

solid carbide / PCD

SOLUTIONS

www.alliedmachine.com



 **SUPERION™**



Optimize your solution



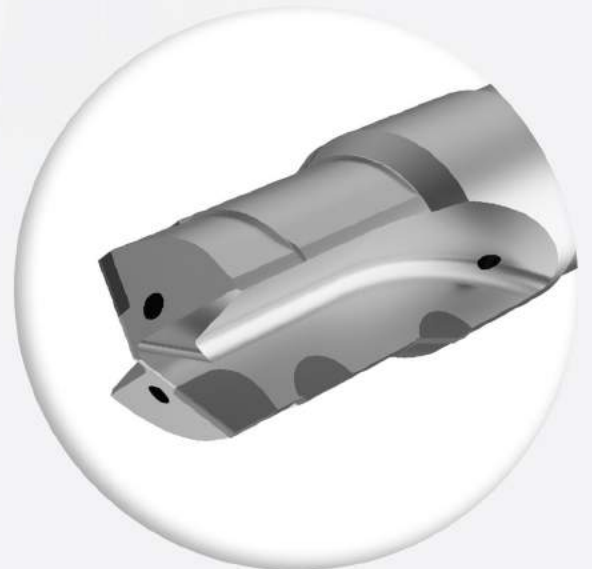
Decrease your cost-per-hole



Reduce your set-up times

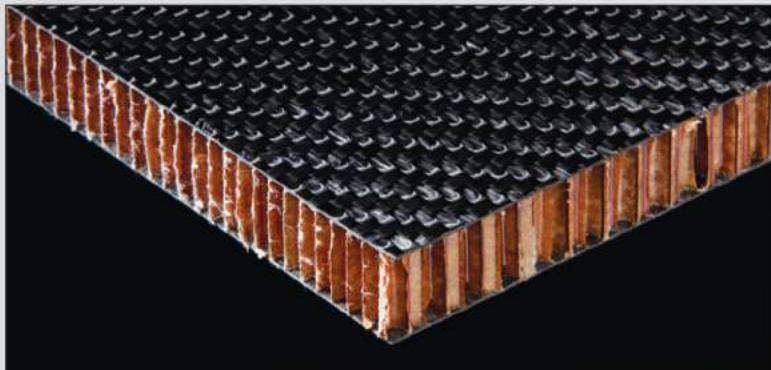
Conquer CFRP with PCD

solutions for exotic materials



**ALLIED MACHINE
& ENGINEERING**

Allied Machine offers a wide range of drilling, boring, reaming, burnishing, and threading tools to lower your **cost-per-hole**.



The Challenge of CFRP Materials

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

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



Holes drilled with
CVD drill insert

SEE THE RESULTS



Holes drilled with
Allied Machine PCD tooling

Just Look at That!

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

Carbon fiber has high tensile strength and abrasive qualities that cause:

- Wear on the cutting tool
- Splintering/fraying of the hole

As you can see, the first test experienced these problems. The PCD tooling, however, successfully drilled clean holes.

Quick and Smooth

To test the capabilities of the PCD tipped solid carbide tooling, we drilled an aerospace component made of carbon composite. Sure enough, the Superion PCD tipped drill produced the clean hole we expected. See the details of the test below.



Hole Diameter

0.256" (6.5mm)

Hole Depth

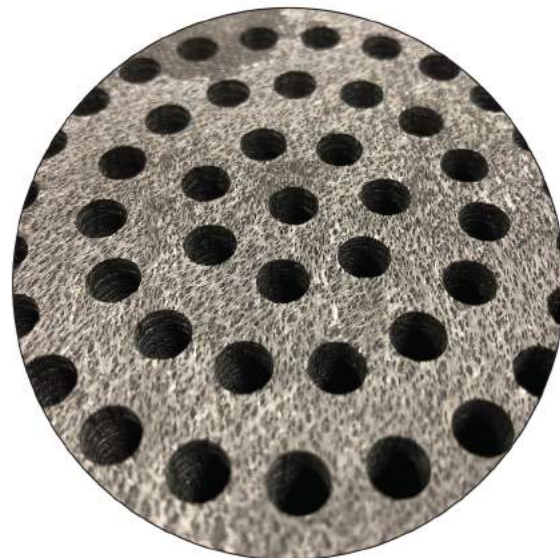
0.500" (12.7mm)

Parameters

368 SFM / 0.0064 IPR / 35.16 IPM

Cycle Time (1 Hole)

