



# DiaPak™

## Carbide-backed thick-film CVD Diamond Tool Tips

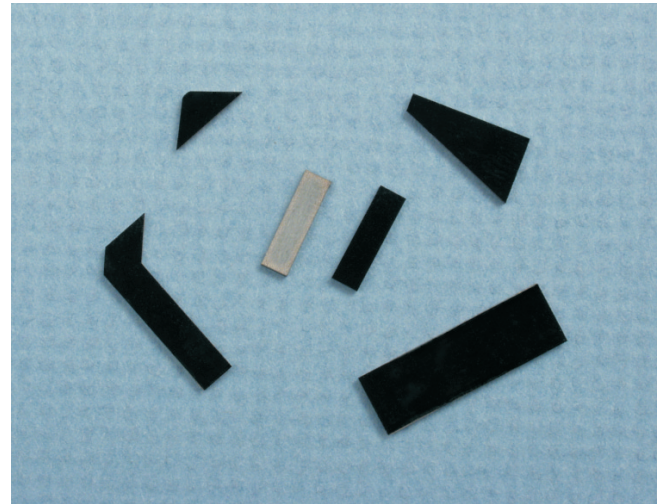
*A long life alternative to traditional polycrystalline diamond (PCD) tool tips*

### Ready-to-mount pure diamond tool tips

DiaPaks are sp<sup>3</sup> DiaTip diamond tool tips, vacuum-brazed to carbide backings. DiaPaks may be mounted by the customer to pocketed carbide inserts, steel cartridges and steel tip holders using conventional atmospheric brazing.

The DiaTip CVD diamond insert tip consists of a cutting edge of pure diamond with no binder. DiaTipped inserts can provide a wear life 2 to 3x that of PCD, and maintain edge sharpness longer. Absence of binder avoids chemical interaction with coolant or workpiece material, eliminating premature failure due to edge erosion.

The high thermal conductivity of pure diamond dissipates heat in the cutting zone to maintain lower cutting temperatures. In addition, the reduced cutting force of diamond lessens spindle power.



Typical DiaPaks; one DiaPak is shown face down to reveal the carbide backing.

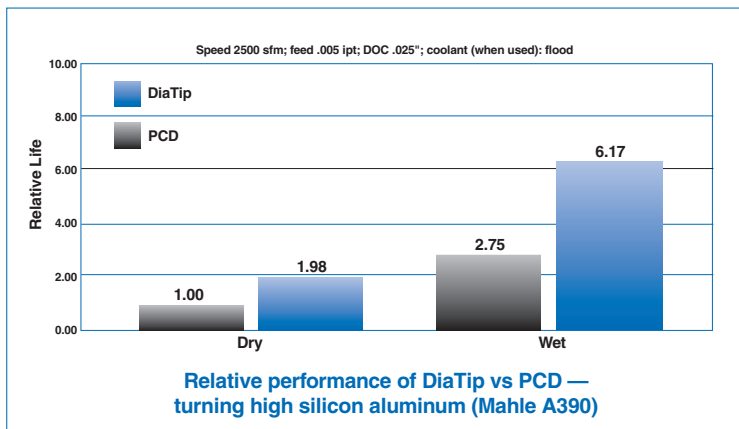
### Features and benefits

- ◆ Harder, more wear resistant — 2 to 3x PCD life
- ◆ Pure diamond, no binders — no chemical interaction or edge erosion
- ◆ Higher thermal conductivity — lower cutting temperature
- ◆ Lower cutting force — reduced spindle power
- ◆ Maintains sharper edge than PCD — smoother and more consistent finish

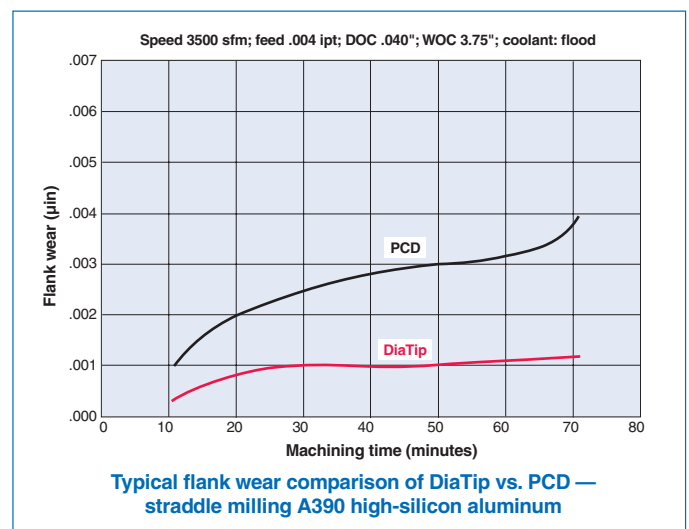
### Applications

- ◆ Silicon aluminum alloys
- ◆ Metal matrix composites (ceramic aluminum alloys)
- ◆ Carbon fiber reinforced plastic
- ◆ Tungsten carbide
- ◆ Platinum
- ◆ High temperature plastics
- ◆ Glass reinforced epoxy

