



Static Dissipative Clear Polycarbonate Carrier 2705

Technical Data – December, 2004

Product Description

3M™ Static Dissipative Clear Polycarbonate Carrier 2705, used in conjunction with a suitable 3M™ Static Dissipative Heat Activated Cover Tape 2675, 3M™ Conductive Pressure Sensitive Cover Tape 2666 or 3M™ Static Dissipative Pressure Sensitive Cover Tape 2684 serves as a reliable and convenient means of helping protect and transport electrical and electronic devices, and precisely delivering them to the assembly point. 3M Polycarbonate Carrier 2705 is a continuous, splice-free, static dissipative carrier tape with precisely formed pockets to ensure component fit to ANSI/EIA guidelines for standard or high precision carrier tape. Polycarbonate Carrier 2705 is available in a broad selection of pocket designs with dimensions to accommodate a variety of common electrical and electronic parts. Customized Polycarbonate Carrier 2705, with dimensions specific to your requirements, is also available upon request.

Construction

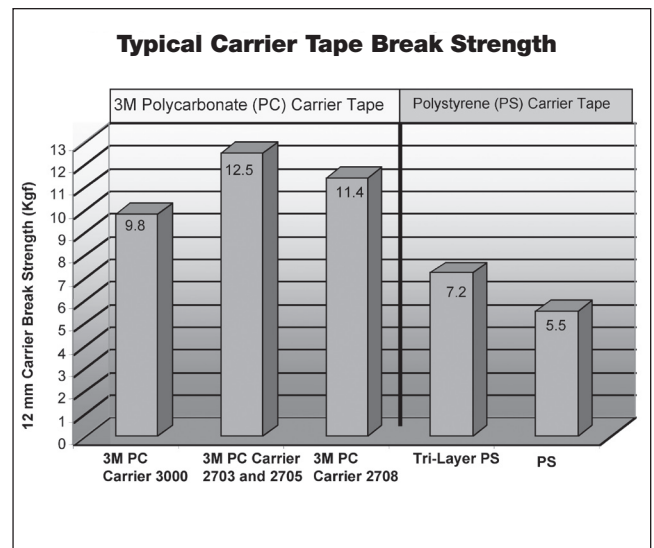
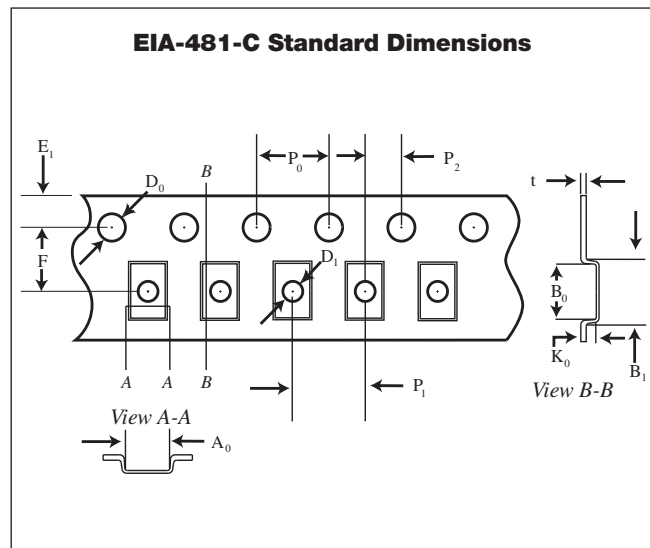
Embossed, static dissipative, heat-resistant, clear polycarbonate film.

Dimensional Properties

Polycarbonate Carrier 2705 meets the ANSI/EIA-481-C Standard for the dimensions illustrated below.

Product Format

Polycarbonate Carrier 2705 is available as continuous, splice-free, 8 mm and 120 mm tapes on 560 mm diameter cardboard supply reels in level-wound format. Reel capacity can be up to 2,000 meters, depending upon the pocket depth, pitch, and carrier width. Polycarbonate Carrier 2705 is also available in 16 mm through 44 mm widths.



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

Typical Mechanical Properties – Shrinkage

Unlike many polyvinyl chloride and polystyrene carrier tapes, which typically shrink in excess of 0.5% after 24 hours of exposure to 60°C (140°F), 3M™ Static Dissipative Clear Polycarbonate Carrier 2705 exhibits shrinkage of less than 0.1%, even after 24 hours exposure at 85°C (185°F). This compares favorably to the EIA-481-C standard which stipulates that the P0-10, or ten-pitch tolerance, maintain a dimension of 40.0 mm ± 0.2 mm, an implied tolerance of ±0.5%. Carrier shrinkage can result in problems with feeding, pocket position, and, in the case of the pocket dimensions, parts sticking in the pockets. The extent of shrinkage in cold-formed polyvinyl chloride or polystyrene carrier pockets is rapidly accelerated by exposure to elevated temperature, and will depend upon the duration of exposure and the maximum temperature reached. Exposure of many of these other carriers to as little as 24 hours at 50°C (122°F) can cause shrinkage in such carriers to exceed the implied EIA-481-C dimensional tolerance.

