

NODE ID: 195.31

GROUP ID: 30.30

FCC ID SDP-ION6300

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

HD-040600001-01



AXS  
SOLID STATE ELECTRICITY METER  
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K=0.15  
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MADE IN U.S.A.

NODE ID: 195.31 GROUP ID: 30.30  
FCC ID SDP-ION6100  
This device complies with part 15 of the FCC Rules. Operation is  
subject to the following two conditions: (1) This device may not  
cause harmful interference, and (2) this device must accept any  
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undesired operation.  
HD-040001001-01



# Thermal Transfer Polyester Label Material

7816

FOD# 1606

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Technical Data

February 1, 1999

*Supersedes July 31, 1996*

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## Construction

(Calipers are nominal values.)

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### Facestock

2.0 mil (51 micron)  
Gloss radiant white polyester

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### Adhesive

0.8 mil (20 micron)  
#310 Acrylic

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### Liner

3.2 mil (81 micron)  
55# Densified kraft

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## Features

- Facestock is topcoated for thermal transfer printing. Resin ribbons are recommended for optimum durability. The topcoat also provides improved ink anchorage for traditional forms of press printing.
- #310 adhesive is a firm adhesive which resists oozing and provides high strength on a variety of surfaces including high surface energy (HSE) plastics and metals.
- 55# densified kraft liner assures consistent die cutting.
- 3M™ Label Material 7816 is UL recognized (File MH16411) and CSA accepted (File 99316). See the UL and CSA listings for details.

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## Application Ideas

- Barcode labels and rating plates.
- Property identification and asset labeling.
- Warning, instruction, and service labels for durable goods.
- Nameplates for durable goods.

## Typical Physical Properties

**Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.**

Adhesion: 180° peel test procedure is ASTM D 3330.

90° peel test procedure is ASTM D 3330 modified for the angle change.

Surface	Initial (10 Minute Dwell/RT)				Conditioned for 3 Days at Room Temperature 72°F (22°C)			
	180° Peel		90° Peel		180° Peel		90° Peel	
	Oz./In.	N/100 mm	Oz./In.	N/100 mm	Oz./In.	N/100 mm	Oz./In.	N/100 mm
Stainless Steel	43	47	35	38	51	56	41	45
Polycarbonate	47	51	37	40	52	57	43	47
Polypropylene	18	20	16	18	18	20	24	26
Glass	52	57	34	37	68	74	47	51
HD Polyethylene	24	26	16	18	33	36	20	22
LD Polyethylene	20	22	12	13	32	35	22	24

Surface	Conditioned for 3 Days at 120°F (49°C)				Conditioned for 24 hours at 90°F (32°C) at 90% Relative Humidity			
	180° Peel		90° Peel		180° Peel		90° Peel	
	Oz./In.	N/100 mm	Oz./In.	N/100 mm	Oz./In.	N/100 mm	Oz./In.	N/100 mm
Stainless Steel	60	66	46	50	74	81	46	50
Polycarbonate	41	45	32	35	62	68	40	44
Polypropylene	35	38	30	33	38	42	27	30
Glass	68	74	42	46	66	72	32	35
HD Polyethylene	30	33	20	22	35	38	27	30
LD Polyethylene	5	4	8	9	20	22	24	26

Liner Release: 180° Removal of Liner from Facestock

Rate of Removal	Grams/Inch Width	N/100 mm
90 inches/minute	11	0.42
300 inches/minute	11	0.42

## Environmental Performance

The properties defined are based on four hour immersions at room temperature (72°F/22°C) unless otherwise noted. Samples were applied to stainless steel panels 24 hours prior to immersion and were evaluated one hour after removal from the solution for peel adhesion. Adhesion measured at 180° peel angle (ASTM D 3330) at 12 inches/minute.

### Chemical Resistance:

Chemical	Adhesion to Stainless Steel		Appearance	Edge Penetration
	Oz./in.	N/100 mm	Visual	Millimeters
Isopropyl Alcohol	54	59	No change	1
Detergent (1% Alconox®*)	66	72	No change	0
Engine Oil (10W30) @ 250°F (121°C)	70	77	No change	1.5
Water for 48 hours	72	79	No change	0
pH 4	70	77	No change	0
pH 10	66	72	No change	0
409®* Cleaning solution	65	71	No change	0
Toluene	29	32	No change	6.3
Acetone	38	42	No change	4.5
Brake Fluid	77	84	No change	0
Gasoline	32	35	No change	5.5
Diesel Fuel	55	60	No change	1
Mineral Spirits	48	52	No change	2.3
Hydraulic Fluid	58	63	No change	0

