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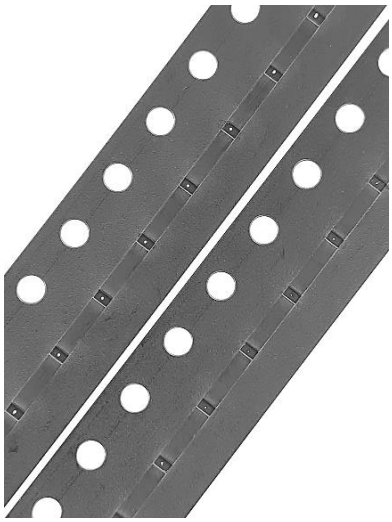
Technical Data | December 2022

3M™ Polycarbonate Carrier 3200 Series, OPPC

(3200UP and 3200UB)

Product Description

3M™ Polycarbonate Carrier 3200 series, Optical Precision Process Carrier (OPPC) helps customers with packaging and transporting ultra-small, electrostatically-sensitive electrical and electronics devices and delivering them to the assembly point. Each pocket is precisely formed to achieve high quality small holes with improved burr control to allow better part capture and enhance small component stability during taping and pick & place applications.



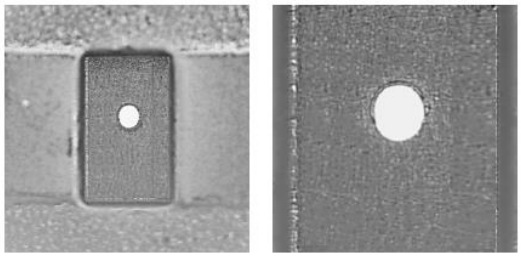
3M™ Polycarbonate Carrier 3200 series OPPC available in range of 8 mm wide in different pocket sizes to accommodate a variety of packages needs

3M carrier 3200 series, OPPC feature ultra-small pocket hole design to draw vacuum for small component loading application. Combined with flat pocket bottoms, it will effectively help minimize bump sticking and component tilting concerns for improved output. Additional advantages consist of improved burr control and helping reduce foreign material contamination issues. 3M carrier 3200 series offer 8mm width for small sized components.

3M carrier 3200UB are recommended for cleanroom compatible applications.

Construction

Embossed, heat-resistant, polycarbonate sheet

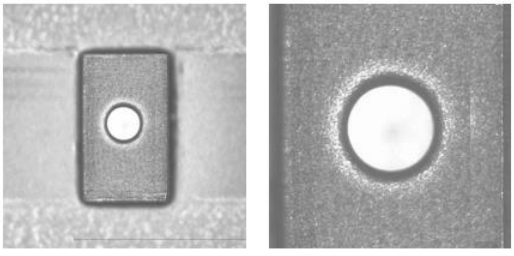


3M™ Polycarbonate Carrier Tape 3200 series, OPPC

Product format

3M carrier 3200UP are available as continuous, splice-free carriers in level winding format and on 330 mm (13”) to 560 mm (22”) plastic or recyclable cardboard reels. 3M carrier 3200UB are available on plastic reels.

Planetary winding format is also available upon request. Reel capacity will typically be from 30 to 2,000 meters, depending upon pocket depth, pitch and winding format.



Typical Carrier Tape using tradition process

3M™ Polycarbonate Carrier 3200 Series, OPPC

Product features

3M™ Polycarbonate Carrier 3200 series, OPPC incorporate features that are ideal for ultra-small components.

1. Precision small pocket hole of 0.07 mm and 0.10 mm for 8mm 3M carrier 3200UP and 3200UB, help minimize component tilting or stuck in pocket after taping and pick and place application.
2. Improved burr control to reduce the potential of burr debris related contamination
3. Tight pocket dimension tolerance for Ao, Bo and Ko (± 0.03 mm) help enable better component fit inside the pockets.
4. Flat pocket bottom helps reduce component rotation, tilting and flipping occurrences for improved throughput.
5. 3M carrier 3200UB is available in a cleanroom compatible format, is cleaned and packaged in a cleanroom environment for protection from particle contamination. Each level winding or planetary reel is sealed individually into a static shielding bag for protection.

3M Polycarbonate Carrier 3200 series		
	3200UP	3200UB
Carrier width	8 mm	
Pocket dimension tolerance	± 0.03 mm	
Pocket hole, D1	0.07 mm or 0.10 mm	
Cleanroom compatible	No	Yes

Typical mechanical properties – shrinkage

3M™ Polycarbonate Carrier 3200 series, OPPC 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 temperatures and will depend upon the duration of exposure and the maximum temperature reached.

Carrier P_0-10 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 3200 series	Typical polystyrene
52°C (126°F), 95%RH	<0.1%	<0.5%
85°C (185°F)	<0.1%	<0.5%

3M™ Polycarbonate Carrier 3200 Series, OPPC

Electrical properties

The electrical properties of 3M™ Polycarbonate Carrier 3200 series, OPPC help protect static-sensitive components through an effective balance between the electrostatic shielding and electrostatic decay properties of the carrier. 3M carrier 3200 series exhibit a nominal surface resistance of 1.0E4 ≤ Rs ≤1.0E8 Ω, which aligns to ANSI/ ESD S541 standard. 3M carrier tape 3200 series can dissipate charges accumulated due to triboelectric effects and is appropriate for packaging electrostatically sensitive chips.

Camber

3M carrier 3200 series, OPPC meet 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 3200 series, OPPC 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 and 3M™ Universal Cover Tape are recommended, which are ideal for ultra-small component applications. 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. Final product specifications and testing methods will be outlined in the product's 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	1.0×10^6	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 & T_1		

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

*Disclaimer if applicable to chart above

3M™ Polycarbonate Carrier 3200 Series, OPPC

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. 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.
3. Camber is a measurement of the weave of the material. Measured over a 250 mm length.
4. Optical properties are measured using a BYK-Gardner Haze-Gard Plus Transmission Meter, Model 4725.
5. 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 $\geq 10^4 \Omega$ and $\leq 10^8 \Omega$.
6. Static decay is measured at carrier tape samples, with an Electrotech Systems Static Decay Meter Model 406-C under room condition.
7. 3M test method was used for the micro-contamination test for 3M carrier tapes.

Storage and Shelf Life

3M™ Polycarbonate Carrier 3200 series, OPPC 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 3200 series, OPPC 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.

3M™ Polycarbonate Carrier 3200 Series, OPPC

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

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