

holemaking  
**SOLUTIONS**

www.alliedmachine.com

**INDEXABLE CARBIDE DRILLING**

**4TEX<sup>®</sup> Drill**

Ø 0.472" - 1.850" (12.00 mm - 47.00 mm)



- ✓ Grab your solution for stainless
- ✓ Tackle complex interruptions
- ✓ Decrease your cost per hole



*Handle interruptions with ease  
solutions for challenging applications*



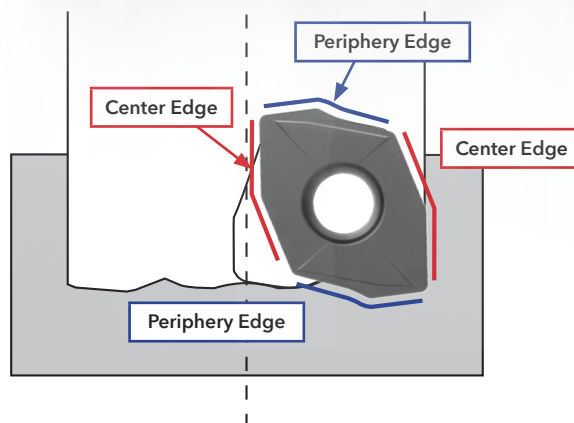
## FEATURES & ADVANTAGES

- ✓ **Superior chip evacuation**  
provided by the two twisted coolant holes
- ✓ **Improved hole size**  
from the increased holder rigidity
- ✓ **Longer tool life**  
provided by the four-sided insert design
- ✓ **Optimal chip formation**  
with ISO-specific insert geometry/coating combinations
- ✓ **Competitive cycle times**  
due to single effective cutting when using light duty machines



# 4 CUTTING EDGES

- Each insert has two inner cutting edges and two outer cutting edges.
- Economical solution that increases tool life because of the ability to rotate the inserts.
- Available in ISO material-specific geometry/coating combinations.



### Periphery Insert

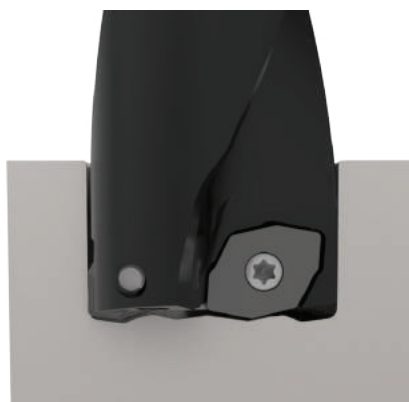


Periphery edge chip formation:



