ScotchCal™ Graphic Film Material
3690E • 3698E

Technical Data **October, 2008**

Product Description

3M™ ScotchCal™ Graphic Film Materials 3690E and 3698E are flexible cast vinyl films suitable for conforming to curved and textured surfaces, including most low surface energy plastics and small diameter applications. These film materials utilize 3M™ Adhesive 320 which offers high initial tack and excellent adhesion to a variety of surfaces including high surface energy (HSE) and low surface energy (LSE) plastics such as polyethylene.

Construction

(Calipers are nominal values.)

Product	Facestock	Adhesive	Liner
3M Label Material 3690E	.002 in. Bright White Cast Vinyl Film (51 microns)	320 High Tenacity Acrylic 1.0 mil (25 microns)	90gsm C2S Yellow Glassine Liner
3M Label Material 3698E	.002 in. Matte Silver Cast Vinyl Film (51 microns)	320 High Tenacity Acrylic 1.0 mil (25 microns)	90gsm C2S Yellow Glassine Liner

Features

- Designed to be dimensionally-stable and can withstand more than five years of outdoor exposure, including ultraviolet light, temperature extremes and solvents. Their thin caliper and flexibility allow for conformance to small diameter and complex curved surfaces.
- The liner is designed for rotary, roll to roll applications. The backside of this liner is not printable. This liner is not suitable for roll to sheet and other layflat applications.
- UL Recognized (File MH11410) and CSA Accepted (File 099316). See UL and CSA files for additional details.

Application Ideas

- Bar code labels and rating plate labels for demanding industrial or equipment applications.
- Durable goods labeling.
- Conformable to small diameter and complex curved surfaces.

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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.

Liner Release	Targets: 12 g/1 in.^{2}	TLMI Method, 180° removal, 90 in./min., 1" width
Service Temperature Short term	-76°F to 302°F (-60°C to 150°C)	
Service Temperature Permanent	-76°F to 203°F (-60°C to 95°C)	
Minimum Application Temperature	50°F (10°C)	
Performance Life to Vertical Surfaces	**Unprinted** Outdoor: Minimum 5 years — Indoor: Unlimited	
	Printed with 3M™ ScotchCal™ 6600 inks Outdoor: Minimum 5 years — Indoor: Unlimited	
Convertability	3M™ High Tenacity Specialty Acrylic Adhesive 320 is specifically designed to be compatible with flexographic and thermal transfer technologies. Its aggressive tack properties, while desirable for the end use application, may require extra care during processing. Please refer to the die cutting/converting section of this data page or the "Guide to Converting and Handling Label Products" technical bulletin for additional information.	

Typical Peel Adhesion Properties

Note: The following tests are intended as a guide to product performance. Application testing is recommended using actual substrates, expected dwell times, and actual conditioning for best determination of product suitability.

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

	Initial (48 hour Dwell/RT)	
Surface	**Oz./in.**	**N/100 mm**
Stainless Steel	102	110
Aluminum	95	103
Chrome	80	86
Acrylic Paint	80	86
ABS Plastic	80	86
Polypropylene	59	64

Environmental Performance

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

Samples were applied to stainless steel panels and allowed to dwell for 24 hours prior to exposures.

Liquid	Dwell Time/Exposure Condition	Results
Salt Spray – 20% @ 95°F (35°C)	240 hours	No change
Transformer Oil @ Room Temperature	24 hours	No change
Diesel Fuel @ Room Temperature	8 hours	No change
Water @ Room Temperature	150 hours	No change

Humidity Resistance:

200 hours at 100°F (38°C) and 95% relative humidity: no change

Weather Resistance:

1,000 hours accelerated weathering in Xenon Tester: no change

Application Techniques

For maximum bond strength, surface should be clean and dry. A typical cleaning solvent is heptane or isopropyl alcohol. **Note:** Consult the manufacturer's MSDS for proper handling and storage of solvents. For best 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. Processed labels should be stored in polyethylene bags to protect against moisture.

Printing

Both 3M™ ScotchCal™ Graphic Film Materials 3690E and 3698E are designed for thermal transfer printing applications. When thermal transfer printing high density bar codes, be sure to use a suitable resin ribbon. Please note that these films are recommended for roll to roll screen printing using appropriate inks for vinyl films (e.g. Marastar SR, Wiederhold J etc, etc.). Both UV and solvent based inks are suitable. Flexographic, letterpress and offset printing methods can be considered but should be evaluated on a case-to-case basis. Whenever printing for the first time, with a different ink system or on a new machine, we strongly recommend carrying out proofing trials to validate ink adhesion and durability prior to a full production run.

Die Cutting / Converting

Die Cutting:

3M™ ScotchCal™ Graphic Film Materials are designed with good kiss-cutting characteristics. Weed stripping is recommended with a 25 mm diameter idler.

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Storage

Store at room temperature conditions of 72°F (22°C) and 50% relative humidity.

Shelf Life

If stored under proper conditions, product retains its performance and properties for two years from date of manufacture.

Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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ISO 9001:2000

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001:2000 standards.

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