

3M™ Polycarbonate Carrier 3000 R Series (3000XPR, 3000XBR, 3000UPR, 3000UBR, 3000NBR, 3000BDR, 3000UPRK, 3000UBRK, 3000NBRK, 3000BDRK, 3000UPRW, 3000UBRW)

Product Description

3M™ Polycarbonate Carrier 3000 R series is used for packaging and transporting thinner electrical and electronic devices with total thickness ≤ 0.21 mm in tape and reel applications. 3M carrier 3000 R series features a small pocket open radius design with tight pocket tolerances to allow for better part capture, to help improve component registration and to help reduce thinner component tilting or migration issues. A smaller pocket hole capability is also available for vacuum designs, which enhances thin and small component stability during taping application.



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3M carrier 3000XBR, 3000UBR, 3000BDR, 3000UBRK, 3000BDRK and 3000UBRW are recommended for cleanroom compatible applications.

Key Features

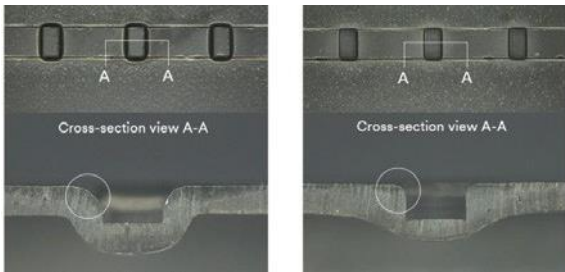
- Small pocket open radius helps minimize component tilting or slipping out of the pocket. Pocket open radius is ≤ 0.1 mm for 8 mm wide 3M carrier 3000UPR, 3000UBR, 3000XPR and 3000XBR, ≤ 0.12 mm for 12 mm, 16 mm and 24 mm wide 3M carrier 3000NBR and 3000BDR, ≤ 0.15 mm for 8 mm and 12 mm wide 3M carrier 3000UPRK, 3000UBRK, 3000NBRK and 3000BDRK, and within 0.10mm and 0.15mm for 8 mm wide 3M carrier 3000UPRW and 3000UBRW.
- Tight pocket dimension tolerance for Ao, Bo and Ko (± 0.05 mm, ± 0.03 mm or ± 0.02 mm), along with small side wall draft angles, helps enable better component fit inside the pocket.
- Flat pocket bottom helps reduce component rotation, tilting and flipping occurrences for improved throughput.
- Raised platform design helps reduce headspace between carrier and cover tape and also helps minimize component migration.
- 3M™ Polycarbonate Carrier 3000XBR, 3000UBR, 3000BDR, 3000UBRK, 3000BDRK and 3000UBRW, available in a cleanroom compatible format, are 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 3000 R Series

Product Construction/Material Description

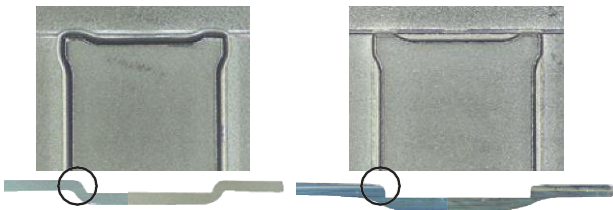
Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

3M™ Polycarbonate Carrier 3000 R series												
	3000 XPR	3000 XBR	3000 UPR	3000 UBR	3000 NBR	3000 BDR	3000 UPRK	3000 UBRK	3000 NBRK	3000 BDRK	3000 UPRW	3000 UBRW
Carrier width / Pitch	Width: 8 mm Default pitch: 4 mm				Width: 12/16/24 mm		Width: 8 mm Default pitch: 4 mm		Width: 12 mm		Width: 8 mm Default pitch: 4 mm	
Pocket tolerance (Ao, Bo, Ko)	± 0.02 mm		± 0.03 mm		± 0.05 mm		± 0.03 mm		± 0.05 mm		± 0.03 mm	
Clean room compatible	No	Clean room	No	Clean room	No	Clean room	No	Clean room	No	Clean room	No	Clean room
Raised platform design	Required		Default		Default		Default		Default		Default	
Pocket opening radius	RA ≤ 0.10 mm				RA ≤ 0.12 mm		RA ≤ 0.15 mm				0.10 mm < RA ≤ 0.17 mm	



Left: 3M Polycarbonate Ultra Precision Carrier 3000UP or 3000UB, 8 mm carrier for component size 0603 mm

Right: 3M Polycarbonate Carrier 3000UPR or 3000UBR, 8 mm carrier with improved pocket opening radius for component size 0603 mm



3M Polycarbonate Carrier 3000 R series, either in 8 mm, 12 mm, 16 mm or 24 mm wide indicate sharper pocket opening.

