

API Thread Grinding / Profile Grinding Wheels

DIANAMIC® manufactures single layer Diamond and cBN API Thread Grinding Wheels and Profile Grinding Wheels.

API thread grinding wheels are used to manufacture carbide inserts used by the petroleum industry. Profile grinding wheels are used to grind very specific forms used in the manufacture of turbines (jet propulsion and electrical production). Profile wheels are also commonly used in the automotive industries.

Two methods of wheel core manufacture are utilized:

- a. Ground forms on wheel adaptors up to 7" (177.8mm) in diameter
Maximum width 2" (50.8mm)
- b. Forms turned on CNC lathes (up to 20" or 508mm in diameter)
Maximum width 12" (305mm)

The methods chosen to manufacture an API Thread Grinding or Profile Grinding wheel core is dependent on the tolerances specified by each individual customer's stated print requirements.

The following two scenarios are examples of minimum achievable ground part tolerances utilizing 325/400 Mesh (FEPA D46) Diamond or cBN.

1. On typical API thread grinding or profile grinding wheel cores on which the forms are mounted on a wheel adaptor and ground between centers, in diameters 6" to 10" and coated with 325/400 Mesh (FEPA D46), the minimum achievable ground part tolerances are:

- a. Radii +/- .0005" (0.012mm)
- b. Tooth location +/- .0003" (0.007mm)
- c. Maximum run out in X and Y axis .0005" (0.012mm)

2. On typical API thread grinding or profile grinding wheel cores which are CNC turned in diameters up to 20" and coated with 325/400 Mesh (FEPA D46), which are clocked or indicated to within .001" (0.0254mm), the minimum achievable ground part tolerances are:

- a. Radii +/- .0007" (0.018mm)
- b. Tooth or form location +/- .0005" (0.012mm)
- c. Maximum run out in X and Y axis .001" (0.0254mm)

Refer to the **DIANAMIC** Superabrasive particle size reference chart for a complete listing of achievable tolerances by mesh / micron size.

API Thread Grinding Technical Information

Wheel Size

The most common API Thread Grinding Wheel offering the greatest accuracy is either 7" (178mm) or 6" (152mm).

1. Ground forms on wheel adaptors up to 7" (177.8mm) in diameter
Maximum width 2" (50.8mm).
2. Forms turned on CNC lathes (up to 20" or 508mm in diameter),
Maximum width 12" (305mm). Normal available tolerances $\pm .001$ ", depending on mesh size.

Angular Compensation

For each design or part number, a 20X and 50X Mylar are drawn. The Mylar is compensated to achieve the ground profile required. We compensate the form according the individual prints specifications for:

- a. Front, Side and Radial clearance
- b. Helix Angle
- c. Top Rake
- d. Tilt

Compensations with more than one correction are quite common. To achieve the correct profile we will advise if any special fixturing or angular tilting is required. Angular tilting of sharp angles dramatically increase wheel life.

Profile Limitations

We are limited by the size of the Diamond or cBN Mesh size specified in respect to profile limitations. The tabulated chart indicates the minimum Female and Male radii achievable in the ground profile.

Delivery

Normal delivery is 4 weeks from receipt of print. Strip / recoat delivery is 5 - 7 work days from receipt of undamaged wheel blanks.

Minimum Achievable Radii by Mesh Size

Mesh	Female	Male
400/500	.003"	.003"
325/400	.004"	.005"
270/325	.005"	.006"
230/270	.006"	.008"
200/230	.008"	.010"
170/200	.010"	.012"
140/170	.011"	.013"
120/140	.012"	.015"
100/120	.015"	.015"
80/100	.018"	.018"
60/80	.020"	.025"
40/50	.035"	.035"

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