

"Spartech. The Leader In Sign Plastics."

• **A Leader In Quality.** Our customers are the focus of everything we do. We are dedicated to deliver a first class product on time, every time, to each of our customers.

• **A Leader In Service.** Regionally located manufacturing plants make Spartech Plastics the most responsive resource for plastic sheet in North America.

• **A Leader In Commitment And Support.** We stock the most complete signface sheet material product line in the industry.

• **A Leader In Technology.** Spartech Plastics' 40+ year reputation for innovation in thermoplastics is unsurpassed.

• **A Leader In The Industry.** With annual sales of over \$600 million, Spartech Plastics is the largest custom sheet extruder in the world.

• **ISO 9002 Certified Plants.** Spartech's full line of sign plastics are manufactured in ISO 9002 certified facilities.

Sign Products Division Manufacturing & Sales Office

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Tuf-Glas

*Continuously Processed
Impact Acrylic*



Tuf-Glas

Continuously Processed Impact Acrylic

Tuf-Glas Continuously Processed Impact Acrylic. Combining exceptional impact strength—almost seven times tougher than conventional acrylic—clarity and stiffness with outstanding formability and ease of fabrication, Tuf-Glas is designed as the premier clear rigid sheet for all types of sign applications.

Tuf-Glas is available in reels and flat sheet in either smooth or matte finish. Sign white and other standard and custom colors are available upon request.

Tuf-Glas	Very High	High	Average
Impact Strength		●	
Flexural Modulus	●		
Heat Deflection Temperature		●	
Formability		●	
Weather Resistance	●		

Fabrication. Tuf-Glas can be sawed, drilled, and routed with standard equipment and procedures recommended for conventional acrylic sheet. Painting, silk-screening, vinyl application and other decorative techniques are easily accomplished; and Tuf-Glas can be joined to itself or other materials by adhesive or solvent bonding. Mechanical fastening may be successful depending upon procedure and end use; please contact your Spartech Plastics Technical Sales Representative for guidelines specific to your custom requirements.

Cutting. Tuf-Glas can be cut with standard power sawing equipment including table saws, band saws and circular saws if proper clamping devices are used. Standard hollow-ground, high-speed cross-cut steel blades are adequate, but carbide-tipped blades are suggested for longer life. Saw blades should have a 0-5

degree positive rake angle. There should be from four to eight teeth per inch depending on sheet thickness. All teeth should be of uniform height. Saws should run at speeds of 8,000 to 12,000 linear feet per minute.

Thickness in inches	Number of teeth/inch
.100 to .125	6 to 8
.125 to .187	5 to 6
.187 & thicker	4 to 5

Band saw blades should have 10-14 teeth per inch; blade speeds should be between 4,000 and 5,000 feet per minute.

Drilling. Tuf-Glas may be drilled with modified, standard high-speed, steel twist drills. The drills should have slow spirals and wide polished flutes. The included tip angle should be ground to 60 degrees and the cutting edge dubbed off to a zero degree rake angle. The back lip clearance angles should be ground to 12-15 degrees.

Cementing. Conventional solvent cements and polymerizable cements will readily join Tuf-Glas. Polymerizable cements give higher joint strengths than solvents.

Painting. Tuf-Glas can be easily painted and silk-screened with standard sign paints for acrylic sheet; impact additives may be used if desired. Grip-Flex[®] and Lacryl[®] spray and screen paints have been thoroughly evaluated and field-tested. Paint can be removed with Trialene soap or a 50/50 mixture of VM&P Naptha in combination with any of the following: Grip-Flex T-1005; Lacryl 205-T; or solvent 100. More aggressive solvents or mixtures can cause crazing, particularly in thermoformed faces with residual stresses; remove solvent from plastic sheet as quickly as possible to avoid solvent attack. Follow the manufacturer's guidelines for proper painting and paint removal procedures.

Physical Property Summary			
Property	Test Method	Value	Unit
Specific Gravity	ASTM D-792	1.17	g/cc
Tensile Modulus	ASTM D-638	320,000	psi
Tensile Strength @ Yield	ASTM D-638	7,000	psi
Flexural Modulus	ASTM D-790	380,000	psi
Flexural Strength @ Yield	ASTM D-790	14,400	psi
Izod Impact	ASTM D-256 (73° F)	.6	ft-lbs/in
Falling Dart Impact	ASTM D-3029 (73° F)	7.0	ft-lbs
Heat Deflection Temperature	ASTM D-648 (264 psi, unannealed)	190	°F
Coefficient of Thermal Expansion	ASTM D-696	5.2 x 10 ⁻⁵	in/in/°F
Hardness	ASTM D-785	68	Rockwell "M"
Flammability	UL Subject 94	HB	.058"
Gardner Gloss	ASTM D-523	99	%

These typical results are based on test procedures which are believed to be reliable. Due to variable conditions or methods of processing, NO GUARANTEES OR WARRANTIES ARE EXPRESSED OR IMPLIED INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, nor any recommendations made to infringe on patents.

Thermoforming. Tuf-Glas forms very easily with better detail at lower temperatures than cast acrylic sheet, on virtually all thermoforming equipment from high-volume, multi-station rotary machines to single station and shuttle presses. Thorough heat-soaking is recommended for good part detail with minimum residual stresses. Forming temperatures range from 275-350°F, with optimum sheet temperature at a uniform 325°F. Part removal temperature should be no greater than 190°F. **Tuf-Glas forming cycle times can be as much as 25% faster than cast acrylic.**

Tuf-Glas has been successfully formed in vertical ovens as well. Sheet should be tenter framed or clamped on all four sides, and time and temperature must be carefully controlled and monitored.

