

# TUFFAK SL

## PRODUCT DESCRIPTION

TUFFAK SI 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. The 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 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 warranty is available for both clear and colors for breakage resistance. The terms of this warranty are available upon request.

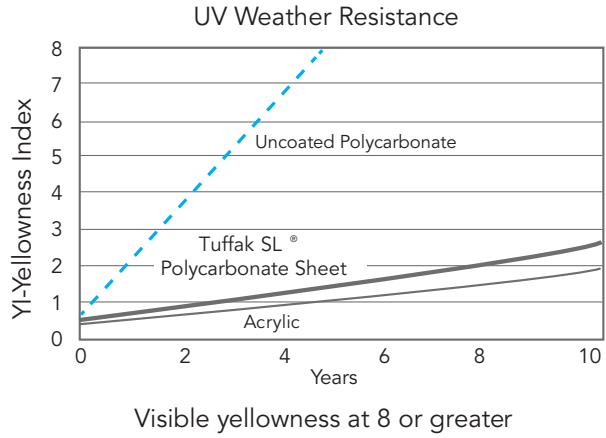
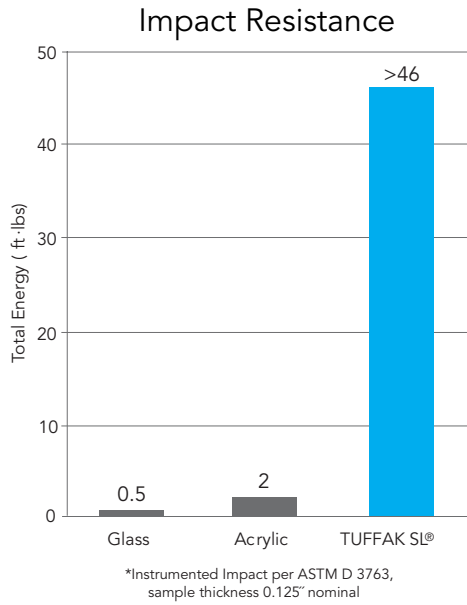
### APPLICATIONS

Flat and formed sign faces and channel letters

### 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, B59 White @ 0.118"            | ASTM D 1003       | %                             | 27                      |
| Light Transmission, B54 White @ 0.150" and 0.177" | ASTM D 1003       | %                             | 27                      |
| 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                     |
| <b>Flexural Strength</b>                          | <b>ASTM D 790</b> | <b>psi</b>                    | <b>13,500</b>           |
| <b>Flexural Modulus</b>                           | <b>ASTM D 790</b> | <b>psi</b>                    | <b>345,000</b>          |
| 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 failure)         |
| Instrumented Impact @ 0.125"                      | ASTM D 3763       | ft-lbs                        | >46                     |
| 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                    |
| <b>ELECTRIC AL</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                                    | -                 | -                             | -                       |
| <b>Stainless Steel Strip electrode</b>            | <b>ASTM D 495</b> | <b>Seconds</b>                | <b>10</b>               |
| 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                      |
| Flame Class @ 0.060"                              | UL 94             | -                             | HB                      |
| Ignition Temperature, Self                        | ASTM D 1929       | °F                            | 1022                    |
| Ignition Temperature, Flash                       | ASTM D 1929       | °F                            | 824                     |

# TUFFAK SL PRODUCT DESCRIPTION



## Regulatory code compliance and certifications

UL 879: Electric Sign Components, UL File #E146154

UL 94: Flammability, UL File #E351891

Miami-Dade NOA #12-0605.05

Florida Building Code 2010

High Velocity Hurricane Zone Classified