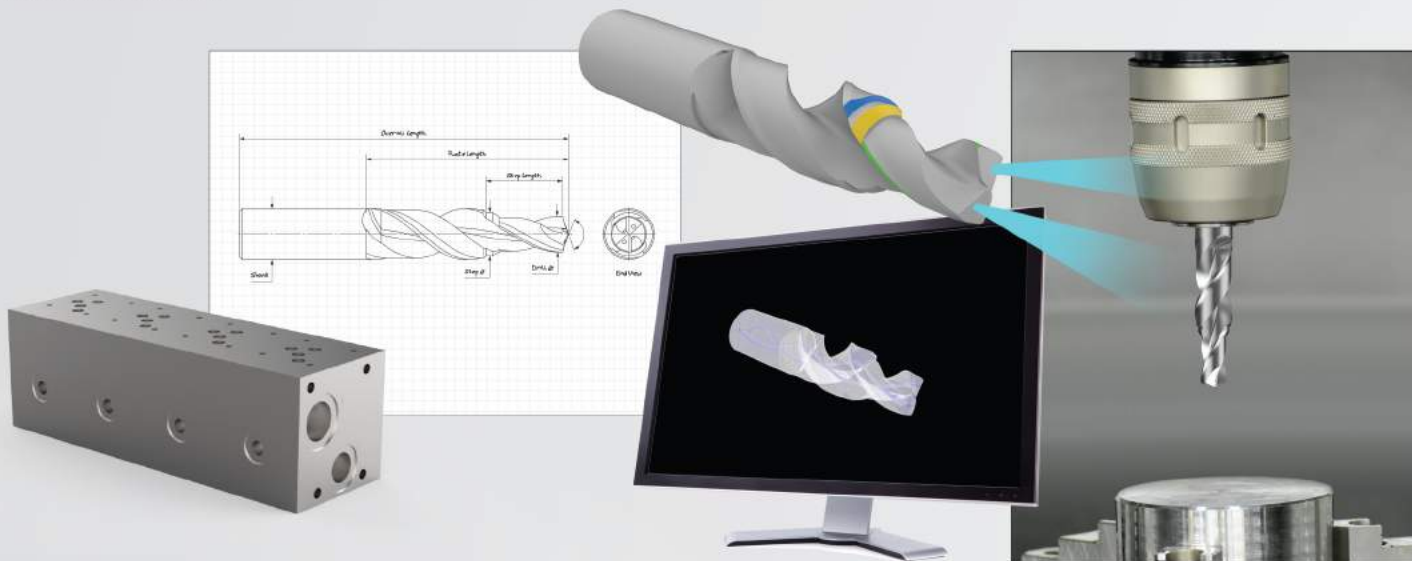
0.85 sec





From Concept to Reality

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



AEROSPACE / Landing Gear Components



YOUR ADVANTAGE

Reduce cycle time, increase throughput, and increase profitability by combining roughing and finishing operations using our drill burnish tool for applications in which finish is critical.

AUTOMOTIVE / Crankshafts



YOUR ADVANTAGE

Combine multiple steps and various profile features to improve throughput. Combination tools reduce costs and increase profit potential.

HEAVY EQUIPMENT / Manifolds



YOUR ADVANTAGE

Solid carbide tooling can optimize the manufacturing of manifolds. Most port specs call for at least 3 steps, and combining these features can reduce costs and increase throughput.

AUTOMOTIVE / Transmission Components

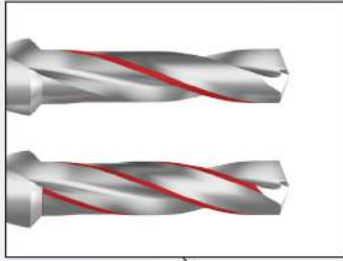


YOUR ADVANTAGE

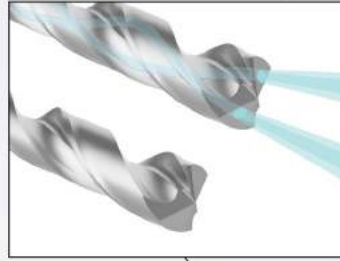
You can rely on Superior's state-of-the-art manufacturing facility, built specifically to satisfy the customer's need whether it's 10 drills or 1,000 drills. Superior will provide consistent and effective solutions to your production need.

