



# Product Data Sheet

## Estar™ Copolyester BR003, Natural

### Application/Uses

- Oral hygiene
- Plastics for hygiene feminine products
- Toothbrushes

### Product Description

Estar™ BR003 Copolyester contains a mold release additive. It has excellent appearance and is nearly water-clear. Its most outstanding features are its chemical resistance and processing capabilities. Exposure to aromatic oils often causes crazing or actual fracture of many polymer resins, but BR003 maintains its physical properties when exposed to these oils, and its appearance is virtually unchanged. BR003 is specifically formulated to provide the optimal combination of chemical resistance, bristle retention, strength, stiffness, processability, clarity, colorability, and feel for toothbrushes. Under existing United States Food and Drug Administration(FDA) regulations, Eastar™ BR003 copolyester may lawfully be used to make food contact articles which comply with the specifications and conditions of use in 21 CFR 177.1240. Migration tests on BR003 samples meet the compliance requirements of 21 CFR 177.1240(e)(1),(2) and (3).

This product has been GREENGUARD INDOOR AIR QUALITY CERTIFIED®.

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### Typical Properties

Property <sup>a</sup>	Test <sup>b</sup> Method	Typical Value, Units <sup>c</sup>
Specific Gravity	D 792	1.20
Mold Shrinkage Parallel to Flow, 3.2-mm (0.125-in.) thickness	D 955	0.002-0.006 mm/mm (0.002-0.006 in./in.)

### Mechanical Properties

Tensile Stress @ Yield	D 638	47 MPa (6900 psi)
Tensile Stress @ Break	D 638	51 MPa (7400 psi)
Elongation @ Yield	D 638	5%
Elongation @ Break	D 638	320%

Flexural Modulus	D 790	2000 MPa (2.9 x 10 <sup>5</sup> psi)
Flexural Yield Strength	D 790	69 MPa (10000 psi)
Rockwell Hardness, R Scale	D 785	103
Izod Impact Strength, Notched		
@ 23°C (73°F)	D 256	80 J/m (1.5 ft·lbf/in.)
@ -40°C (-40°F)	D 256	40 J/m (0.7 ft·lbf/in.)
Impact Strength, Unnotched		
@ 23°C (73°F)	D 4812	NB
@ -40°C (-40°F)	D 4812	NB
Impact Resistance (Puncture), Energy @ Max. Load		
@ 23°C (73°F)	D 3763	42 J (31 ft·lbf)
@ -40°C (-40°F)	D 3763	48 J (35 ft·lbf)

### Mechanical Properties (ISO Method)

Tensile Strength @ Yield	ISO 527	47 MPa
Tensile Strength @ Break	ISO 527	46 MPa
Elongation @ Yield	ISO 527	4%
Elongation @ Break	ISO 527	200%
Tensile Modulus	ISO 527	1800 MPa
Flexural Modulus	ISO 178	1850 MPa
Flexural Strength	ISO 178	65 MPa
Izod Impact Strength, Notched		
@ 23°C	ISO 180	7.8 kJ/m <sup>2</sup>
@ -40°C	ISO 180	4.8 kJ/m <sup>2</sup>

### Thermal Properties

Deflection Temperature		
@ 0.455 MPa (66 psi)	D 648	73°C (164°F)
@ 1.82 MPa (264 psi)	D 648	65°C (149°F)

### Optical Properties

Haze	D 1003	0.3%
Regular Transmittance	D 1003	89%
Total Transmittance	D 1003	91%

### Typical Processing Conditions

Drying Temperature	70°C (160°F)
Drying Time	3 hrs
Processing Melt Temperature	230-280°C (450-530°F)
Mold Temperature	15-30°C (60-80°F)

<sup>a</sup> Unless noted otherwise, all tests are run at 23°C (73°F) and 50% relative humidity.

<sup>b</sup> Unless noted otherwise, the test method is ASTM.

° Units are in SI or US customary units.

## **General**

Properties reported here are typical of average lots. Eastman makes no representation that the material in any particular shipment will conform exactly to the values given.

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