Left: 3M Polycarbonate Carrier 3000 or 3M Polycarbonate Precision Carrier 3000BD, 12 mm carrier with standard pocket opening radius

Right: 3M Polycarbonate Carrier 3000NBR or 3000BDR, 12 mm carrier with improved pocket opening radius.

3M™ Polycarbonate Carrier 3000 R Series

Typical Applications

- 3M™ Polycarbonate Carrier 3000 R series is used for packaging and transporting thinner electrical and electronic devices with total thickness ≤ 0.21 mm in tape and reel applications.
- 3M carrier 3000XBR, 3000UBR, 3000BDR, 3000UBRK, 3000BDRK and 3000UBRW are recommended for cleanroom compatible applications.

Recommended Cover Tapes

Thin chip devices require extreme care during the de-taping process to help prevent components from bouncing out of the carrier pocket or sticking to the 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

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3M™ Polycarbonate Carrier 3000 R Series					
Description	Type	Units	Typical performance	Testnotes	Testmethod
Material properties	Material type		Polycarbonate	1	
Material properties	Max usable temperature	°C (°F)	125 (257)		
Physical properties	Tensile strength (yield)	MPa (Kpsi)	57.2 (8.3)	2	ASTM-D638
Physical properties	Tensile strength (break)	MPa (Kpsi)	57.2 (8.3)	2	ASTM-D638
Physical properties	Impact strength	J/m (Ft-lb/in)	>70 (1.32)	3	ASTM-D256
Physical properties	Camber (planetary format)	mm (in)	≤ 1.0 (0.039)	4	EIA-481-F
Physical properties	Camber (level winding format)	mm (in)	≤ 2.0 (0.079)	4	EIA-481-F
Physical properties	Optical	%	Opaque	5	ASTM-D1003
Electrical properties	Resistance	Ohms	1.0×10^6	6	ANSI/ESD S541
Electrical properties	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 material type		Reinforced cardboard or plastic		
Product format	Reel hub inside diameter	mm (in)	76.2 (3.0)		
Product format	Pockets per reel		Varies per pitch		
Product format	Length	m	Varies per K0 & T1		

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

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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.
- Camber is a measurement of the weave of the material, measured over a 250 mm length.
- Optical properties are measured using a BYK-Gardner Haze-Gard Plus Transmission Meter, Model 4725.
- 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 tolerance for the products is $1.0E4 \Omega \leq R_s < 1.0E11 \Omega$.
- Static decay is measured at carrier tape samples, with an Electrotech Systems Static Decay Meter Model 406-C, under room temperature conditions.
- 3M test method was used for the micro-contamination test for 3M carrier tapes.

Typical Mechanical Properties – Shrinkage

3M™ Polycarbonate Carrier 3000 R series 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, maintain 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, but 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 3000 R Series	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 3000 R series help provide protection of static-sensitive components through an effective balance between the electrostatic shielding and electrostatic decay properties of the carrier. 3M carrier 3000 R series exhibits a nominal surface resistance of $1.0E4 \Omega \leq R_s < 1.0E11 \Omega$, which aligns to ANSI/ESD S541 standard. The products can help dissipate charges accumulated due to triboelectric effects and can be used for packaging electrostatically sensitive chips.

Camber

3M carrier 3000 R series products meet the EIA-481-F Standard for camber which is not greater than 1 mm in 250 linear millimeters in a planetary format. For carrier in a level winding format, camber will not be greater than 2 mm 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

Storage Conditions and Shelf Life

3M™ Polycarbonate Carrier 3000 R series 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 products must be protected from

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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 products. It is recommended that the products be used on a “first-in, first-out” basis.

The shelf life of 3M carrier 3000 R series 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.

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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