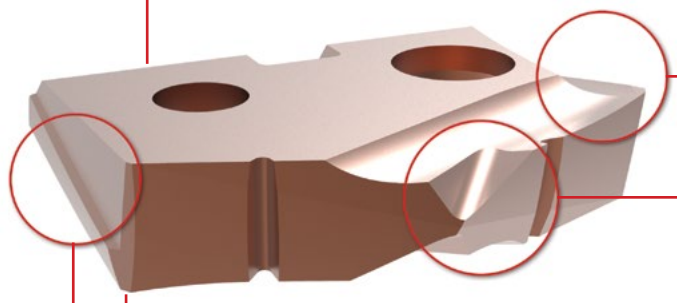
**Next Level Solutions: GEN2 T-A®**

What takes a solution to the next level? When you make innovative designs and enhancements to a product that already achieves high performance results, you push the boundaries of what is known. And when you push the known boundaries, the unknown becomes the next level.

After all, everything begins as unknown.

**AM200® Coating**

- ***Improves heat resistance*** over TiN, TiCN, and TiAlN with improved wear capabilities
- ***Increases penetration rates***
- ***Increases tool life*** more than 20% over TiAlN coating



**Ground Back Location**
- Ensures accurate positioning

**Curved Cutting Edge** (not all series)
- Enhances chip formation

**Notch Point® Geometry**
- Improves stability and hole straightness
- Reduces thrust

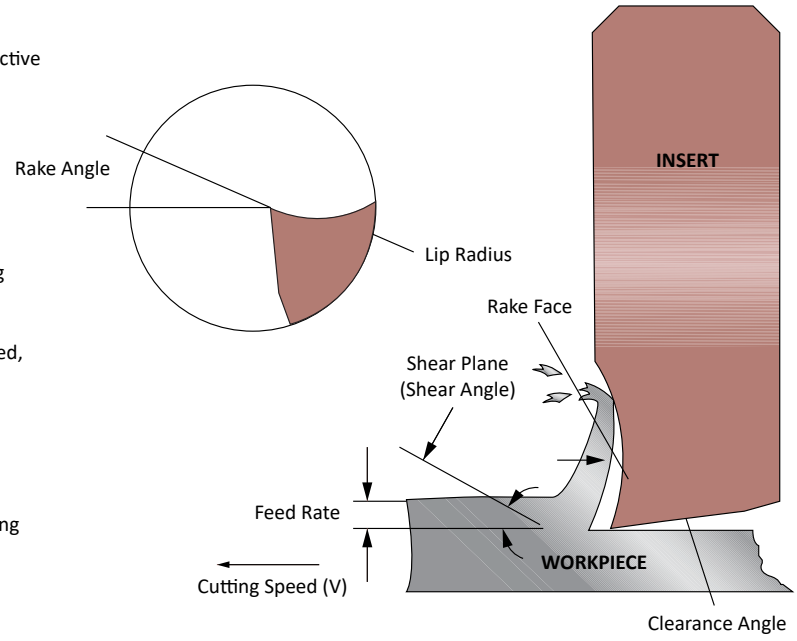
**Corner Clip**
- Improves heat dispersion
- Increases tool life

**Helical Margin** (not all series)
- Increases drill stability

**Improving Chip Formation**

Achieving optimal chip formation is crucial. The quality of the chips being produced directly affects everything in the entire process: the cycle time, the tool life, the scrap rate, and the quality and condition of the final machined hole.

We know how important chip formation is. That's why we constantly improve and develop new geometries to create a better, more productive T-A® product.




**Setting Up New Applications**

- Check coolant flows adequately through the tool before beginning
- Drill a short hole 1xD deep initially
- The chips produced should be short in length and material coloured, not straw or blue
- Measure the hole produced to check that it is within the desired tolerance
- If all is correct, continue to machine the remainder of the hole
- Ensure the drilling process is quiet and smooth with no chip packing

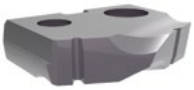
**Wear vs Toughness**

When selecting a grade of cutting tool material for your application, both wear resistance and grade toughness should be considered. The greater the wear resistance a cutting tool material exhibits, the more likely chipping or fracture is to occur. This requires more rigid machining conditions.

On the other hand, to effectively machine some materials, cobalt or carbide grades of cutting tool material may be required. The graph will aid you in the selection of a cutting tool material with the right combination of wear resistance and toughness to make your application both efficient and cost effective.

