

## TUFFAK SL POLYCARBONATE SHEET

### UV RESISTANT SIGN GRADE

TUFFAK SL Sign Grade sheet is a polycarbonate product with an advanced UV resistance technology that promotes long lasting outdoor weathering performance. It features outstanding impact strength, excellent dimensional stability, high temperature resistance, and high clarity. This lightweight thermoformable sheet is also easy to fabricate and decorate. TUFFAK SL is offered in clear, a wide range of standard sign colors, or can be custom matched to any color. The product, available in either sheet or reels, has a proven track record of outstanding performance in extreme environments and meets the UL 879 standard for electric sign components. A ten (10) year limited product warranty is available for both clear and colors for breakage resistance. Clear sheet is also covered for weathering resistance. The terms of the warranty are available upon request.

### APPLICATIONS

Flat and formed sign faces and channel letters

### Regulatory code compliance and certifications

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

UL 879: Electric Sign Components,  
UL File #E146154

UL 94: Flammability File #E87887

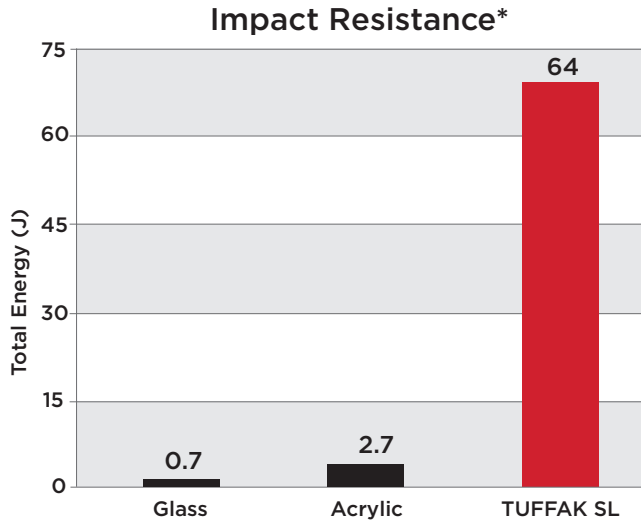
UL 746C: Suitability for Outdoor Use,  
UL File #E87887

