

TUFFAK 15 polycarbonate sheet

EXTENDED ABRASION AND UV RESISTANCE

TUFFAK 15 sheet is a polycarbonate product that offers excellent impact resistance in high risk areas, weathering life, and optical quality. It provides a clear aesthetic advantage over wire glass and metal screens for security glazing. TUFFAK 15 protects against vandalism, forced entry attempts or attacks, and accidental impacts to minimize the risk of theft and glass replacement in damage prone areas. Advanced manufacturing technology has resulted in high optical quality with minimal distortion in clear and standard glazing tints. The abrasion resistant coating, applied to both sides, provides up to twice the life of prior polycarbonate sheet products. TUFFAK 15 sheet has a fifteen (15) year Limited Product Warranty against breakage, yellowing, and loss of light transmission. The terms of the warranty are available upon request.

APPLICATIONS

Educational, psychiatric and medical facilities, retail and government buildings, and transportation centers at risk from breakage and vandalism

| Typical Properties* | | | |
|--|-------------|-----------|-------------|
| Property | Test Method | Units | Values |
| PHYSICAL | | | |
| Specific Gravity | ASTM D 792 | - | 1.2 |
| Light Transmission | ASTM D 1003 | % | 86 |
| Chemical Resistance | ASTM D 1308 | - | Pass |
| Taber Abrasion, 100 Cycles CS-10F | ASTM D 1044 | | |
| Delta Haze | | % | 2 |
| MECHANICAL | | | |
| Tensile Strength, Ultimate | ASTM D 638 | psi | 9,500 |
| Tensile Modulus | ASTM D 638 | psi | 340,000 |
| Flexural Strength | ASTM D 790 | psi | 13,500 |
| Izod Impact Strength, Notched @ 0.125" | ASTM D 256 | ft-lbs/in | 16 |
| Izod Impact Strength, Unnotched @ 0.125" | ASTM D 256 | ft-lbs/in | 60 |
| Instrumented Impact @ 0.125" | ASTM D 3763 | ft-lbs | 47 |
| THERMAL | | | |
| Coefficient of Thermal Expansion | ASTM D 696 | in/in/°F | 3.75 x 10-5 |
| Heat Deflection Temperature @ 264 psi | ASTM D 648 | °F | 270 |
| Heat Deflection Temperature @ 66 psi | ASTM D 648 | °F | 280 |
| FLAMMABILITY | | | |
| Horizontal Burn, AEB | ASTM D 635 | in | <1 |
| Ignition Temperature, Self | ASTM D 1929 | °F | 1022 |
| Ignition Temperature, Flash | ASTM D 1929 | °F | 824 |

*Typical properties are not intended for specification purposes.

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, 6th Ed.
High Velocity Hurricane Zone Classified
Miami-Dade NOA: NOA

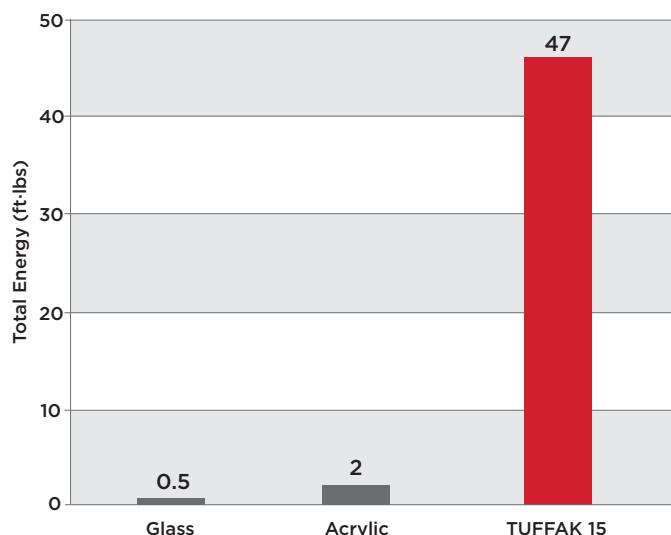
ICC-ES Evaluation report ESR-2728

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

AAMA 501.8: Resistance to Human Impact of Windows Systems Intended for Use in Psychiatric Applications