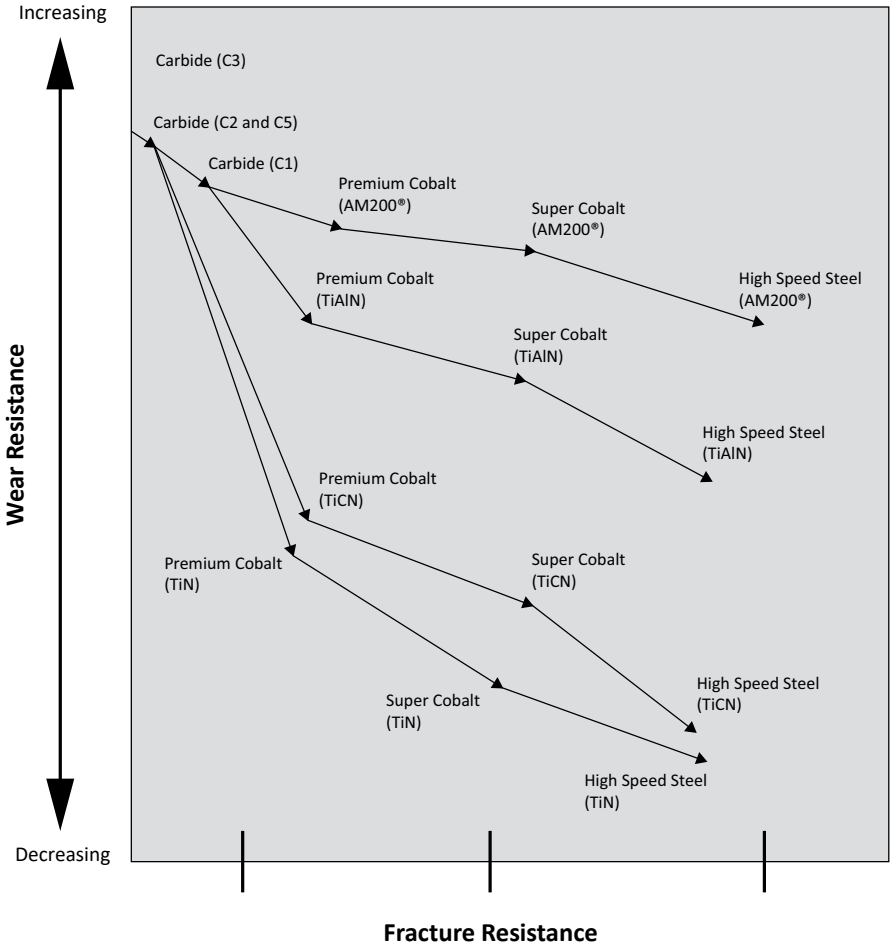
**AM200®**

**TiN**



**TiAlN**

**TiCN**



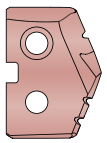

**T-A® System Guidelines for Use**

- Select the shortest holder possible for the application
- Ensure the T-A® holder is held securely and is within 0.08mm (0.003") of centre line
- The T-A® insert should be installed in the slot of the holder using the TORX® Plus screws provided. These should be tightened to the values listed on the T-A® holder pages
- The holder slot should be clean from dirt or debris
- Check that the insert outer diameter is a minimum of 0.30mm (0.012") larger than the holder body diameter
- Use the recommended cutting data section for guidance when selecting correct insert grades, along with speeds and feeds
- **NOTE:** These cutting parameters are starting conditions only and make no allowance for machine or component rigidity

## Product Nomenclature

### T-A® Drill Inserts

| 4 | 5 | 3 | H | – | 40 |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | | 5 |



| 1. Insert | 2. Material | 3. Series | 4. Coating | 5. Diameter |
|---|---|---|---|---|
| **1** = T-A® Original | **3** = HSS | **Y** = Y series | **H** = AM200® | **13** = Metric |
| **4** = GEN2 T-A® | **5** = Super cobalt | **Z** = Z series | **A** = TiAlN | **.515** = Decimal |
| | **8** = Premium cobalt | **0** = 0 series | **N** = TiCN | **0017** = Inch |
| | **C1** = K35 (C1) carbide | **1** = 1 series | **T** = TiN | |
| | **C2** = K20 (C2) carbide | **2** = 2 series | | |
| | **C3** = K10 (C3) carbide | **3** = 3 series | | |
| | **C5** = P40 (C5) carbide | **4** = 4 series | | |
| | | **5** = 5 series | | |
| | | **6** = 6 series | | |
| | | **7** = 7 series | | |
| | | **8** = 8 series | | |

**Ordering Instructions**

▸ **Standard Items:**

All orders are processed through Allied Machine's computerised order entry and invoicing system. Please specify the correct catalogue number as well as a full description of the desired item(s) so we can process your order accurately and efficiently. Incorrect item numbers and/or descriptions will cause unnecessary delays and possible returns that are subject to a 10% restocking charge. Your assistance is critical if we are to achieve our goal of processing orders and shipping in-stock items error free within 24 hours.

