POLYONICS®

Materials For Harsh Environments

Polyimide Laser Markable Label Materials

Polyonics new family of laser markable label materials (LML) represents the next generation label technology for high temperature and harsh environment applications.

The Polyonics LML products are constructed from highly durable polyimide and aluminum films that can be ablated with a wide variety of popular low power lasers to provide long term durability and improved readability. The LML products offer UL approval (MH19503) and are tested to premier automotive and aerospace label standards.

Optimizes Direct Part Marking

The unique Polyonics LML materials are designed to optimize any direct part marking system (DPM) and help lower manufacturing costs. LML materials improve read rates of DPMs by increasing bar code contrast. They also allow manufacturers to capture QC and test data by directly marking the labels in process. In addition, using LML materials in concert with DPMs helps simplify the rework process by allowing relabeling and repositioning of bar codes.

High Temperature Alternatives to PET and Acrylic

Polyimide is the material of choice for applications involving extreme temperatures and direct exposure to harsh chemicals. Now with the Polyonics polyimide LMLs, manufacturers can dramatically improve the long term durability of their labeling in the harshest of applications. Ultra-high temperature aluminum LML materials are also available.

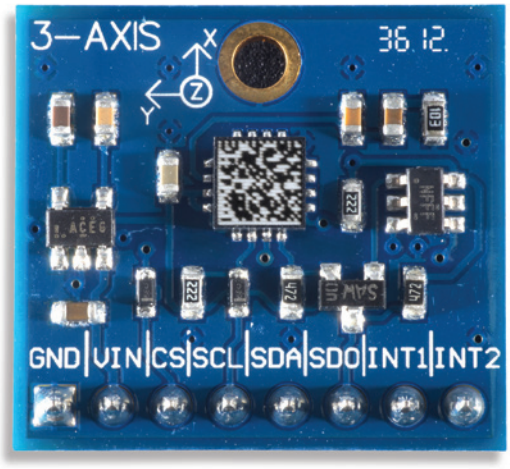
LML Superior to Thermal Transfer Printed Labels

The weak link with traditional thermal transfer printed labels is ink. Regardless of the film and PSA's resistance to high temperatures and harsh chemicals, the ability of the material to continue to serve as an information or tracking label comes down to ink especially in regards to application involving high levels of abrasion. With LML materials, there is no ink so the label's overall durability is automatically higher offering superior abrasion and high temperature resistance, chemical resilience and weatherability.

LML Features and Benefits

- Can be easily ablated by low power CO_2, YAG, UV, Vanadate and fiber diode lasers
- Produces high definition 2D and linear bar code images
- Reduces microstructure damage from direct laser marking
- High Strength Acrylic and Low Surface Energy PSAs with Liners for Die Cutting
- Increased contrast improves readability of laser marked 2D and linear bar codes
- High durability and increased temperature and chemical resistances for long term survival in harsh environments
- Tested to the GMW14573 and GM6121M automotive label requirements[1]
- Low Outgassing ASTM E-595-07
- Tested to Boeing 13-47J chemicals requirements[3]
- Rework and repositioning options for direct laser marked parts
- UL 969 certified (XF-537 and XF-539)
- ESD protection (Black LMLs)
- Halogen free, REACH and RoHS compliant
- Superior to thermal transfer printed labels
- Tested to UL/IEC 60601-1 and/or 61010-1 (3rd editions) UDI label coating durability requirements
- Complies with Title 21-FDA, chapter 1, subchapter H, Class II multi-use medical device UDI labeling requirements