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Impact Resistance*



*Instrumented Impact per ASTM D 3763, sample thickness is 0.125" nominal

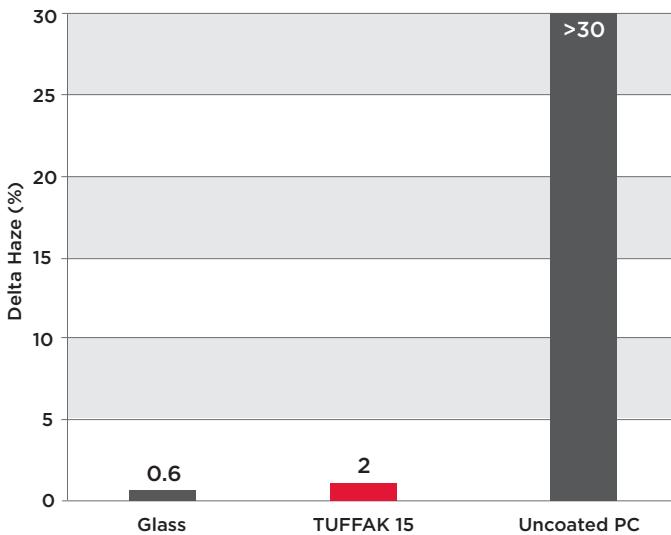
Chemical Resistance*

| Chemical Tested | Resistance Time |
|---------------------------------|-----------------|
| Acetone | >24 hrs |
| Ammonia (10% concentration) | >24 hrs |
| Antifreeze (50/50) | >24 hrs |
| Benzene | >24 hrs |
| Bleach (Clorox concentrated) | >24 hrs |
| Chloroform | >24 hrs |
| Denatured Alcohol | >24 hrs |
| Di (2-ethylhexyl) phthalate | >24 hrs |
| Diesel Oil | >24 hrs |
| Isopropyl Alcohol (IPA) | >24 hrs |
| Kerosene | >24 hrs |
| Methyl Alcohol | >24 hrs |
| Methyl Butyl Ketone | >24 hrs |
| Methyl Ethyl Ketone | >24 hrs |
| Methylene Chloride | >24 hrs |
| Naphthalene, 1-bromo- | >24 hrs |
| Potassium Hydroxide - Lye (10%) | >24 hrs |
| Sodium Hydroxide (10%) | >24 hrs |
| Toluene | >24 hrs |
| Turpentine | >24 hrs |
| Unleaded Gasoline (87 Octane) | >24 hrs |
| Vinegar | >24 hrs |
| Xylene | >24 hrs |
| Acids: | |
| Hydrochloric Acid (20%) | >24 hrs |
| Nitric Acid (20%) | >24 hrs |
| Sulfuric Acid (20%) | >24 hrs |

*Tested in accordance to ASTM D 1308-02

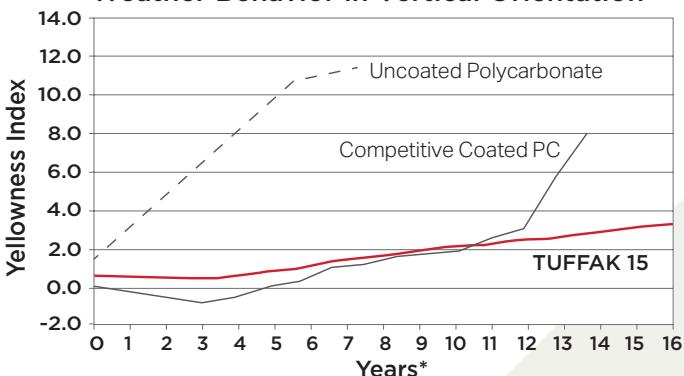
Always keep hazardous chemicals away from uncoated edge of Tuffak Polycarbonate Sheet

Abrasion Resistance*



*Taber Abrasion per ASTM D 1044, 100 cycles using CS-10F wheel

Weather Behavior in Vertical Orientation



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

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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 determine the suitability of our materials and suggestions before adopting them on a commercial scale.

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