

## 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

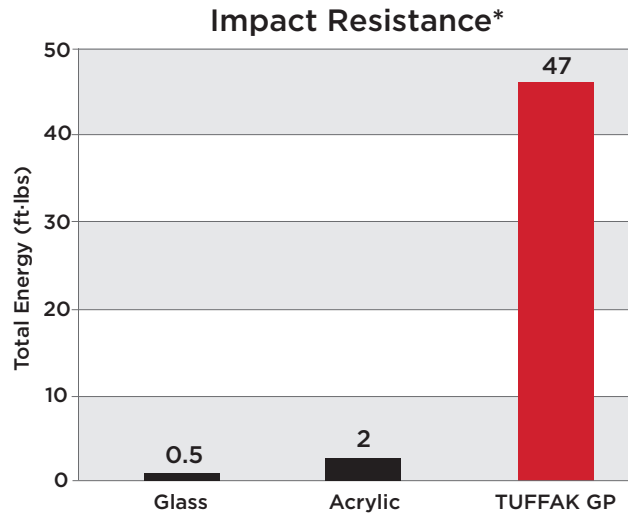
Industrial glazing, machine guards, structural parts, thermoformed and fabricated components

### TYPICAL PROPERTIES\*

| Property                                     | Test Method   | Units                         | Values                  |
|--|---------------|-------------------------------|-------------------------|
| <b>PHYSICAL</b>                              |               |                               |                         |
| Specific Gravity                             | ASTM D 792    | -                             | 1.2                     |
| Refractive Index                             | ASTM D 542    | -                             | 1.586                   |
| Light Transmission, Clear @ 0.118"           | ASTM D 1003   | %                             | 86                      |
| Light Transmission, I30 Gray @ 0.118"        | ASTM D 1003   | %                             | 50                      |
| Light Transmission, K09 Bronze @ 0.118"      | ASTM D 1003   | %                             | 50                      |
| Light Transmission, I35 Dark Gray @ 0.118"   | ASTM D 1003   | %                             | 18                      |
| Water Absorption, 24 hours                   | ASTM D 570    | %                             | 0.15                    |
| Poisson's Ratio                              | ASTM E 132    | -                             | 0.38                    |
| <b>MECHANICAL**</b>                          |               |                               |                         |
| Tensile Strength, Ultimate                   | ASTM D 638    | psi                           | 9,500                   |
| Tensile Strength, Yield                      | ASTM D 638    | psi                           | 9,000                   |
| Tensile Modulus                              | ASTM D 638    | psi                           | 340,000                 |
| Elongation                                   | ASTM D 638    | %                             | 110                     |
| Flexural Strength                            | ASTM D 790    | psi                           | 13,500                  |
| Flexural Modulus                             | ASTM D 790    | psi                           | 345,000                 |
| Compressive Strength                         | ASTM D 695    | psi                           | 12,500                  |
| Compressive Modulus                          | ASTM D 695    | psi                           | 345,000                 |
| Izod Impact Strength, Notched @ 0.125"       | ASTM D 256    | ft-lbs/in                     | 18                      |
| Izod Impact Strength, Unnotched @ 0.125"     | ASTM D 256    | ft-lbs/in                     | 60 (no break)           |
| Instrumented Impact @ 0.125"                 | ASTM D 3763   | ft-lbs                        | 47                      |
| Shear Strength, Ultimate                     | ASTM D 732    | psi                           | 10,000                  |
| Shear Strength, Yield                        | ASTM D 732    | psi                           | 6,000                   |
| Shear Modulus                                | ASTM D 732    | psi                           | 114,000                 |
| Rockwell Hardness                            | ASTM D 785    | -                             | M70 / R118              |
| <b>THERMAL</b>                               |               |                               |                         |
| Coefficient of Thermal Expansion             | ASTM D 696    | in/in/°F                      | 3.75 x 10 <sup>-5</sup> |
| Coefficient of Thermal Conductivity          | ASTM C 177    | BTU-in/hr-ft <sup>2</sup> -°F | 1.35                    |
| Heat Deflection Temperature @ 264 psi        | ASTM D 648    | °F                            | 270                     |
| Heat Deflection Temperature @ 66 psi         | ASTM D 648    | °F                            | 280                     |
| Brittleness Temperature                      | ASTM D 746    | °F                            | -200                    |
| Shading Coefficient, clear @ 0.236"          | NFRC 100-2010 | -                             | 0.97                    |
| Shading Coefficient, Gray or Bronze @ 0.236" | NFRC 100-2010 | -                             | 0.77                    |
| U factor @ 0.236" (summer, winter)           | NFRC 100-2010 | BTU/hr-ft <sup>2</sup> -°F    | 0.85, 0.92              |
| U factor @ 0.375" (summer, winter)           | NFRC 100-2010 | BTU/hr-ft <sup>2</sup> -°F    | 0.78, 0.85              |
| <b>ELECTRICAL</b>                            |               |                               |                         |
| Dielectric Constant @ 10 Hz                  | ASTM D 150    | -                             | 2.96                    |
| Dielectric Constant @ 60 Hz                  | ASTM D 150    | -                             | 3.17                    |
| Volume Resistivity                           | ASTM D 257    | Ohm-cm                        | 8.2 x 10 <sup>16</sup>  |
| Dissipation Factor @ 60 Hz                   | ASTM D 150    | -                             | 0.0009                  |
| Arc Resistance                               |               |                               |                         |
| Stainless Steel Strip electrode              | ASTM D 495    | Seconds                       | 10                      |
| Tungsten Electrodes                          | ASTM D 495    | Seconds                       | 120                     |
| Dielectric Strength, in air @ 0.125"         | ASTM D 149    | V/mil                         | 380                     |
| <b>FLAMMABILITY</b>                          |               |                               |                         |
| Horizontal Burn, AEB                         | ASTM D 635    | in                            | <1                      |
| Ignition Temperature, Self                   | ASTM D 1929   | °F                            | 1022                    |
| Ignition Temperature, Flash                  | ASTM D 1929   | °F                            | 824                     |
| Flame Class @ 0.060"                         | UL 94         | -                             | HB                      |
| @ 0.394"                                     | UL 94         | -                             | V-0                     |

