

# 3M™ Polycarbonate Carrier 3202 R Series, 2D Barcode and OPPC (3202UPR, 3202UBR, 3202XPR and 3202XBR)

## Product Description

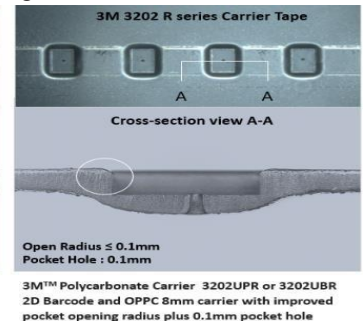
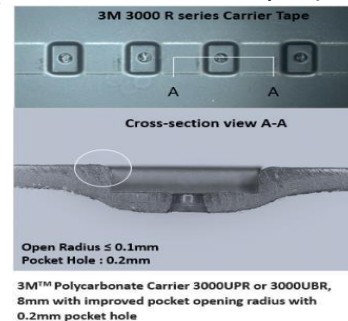
3M™ Polycarbonate Carrier 3202 R series, 2D Barcode and Optical Precision Process Carrier (OPPC) helps customers with packaging and transporting thinner and ultra-small electrical and electronic devices with total thickness  $\leq 0.15$  mm in tape and reel. Each pocket hole is precisely formed to achieve high quality small holes with improved burr control to allow better part capture and to enhance thin and small component stability during taping application. A unique 2D Barcode is imprinted either between each sprocket hole or the pocket on the crossbar for chip identification and traceability.

3M carrier 3202 R series, 2D Barcode, OPPC features 2D Barcode with small pocket open radius design, tight pocket tolerances and ultra-small pocket hole to draw vacuum for small component loading application. Combined with flat pocket bottoms design, it effectively helps minimize bump stuck, component tilting and migration issues. Additional advantages consist of improved burr control and helping reduce foreign material contamination issues. 3M carrier 3202 R series offers 8mm width for small sized and thin components.

3M carrier 3202UBR and 3202XBR are recommended for cleanroom compatible applications.



3M™ Polycarbonate Carrier 3202 R series, 2D Barcode and OPPC, available in a range of different pocket sizes to accommodate a variety of package needs.



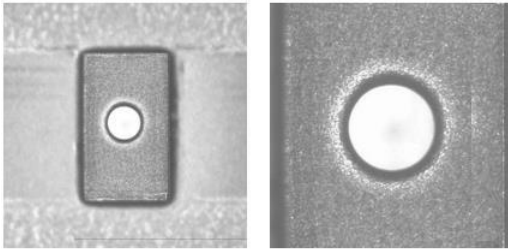
## Construction

Embossed, heat-resistant, polycarbonate sheet.

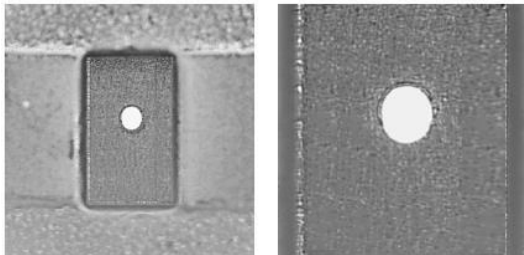
## Product Format

3M carrier 3202UPR and 3202XPR 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 3202UBR and 3202XBR are available on plastic reels. Planetary winding format is also available upon request. Reel capacity will typically be 30 – 2,000 m; exact lengths depend on the pocket depth, pitch and winding format.