180°

### Center Insert

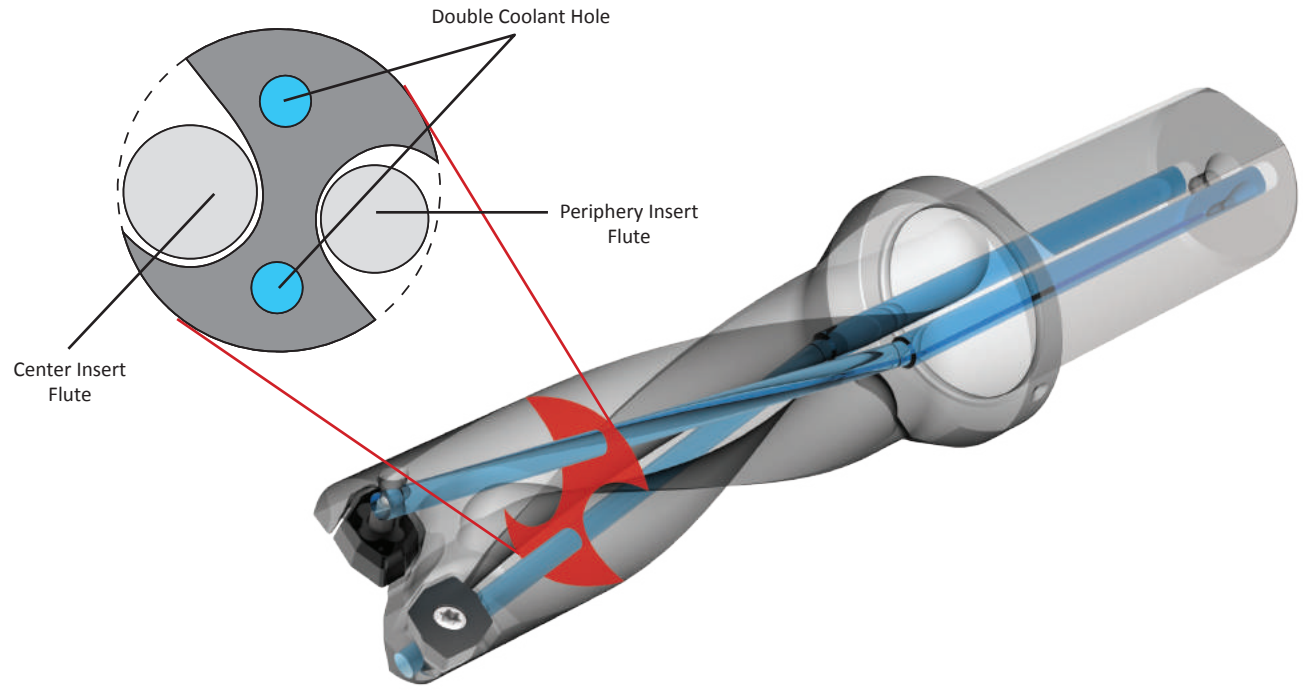
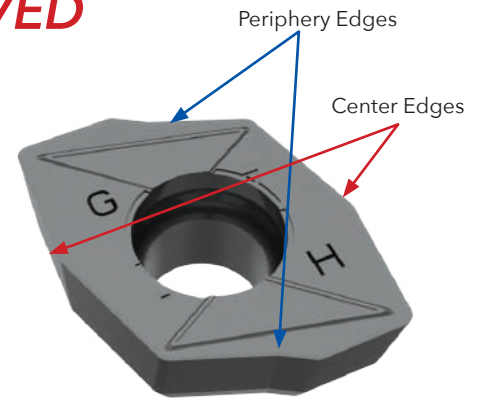


Center edge chip formation:

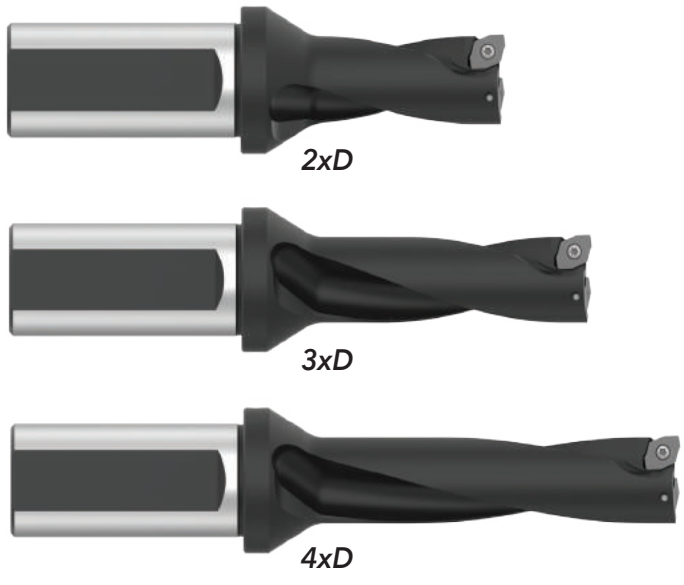


# DESIGNED TO GIVE YOU **IMPROVED HOLE SIZE AND STRAIGHTNESS**

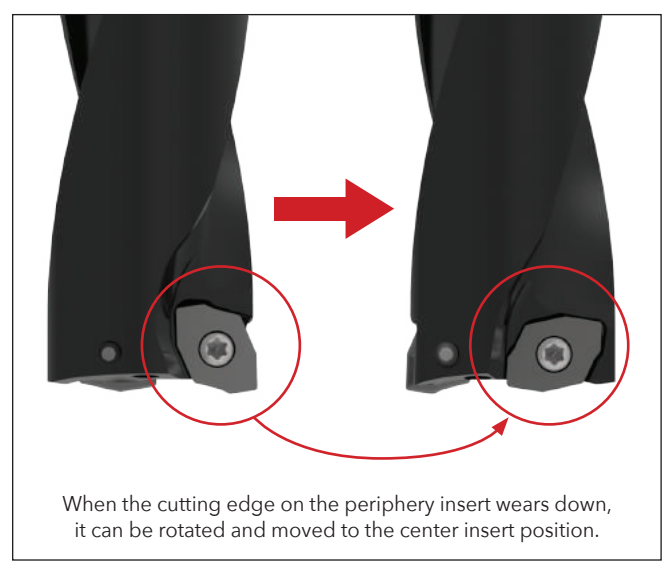
- The two twisted coolant holes allow the core to remain intact, making the core thicker and stronger for improved hole straightness even in uneven surfaces.
- The enlarged dual coolant outlets increase the coolant volume, which improves the chip evacuation resulting in improved hole size.
- The flute space of the internal cutting edge side (where chips get stuck most often) is 1.6x larger than typical IC drills, helping to mitigate catastrophic failures and improve hole size.



## AVAILABLE **LENGTHS**



## **LONGER** TOOL LIFE





## "Going to all costs" doesn't always mean you have to spend more.

We can all agree scrapping parts is always a bad thing, but scrapping extremely expensive parts is even worse. Our customer was machining air-cooled heat exchangers that cost \$15,000 each. Needless to say, they were going to all costs to make sure the parts were right the first time.



But going to all costs doesn't mean you can't find other ways to decrease your costs.

The high penetration drill they were using worked well, but with a hefty price tag on the replaceable insert, they wanted to reduce their drilling costs. The customer decided to test the **4TEX Indexable Carbide Drill** with inserts that cost 81.54% less. Using the 4TEX "M" geometry inserts—designed to produce excellent chips in ductile materials and improve tool life in heat resistant materials—the customer was thrilled with the small chips and equal hole quality.

With the previous drill, the customer achieved 30 holes of tool life before needing to replace the insert. Utilizing the 4TEX four-sided insert design along with the "M" geometry's heat resistant coating, they achieved 100 holes of tool life before replacing the inserts.

With insert cost savings of 94.5%, the switch to the 4TEX Drill was a no-brainer for the customer. **Just because a part is expensive doesn't mean it also needs to cost more to machine.**

Product:	4TEX Drill	Measure	Replaceable Insert Drill	4TEX Drill
Objective:	Decrease tooling costs	RPM	396	991
Industry:	Heat exchangers/tube sheets	Speed	100 SFM (30.48 m/min)	250 SFM (76.20 m/min)
Part:	Air cooled heat exchanger	Feed Rate	0.010 IPR (0.25 mm/rev)	0.003 IPR (0.08 mm/rev)
Material:	Inconel 825 plate	Penetration Rate	3.96 IPM (100.58 mm/min)	2.97 IPM (75.44 mm/min)
Hole Ø:	0.964" (24.49 mm)	Cycle Time	26 sec	35 sec
Hole Depth:	1.750" (44.45 mm)	Tool Life	30 holes	100 holes
4TEX offered 94.5% cost per hole savings over the competitor tooling.				

- ▶ 4TEX Drill holder  
3xD length  
Item No. D3072450M-100F

- ▶ 4TEX Drill inserts  
M geometry  
(stainless steel & high temp)  
Item No. 4T-070305-M

94.5% cost per hole savings



The four-sided indexable inserts with heat-resistant coating provided:

- ✓ Decreased tooling costs
- ✓ Increased tool life
- ✓ Worry-free machining



### Do you need performance in extreme machining conditions?

Tooling is only a sliver of the pie when it comes to productivity. It doesn't matter what your tooling is capable of if your machine conditions restrict those capabilities. Our customer, who drills holes for machine gun bolt switches, utilizes a machine with oil coolant that creates more extreme drilling conditions than water-based coolant.