SOLID CARBIDE TOOLING SOLUTIONS

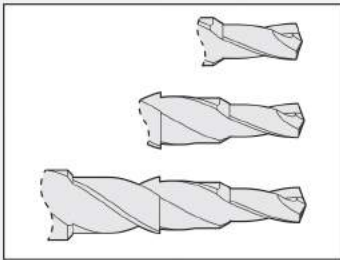
Single or double margin



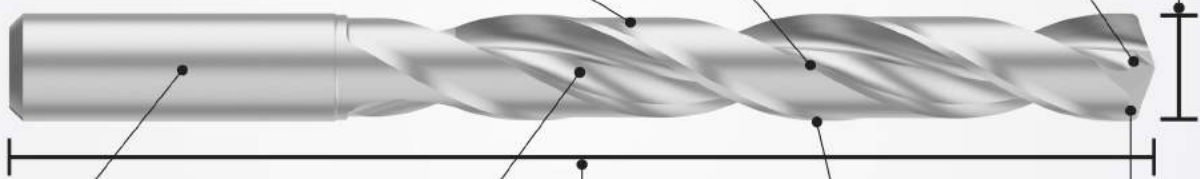
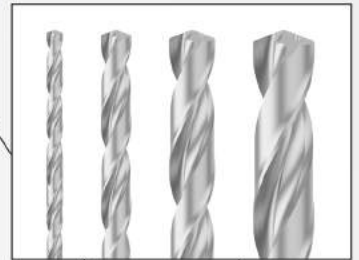
Coolant and non-coolant options



Designs with up to 3 steps



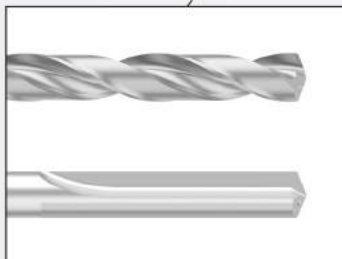
Ø 3 - 20mm



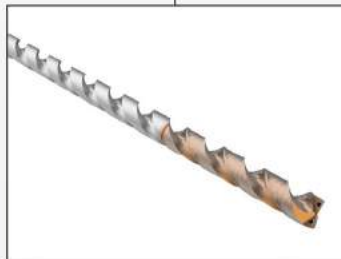
DIN6537

sizes:
4, 6, 8, 10, 12,
14, 16, 18, 20

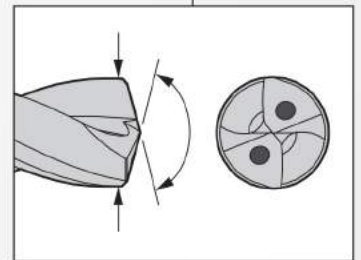
Shank configuration



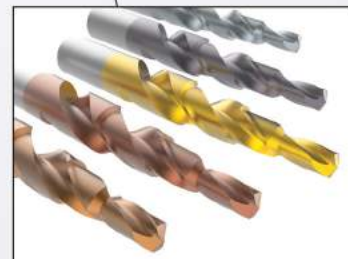
Helical flute or
straight flute (burnishing tools)



Lengths up to 20xD



Different features and geometries
based on application*

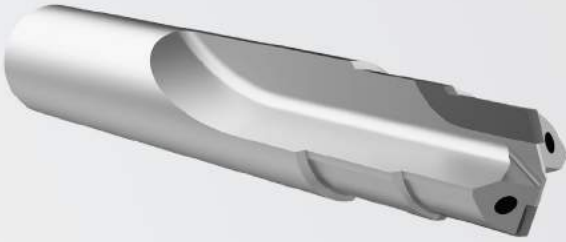


Available in different
coating options

*The optimal geometry will be selected by our Engineering Team per your application details.

PCD TOOLING SOLUTIONS

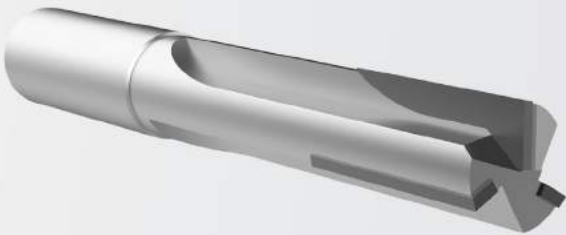
OUR **SOLUTION** | PCD Wafer Step Drills



→ YOUR **ADVANTAGE**

- Optimizes hole making in aluminum work pieces
- Precision wafers are brazed to carbide bodies and finished to meet the needs of your application
- Ideal for tight toleranced, high volume work and provides significant cost-per-hole improvement where tool life and surface finish is critical

OUR **SOLUTION** | PCD End Mills



→ YOUR **ADVANTAGE**

- Multiple-fluted PCD end mills stand up to high heat
- Reduces set-up and tool change time, which allows you to outrun conventional carbide endmills
- Ideal solution for high volume aluminum milling