## 3M™ Polycarbonate Carrier 3202 R Series, 2D Barcode and OPPC



Typical Carrier Tape using tradition process



3M™ Polycarbonate Carrier Tape 3202 R series, OPPC

### Key Features

- 3M™ Polycarbonate Carrier 3202 R series, 2D Barcode and OPPC incorporate features to help enable effective transport of thin and/or ultra-small components.
- Small pocket open radius of  $\leq 0.1$  mm for 3M carrier 3202UPR, 3202UBR, 3202XPR and 3202XBR helps minimize component tilting or slipping out of the pocket.
- Precision small pocket holes of 0.07 mm and 0.10 mm for 3M carrier 3202UPR, 3202UBR, 3202XPR and 3202XBR, help minimize component tilting or stuck in pocket after tape and reel.
- Improved burr control to help reduce the potential of burr debris related contamination
- Tight pocket dimension tolerance for Ao, Bo and Ko ( $\pm 0.03$  mm or  $\pm 0.02$  mm) with small side wall draft angles, helps enable better component fit inside the pockets.
- Unique 2D barcode chip identification and traceability for quality check & monitoring throughout the process up to final module assembly
- Flat pocket bottom helps reduce component rotation, tilting and flipping occurrences for improved throughput.
- A unique raised platform design helps reduce headspace between carrier and cover tape and also helps minimize component migration.
- 3M carrier 3202UBR and 3202XBR, 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.

### 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 3200 series, Optical Precision Process Carrier	3202XPR	3202XBR	3202UPR	3202UBR
Carrier Width	8 mm	8 mm	8 mm	8 mm
Pocket Opening Radius	$\leq 0.1$ mm	$\leq 0.1$ mm	$\leq 0.1$ mm	$\leq 0.1$ mm
Pocket Dimension Tolerance	$\pm 0.02$ mm	$\pm 0.02$ mm	$\pm 0.03$ mm	$\pm 0.03$ mm

## 3M™ Polycarbonate Carrier 3202 R Series, 2D Barcode and OPPC

Pocket Hole	0.07 mm or 1.0 mm	0.07 mm or 1.0 mm	0.07 mm or 1.0 mm	0.07 mm or 1.0 mm
2D Barcode Position	Between sprocket holes or pocket holes	Between sprocket holes or pocket holes	Between sprocket holes or pocket holes	Between sprocket holes or pocket holes
Raised Platform Design	Required	Preferred	Required	Preferred
Cleanroom Compatible	No	Yes	No	Yes

### Typical Mechanical Properties – Shrinkage

3M™ Polycarbonate Carrier 3202 R series, 2D Barcode and OPPC 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.

### 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 3202 R series, 2D Barcode and OPPC	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 3202 R series, 2D Barcode and OPPC help protect static-sensitive components through an effective balance between the electrostatic shielding and electrostatic decay properties of the carrier. 3M carrier 3202 R series, 2D Barcode, OPPC exhibits a nominal surface resistance of  $1.0E4 \leq R_s < 1.0E11 \Omega$ , which aligns to ANSI/ ESD S541 standard. 3M carrier 3202 R series, 2D Barcode, OPPC can dissipate charges accumulated due to triboelectric effects and is appropriate for packaging electrostatically sensitive chips.

### Camber

3M carrier 3202 R series, 2D Barcode, OPPC meets the EIA-481-F Standard for camber which is not greater than 1 mm in 250 linear mm in planetary format. For carrier in level winding format, camber will not be greater than 2 mm in 250 linear mm. Camber performance is maintained for a period of 1 year from the date of manufacture when stored under recommended storage conditions.

### Cover tape recommendations

Thin chip devices require extreme care during the de-taping process to help 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 for these applications, which are ideal for many small and thin 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.

## 3M™ Polycarbonate Carrier 3202 R Series, 2D Barcode and OPPC

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 <sup>6</sup>	6	ANSI/ESD S541
	Static decay	Second	0.01	6	3M test method
Chemical properties	Extractable ionics (Cl <sup>-</sup> , NO <sub>3</sub> <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup> , Na <sup>+</sup> , K <sup>+</sup> , Ca <sup>2+</sup> )	ppm	<5	7	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 <sub>1</sub>		

\*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.  
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 1.0E4 Ω ≤ Rs < 1.0E11 Ω.
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 Conditions and Shelf Life

3M™ Polycarbonate Carrier 3202 R series, 2D Barcode and 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 3202 R series, 2D Barcode and OPPC is five years from the date of manufacture when stored according to the recommended storage conditions above.

# 3M™ Polycarbonate Carrier 3202 R Series, 2D Barcode and OPPC

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

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