

## DURATEC<sup>®</sup> MACHINABLE CERAMIC – MACHINING INSTRUCTIONS

### 1.0 Straight Line Cutting

#### DRY CUTTING

Duratec<sup>®</sup> panels should be worked and cut dry. A total thickness of up to 75mm can be cut at one time. The use of the following equipment and procedures will ensure clean, chip free edges.

**Saw:** Overhead Radial saw/Flat bed beam saw, with hold down clamps to stop panel vibration and movement that could cause chipping. The use of a slotted board support beneath the panel is also necessary to minimize chipping.

**Blade:** Carbide Tipped

- 460mm diameter/48 Teeth – 400mm diameter/32 Teeth
- 10 degree positive Rake
- 3.8 to 4mm Plate
- 5mm Kerf

**Blade Drive:** Variable depending on sharpness of blade.

- 900 rpm (Sharp)
- 600 rpm (worn)

This can be obtained either by Gearing, or an Inverter drive.

**Blade**

**Penetration:** 10-12mm beyond material

**Feed:** Variable hydraulic motor for controlling the traverse speed of saw. The Duratec<sup>®</sup> remains stationary, the saw travels.

**Feed Speed:** Depending on thickness of board:

Thickness	Feed Speed 1	Feed Speed 2
6-12mm	10 meters per minute	7 meters per minute
15-25mm	8 meters per minute	5 meters per minute
30-50mm	6 meters per minute	4 meters per minute
60-100mm	3 meters per minute	1 meter per minute

Using a **sharp** blade, take Feed Speed 1 with reductions as blade wears. Speed is controlled to assure clean cuts, as the cut edge deteriorates the speed is reduced until the rate dictates that a new or sharpened blade be used.

Feed Speed 2 is recommended as a minimum feed rate before changing blade.

Duratec<sup>®</sup> can also be cut using carbide tipped circular saws running at low revs and carbide bladed band saws.

As Duratec<sup>®</sup> is abrasive, carbide tipped hand saws are recommended.



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### WET CUTTING

Duratec<sup>®</sup> can be cut wet, but it is not the preferred method of cutting. The advantages are a better surface finish and less tool wear. The disadvantage is the care needed during drying to prevent shrinkage and cracking of the material. The Duratec<sup>®</sup> is totally submerged in water until saturated then cut while still wet.

- Blade:** 450mm segmented Diamond 36/44 grade.  
Alternatively, a polycrystalline tipped blade can be used (but tend to be expensive).  
These will give an excellent cutting finish which in most instances will not need to be machine finished.
- Blade Drive:** 2500-3000 rpm
- Blade Penetration:** 10 to 12mm
- Feed:** Variable hydraulic or cable
- Feed Speed:** Depending on thickness of board:

Thickness	Feed Speed
6-12mm	5 meters per minute
15-25mm	3 meters per minute
30-50mm	1.5 meters per minute
60-100mm	0.5 meters per minute

### 2.0 Drilling

Duratec<sup>®</sup> is drilled dry. Use carbide (solid/tipped) drills only

Sizes	Speed
1mm to 12mm diameter	2000 to 2300 rpm
14mm to 25mm diameter	1000 to 1200 rpm
26mm to 50mm diameter	500 to 700 rpm

- Feed Speed:** Peck drill to stop dust build up, this will stop overheating at the drill tip, prolonging the life of the drill. The feed is determined by the diameter of the drill, and is governed by the sharpness of the tip (cutting edge). The nature of the material is very abrasive, shortening the life of the tip, hole to hole. Feed is achieved by judging the resistance against the tip on drilling (touch).

- Guide line speeds:** Through holes

Sizes	Speed
1mm – 3mm	300mm – 400mm per minute
4mm – 12mm	400mm – 500mm per minute
13mm - 20mm	400mm – 500mm per minute
21mm – 25mm	300mm – 400mm per minute

Larger holes can be drilled using two flue (carbide tipped) router cutters, but must be piloted first with a drill to clear bottom cut clearance. Holes exceeding 40mm – 50mm should be drilled using a Boring Head with carbide tipped tools, or trepanning tools, keeping speeds down to a maximum of 100 rpm.

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### 4.0 Tapping

Machine tapping tends to be too fierce (hand tapping is recommended)

### 5.0 Fasteners and Fastening

Self-tapping screws can be used (holes must be piloted to the body size of the screw) eg. a 4mm screw will need a 3mm/3.5mm pilot hole.

For edge construction (box) wire helicoils are recommended

Clearance Holes: Sufficient clearance is required to allow for thermal movement of the fastener and board. 1mm minimum on diameters for steel screw fastenings is recommended

### 6.0 Hand Tools

Cutting: Carbide blades recommended

Drilling: Variables speed required

Finishing Tools: Filing/sanding can be achieved, but tool life is short

### 7.0 Health and Safety

It is recommended that an adequate extraction system is installed adjacent to the cutting tools to remove nuisance dust

The instructions are for guidance only. We suggest that machining trials are carried out on a test piece prior to machining finished components.

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