### Temperature Resistance:

300°F (149°C) for 24 hours:

no significant visual change  
0.7% MD shrinkage  
0.8% CD shrinkage

-40°F (-40°C) for 10 days:

no significant visual change

### Humidity Resistance:

24 hours at 100°F (38°C) and 100% relative humidity: no significant change in appearance or adhesion

### Accelerated Aging:

ASTM D 3611: 96 hours at 150°F (65°C) and 80% relative humidity

	Rate of Removal	Grams/Inch Width	N/100 mm
180° Removal of Liner from Facestock	90 inches/minute	11	0.42
	Rate of Removal	Oz./In. Width	N/100 mm
180° Peel Adhesion from Stainless Steel	12 inches/minute	49	1.89

<b>Shelf Life</b>	Two years from date of manufacture of product when properly stored at 72°F (22°C) and 50% relative humidity.
<b>Agency Listing Information</b>	<p><b>Thermal Transfer Printing</b></p> <p>Printer: UL no longer requires evaluation and listing of specific printers.</p> <p>*Ink Ribbon/UL Recognized Components</p> <p>Advent: 301 Black; 303 Black; 501 Black; 501 Red; 501 Blue; 501 Green</p> <p>Aarmor: AXR-7; AXR-7+; AXR-600</p> <p>Astromed™: R5</p> <p>CPTM: 5440 Red; 5640 Blue; 5940 Black</p> <p>Dasco: DR-74; DR-84</p> <p>Great Ribbon: SDR</p> <p>ICS: ICS-CC-4099.1</p> <p>Iimak™: SH-36; SP-330; PrimeMark</p> <p>Intermec: 053258-2; 054048-4</p> <p>Japan Pulp and Paper: JP Resin 1; JP Resin 2 Blue; JP Resin 2 Red (suitable for indoor use only); JP Resin 2 Green (suitable for indoor use only)</p> <p>Kurz™: K500; K501</p> <p>Markem™: 716 (suitable for indoor use only)</p> <p>Mid City Columbia™: CGL-80; CGL-80HE</p> <p>NCR™: Matrix Resin; Matrix; PaceSetter; Promark II; Ultra V</p> <p>Pelikan™: T016</p> <p>Ricoh™: B110A; B110C; B110CX</p> <p>Sato™: Premier 1</p> <p>Sony™: 4070; 4072; 4075; 4085; 5070; Signature™ Series Resin; Signature™ Series Wax</p> <p>UBI™: HR03; HR04</p> <p>Zebra™: 5095; 5099; 5100; 5175</p>

7816

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**Processing****Printing:**

Facestock is topcoated for improved ink receptivity and is designed for thermal transfer printing. It is printable by all standard roll processing methods including flexography, hot stamp, letterpress, and screen printing. Refer to the Graphic Ink Selection Guide or call 3M Customer Service at 1-800-223-7427 for additional information.

**Die Cutting:**

Rotary die cutting is recommended. Fanfolding of labels is not recommended. Small labels should be evaluated carefully. Winding tensions should be kept at a minimum to help prevent the adhesive from oozing.

**Packaging:**

Finished labels should be stored in plastic bags.

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**Special Considerations**

For maximum bond strength, the surface should be clean and dry. Typical cleaning solvents are heptane and isopropyl alcohol.\*\*

\*\*NOTE: When using solvents, read and follow the manufacturer's precautions and directions for use.

For best bonding conditions, application surface should be at room temperature or higher. Low temperature surfaces, below 50°F (10°C), can cause the adhesive to become so firm that it will not develop maximum contact with the substrate. Higher initial bonds can be achieved through increased rubdown pressure.

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**Technical Information and Data**

The technical information and data, recommendations, and other statements provided are based on tests or experience which 3M believes to be reliable, but the accuracy or completeness of such information is not guaranteed.

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**Product Use**

Please remember that many factors can affect the use and performance of a 3M product in a particular application. The materials to be bonded with the product, the surface preparation of those materials, the product selected for use, the conditions in which the product is used, and the time and environmental conditions in which the product is expected to perform are among the many factors that can affect the use and performance of a 3M product. Given the variety of factors that can affect the use and performance of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

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**Warranty and Limited Remedy**

The 3M product will be free from defects in material and manufacture for a period of one (1) year from the date of manufacture. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. If the 3M product is defective within the warranty period stated above, your exclusive remedy and 3M's sole obligation shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product.

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**Limitation of Liability**

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