POLYONICS

POLYONICS FLAMEGARD™

# XF-603

## Flame Retardant Polyimide

**WHITE**



**Description:**

POLYONICS XF-603 is a special 1 mil (25µ) polyimide film with a high-temperature permanent pressure sensitive acrylic adhesive and a high opacity, semi- gloss white topcoat specifically designed to be flame retardant to the UL94 VTM-0 standard.

**Use:**

The XF-603 material is intended to be used in harsh environments, including applications that require materials that will not propagate a flame. If exposed to a flame, the XF-603 is designed to prevent the propagation of that flame. The XF-603 uses a unique top coat, polyimide film, and adhesive combination that provide flame retardant performance to meet the UL94 VTM-0 standard. In addition, the flame retardant performance is achieved without the use of halogenated flame retardant materials which make it suitable for electronics applications.

The XF-603 is designed to be used in harsh environments and can be printed with thermal transfer or flexographic ink systems to produce bar code, graphic, or text information. When printed with the appropriate thermal transfer ribbon, the XF-603 is resistant to chemical exposure such as isopropanol, terpene, and saponifiers. The image resists smearing, even when the material is directly exposed to rubbing or incidental contact.

The durable polyimide film and special pressure sensitive adhesive is designed to withstand high temperature exposure up to and exceeding 150C. Minimal discoloration and shrinkage will result when exposed for prolonged periods at this temperature.

**Applications**:

POLYONICS XF-603 is an ideal material for the following applications:

- Battery labels where flame, chemical and high temperature exposure may result.
- Tracking labels for mobile hand-held devices.
- Electronic product identification labels.
- UL rating label for an electronic device.
- High temperature label applications where dimensional stability is critical.
- Small label applications that require high resolution printing.
- IC labeling for work in process, permanent ID & warranty labeling.
- Product ID, asset tracking.
- Anywhere a label will be exposed to extreme temperatures.
- Low profile label applications where label thickness is an issue.

**Special Considerations**:

- The surface that you want to label should be clean, dry and free of any surface contamination, such as dust, oil or rust. Isopropyl alcohol is a recommended solvent to clean the surface.
- When you apply the label, you must use firm pressure to increase the physical contact of the adhesive with the surface of the product.
- Pressure sensitive adhesives will provide stronger bonds to a warm surface, as compared to a colder one. On the warm surface, the adhesive will 'flow' more readily and increase adhesion.
- The XF-603 top coat & print should not be contacted while exposed to elevated temperature.
- All values shown are averages and should not be used for specification purposes. Adhesion and tack values have a 15% tolerance allotted to the above values stated.

- Test data and test results contained in this document are for general information only and shall not be relied upon by POLYONICS customers for designs and specifications, or be relied on as meeting specified performance criteria.
- Customers desiring to develop specifications or performance criteria for specific product applications should contact Polyonics for further information

**Technical Data**

| PROPERTIES | TEST METHODS | AVERAGE RESULTS | |
|---|---|---|---|
| | | USA Units | SI Units |
| Thickness | ASTM D1000 | | |
| -Face | | 0.0015 inch | 0.038 mm |
| -Adhesive | | 0.0011inch | 0.028 mm |
| -Total | | 0.0026 inch | 0.066 mm |
| | | | |
| Adhesion | Polyonics 80313 | | |
| -Stainless Steel | 20 minute dwell | ≥ 27 oz/in | ≥29N/100 mm |
| | 24 hour dwell | ≥ 32 oz/in | ≥35N/100 mm |
| Tack | Polyonics 80155 | ≥ 1000 g/in | |
| Opacity | Polyonics 80166 | ≥ 85% | |
| Color | | White | |
| Gloss | BYK Gardner | >75GU @ 60 degrees | |
| Flammability | UL94 Standard | | |
| | VTM-0 rating | Pass | |
| | V0 rating | Pass (Aluminum substrate) | |
| Federal Aviation Regulation | 25.853 & 25.855 | Pass | |
| Smoke | BSS7238 | Pass | |
| Toxicity | BSS7239 | Pass | |
| Weatherometer Testing | ASTM G154 | | |
| Temperature Rating: | Long term | 100 hours at 302ºF (125ºC) | |
| | Operating | 5 minutes at 500ºF (260ºC) | |
| | Short term | 90 seconds at 572ºF (300ºC) | |
| Shelf Life | 1 year below 80ºF (27ºC) and 60% R.H. | | |
| UL Approved Ribbons | ITW B324, DNP R510, Armor AXR7+, 8, IIMAK SP330, Fujicopian FTX308 | | |
| UL File # | MH 19503 PGJI2 & E338081 | | |

## Durability Testing

| Properties | Test Methods | Test Environment | PCS[1] | Read Rate[2] |
|---|---|---|---|---|
| Heat/ Chemical | Polyonics 80386 | Control- 70°C 5 min. | 99% | 100% |
| | | Re-entry KNI 2000 Terpene 40-45ºC, 5 min. | 98% | 100% |
| | | Isopropanol 99%, 70ºC, 5 min. | 99% | 100% |

## Polyonics Material Compliance

| | |
|---|---|
| **RoHS- Restriction of Hazardous Substances (EU Directive 2002/95/EC)** | Limits set forth in Directive 2005/618/EC amending Directive 2002/95/EC |
| **REACH- Registration Evaluation and Authorization of Chemicals (EU Directive 1907/2006/EC)** | Limits set forth in Directive 1907/2006/EC Article 7 (2) |
| **Halogen Free - Restriction use of Halogen (IEC 61249-2-21)** | Limits set forth in International Electrochemical Commission |

## Polyonics Material Recognition

| | |
|---|---|
| **Underwriters Laboratories UL94 Standard – VTM-0** | Approved |
| **Underwriters Laboratories UL969 Standard – Indoor** | Approved |

## Key for tables on page 2

- All SI units are mathematically derived from U.S. conventional units.
- Labels printed with recommended thermal transfer ribbon. Labels printed with 6.7 mil X dimension bars at 2:5 ratio. Labels exposed to indicate environments.
- [1]PCS - Print Contrast Signal. PCS determined with Quick Check 650, 0.005" aperture, 660 nm wave lengths.
- Quick Check 650 manufactured by: Photographic Sciences Corp.
- [2] Read rate determined using PSC 850 laser scanner.

**References**:
ASTM: American Society for Testing and Materials (U.S.A)
SI: International System of Units

**Trademarks**:
RE-ENTRYTM is a registered trademark of Environsolv Inc.

RoHS Compliant

SJ/T11364-2006 & EU202/95/EC
2003/11/EC
76/69/EEC

**WARRANTY-LIMITATION**

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