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GEMSTONE SOLID SURFACE

CUTTING & FINISHING SPECIFICATION SHEET

MATERIAL OVERVIEW

- **Product:** Gemstone Solid Surface (Acrylic + Aluminium Hydroxide Composite)
- **Density:** ~1,800 kg/m³ (1.80 g/cm³)
- **Thickness:** 20 mm standard (40 mm built-up optional)
- **Sheet Size:** 3660 × 600 × 20 mm (79 kg)

TOOLING & MACHINE TYPES

Machine Type	Application
CNC Router / Machining Centre	Precision profiling, sink & bowl cut-outs, shaping
Plunge Saw	On-site straight cuts or trimming large sheets
Circular / Panel Saw	Sheet separation and rough panel sizing
Jigsaw	Curved cuts, detail trimming, and small on-site cut-outs

RECOMMENDED CUTTER / BLADE SPECS

Machine	Cutter / Blade Type	Diameter Range	Notes
CNC Router	Solid carbide end-mill / router bit	6–12 mm (edge profiling), 12–16 mm (general contour)	High precision, clean edges
Fly-Cutter / Surfacing Bit	Solid carbide	25–50 mm	Level seams, remove adhesive
Plunge Saw / Circular Saw	Carbide-tipped aluminium-rated blade	160–190 mm	Smooth straight cuts
Jigsaw	Fine-tooth carbide / aluminium blade	50–100 mm length	Curved or irregular cuts

CUTTING PARAMETERS (REFERENCE STARTING POINTS)

Parameter	Recommended Range	Notes
Spindle Speed (CNC)	12,000 – 18,000 RPM	Adjust to tool diameter & rigidity
Feed Rate (CNC)	3 – 5 m/min (for 6 mm cutter)	Increase for larger cutters
Depth of Cut	3 – 5 mm per pass	Use multiple passes for 20 mm sheet
Chip Load	0.05 – 0.10 mm/tooth	Target for PMMA composites
Cut Direction	Climb cut	Smoother finish, less chipping
Saw Speed	Standard panel-saw RPM (3,000 – 4,000 RPM)	With aluminium-rated carbide blade

FINISHING & POLISHING PROCEDURE

1. **Edge Sanding:** 180 → 320 → 400 grit sequence.
2. **Buffing:** Use Scotch-Brite pad or fine polishing compound.
3. **Cleaning:** Mild detergent or Gemstone-approved cleaner only — avoid acetone or harsh solvents.
4. **Seaming:** Use colour-matched adhesive, clamp, trim, then sand and buff for a seamless appearance.

WORKHOLDING & SAFETY

- Use **vacuum table or firm clamps** to prevent vibration.
- Maintain **dust extraction**—fine aluminium hydroxide dust requires filtration.
- **PPE Required:** Safety glasses, ear protection, gloves, and P2 respirator.
- Clean tool flutes regularly to avoid heat build-up.

ADJUSTMENT NOTES

- **Reduce RPM or increase feed** if edges burn or melt.
- **Lower feed or use larger diameter bit** if chatter occurs.
- For tight curves, reduce feed and use smaller diameter cutters.
- Always test-cut new tools or materials before production.

SUMMARY

Use carbide or carbide-tipped tooling rated for aluminium or plastic composites. Maintain mid-high spindle speeds (12 000–18 000 RPM), multiple shallow passes, and proper finishing to achieve a seamless, high-gloss Gemstone surface.

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