

Porous Machining Tip Sheet

For Porous Alumina & Silicon Carbide

GENERAL

- Porous Alumina and Silicon Carbide are relatively easy to grind for ceramics.
- Metal bonded diamond abrasives are recommended for all machining operations.
- Water is usually necessary for lubrication. An oil based lubricant and rust inhibitor may be added to the water stream to prolong equipment and tool life. The waste stream will be dilute abrasive slurry.
- Washing and thorough flushing of the parts is required to clean out the pores of cutting fluid and particles.
- Lubrication may not be necessary for small parts, especially for thin walled parts.
- Dusting and edge breakout are more prevalent as the pore diameter decreases.
- Surface finish becomes better as the pore diameter decreases.
- Worn diamond will adversely affect machining efficiency and capability.
- Minimize vibrations.
- Keep the part very secure.
- Silicon Carbide is generally more difficult to machine than alumina.

CUTTING & SAWING

- Tile saw blades work for most applications but wear quickly, especially on Silicon Carbide.
- Continuous rim blades are suitable, but segments will also work on larger samples.
- Single pass cutting is generally acceptable.

DRILLING

- Core drilling is recommended.
- Continuous rim or segments are acceptable.
- Masonry bits will cut but wear quickly and usually leave a relatively poor finish.
- For a 0.5 in core drill, feed at 0.5 in /minute at 2000-3000 RPM. Decrease the feed rate and speed as the drill diameter increases.

GRINDING & MACHINING

- All common grinding techniques are applicable.
- Sandpaper will not effectively grind porous Alumina or Silicon Carbide.
- Metal bonded diamond abrasives are recommended.
- Single point machining is not recommended except for very fine grades.
- Down feed of 0.004 in/min - 0.020 in/min is common.

SAFETY

- It is recommended the operator wear safety glasses and dust mask.
- Secure holding devices are required.
- Alumina and Silicon Carbide are not toxic, but the waste stream is abrasive and may cause irritation.

Note.- This general information is to be used only as a guideline.

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