

3M™ Polycarbonate Ultra Precision Carrier (UPC) 3000UP

Product Description

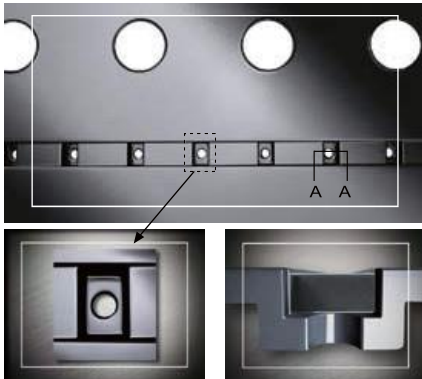
3M™ Polycarbonate Ultra Precision Carrier (UPC) 3000UP is designed to meet the growing challenges of packaging and transporting smaller and thinner electrical and electronic devices in tape and reel. 3M carrier 3000UP offers an ultra-precise pocket cavity design with tighter tolerances to allow for better part capture, improved component registration and reduced concerns associated with component migration. An ultra small pocket hole is available for vacuum designed to enhance component stability during taping applications.



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Product Format

3M carrier 3000UP is available as continuous, splice-free, 8 mm 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 be from 30 to 2,000 meters, depending upon the pocket depth, pitch and winding format.



3M™ Polycarbonate Ultra Precision Carrier (UPC) 3000UP for 0603 (0201) package

Key Features

3M carrier 3000UP is designed to provide tight pocket dimensional tolerances of ± 0.03 mm for Ao, Bo, Ko dimensions and small sidewall draft angles, which allows for better component in pocket fit (part capture) and registration. Additional features consist of a reduced pocket hole (D1) of 0.15 mm to draw vacuum for small component loading applications, combined with flat pocket bottoms, will effectively help reduce component rotation, tilting and flipping concerns for improved throughput.

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Typical Mechanical Properties – Shrinkage

3M™ Polycarbonate Ultra Precision Carrier (UPC) 3000UP 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 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 polystyrene carrier pockets can be rapidly accelerated by exposure to elevated temperature and will depend upon the duration of exposure and the maximum temperature reached.

3M 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™ Polycarbonate Carrier 3000UP	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 Polycarbonate Carrier 3000UP provide protection of static-sensitive components through an effective balance between the electrostatic shielding and electrostatic decay properties of the carrier. 3M carrier 3000UP exhibits a nominal surface resistance of $1.0E4 \leq R_s \leq 1.0E8 \Omega$, which aligns to ANSI/ ESD S541 standard. 3M carrier tape 3000UP can dissipate charges accumulated due to triboelectric effects and is appropriate for packaging electrostatically sensitive components.

Camber

3M carrier 3000UB meets the EIA-481-F Standard for camber which is not greater than 1mm in 250 linear millimeters in planetary format. For carrier in a level winding format, camber does not exceed 2mm in 250 linear millimeters. Camber performance is maintained for a period of 1 year from the date of manufacture when stored under recommended storage conditions.

Packaging Format

3M carrier 3000UP meets the EIA-481-F Standard for camber which is not greater than 1mm in 250 linear millimeters in planetary format. For carrier in a level winding format, camber does not exceed 2mm in 250 linear millimeters. Camber performance is maintained for a period of 1 year from the date of manufacture when stored under recommended storage conditions.

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 unit stick to cover tape. Therefore, 3M™ Pressure Sensitive Adhesive Cover Tapes are recommended. 3M™ Static Dissipative Heat Activated Adhesive Cover Tapes are also suggested.

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.

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

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	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	5.0×10^5	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 & T ₁		

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

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.

Storage Conditions and Shelf Life

3M™ Polycarbonate Ultra Precision Carrier 3000UP 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 3000UP is five years from the date of manufacture when stored according to the recommended storage conditions.

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, specification 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.

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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