501 High Gloss Polyimide (White)

Series 501 is a 2 mil polyimide film with a permanent acrylic pressure sensitive adhesive top coated with a high opacity, gloss white top coat designed for thermal transfer printing with resin based ribbons.

This product is designed for barcode and alphanumeric identification of printed circuit boards and related electronic components. It is an ideal label material to withstand surface mount board processes, on either the top or bottom side of the circuit board. It can also be used on the top side of the board in mixed processes, and is recommended for the bottom side which is directly exposed to the wave solder environment.

Recommended Ribbon: Liberty Marking HT-50.
Recommended Printer: Zebra 90XiII thermal transfer printer.

<table>
<thead>
<tr>
<th>PROPERTIES</th>
<th>TEST METHODS</th>
<th>AVERAGE RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>US UNITS</td>
</tr>
<tr>
<td>Thickness Substrate</td>
<td>ASTM D1000</td>
<td>0.0027 inch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0018 inch</td>
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<tr>
<td></td>
<td></td>
<td>0.0045 inch</td>
</tr>
<tr>
<td>Adhesion to:</td>
<td>ASTM D1000</td>
<td>59 oz/in</td>
</tr>
<tr>
<td>Stainless steel</td>
<td></td>
<td>83 oz/in</td>
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<tr>
<td>20 minute dwell</td>
<td></td>
<td>25 oz</td>
</tr>
<tr>
<td>24 hour dwell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tack</td>
<td>ASTM D2979</td>
<td>100 hrs</td>
</tr>
<tr>
<td>Polyken ™ Probe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 second dwell</td>
<td>PSTC</td>
<td></td>
</tr>
</tbody>
</table>

Product Performance and Suitability

All of the descriptive information and recommendations for the use of Liberty Marking Systems products are to be used only as a guide. The furnishing of such information and recommendations shall in no event constitute a warranty of any kind by Liberty Marking Systems. All purchasers of Liberty Marking Systems products shall independently determine the suitability of the material for the purpose for which it is purchased. No distributor, salesman, or representative of Liberty Marking Systems is authorized to give any warranty, guarantee, or to make any representation in addition or contrary to the above.
PROPERTIES
Heat/Chemical/Abrasion Resistance
Sample labels were printed with Liberty HT-50 thermal transfer ribbon using a Zebra 90Xi printer. Barcodes were printed with 6 mil X dimension bars and a 3:1 ratio. Abrasion performance tested with 100 strokes of a stainless steel ball (AISI 302, 0.3125” diameter) with 300 gram load.

TEST ENVIRONMENT | PCS | READ RATE | PCS AFTER ABRASION | READ RATE AFTER ABRASION
--- | --- | --- | --- | ---
Control | 99% | 100% | 99% | 100%
230° C heat, 5 minutes | 99% | 100% | 99% | 100%
Kyzen Corp. Aquanox SSA | 100% | 99% | 100% | 100%
30% aqueous, 40-45° C, 10 minutes | 98% | 100% | 98% | 100%
RE-ENTRY, KNI 2000 Terpene, 40-45° C, 10 minutes | 97% | 100% | 97% | 100%
Alpha Metals Inc. EC-7R Terpene | 98% | 100% | 98% | 100%
Alpha Metals Inc. 2110 Saponifier | 97% | 100% | 97% | 100%
Isopropanol 99%, 82° C, 10 minutes | 99% | 100% | 99% | 100%
Deionized Water, 100° C, 10 minutes | 99% | 100% | 99% | 100%

1 PCS (Print Contrast Signal). PCS determined with Quick Check 650, 0.005” aperture, 660 nm wavelength. Quick Check 650 manufactured by Photographic Sciences Corp.
2 Read Rate determined using PSC 850 laser scanner.
3 Followed by 2 minute immersion in deionized water at 100° C.

PROPERTIES
Chemical Resistance
Sample labels were printed with Liberty HT-50 thermal transfer ribbon using a Zebra 90Xi printer. Barcodes were printed with 6 mil X dimension bars and a 3:1 ratio. Samples subjected to 3 cycles of one minute immersions immediately followed by a toothbrush rub after each immersion.

TEST FLUID | RESULTS
--- | ---
Solvent A | No visible effect
1 part IPA, 1 part Mineral Spirits | Solvent deleted per Notice 12
Solvent B | No visible effect
1,1,1 - Trichloroethane | No visible effect
Solvent C | Solvent D
Terpene Defluxer | Saponifier

Shelf Life: 1 year below 80° F (27° C) and 60% RH.
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EC-7R™ is a trademark of Petroferm Inc. Polyken™ is a trademark of the Kendall Corporation. RE-ENTRY™ is a trademark of Environsolv Inc. References: AISI: American Iron and Steel Institute (USA) ASTM: American Society for Testing and Materials (USA) PSTC: Pressure Sensitive Tape Council (USA) SI: International Systems of Units.