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

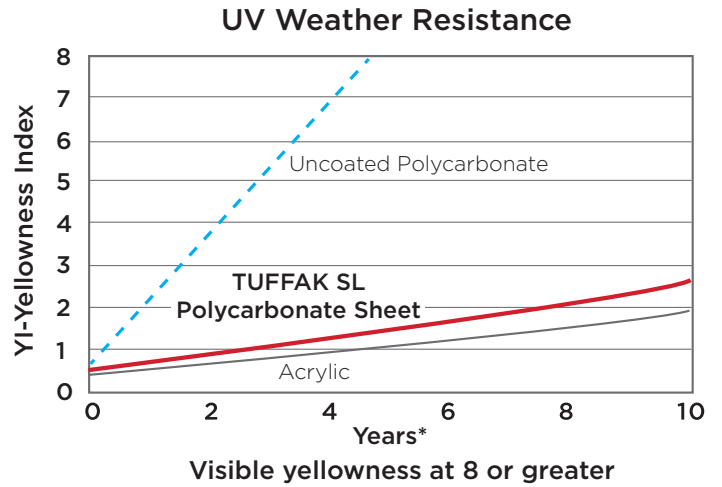
### TYPICAL METRIC PROPERTIES

| Property   | Test Method | Units                          | Values                 |
|--|-------------|--------------------------------|------------------------|
| <b>PHYSICAL</b>                                  |             |                                |                        |
| Specific Gravity                                 | ASTM D792   | -                              | 1.2                    |
| Refractive Index                                 | ASTM D542   | -                              | 1.586                  |
| Light Transmission, Clear @ 3.0mm                | ASTM D1003  | %                              | 86                     |
| Light Transmission, B59 White @ 3.0mm            | ASTM D1003  | %                              | 27                     |
| Light Transmission, B54 White @ 3.81mm and 4.5mm | ASTM D1003  | %                              | 27                     |
| Light Transmission, B72 White, All gauges        | ASTM D1003  | %                              | 72                     |
| Water Absorption, 24 hours                       | ASTM D570   | %                              | 0.15                   |
| Poisson's Ratio                                  | ASTM E132   | -                              | 0.38                   |
| <b>MECHANICAL</b>                                |             |                                |                        |
| Tensile Strength, Ultimate                       | ASTM D638   | MPa                            | 66                     |
| Tensile Strength, Yield                          | ASTM D638   | MPa                            | 62                     |
| Tensile Modulus                                  | ASTM D638   | MPa                            | 2340                   |
| Elongation                                       | ASTM D638   | %                              | 110                    |
| Flexural Strength                                | ASTM D790   | MPa                            | 93                     |
| Flexural Modulus                                 | ASTM D790   | MPa                            | 2380                   |
| Compressive Strength                             | ASTM D695   | MPa                            | 86                     |
| Compressive Modulus                              | ASTM D695   | MPa                            | 2380                   |
| Izod Impact Strength, Notched @ 3.2mm            | ASTM D256   | J/cm                           | 9.6                    |
| Izod Impact Strength, Unnotched @ 3.2mm          | ASTM D256   | J/cm                           | 32 (no break)          |
| Instrumented Impact @ 3.2mm                      | ASTM D3763  | J                              | 64                     |
| Shear Strength, Ultimate                         | ASTM D732   | MPa                            | 69                     |
| Shear Strength, Yield                            | ASTM D732   | MPa                            | 41                     |
| Shear Modulus                                    | ASTM D732   | MPa                            | 786                    |
| Rockwell Hardness                                | ASTM D785   | -                              | M70 / R118             |
| <b>THERMAL</b>                                   |             |                                |                        |
| Coefficient of Thermal Expansion                 | ASTM D696   | cm/cm/°C                       | 6.8 x 10 <sup>-5</sup> |
| Coefficient of Thermal Conductivity              | ASTM C177   | Cal cm/sec-cm <sup>2</sup> -°C | 0.0005                 |
| Heat Deflection Temperature @ 1.82 MPa           | ASTM D648   | °C                             | 132                    |
| Heat Deflection Temperature @ 0.46 MPa           | ASTM D648   | °C                             | 137                    |
| Brittleness Temperature                          | ASTM D746   | °C                             | -129                   |
| <b>ELECTRICAL</b>                                |             |                                |                        |
| Dielectric Constant @ 10 Hz                      | ASTM D150   | -                              | 2.96                   |
| Dielectric Constant @ 60 Hz                      | ASTM D150   | -                              | 3.17                   |
| Volume Resistivity                               | ASTM D257   | Ohm-cm                         | 8.2 x 10 <sup>16</sup> |
| Dissipation Factor @ 60 Hz                       | ASTM D150   | -                              | 0.0009                 |
| Arc Resistance                                   | -           | -                              | -                      |
| Stainless Steel Strip electrode                  | ASTM D495   | Seconds                        | 10                     |
| Tungsten Electrodes                              | ASTM D495   | Seconds                        | 120                    |
| Dielectric Strength, in air @ 3.2mm              | ASTM D149   | V/mm                           | 15000                  |
| <b>FLAMMABILITY</b>                              |             |                                |                        |
| Horizontal Burn, AEB                             | ASTM D635   | cm                             | <2.54                  |
| Flame Class @ 1.52mm                             | UL 94       | -                              | HB                     |
| Ignition Temperature, Self                       | ASTM D1929  | °C                             | 550                    |
| Ignition Temperature, Flash                      | ASTM D1929  | °C                             | 440                    |

# TUFFAK SL POLYCARBONATE SHEET



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



\*Based upon xenon WOM accelerated weathering for UV dose at mid-latitude location

## TUFFAK SL Standard Colors

| Standard Plaskolite Color | Standard Industry Color | Standard Gauge  |
|---------------------------|-------------------------|-----------------|
| White/ B59 - B54          | 7328                    | 0.093" - 0.236" |
| Red/ D96                  | 2283                    | 0.118" - 0.177" |
| Red/ D99                  | 2793                    | 0.118" - 0.177" |
| Blue/ F84                 | 2114                    | 0.118" - 0.177" |
| Blue/ F85                 | 2051                    | 0.118" - 0.177" |
| Green/ H87                | 2108                    | 0.118" - 0.177" |
| Yellow/ M72               | 2037                    | 0.118" - 0.177" |
| Orange/ C59               | 2119                    | 0.118" - 0.177" |

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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