Carrier Shrinkage after 24 Hours

Temperature	3M Carrier 2705	Typical PVC	Typical Polystyrene
60°C (140°F) , 85%RH	<0.1%	≥1.0%	≤0.5%
85°C (185°F)	<0.1%	>1.0%	>0.5%

Camber

3M™ Polycarbonate Carrier 2705 in a planetary format meets the EIA-481-C Standard for camber: not greater than 1 mm in 250 lineal millimeters. For 8 mm through 12 mm carriers in the level-wound format, camber will be not greater than 2 mm in 250 lineal millimeters.

Storage Conditions

It is recommended that Polycarbonate Carrier 2705 be stored indoors, in its original packaging, in a controlled climate environment, typically at or below 35°C (95°F) and 70% relative humidity. Conditions should not exceed 85°C (185°F) for prolonged periods, and the product must be protected from exposure to direct sunlight. Exposure to elevated humidity reduces the compressive strength of corrugated, cardboard containers. The recommended stacking height must be followed to avoid damaging the packaged product. It is recommended that the product be used on a “first-in, first-out” basis.

Shelf Life

It is recommended that Polycarbonate Carrier 2705 be used within five years from the date of manufacture when stored according to the recommended storage conditions.

Cover Tape Recommendations

3M™ Conductive Pressure Sensitive Cover Tape 2666 and 3M™ Static Dissipative Clear Heat Activated Cover Tape 2678 have been specifically designed for optimized performance on and are recommended for use with 3M’s Polycarbonate Carrier 2705.

3M™ Static Dissipative Clear Polycarbonate Carrier 2705

Description	Units	Typical Performance	Test Notes	Test Method	
Material Properties	Type Max, Usable Temperature	°C (°F)	Polycarbonate 125 (257)	1	
Physical Properties	Tensile Strength (Yield)	MPa (Kpsi)	63 (9.1)	2	ASTM-D638
	Tensile Strength (Break)	MPa (Kpsi)	72 (10.5)	2	ASTM-D638
	Impact Strength	Nm (F-lb/in)	>.15 (1.32)	3	ASTM-D256
	Shrink	%	<0.1	4	ASTM-D955
	Camber (planetary format)	mm (in)	<1.0 (0.039)	5	EIA-481-C
	Transmission	%	91.5	6	ASTM-D1003
	Haze	%	0.3	6	ASTM-D1003
	Clarity	%	99.1	6	ASTM-D1003
Electrical Properties	Resistivity	Ohms/sq	Non-Conductive	7	ASTM-D257
Chemical Properties	Extractable Ionics (Cl ⁻ , NO ₃ ⁻ , SO ₄ ⁼ , Na ⁺ , K ⁺ , Ca ⁺⁺)	ppm	<5	8	MIL STD 883E
Product Format	Reel Type	Material	Reinforced Cardboard		
	Reel Hub Inside Diameter	mm (in)	76.2 (3.0)		
	Pockets Per Reel	Count	Varies per pitch		
	Length	m (f)	Varies per Ko		

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Test Notes

1. Engineering grade resin.
2. Tensile tests are conducted at 21°C (70°F), 50% RH under controlled conditions with a constant rate of jaw separation of 100 mm/minute from an initial separation of 126 mm. Yield strength is the force which produces 5% elongation of the sample. Breaking strength is the ultimate strength for the material at the break point.
3. Impact strength testing utilizes a mandrel to hold a section of the material under test. A weight is allowed to strike the material from a known radius and after the strike the swing is measured vs. free swing and the strength of the material is calculated from the difference.
4. Shrink is measured at 60°C (140°F), 85% RH as well as the 85°C (185°F) after 24 hours exposure and expressed in percentage of the initial measurement.
5. Camber is a measurement of the weave of the material. Measured over a 250 mm length.
6. Optical properties are measured using a spectrophotometer and measuring wavelengths from 450 to 800 nm. Material is considered opaque if light transmission is less than 1%.
7. Resistivity tests are conducted at 21°C (70°F), 50% RH under controlled conditions. Resistivity is measured in the bottom of the pocket of the carrier using the defined test method. Specification tolerances for this carrier is $10^8 \leq R_s \leq 5 \times 10^{11}$. Static decay is measured with an Electrotech Systems Static Decay Meter Model 406-C, using Federal Test Method Standard 101B, Method 4046.
8. Chemical extraction is measured using 20-hour water extraction test as defined in the test method MIL STD 883C, test method 5011. Resultant solutions are measured using chromatography.

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