Because oil coolant doesn't dissipate heat fast enough, the customer's tooling only lasted for 160 holes per insert, and the tool experienced sporadic failure. They also needed to run a peck cycle for chip control.

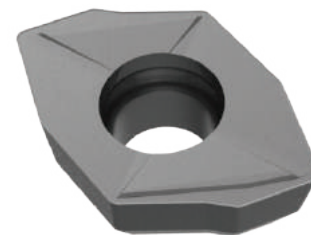
The customer decided to test the **4TEX Indexable Carbide Drill** using the "P" geometry with AM480 coating designed specifically for wear-resistance in steel material applications. The 4TEX "P" geometry allowed for the speed and feed to be altered and accommodated the machine's oil coolant. The 4TEX penetration rate was able to decrease cycle time and also double the tool life to 320 holes per insert. The 4TEX geometry also improved chip formation and eliminated the peck cycle.

The 4TEX provided the stable and repeatable process the customer was looking for while increasing tool life by 100%. With all their objectives met, the customer was thrilled with the solution that optimized their machine's limitations. **Are you using the solution that best optimizes your machine's limitations?**

		Measure	Competitor IC Drill	4TEX Drill
<b>Product:</b>	4TEX Drill			
<b>Objectives:</b>	(1) Exceed 160 holes per insert (2) Eliminate peck cycle (3) Provide stable/repeatable process	RPM	2075	1223
<b>Industry:</b>	Firearms	Speed	509 SFM (155.14 m/min)	300 SFM (91.44 m/min)
<b>Part:</b>	Machine gun bolt switch hole	Feed Rate	0.0015 IPR (0.04 mm/rev)	0.003 IPR (0.08 mm/rev)
<b>Material:</b>	4340 steel	Penetration Rate	3.11 IPM (78.99 mm/min)	3.67 IPM (93.22 mm/min)
<b>Hole Ø:</b>	0.937" (23.80 mm)	Peck Cycle	Yes	No
<b>Hole Depth:</b>	0.590" (14.99 mm)	Cycle Time	16 sec	9 sec
		Tool Life	160 holes per insert	320 holes per insert

▶ 4TEX Drill holder  
2xD length  
Item No. D20709371-100F

▶ 4TEX Drill inserts  
P geometry (steel)  
Item No. 4T-070305-P



The four-sided indexable inserts with wear-resistant coating provided:

- ✓ Increased tool life
- ✓ Decreased cycle time
- ✓ Worry-free machining

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## Sometimes, you just need to keep it simple.

If your tooling adds an unnecessary level of complication to your machining process, it's likely there's a better solution out there somewhere. Of course, sometimes you don't realize there's an extra level of complexity until you try something else. Our customer, who was machining link arms for steering columns, initially wanted to improve their tool life and increase their penetration rates.



The customer decided to test the **4TEX Indexable Carbide Drill** using the "P" geometry with AM480 coating designed specifically for wear-resistance in steel material applications. The 4TEX checked both of the customer's boxes by increasing the penetration rate and doubling the tool life.

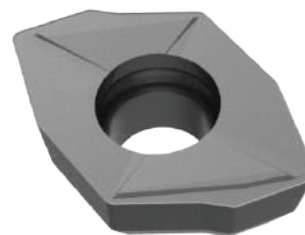
However, there were two additional benefits the customer hadn't been focused on: (1) the previous tooling left an exit burr on the hole, but the 4TEX drilled a clean hole every time, and (2) the 4TEX utilized only one style of inserts for both pockets. This simple feature proved beneficial because the previous tooling had two separate inserts (one specifically for each pocket). On occasion, the operators had accidentally put the wrong inserts in the wrong pockets, leading to damaged tooling.

