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HIGH TEMPERATURE LIGHT TRANSMISSIBLE THERMOPLASTICS & ADDITIVES

# HTLT 3700X/UVS Thermoplastic

**HTLT 3700X/UVS** resin is a transparent, organic/inorganic, amorphous thermoplastic. It is a tough, impact resistant, high-temperature thermoplastic that can be injection molded with precision detail. The **HTLT 3700X/UVS** has an index of refraction of 1.56, visible light transmission in excess of ordinary glass, and a sustained operating temperature up to $180^0$ C. Given its high glass transition temperature and excellent thermal insulation properties, HTLT parts are suitable for use in solder reflow processes including lead-free solder reflow applications. When molded, HTLT parts are optically transparent. The **HTLT 3700X/UVS** has been formulated to optimize thermal, photolytic, and hydrolytic oxidation resistance while exhibiting water-white clarity and nearly 90% transmission at 450 nanometers.

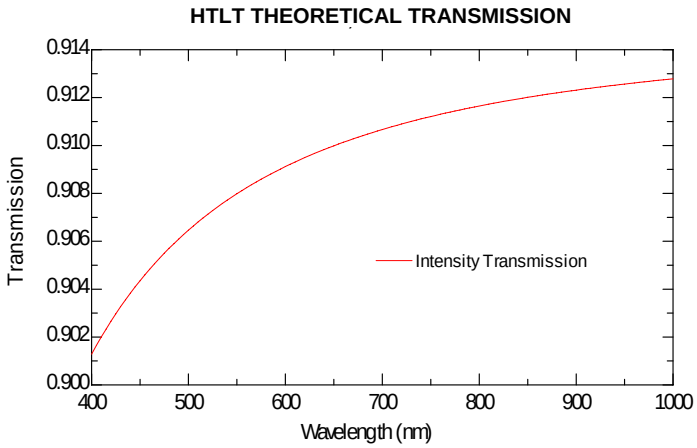
| **PROPERTY*:** | **HTLT 3700X/UVS** |
|---|---|
| Specific Gravity, g/cc | 1.12 |
| Melt Temperature, $^0$C ** | > 300 (572 F) |
| Melt Flow @ 330$^0$C (626 F), 2.16 kg, (ASTM D 1238) | 4.0-6.0 (g/10 min.) |
| Glass Transition Temperature: | |
| ($^0$C) (DMTA)(2$^0$/min. ramp) | 260$^0$ |
| ($^0$C) (DMTA)(4$^0$/min. ramp/est.) | 265$^0$ |
| Mold Shrinkage (%) | 0.9 – 1.0 |
| Coefficient of Linear Thermal Expansion | |
| flow/cross flow, ASTM D 696 in/in/$^0$F | 3.9 E-05 |
| Ball Indentation Hardness (ISO 2039-1) | 115 Mpa |
| Unnotched Izod Impact (23$^0$ C, 3.18 mm, ASTMD256) | No Break (J/m) |
| Tensile Elongation @ break, % | 50.0 |
| Tensile Elongation @ yield, % | 7.0 |
| Tensile Modulus (1 mm/min; ASTM 638 lb/in$^2$) | 330,000 |
| UL94 Flame Class (UL 94, Class, 1.5 mm thickness) | HB |
| Water Absorption, 24 hour immersion | < 0.10 % |
| 85/85 (85 % r.h & 85$^0$ C, 1000 hrs.) | Pass |
| | |
| **Electrical Properties (23$^0$ C/50 % r.h.):** | |
| Dissipation Factor, 60 Hz (ASTM D 150) | 0.001 |
| Tinfoil Electrodes, | |
| Volume Resistivity ((ASTM D 257, Ohm*m) | 1.0 E+16 |
| Tinfoil Electrodes, | |
| Surface Resistivity (ASTM D 257, Ohm) | 1.0 E+16 |
| Tinfoil Electrodes, | |
| Dielectric Constant (ASTM D 150, 60 Hz) | 2.9 |
| Dielectric Constant (ASTM D 150, 1 MHz) | 2.9 |

* HTLT 3700X (UVS) thermoplastics are experimental, developmental products and property values are approximate/extrapolated in some cases.

** HTLT 3700X (UVS) is fully amorphous. TGA studies demonstrate that HTLT resins are thermally stable, exhibiting no oxidation, below 407$^0$ C.

**Optical Properties:**

| | |
|---|---|
| Index of Refraction | 1.550 |
| Actual Transmittance (1.2 mm), 585 nm, % | 89.3 |
| Luminous Transmittance, Max.Theoretical Value, % | |
| *400 nm* | 90.1 |
| *700 nm* | 91.0 |
| *1000 nm* | 91.2 |
| Abbe Number | 33.5 |
| UV Transmission Cut-Off | 360 nm |
| Haze, 1000 microns thickness | <0.7 |
| Yellowness Index/1000 microns (Clear Transparent Material) | <0.7 |




**REFRACTIVE INDEX vs. WAVELENGTH (Extrapolated from Actual/589.93 nm/1.5550)**

| **Wavelength (nm)** | 410.47 | 435.8 | 480.39 | 589.93 | 643.85 |
|---|---|---|---|---|---|
| **Refractive Index** | 1.5844 | 1.5776 | 1.5685 | 1.5550 | 1.5509 |

**REFRATIVE INDEX @ 589.3 nm vs. TEMPERATURE (Extrapolated from Actual/20$^0$C/1.5550)**

| **Temperature ( $^0$C )** | -40 | -25 | 0 | 20 | 40 | 60 | 85 | 100 |
|---|---|---|---|---|---|---|---|---|
| **Refractive Index** | 1.5590 | 1.5579 | 1.5565 | 1.5550 | 1.5530 | 1.5510 | 1.5470 | 1.5454 |

* The refractive index of 1.550 @ 20$^0$ C @ 589.93 nm is a measured value of the base HTLT resin compound, and the other values reported for the other temperatures are extrapolated from known values of the base resin composition and are believed to be reasonably accurate for the HTLT 3700X/UVS thermoplastic.

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