



FOR LESS STRESS TUFFAK MG AND TUFFAK WG ARE CLEARLY THE RIGHT CHOICE

TUFFAK MG and **TUFFAK WG** are thick gauge thermoplastic sheets with superior dimensional stability specifically designed for tight tolerances. High temperature resistance and ease of fabrication make them ideal for many applications. **TUFFAK WG** is optically clear and **TUFFAK MG** is available in clear and colors – call for availability.

TUFFAK MG is used in tight tolerance machined parts such as fluid manifolds, insulators and other electrical components.

- » Low stress engineering thermoplastic
- » Translucent textured finish
- » Extremely high impact strength
- » High modulus of elasticity
- » Outstanding dimensional stability
- » Good electrical properties
- » Intended for highly-machined component applications

TUFFAK WG applications include sight windows for industrial tanks and vessels, viewport windows, medical parts and military.

- » Amorphous thermoplastic sheet
- » Clear polished finish
- » Extremely high impact strength
- » Very low internal stress
- » High modulus of elasticity
- » Outstanding dimensional stability
- » Good electrical properties
- » Available in 0.75", 1.00", 1.25", 1.50", 1.75" and 2.00"

See page 2 for general fabrication guidelines

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Fabrication guidelines

Cutting: A circular saw blade with carbide teeth utilizing the “triple chip” tooth design is the preferred method of cutting TUFFAK MG polycarbonate sheet. Table or overhead panel saws are normally used. Circular saws should be run in the speed range of 6000-8000 ft/min. Blades for cutting 3/32” and thicker material should have 3-5 teeth per inch. The hook or rake angle should be 10°-15°.

Drilling: Standard high speed twist drills should be used when drilling TUFFAK MG polycarbonate sheet. To achieve the best possible hole, surface speeds of 200 to 300 in./min for drills less than 1/4” to 1/2” in diameter should be used when material is machine dry. A cooling medium* should be used with speeds of 500-700 in./min for drills under 1/4” diameter, and 1500 to 1600 in./min for drills 1/4” to 1/2” in diameter. A feed rate of 0.001 to 0.0015 per revolution is also recommended.

Milling: Milling can be used for either roughing or achieving extremely high quality surface finishes. Best results can be obtained when using a high-speed steel end drill of the four-flute type with a 15° rake angle.

Turning: Using conventional metal turning lathes with variable speed control, TUFFAK MG polycarbonate sheet can be cut without coolant at turning speeds of 1500 to 2500 in/min. If cutter at higher speeds, water is preferred as a coolant. Good results can be obtained when using a round tip cutter. a high turning speed, a shallow cut and a low cross-feed rate. Radii of 15 to 30 mils are suggested for round tip cutters.

Polishing: TUFFAK MG machine grade polycarbonate is manufactured using clear resin but is textured on both sides so it is not optically clear. It can be mechanically polished or solvent vapor polished to yield an optically clear finished part. Please follow all EPA, local, state, and governmental guidelines when using any chemical-type polishing method.

Cautions

The following are suggested guidelines or concerns when working with TUFFAK MG and TUFFAK WG polycarbonate sheet.

1. Thermal expansion is up to 10 times greater with plastics than metals
2. Plastics will lose heat more slowly than metals
3. Avoid localized overheating
4. Softening/melting temperatures of plastics are much lower than metals

For more in-depth fabrication guidelines please consult the TUFFAK Fabrication Manual which can be found on www.plaskolite.com

Regulatory code compliance and certifications

Flammability - Plastic component	UL 94 V-0	UL File #E87887
Polycarbonate sheet classification	A-A-59502	Type 1 Class 1
Polycarbonate resin classification	ASTM D 3935	PC0116