



POLYONICS

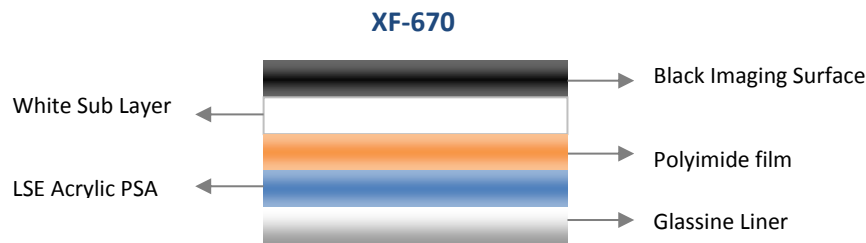
Laser Markable Label Materials

XF-670

1mil Black LSE Polyimide

Description:

POLYONICS XF-670 is a 1 mil (25µm) polyimide laser markable label material tested to the **GMW14573/GM6121M** automotive under-the-hood label requirements. XF-670 has a high opacity, matte black topcoat and white sub-layer specifically designed for laser marking with a CO₂, YAG, UV or Fiber Diode marking system. The material uses Polyonics ThermoGard™ technology and includes a low surface energy (LSE) permanent pressure sensitive acrylic adhesive (PSA) and glassine liner. The material can be either die or laser cut and has a static dissipative imaging surface using Polyonics TriboGard™ technologies.



Use:

The XF-670 material is designed to be die or laser cut into discrete labels by mechanical methods and marked with a CO₂, YAG, UV or Fiber Diode laser set to the correct power settings. The markings can be very small and include text, bar code or graphics. The material provides a very readable, high contrast background for compared to direct laser marking. The marked labels provide a durable identification system that can be used in high temperature and harsh environments including chemical exposure. For example, the XF-670 is an excellent option for bar code labels used to track printed circuit boards as the laser marking will survive the requirements of MIL-STD-202G, Notice 12, and Method 215K. The static dissipative imaging surface helps protect static sensitive devices and reduces any static charges generated during application.

Applications:

- Tested to the GMW14573 Automotive Performance Requirements for Labels
- ID tracking for components with low surface energy (LSE) surfaces
- When dimensional stability of the label is critical
- IC labeling for work in process, permanent ID & warranty labeling
- Product ID, asset tracking
- Protect static sensitive devices
- Anywhere a label will be exposed to extreme temperatures, harsh environments and/or Exposure to chemicals

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 would be a recommend 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 versus cold.
- The XF-670 is designed for laser marking with a CO₂, YAG, UV or Fiber Diode laser. It is not designed for secondary printing such as thermal transfer or flexographic print systems.
- All values shown are averages and should not be used for specification purposes.



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Polyonics Material Data

| PROPERTIES | TEST METHODS | AVERAGE RESULTS | | | | | |
|----------------------------------|------------------------|---|----------|---------------------|-----------------|--------|----------|
| | | USA Units | | | SI Units | | |
| Thickness | ASTM D1000 | | | | | | |
| Image Layer (Black) | | 0.0002 inch | | | 0.005 mm | | |
| Sub Layer (White) | | 0.0005 inch | | | 0.013 mm | | |
| Film | | 0.0010 inch | | | 0.025 mm | | |
| Adhesive | | 0.0011 inch | | | 0.028 mm | | |
| Total | | 0.0028 inch | | | 0.071 mm | | |
| Adhesion | Stainless Steel | Polypropylene | | Polyethylene (HDPE) | | TPO | |
| Polyonics 80313 | | Smooth | Textured | Smooth | Textured | Smooth | Textured |
| 20 minute dwell | ≥ 100 oz/in | 114 | 62 | 110 | 70 | 53 | 20 |
| 24 hour dwell | ≥ 120 oz/in | 114 | 69 | 112 | 79 | 108 | 51 |
| Gloss | BYK Tester @ 60° | 2-10 GU | | | | | |
| Label Surface Resistance | EOS/ESD S.11.11 | ≥ 10 ³ Ω and ≤ 10 ⁴ Ω | | | | | |
| Dielectric Strength | ASTM D-149 | >7.6kv/mil | | | >299kv/mm | | |
| Peel Value (Volts/sq.in.) | Polyonics 80331 | < 100 volts | | | | | |
| Tack | Polyonics 80155 | ≥ 3000 g/in | | | | | |
| Temperature Rating: | Long term | 100 hrs at 125°C, 24 hrs -70C | | | | | |
| | Operating | 5 minutes -55C to 260C | | | | | |
| | Short term | 90 seconds at 300°C | | | | | |
| Out Gassing | ASTM E595 | TML=1.02%, CVCM=0.03%, WVR=0.54% | | | | | |
| Coating Durability | ASTM D4752-10 | IPA | | | MEK | | |
| | | >100 Double rubs | | | >25 Double rubs | | |
| | Abrasion (GM 6121M) | 500 cycles | | | | | |
| | UL/IEC 60601 and 61010 | 15s distilled water+15 methylated spirits+15s isopropyl alcohol (60601) 30sec 70 isopropyl alcohol (61010) | | | | | |
| Application Temperature | | 50°F | | | | | |
| Shelf Life | | 1 year below 80°F (27°C) and 60% R.H. | | | | | |



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Durability Testing

Table with 4 columns: Properties, Test Methods, Test Environment, Web Scan Print Quality. Rows include Heat / Chemical, Automotive under-the-hood, and various chemical/temperature tests.

Chemical Testing

Table with 4 columns: Properties, Test Method, Test Fluid, Results. Rows include Chemical Resistance tests with MIL-STD-202G and various solvents.

Polyonics Material Compliance

Table with 2 columns: Compliance Standard (RoHS, REACH, Halogens), Limits set forth in Directive/Article.

Notes:

- All SI units are mathematically derived from US conventions
- Labels printed with recommended thermal transfer ribbons
- Labels printed with 6.7 mil x dimension bars at 2.5 ratio
- Labels exposed to indicated environments
- Web Scan is a 2D label scanner. "Pass" refers to no change in readability post exposure to chemicals listed

Trademarks: XJN™ and Aquanox™ are trademarks of Kyzen Corp

References:

- ASTM: American Society for Testing and Materials
- SI: International Systems of Units



91425 9 7/18/14/Rev 29 Apr '15/dg



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WARRANTY-LIMITATION

Polyonics' products are sold with the understanding that the Buyer will test them in actual use and determine for him/herself their adaptability to his/her intended uses. Polyonics warrants to the buyer that its products are free from defects in material and workmanship, but limits its obligation under this warranty to replacement of the products shown to Polyonics' satisfaction to have been defective, provided that the Buyer has complied with the handling, storage and shelf life requirements as specified by Polyonics in applicable materials specifications.

The above warranties extend solely to Buyer and all warranty claims must be made by Buyer. Rework or Replacement shall neither extend nor decrease the original warranty period. The term of all warranty periods shall not exceed thirty (30) days from the date of the original shipment.

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Polyonics World Headquarters

28 Industrial Park Drive
Westmoreland, NH 03467
Ph: 603.352.1415
Fax: 603.352.1936
Email: info@polyonics.com

Polyonics Asia

Fuweo Mansion Rm 411
Hongtu Road 88
Nancheng District
Dongguan, Guangdong, China 523078
Ph: 86.755.8825.0441
Fax: 86.755.8825.2429
Email: infoasia@polyonics.com