\*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 0.125" nominal

## Standard Products Comparison

| Property                 |                        | Polycarbonate                    | Acrylic                          | Glass                           |
|--------------------------|------------------------|----------------------------------|----------------------------------|---------------------------------|
| Impact Resistance        | Drop Ball Test, 0.5 lb | No Break                         | 1.75 ft-lbs                      | 0.7 ft-lbs                      |
| Cold Bend                | Bend Radius            | 100x material thickness          | 180x material thickness          | Not possible                    |
| Sheet Weight             | 0.125"                 | 0.78 lb/ft <sup>2</sup>          | 0.75 lb/ft <sup>2</sup>          | 1.60 lbs/ft <sup>2</sup>        |
| Thermal Expansion Rate   | -                      | 3.75 x 10 <sup>-5</sup> in/in/°F | 4.10 x 10 <sup>-5</sup> in/in/°F | 5.0 x 10 <sup>-6</sup> in/in °F |
| Shading Coefficient      | 0.236" clear sheet     | 0.97                             | 1.01                             | 1.03                            |
| U Factor - Summer        | 0.236"                 | 0.85 BTU/hr-ft <sup>2</sup> ·°F  | 0.83 BTU/hr-ft <sup>2</sup> ·°F  | 0.92 BTU/hr-ft <sup>2</sup> ·°F |
| U Factor - Winter        |                        | 0.92 BTU/hr-ft <sup>2</sup> ·°F  | 0.91 BTU/hr-ft <sup>2</sup> ·°F  | 1.02 BTU/hr-ft <sup>2</sup> ·°F |
| Sound Transmission Class | 0.236"                 | 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 2017  
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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