Photo: Aviation Specialties Unlimited



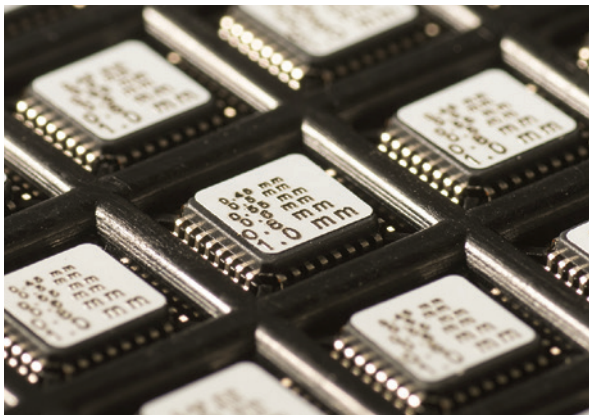
Applications

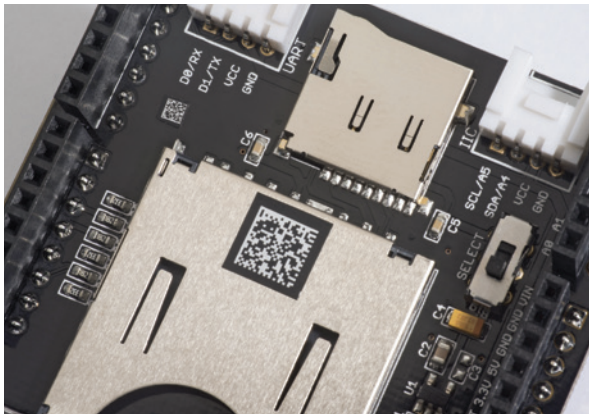
- High resolution 2D and linear bar codes
- Automotive under-the-hood labels [1]
- UL approved high temperature asset tracking
- Electronics tracking
- UDI medical/pharmaceutical labeling
- Aerospace components, avionics, heat treated parts, structures, etc.
- Labeling for harsh environments including strong chemicals
- DOD/IUID military asset tracking
- Labels for low surface energy (polymers, resins, plastics, etc) and high surface energy (metals, ceramics, glass, etc.) materials
- High abrasion areas

Polyonics LML Product Line

Product	Film/face	Adhesive[2]	Total Thickness	Applications	Description
XF-537	25 µm Black Antistatic Polyimide	25 µm High Temperature Acrylic	66 µm	Electronics/PCB Tracking, High Surface Energy (HSE) Materials, Metals, Glass, Ceramics, etc.	High temperature and chemical resistant ESD black top coat. **UL 969 Certified**, halogen free, REACH, RoHS and UL/IEC 60601/61010 compliant. ASTM E595 Class A low outgassing. Min. Application Temperature: 50°F (10°C) Temperature range: -70° to 260°C
XF-539	25 µm TruWhite™ Polyimide	25 µm High Temperature Acrylic	66 µm	Electronics Component Tracking, General Industrial HSE Materials, Metals, Glass, Ceramics, etc. Low soot.	Abrasion resistant white top coat. **UL 969 Certified**, halogen free, REACH, RoHS and UL/IEC 60601/61010 compliant. Low soot and ASTM E595 Class A low outgassing. Min. Application Temperature: 50°F (10°C) Temperature range - 70 to 260°C
XF-670	25 µm Black Antistatic Polyimide	25 µm High Temperature, Low Surface Energy Acrylic	66 µm	Harsh Environment Tracking, Automotive Under-the-Hood[1], IUID, UDI, Low Surface Energy (LSE) Materials, Plastics, etc.	High temperature and harsh chemical resistant ESD black top coat. Halogen free, REACH, RoHS and UL/IEC 60601/61010 compliant. Min. Application Temperature: 32°F (0°C) Temperature range: -70° to 260°C
XF-671	25µm TruWhite™ Polyimide	25µm High Temperature, Low Surface Energy Acrylic	66 µm	High heat, steam and humidity. UDI Class II multi-use autoclave sterilization (>3300 cycles) and detergent washing (<500 cycles).	High temperature, white top coat resistant to steam, chemicals, water, etc. Halogen free, REACH, RoHS and UL/IEC 61010 compliant. Min. Application Temperature: 32°F (0°C) Temperature Range: -70° to 260°C
XF-672	25 µm TruWhite™ Polyimide	25 µm High Temperature, Low Surface Energy Acrylic	66 µm	Harsh Environment Tracking, Automotive Under-the-Hood[1], IUID, UDI, LSE Materials, Plastics, etc. Low Soot.	Abrasion resistant white top coat. Low soot. Halogen free, REACH, RoHS and UL/IEC 60601/61010 compliant. Min. Application Temperature: 32°F (0°C) Temperature range -70 to 260°C
XF-680	50 µm TruWhite™ Aluminum	25 µm Ultra-high Temperature Silicone	86 µm	Aerospace, hot metals, heat treating, etc. High chemical resistance post 400°C cure of top coat.	Ultra-high temperature. Halogen free, REACH, RoHS and UL/IEC 61010 compliant. Low soot. Top coat highly resistant to chemicals above 400°C. Temperature range: -100°C to 600°C Continuous operation: -100°C to 350°C

[1] Download a complete GMW14573/GM6121M automotive label test report at: http://polyonics.com/LaserMarkable/LML_GM_TestReport.pdf
[2] LML materials can be configured with glassine or PET liners. Silicone PSAs are also available for ultra-high temperature applications.
[3] Download a complete aerospace chemicals, UV and abrasion test report at: http://polyonics.com/LaserMarkable/AeroChart11_3D7.pdf





POLYONICS®

For additional technical information, please contact: **info@polyonics.com**

POLYONICS®

World Headquarters
28 Industrial Park Drive
Westmoreland, NH 03467 USA
1.888.765.9669

Polyonics - Asia
Dongguan, China
86.755.8825.0441
infoasia@polyonics.com

www.polyonics.com

RoHS Compliant
SJ/T11364-2006 & EU2002/95/EC 2003/11/EC 76/69/EEC

CERTIFIED
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