All around, the 4TEX improved the customer's process. While certain metrics were similar in comparison, the elimination of exit burrs and the insert design were more than enough to seal the deal for the 4TEX. **Be on the lookout for tooling benefits you didn't realize you needed.**

		Measure	Competitor IC Drill	4TEX Drill
<b>Product:</b>	4TEX Drill			
<b>Objectives:</b>	(1) Improve tool life (2) Improve penetration rate	RPM	1041	950
<b>Industry:</b>	Agricultural	Speed	375 SFM (114.30 m/min)	342 SFM (104.24 m/min)
<b>Part:</b>	Steering column link arm	Feed Rate	0.005 IPR (0.127 mm/rev)	0.006 IPR (0.1524 mm/rev)
<b>Material:</b>	Ductile cast iron	Penetration Rate	5.20 IPM (132.08 mm/min)	5.70 IPM (144.78 mm/min)
<b>Hole Ø:</b>	1.375" (34.93 mm)	Exit Burr	Yes	No
<b>Hole Depth:</b>	3.250" (14.99 mm)	Cycle Time	37 sec	34 sec
		Tool Life	300 parts per insert	600 parts per insert

- ▶ 4TEX Drill holder  
3xD length  
Item No. D3111375I-150F
- ▶ 4TEX Drill inserts  
P geometry (steel)  
Item No. 4T-11T306-P

100% tool life increase



The four-sided indexable inserts with wear-resistant coating provided:

- ✓ Increased tool life
- ✓ Increased penetration rates
- ✓ Eliminated exit burrs
- ✓ Worry-free machining

## The good kind of ‘when it rains, it pours.’

Reliability and cycle time are key if you’re running lights-out. Our customer’s machinists set up their machines during the day to run unmanned and unwatched the remainder of the shift. They were machining electrical harness mounts from copper 110, and their tooling seemed to be performing well enough. However, when they saw an opportunity to potentially increase their penetration rates, they decided to investigate.



The customer tested the **4TEX Indexable Carbide Drill** using the “N” geometry—designed specifically for non-ferrous materials—with a TiCN coating giving them high lubricity. Originally, the customer was hoping for a 15% increase in penetration rate. The 4TEX blew past that expectation and increased the penetration rate by 158%. Along with that, the 4TEX decreased cycle time by 63%, all while providing a reliable process that produced better chips in a very difficult chip-forming material.

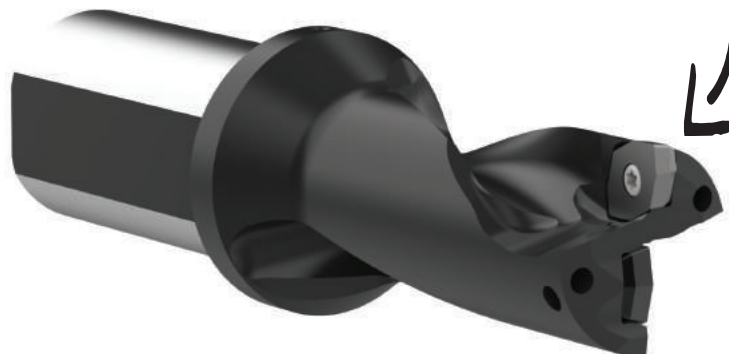
Already thrilled with the results, the customer also achieved improved tool life with the 4TEX. In fact, the previous tooling provided 50 parts per index, but the 4TEX crushed that number with 150 parts per index (a 200% increase in life).

When testing began, the customer was hoping for a slight increase in penetration rate while maintaining their tool life. When all was said and done, the 4TEX Drill had not only drastically increased penetration rate, it had also decreased cycle time, increased tool life, and improved chip formation. **Sometimes, when it rains, it pours - and that doesn't always have to be a bad thing.**

Product:	4TEX Drill	Measure	Competitor IC Drill	4TEX Drill
		Objectives:	(1) Increase penetration rate by 15% (2) Maintain tool life	RPM
Industry:	Renewable energy/energy (electrical)	Speed	320 SFM (97.54 m/min)	375 SFM (114.30 m/min)
		Feed Rate	0.0055 IPR (0.14 mm/rev)	0.012 IPR (0.30 mm/rev)
Part:	Electrical harness mount	Penetration Rate	5.3 IPM (134.62 mm/min)	13.7 IPM (347.98 mm/min)
Material:	Copper 110	Cycle Time	22 sec	8 sec
Hole Ø:	1.250" (31.75 mm)	Tool Life	50 parts	150 parts
Hole Depth:	2.000" (50.80 mm)			