▸ **Non-Standard Sizes and Geometries:**

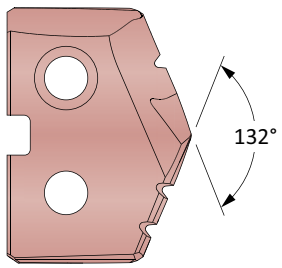
| | | |
|---|---|---|
| Non-standard diameter | Substitute the required diameter in place of the standard diameter. | |
| | **Ex:** Standard item number | **132T-34** |
| | Non-standard diameter with standard geometry (metric) | **132T-34.20** (Note: 2 decimal places) |
| | Non-standard diameter with standard geometry (inch) | **132T-1.0200** (Note: 4 decimal places) |

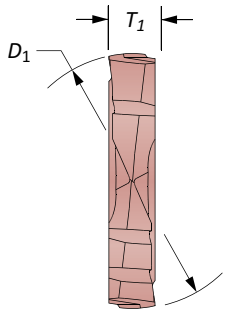
| | | |
|---|---|---|
| Special geometry | Add the special geometry code at the end of the standard item number (see pages A30: 4 - 6 for geometry options). | |
| | **Ex:** Standard item number | **132T-34** |
| | Standard diameter with special geometry (metric) | **132T-34-SK** |

| | | |
|---|---|---|
| Non-standard diameter with special geometry | Replace the standard diameter and add the special geometry code. | |
| | **Ex:** Standard item number | **132T-34** |
| | Non-standard diameter with special geometry (metric) | **132T-34.20-SK** (Note: 2 decimal places) |

**Reference Key**

| Symbol | Attribute |
|---|---|
| $D_1$ | Insert diameter |
| $T_1$ | Insert thickness |

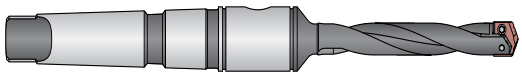


## Product Nomenclature

### T-A® Drill Holders

| 2 | 30 | 20 | S | – | 004 | M |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | | 5 | 6 |



**1. Holder**

**2** = T-A® holder

**2. Length**

**10** = Stub
**20** = Short
**30** = Intermediate
**40** = Standard
**45** = Standard Plus
**50** = Extended
**60** = Long
**65** = Long Plus
**70** = XL
**90** = 3XL

**3. Series**

**Y0** = Y series
**Z0** = Z series
**00** = 0 series
**05** = 0.5 series
**10** = 1 series
**15** = 1.5 series
**20** = 2 series
**25** = 2.5 series
**30** = 3 series
**40** = 4 series
**50** = 5 series
**70** = 7 series

**4. Flute**

**S** = Straight
**H** = Helical

**5. Shank Designator**

| Morse Taper | Metric | Imperial |
|---|---|---|
| **002** = 2MT | **16** = 16mm | **063** = 5/8” |
| **003** = 3MT | **20** = 20mm | **075** = 3/4” |
| **004** = 4MT | **25** = 25mm | **100** = 1” |
| **005** = 5MT | **32** = 32mm | **125** = 1-1/4” |
| | **40** = 40mm | **150** = 1-1/2” |
| | **50** = 50mm | **175** = 1-3/4” |
| | | **200** = 2” |
| | | **300** = 3” |

**6. Shank Code**

**M** = Metric Morse taper
**I** = Imperial Morse taper
**L** = Lathe shank
**FM** = Flanged metric shank
**F** = Flanged shank

**Reference Key**

| Symbol | Attribute |
|---|---|
| $D_1$ | Drill insert range |
| $D_2$ | Shank diameter |
| $L_1$ | Overall length |
| $L_2$ | Drill depth |
| $L_3$ | New tool reference length |
| $L_4$ | Holder length |
| $L_7$ | Shank length |
| $P_1$ | Rear pipe tap |
| $P_2$ | Side pipe tap |
| ***RCA*** | Corresponding RCA item number |
| ***MT*** | Morse taper size |
| ***ER*** | ER collet size |