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Technical Data | November 2022

3M™ Polycarbonate Carrier 3002, 2D Barcode

Product description

3M™ Polycarbonate Carrier 3002, 2D Barcode used in conjunction with an appropriate 3M™ Cover Tape, serves as a reliable and convenient means of helping customers protect and transport electrostatically sensitive electrical and electronic devices, and deliver them to the assembly point. Each pocket is imprinted with a unique 2D Barcode either between the sprocket hole or the pocket on the crossbar for chip identification and traceability. 3M carrier 3002, 2D barcode is a continuous, splice-free, polycarbonate carrier with precisely formed pockets to ensure component fit to ANSI/EIA Standard. 3M carrier 3002, 2D barcode is available in a broad selection of pocket designs with dimensions that can accommodate a variety of common electrical and electronics parts. Customized 3M carrier 3002, including those for connectors, with dimensions specific to your requirements, is also available upon request.

Construction

Embossed, heat-resistant, polycarbonate sheet

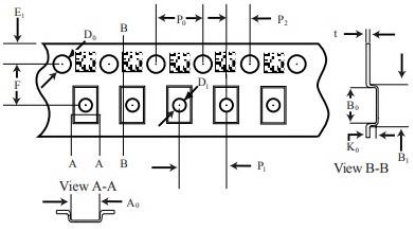
Dimensional properties

3M carrier 3002, 2D barcode meets the ANSI/ EIA-481-F Standard for the dimensions illustrated to the right.

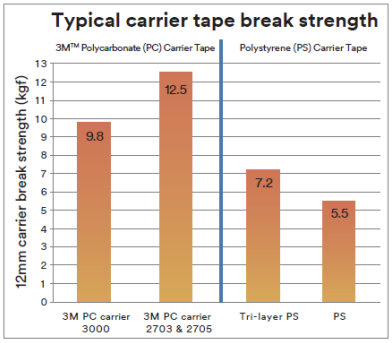
Product format

3M carrier 3002, 2D barcode is available as continuous, splice-free, 8mm through 24mm carrier in level winding format on 330 mm (13”) up to 560 mm (22”) plastic or recyclable cardboard reels. Planetary winding format is also available upon request. Reel capacity will typically up to 500m, depending upon pocket depth, pitch and winding format.

EIA-481-E Standard dimensions



Typical carrier tape break strength



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

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Typical mechanical properties – shrinkage

3M™ Polycarbonate Carrier 3002, 2D Barcode exhibits shrinkage of less than 0.1% for P_0-10, even after 24 hours exposure at 85°C (185°F). This compares favorably to the EIA-481-F Standard which stipulates that the P_0-10, or ten-pitch tolerance, maintains a dimension of 40.0 mm ± 0.2 mm, an implied tolerance of ± 0.5%. Carrier shrinkage may 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 polystyrene carrier pockets can be rapidly accelerated by exposure to elevated temperature, will depend upon the duration of exposure and the maximum temperature reached.

Carrier P_0-10 shrinkage after 24 hours

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Temperature	3M carrier 3002	Typical polystyrene
52°C (126°F), 95%RH	<0.1%	<0.5%
85°C (185°F)	<0.1%	<0.5%

Electrical properties

The electrical and triboelectric properties of 3M carrier 3002, 2D barcode help provide protection of static- sensitive components through an effective balance between the electrostatic shielding and electrostatic decay properties of the carrier. 3M carrier 3002 exhibits a nominal surface resistance of $1.0E4 \leq Rs < 1.0E11\ \Omega$, which aligns to ANSI/ ESD S541 standard. 3M carrier 3002 can dissipate charges accumulated due to triboelectric effects and is appropriate for packaging electrostatically sensitive chips.

Camber

3M carrier 3002, 2D barcode meets the EIA-481-F Standard for camber which is not greater than 1 mm in 250 lineal millimeters in a planetary format. For carrier in a level winding format, camber will not be greater than 2 mm in 250 lineal millimeters.

Recyclability

3M carrier 3002 is a carbon-filled thermoplastic polymer film which can be recycled after use. However, recycling programs for this product may not exist in your area. See local area laws and requirements for proper recycling of the product.

Cover tape recommendations

3M™ Static Dissipative Heat Activated Adhesive Cover Tapes or 3M™ Pressure Sensitive Adhesive Cover Tapes are recommended for use with 3M carrier 3002, 2D barcode.

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Typical physical properties and performance characteristics

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Description	Type	Units	Typical Performance	Test Notes	Test Method
Material Properties	Type		Polycarbonate	1	
	Max, usable temperature	°C (°F)	125 (257)		
Physical Properties	Tensile strength (yield)	MPa (Kpsi)	57.2 (8.3)	2	ASTM-D638
	Tensile strength (break)	MPa (Kpsi)	57.2 (8.3)	2	ASTM-D638
	Impact strength	J/m(Ft-lb/in)	>70 (1.32)	3	ASTM-D256
	Camber (planetary format)	mm (in)	≤1.0 (0.039)	4	EIA-481-F
	Camber (level winding format)	mm (in)	≤2.0 (0.079)	4	EIA-481-F
	Optical	%	Opaque	5	ASTM-D1003
Electrical Properties	Resistance	Ohms	1.0×10^6	6	ANSI/ESD S541
	Static Decay	Second	0.01	7	3M test method
Chemical properties	Extractable Ionics	ppm	<5	8	3M test method
	(Cl^-, NO_3^-, SO_4^{2-}, Na^+, K^+, Ca^{2+})				
Product Format	Reel Type	Material	Reinforced cardboard or plastic		
	Reel hub inside diameter	mm (in)	76.2 (3.0)		
	Pockets per reel	Count	Varies per pitch		
	Length	m (f)	Varies per Ko		

*Methods listed as ASTM are tested in accordance with the ASTM method noted

*Disclaimer if applicable to chart above

Test notes

1. Engineering grade resin.
2. Tensile tests are conducted at 23°C (73°F), 50% RH under controlled conditions with a constant rate of jaw separation of 50 mm/minute from an initial separation of 115 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. Camber is a measurement of the weave of the material. Measured over a 250 mm length.
5. Optical properties are measured using a BYK-Gardner Haze-Gard Plus Transmission Meter, Model 4725.
6. Resistance tests are conducted at 23°C (73°F), 50% RH under controlled conditions by resistance meter.
7. Resistance is measured at the sealing surface of a typical carrier using the defined test method. Specification tolerances for this carrier is $\geq 10^4\ \Omega$ and $\leq 10^8 \Omega$.
8. Static decay is measured at carrier tape samples, with an Electrotech Systems Static Decay Meter under room condition. Model 406-C
9. 3M test method was used for the micro-contamination test for 3M carrier tapes.

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Storage and Shelf Life

3M™ Polycarbonate Carrier 3002, 2D Barcode should be stored indoors, in its original packaging, in a controlled climate environment, typically at or below 35°C (95°F) and 70% relative humidity. 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.

The shelf life of 3M carrier 3002, 2D barcode is five years from the date of manufacture when stored according to the recommended storage conditions above.

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is manufactured and deemed commercially available from 3M. The COA contains the 3M test methods, specifications limits and test results for the product’s performance attributes that the product will be supplied against. Contact your local 3M representative for this product’s COA.

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Safety Data Sheet: Consult Safety Data Sheet before use.

Regulatory: For regulatory information about this product, contact your 3M representative.

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