### Turning

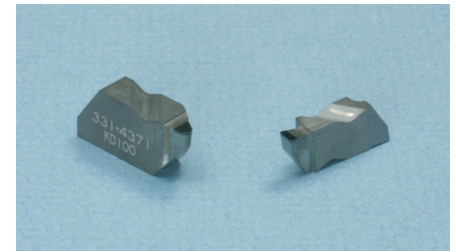
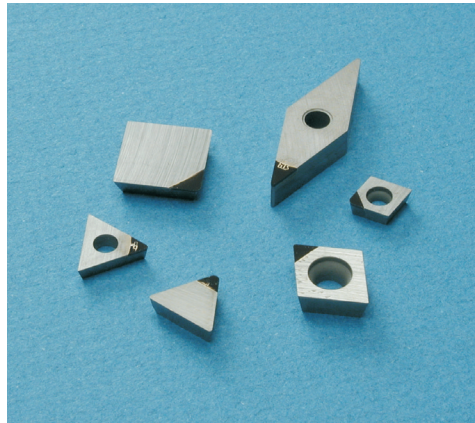
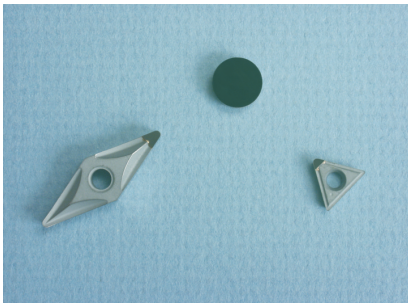
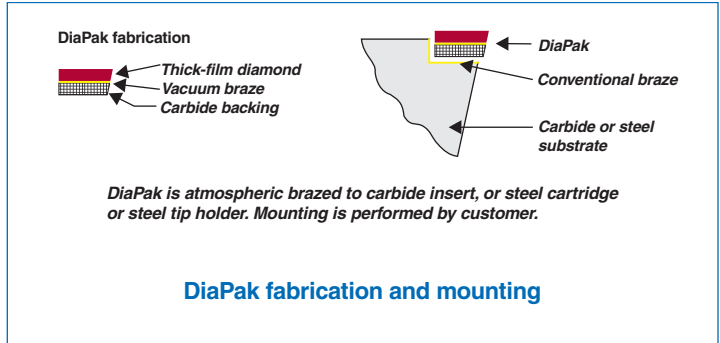


### Milling



## DiaPak fabrication

A stand-alone sheet of pure CVD diamond is grown in a chemical vapor deposition reactor. The sheets are polished to a typical thickness of .020 in (500 microns). The diamond sheets are laser cut into DiaTips, which are then vacuum brazed to carbide backings to form DiaPaks. The DiaPaks may then be mounted on carbide inserts, steel cartridges or steel tool tips using conventional atmospheric brazing.



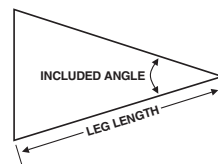
Examples of DiaTipped inserts and grooving tools.

## DiaPak sizes and shapes available

DiaTip carbide-backed DiaPaks are 0.040 in. (1 mm) thick. They can be brazed to carbide inserts, steel cartridges and steel tip holders using conventional induction brazing.

Standard DiaPak configurations are listed at right.

Custom sizes and shapes can be supplied in 3 to 4 weeks, minimum order 100 pieces.



## Standard DiaPak configurations

- 35-degree triangle with 5.0mm leg length
- 55-degree triangle with 4.0mm leg length
- 55-degree triangle with 5.0mm leg length
- 60-degree triangle with 4.0mm leg length
- 60-degree triangle with 5.0mm leg length
- 60-degree triangle with 7.0mm leg length
- 80-degree triangle with 3.0mm leg length
- 80-degree triangle with 4.0mm leg length
- 80-degree triangle with 5.0mm leg length
- 80-degree triangle with 6.5mm leg length
- 90-degree triangle with 4.0mm leg length
- 90-degree triangle with 5.0mm leg length
- 90-degree triangle with 6.5mm leg length
- 90-degree triangle with 7.5mm leg length



## sp3 Diamond Technologies

2220 Martin Avenue, Santa Clara, CA 95050

Tel. (877) 773-9940; (408) 492-0630 • Fax (408) 492-0633

Email: diamond@sp3inc.com • web: www.sp3inc.com