PCD tooling is available from Ø 3 - 20mm

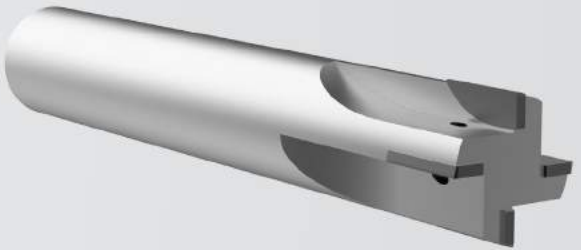
OUR **SOLUTION** | PCD Nib Drills



→ YOUR **ADVANTAGE**

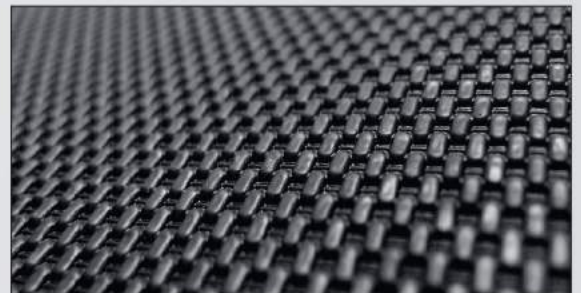
- Offers significant tool life improvement over carbide in both aluminum and CFRP/carbon fiber applications
- Tool design revolves around a PCD head brazed to a carbide body (finish grinding occurs after braze to ensure that the tool is ground to your need)
- Significantly improves cost-per-hole in high volume applications

OUR **SOLUTION** | PCD Reamers



→ YOUR **ADVANTAGE**

- Reduces cost and increases profitability in precision finish applications where tolerances and surface finish cannot be achieved using a high speed steel or carbide drill
- The cost reduction is a product of increased life, effective rates, and improved shop throughput



PCD tooling is ideal for CFRP and other unique materials

SUPERION™

SOLID CARBIDE / PCD SOLUTIONS

WHAT IS SUPERION?

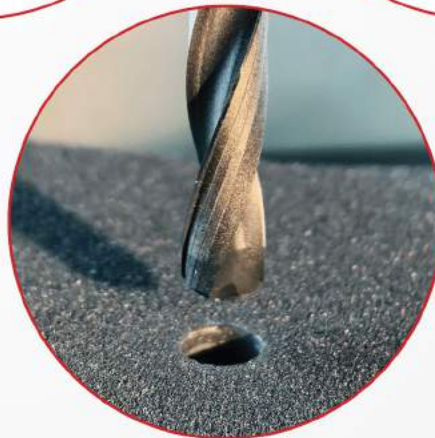
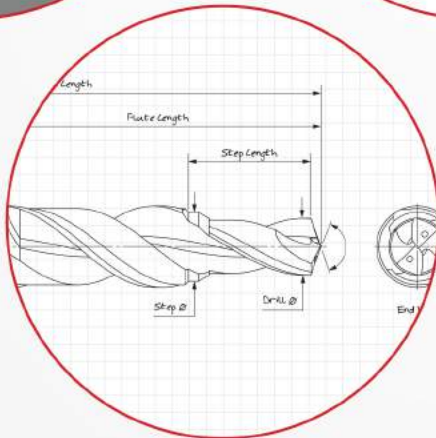
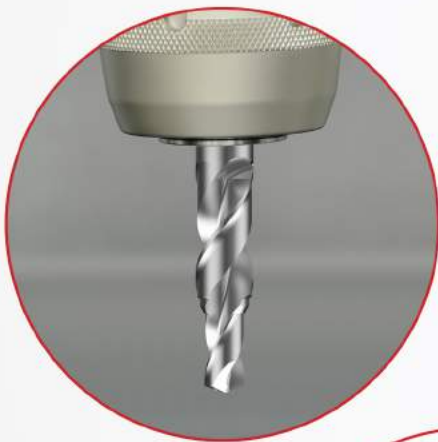
Superion capabilities provide cutting edge solutions in both solid carbide and PCD tooling.

WHY SHOULD YOU USE SUPERION?

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

WHEN SHOULD YOU USE SUPERION?

- When finish is critical and dimensions are tight, Superion will deliver a tool to maintain your tolerances.
- When your tooling budget requires regrinds and the ability to re-manufacture, Superion tackles your needs.
- If you're dealing with CFRP or other unique materials, Superion tooling is the right solution.



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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.
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