

TUFFAK GP POLYCARBONATE SHEET

GENERAL PURPOSE

TUFFAK GP sheet is a polished surface, UV stabilized, transparent polycarbonate product. It features outstanding impact strength, superior dimensional stability, high temperature resistance, and high clarity. This lightweight thermoformable sheet is also easy to fabricate and decorate. TUFFAK GP sheet is offered with a five (5) year Limited Product Warranty against breakage. The terms of the warranty are available upon request.

APPLICATIONS

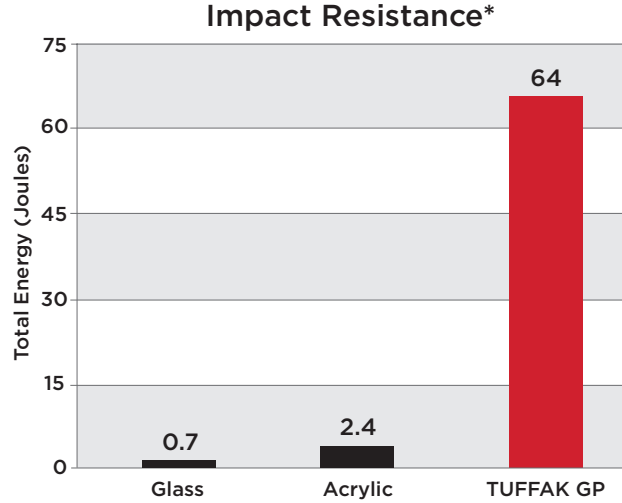
Industrial glazing, machine guards, structural parts, thermoformed and fabricated components

TYPICAL METRIC ISO PROPERTIES*

Property	Test Method	Units	Values
PHYSICAL			
Density	ISO 1183	g/cm ³	1.2
Refractive Index	ISO 489	-	1.586
Light Transmission, Clear @ 3.0mm	ASTM D 1003	%	86
Light Transmission, I30 Gray @ 3.0mm	ASTM D 1003	%	50
Light Transmission, K09 Bronze @ 3.0mm	ASTM D 1003	%	50
Light Transmission, I35 Dark Gray @ 3.0mm	ASTM D 1003	%	18
Water Absorption	ISO 62 (1)	%	0.15
Haze @ 3mm, clear	ASTM D 1003	%	<1
MECHANICAL**			
Tensile Strength, Ultimate	ASTM D 638	MPa	66
Tensile Strength, Yield	ISO 527-2	MPa	62
Tensile Modulus	ISO 527-2	MPa	2340
Elongation at Break	ISO 527-2	%	110
Flexural Strength	ISO 178	MPa	93
Flexural Modulus	ISO 178	MPa	2380
Compressive Strength	ASTM D 695	MPa	86
Compressive Modulus	ASTM D 695	MPa	2380
Izod Impact Strength, Notched	ISO 180/1A	kJ/m ²	>65
Charpy Impact Strength, Unnotched	ISO 179/1eU	kJ/m ²	No Break
Instrumented Impact @ 3.18mm	ASTM D 3763	J	64
Shear Strength, Ultimate	ASTM D 732	MPa	69
Shear Strength, Yield	ASTM D 732	MPa	41
Shear Modulus	ASTM D 732	MPa	786
Rockwell Hardness	ASTM D 785	-	M70 / R118
THERMAL			
Coefficient of Linear Thermal Expansion	ISO 11359-2	um/m-°C	68
Thermal Conductivity	ASTM C 177	Cal cm/sec-cm2-°C	0.005
Heat Deflection Temperature @ 1.86 MPa	ISO 75-1	°C	132
Vicat Softening Temp. (50N)	ISO 306	°C	144
Brittleness Temperature	ASTM D 746	°C	-129
Shading Coefficient, clear @ 6.0mm	NFRC 100-2010	-	0.97
Shading Coefficient, Gray or Bronze @ 6.0mm	NFRC 100-2010	-	0.77
U factor @ 6.0mm (summer, winter)	NFRC 100-2010	W/m ² -°C	4.83, 5.22
U factor @ 9.54mm (summer, winter)	NFRC 100-2010	W/m ² -°C	4.43, 4.83
ELECTRICAL			
Dielectric Constant @ 50 Hz	DIN 53483	-	3.0
Surface Resistivity	IEC 60093	Ohm	>10 ¹⁴
Volume Resistivity	IEC 60093	Ohm-cm	>10 ¹⁵
Dissipation Factor @ 100 Hz & 1MHz	DIN 53483	-	0.0006/0.009
Arc Resistance			
Stainless Steel Strip electrode	ASTM D 495	Seconds	10
Tungsten Electrodes	ASTM D 495	Seconds	120
Dielectric Strength, in air @ 3.0mm	ASTM D 149	V/mm	15000
FLAMMABILITY			
Horizontal Burn, AEB	ASTM D 635	cm	<2.54
Ignition Temperature, Self	ASTM D 1929	°C	577
Ignition Temperature, Flash	ASTM D 1929	°C	466
Flame Class @ 1.52mm - <10.0mm (All colors, Clear)	UL 94	-	HB
@ >/= 10.0mm (Clear)	UL 94	-	V-0
Flammability (2-5mm)	Euroclass EN13501	-	B,s1,do

*Typical properties are not intended for specification purposes.
**Some properties characterized using non-textured sheet.

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*Instrumented Impact per ASTM D 3763, sample thickness 3.2mm nominal

Standard Products Comparison

Property		Polycarbonate	Acrylic	Glass
Impact Resistance	Drop Ball Test, 0.5 lb	No Break	2.37J	0.95J
Cold Bend	Bend Radius	100x material thickness	180x material thickness	Not possible
Sheet Weight	3.18mm	3.81/m ²	3.66 kg/m ²	7.81 kg/m ²
Thermal Expansion Rate	-	6.8 x 10 ⁻⁵ cm/cm/°C	7.4 x 10 ⁻⁵ cm/cm/°C	9.0 x 10 ⁻⁶ cm/cm °C
Shading Coefficient	6.0mm clear sheet	0.97	1.01	1.03
U Factor - Summer	6.0mm	4.83 W/m ² .°C	4.71 W/m ² .°C	5.22 W/m ² .°C
U Factor - Winter		5.22 W/m ² .°C	5.15 W/m ² .°C	5.79 W/m ² .°C
Sound Transmission Class	6.0mm	29	30	27

Regulatory code compliance and certifications

ANSI Z97.1-2009, 2015: American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test, Class A, Unlimited

CPSC 16 CFR 1201 Category I and Category II: Safety Standard for Architectural Glazing Materials

Florida Building Code
High Velocity Hurricane Zone Classified
Miami-Dade NOA: NOA

ICC-ES Evaluation Report ESR-2728

UL 94: Flammability File #E87887

UL 972: Burglary Resistant Glazing Materials, UL File #BP2126

UL 746C: Suitability for Outdoor Use, UL File #E87887*

TUFFAK GP products have limited weathering properties, for more information contact your Plaskolite representative.

These suggestions and data are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and methods of use are beyond our control. We recommend that the prospective user determines the suitability of our materials and suggestions before adopting them on a commercial scale.

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