

Technical Data: GR Diamond Coated Series / D1 & D2

Speeds and Feeds for milling graphite and abrasive materials.

Use maximum spindle RPM to achieve up to 3000 SFPM.

- D1 & D2 coated GR Series will likely utilize your maximum possible spindle speed
- For reference, the chart below displays your achievable SFPM based upon your machining center
- Tool life should be 10–50 times that of uncoated carbide with improved accuracy and finish
- Long life allows unattended machining and part completion without tooling change
- Premium carbide substrate and special material preparation increases coating adhesion

| Diam mm | 100 SFPM | 250 SFPM | 500 SFPM | 3000 SFPM | Roughing Feed Rate CPT | Finishing Feed Rate CPT | Roughing Feed mm per tooth | Finishing Feed mm per tooth |
|-----------|----------|----------|-----------|-----------|------------------------|-------------------------|----------------------------|-----------------------------|
| | 30 M/min | 75 M/min | 150 M/min | 900 M/min | | | | |
| 1/64 0.4 | 24000 | 60000 | max rpm | max rpm | .0002 - .0005 | .0002 - .0003 | 0.005 - 0.013 | 0.005 - 0.008 |
| 1/32 0.8 | 12000 | 30000 | 60000 | max rpm | .0005 - .001 | .0003 - .0006 | 0.013 - 0.025 | 0.008 - 0.015 |
| 1/16 1.5 | 6100 | 15300 | 30500 | max rpm | .0008 - .002 | .0005 - .0013 | 0.203 - 0.051 | 0.013 - 0.033 |
| 3/32 2.5 | 4100 | 10200 | 20400 | max rpm | .001 - .0022 | .0008 - .0015 | 0.025 - 0.056 | 0.020 - 0.038 |
| 1/8 3.0 | 3050 | 7640 | 15300 | max rpm | .001 - .0025 | .001 - .002 | 0.025 - 0.064 | 0.025 - 0.051 |
| 3/16 4.5 | 2050 | 5100 | 10200 | 61000 | .002 - .0035 | .001 - .0025 | 0.051 - 0.090 | 0.025 - 0.064 |
| 1/4 6.0 | 1500 | 3820 | 7640 | 45800 | .0025 - .0045 | .001 - .0035 | 0.064 - 0.114 | 0.025 - 0.090 |
| 5/16 8.0 | 1220 | 3050 | 6120 | 36700 | .003 - .005 | .001 - .004 | 0.076 - 0.127 | 0.025 - 0.102 |
| 3/8 10.0 | 1020 | 2550 | 5100 | 30500 | .003 - .006 | .001 - .004 | 0.076 - 0.152 | 0.025 - 0.102 |
| 7/16 11.0 | 875 | 2200 | 4365 | 26200 | .004 - .008 | .001 - .005 | 0.102 - 0.203 | 0.025 - 0.127 |
| 1/2 12.0 | 765 | 1900 | 3820 | 23000 | .005 - .012 | .001 - .006 | 0.127 - 0.305 | 0.025 - 0.152 |

Metric dimensions and recommendations displayed in blue type. M/min = surface meters per minute. SFPM = surface feet per minute. Feed rates displayed in chip load per tooth.

Typical Applications for D1 & D2 Diamond:

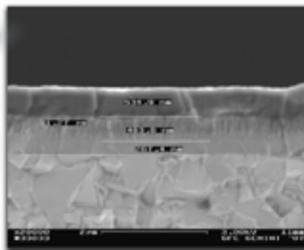
- Graphites • Aluminum-Silicon Alloys • Carbon Fiber Composites • Plastics • Green Ceramics
- Copper Alloys • Brass Magnesium • Hard Carbons • Fiberglass • High Silicon Aluminum
- Composite CFRP's • Metal Matrix Composites • Wood Composites
- Delrin • Kevlar • PEEK • Glass-Filled Composites



About our D1 & D2 Diamond Coatings:

RoundTool Laboratories Diamond Coated End Mill Series are a perfect match on graphite molds for EDM. Our D1 and D2 coatings offer industry leading wear resistance when subjected to the abrasive properties of EDM graphite parts. RoundTool offers two versions of diamond; D1 is a PVD applied diamond while our D2 is a CVD application. Supporting both Series is a carbide end mill specially designed and manufactured with graphite milling in mind. While other companies simply coat standard off-the-shelf end mills, the GR-D1 and GR-D2 represent customized engineering featuring higher helix & heavier core, which in turn offer freer cutting and less deflection. These two series have also achieved great success in other applications featuring highly abrasive materials.

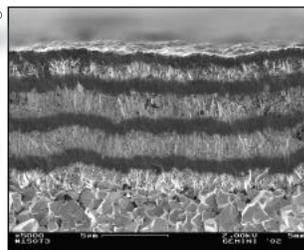
SmoothCoat®



SmoothCoat® D1: RoundTool Lab's new generation of D1 raises the bar on PVD diamond coatings. D1 PVD Diamond is a smooth amorphous diamond coating that also maintains an extremely upsharp cutting edge. D1 offers the highest value proposition in a large majority of applications. Short, medium, and long running jobs all benefit from D1's unique attributes, and small diameter end mills particularly are complimented by the smooth & thin coating structure. These end mills will produce the finest finish and most accurate cut of our diamond selection. D1 end mills also have a quick turnaround time with our in-house coating facility.

Type: PVD Color: Shiny Black Thickness per side: 1.75 – 2.5 microns

SmoothCoat®



SmoothCoat® D2: RoundTool Lab's new generation of D2 is a "grown on" CVD diamond coating that offers the highest wear resistance in machining graphite and abrasive non-metals. Tool life can be increased by up to 50x that of standard uncoated carbide end mills. With long tool life and minimal wear, D2 coated end mills improve part accuracy and workpiece tolerance levels. D2 end mills have a longer lead time due to the amount of time spent in the coating vessel physically growing the diamond crystalline structure.

Type: CVD Color: Flat Dark Grey Thickness per side: 4–6 microns