▶ 4TEX Drill holder  
2xD length  
Item No. D2091250I-125F

▶ 4TEX Drill inserts  
N geometry (non-ferrous materials)  
Item No. 4T-09T306-N



The four-sided indexable inserts with non-ferrous geometry provided:

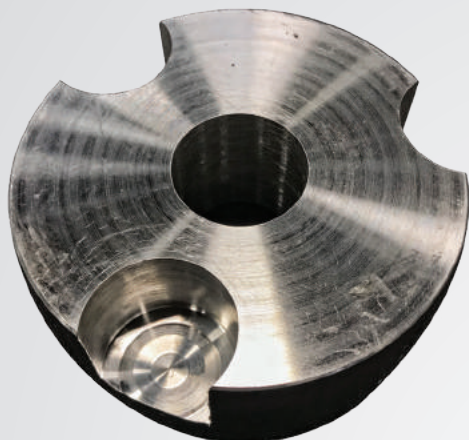
- ✓ Increased penetration rate
- ✓ Decreased cycle time
- ✓ Increased tool life
- ✓ Worry-free machining





## (DON'T) PARDON THE INTERRUPTION

The 4TEX Drill is the premium solution when the cut is interrupted. The indexable carbide insert design provides multiple points of stability, so the entire cutting edge does not require engagement while still providing the hole quality required.

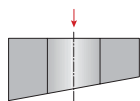


### QUICK TROUBLESHOOTING



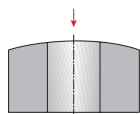
#### Starting on Angled Surfaces

- Reduce entry feed by 20 - 50%
- Use lower rake geometry if insert chipping occurs



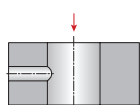
#### Angled Bore Exit

- Reduce entry feed by 50% on breakout
- Use tough insert and stable corner radius



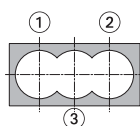
#### Starting on Convex Surfaces

- Reduce entry feed by 50%
- Use lower rake geometry if insert chipping occurs



#### Drilling Through a Cross Hole

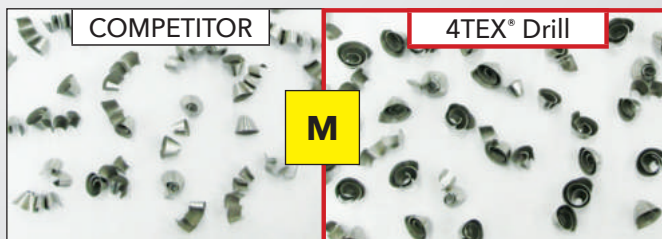
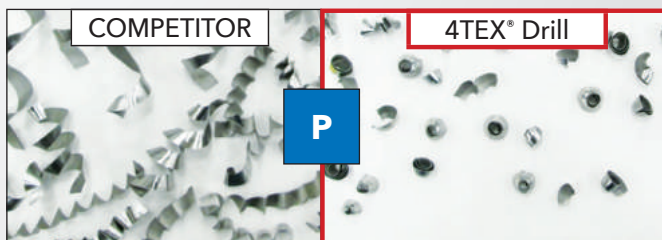
- Reduce feed rate by 50% if necessary
- Use good coolant flow and monitor chip packing
- Use lower rake geometry if insert chipping occurs



#### Chain Drilling

- Use good coolant flow
- Reduce feed rate by 50% for interrupted cut
- Use lower rake geometry if insert chipping occurs

### THE PROOF IS IN THE CHIPS



Allied Machine offers expert engineering support. Whether you need a quote, a test, or an application solution, a highly skilled and trained engineer is standing by, ready to help. [www.alliedmachine.com/contactus](http://www.alliedmachine.com/contactus)

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