

3M™ Polycarbonate Ultra Precision Carrier (UPC) 3002UP, 2D Barcode

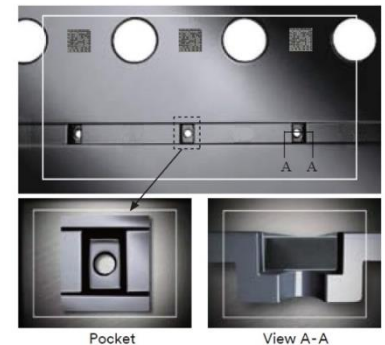
Product Description

3M™ Polycarbonate Ultra Precision Carrier (UPC) 3002UP, 2D Barcode helps customers meet the growing challenges of packaging and transporting smaller and thinner electrical and electronic devices in tape and reel. 3M carrier 3002UP offers an ultra-precise pocket cavity design with tighter tolerances to allow for better part capture, improved component registration and to help reduce concerns associated with component migration. 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. An ultra-small pocket hole is available for vacuum to enhance component stability during taping applications.



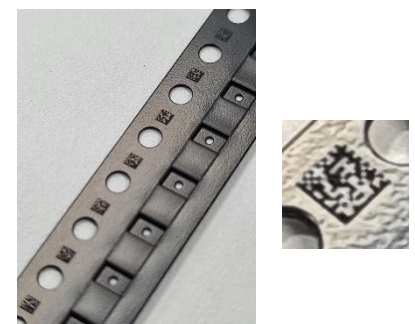
Product format

3M carrier tape 3002UP is available as continuous, splice-free, 8 mm through 24 mm carrier in level winding formats on 330 mm (13") to 560 mm (22") plastic or recyclable reels. Planetary winding format is also available upon request. Typically, reel capacity is 500 m but actual length depends on the pocket depth, pitch and winding format.



Key Features

- Tighter pocket tolerances of ± 0.03 mm for A_o , B_o and K_o dimensions
- Small sidewall draft angles, which allows for better component-in-pocket fit (part capture) and registration
- Reduced pocket hole ($D1 = 0.15$ mm) to draw vacuum for small component loading applications
- Flat pocket bottoms, to help reduce component rotation, tilting and flipping concerns for improved throughput
- Unique chip identification and traceability for quality checks & monitoring throughout the process and up to final module assembly



3M™ Polycarbonate Ultra Precision Carrier with 2D Barcode 3002UP package

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Typical mechanical properties – shrinkage

3M™ Polycarbonate Ultra Precision Carrier (UPC) 3002UP, 2D Barcode exhibits shrinkage of less than 0.1% for P₀-10, even after 24 hours exposure at 85°C (185°F). This compares favorably to the EIA-481-F Standard which stipulates that the P₀-10, 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 temperatures and will depend upon the duration of exposure and the maximum temperature reached.

Carrier P₀-10 shrinkage after 24 hours

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

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

Electrical properties

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

Camber

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

Recyclability

3M carrier 3002UP is a carbon-filled thermoplastic polymer film which can be recycled after use. See local area laws and requirements for proper recycling of this product.

Cover tape recommendations

Smaller chip devices require extreme care during the de-taping process to prevent the components from bouncing out of the carrier and sticking to cover tape. Therefore, 3M™ Pressure Sensitive Adhesive Cover Tapes are recommended for these applications. 3M™ Static Dissipative Heat Activated Adhesive Cover Tapes are also suggested.

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Typical physical properties and performance characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Final product specifications and testing methods will be outlined in the products Certificate of Analysis (COA) that is provided once the product is approved by 3M for general commercialization and development work is completed.

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 x 10 ⁶	6	ANSI/ESD S541
	Static Decay	Second	0.01	7	3M test method
Chemical properties	Extractable Ionics (Cl ⁻ , NO ₃ ⁻ , SO ₄ ²⁻ , Na ⁺ , K ⁺ , Ca ²⁺)	ppm	<5	8	3M test method
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. Resistance is measured at the sealing surface of a typical carrier using the defined test method. Specification tolerances for this carrier is $1.0E4 \Omega \leq R_s < 1.0E11 \Omega$.
7. Static decay is measured at carrier tape samples, with an Electrotech Systems Static Decay Meter Model 406-C under room condition.
8. 3M test method was used for the micro-contamination test for 3M carrier tapes.

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Storage and Shelf Life

3M™ Polycarbonate Ultra Precision Carrier 3002UP, 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 3002UP 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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Regulatory: For regulatory information about this product, contact your 3M representative.

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Electronics Materials Solutions Division
3M Center, Building 224-3N-11
St. Paul, MN 55144-1000
1-800-251-8634 phone
651-778-4244 fax
www.3M.com/electronics

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