

## ES-3000

### High Reactivity Smc/Bmc Type Polyester

#### DESCRIPTION AND BASIC PROPERTIES

ES-3000 Orthophthalic Based SMC / BMC Type Polyester is a high reactivity polyester specially designed for compression molding process.

ES-3000 Orthophthalic Based SMC / BMC Type Polyester has fast thickening behavior with Magnesium Oxide. It is possible to obtain rigid materials with excellent mechanical properties with high reactivity. It also suitable use with thermoplastic resins that prevent volumetric shrinkage. It is suggested to use with ESODEX resins. It is suitable for use in products such as automobile parts, electrical parts, waste water drainage covers, electrical and natural gas boxes, lighting equipment, city furniture, floor tiles, roof and side coatings, highway applications.

#### MECHANICAL PROPERTIES OF CURED RESIN

	UNIT	VALUE <sup>1</sup>	METHOD
Tensile Strength	MPa	65 ± 5	ASTM D638
Tensile E-Modulus	GPa	3.1 ± 0.1	ASTM D638
Elongation At Break	%	2 ± 0.2	ASTM D638
Flexural Strength	MPa	120 ± 10	ASTM D790
Flexural E-Modulus	GPa	3.7 ± 0.1	ASTM D790
Impact Strength	Kj/m <sup>2</sup>	7 ± 2	ISO 180
Heat Deflection Temperature (HDT) <sup>2</sup>	°C	115 ± 5	ISO 75 A
Barcol Hardness	Barcol	45 ± 5	ASTM D2583
Glass Transition Temperature(Tg)	°C	135 ± 5	ISO 11357-2

<sup>1</sup>For fully cured resin, curing Schedule- 24 hrs at 20°C, 4 hrs at 90°C

<sup>2</sup>Curing Schedule- 24 hrs at 20°C, 4 hrs at 90°C, 3 hrs at 120°C

#### APPLICATION METHODS

Hot Press  
(Sheet-Bulk Moulding Compound)

#### CHEMICAL STRUCTURE

Acid : Orthophthalic Acid  
Acceleration: No  
Reactivity: Very High

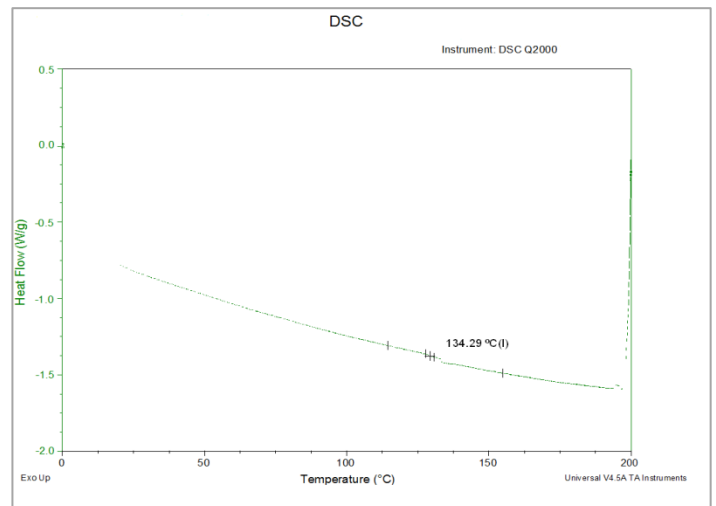
#### PROPERTIES OF LIQUID FORM

	UNIT	VALUE	METHOD
Appearance		Clear, yellowish	
Viscosity <sup>1</sup>	cp	1200±100	ISO 2555
Monomer Content	%	35 ± 3	ISO 3251
Density	g/cm <sup>3</sup>	1.120±0.02	ISO 1675
Acid Number	mg KOH/g	23 ± 3	ISO 2114
Gel Time <sup>2</sup>	min	5 ± 1	ISO 2535
Gel Time <sup>3</sup>	min	14 ± 2	ISO 584
Cure Time <sup>3</sup>	min	35 ± 5	ISO 584
Peak Exotherm <sup>3</sup>	°C	210 ± 20	ISO 584
Shelf Life	month	6	-

<sup>1</sup>Brookfield DV II, 25°C, 3 spd, 10 rpm

<sup>2</sup>25°C 0.4% Cobalt Octoate (6 % con.) and 2% MEK-P (Butanox M60)

<sup>3</sup>82.2°C 3% Trigonox 29 C 50.



Differential Scanning Calorimetry (DSC)  
Determination of Glass Transition Temperature (Tg)

## PRESSED BMC PLATE FEATURES

### BMC FORMULATION

Raw Material	%
ES-3000	20.0
LSA	5.0
TBPB	0.4
Zinc Stearate	1.0
Filler	55.1
Fiberglass	18.0
Thickener (%35 MgO)	0.5

### APPLICATION

When preparing SMC or BMC with ES-3000, other low-profile additives (ESODEX 301, ESODEX 130) may be preferred as well as standard LSA (ESODEX 100). In practice, the selected LSA Eskim is ESODEX-100. It is also advisable to add 300-600 ppm p-benzoquinone according to the size of the dough part made.

## PRESSED BMC PLATE FEATURES

	UNIT	VALUE	METHOD
Fiberglass Content	%	18	
Density	g/cm <sup>3</sup>	1.7 ±0.02	DIN 53479
Shrinkage	%	0.19 ±0.015	DIN 53464
Flexural Strength	MPa	125 ± 10	ASTM D790
Flexural E-Modulus	GPa	18.5 ± 0.1	ASTM D790
Impact Strength	Kj/m <sup>2</sup>	27 ± 2	ISO 180
Barcol Hardness	Barcol	60 ± 5	ASTM D2583
Gloss	Gloss	80 ± 2	ASTM D 523

## STORAGE CONDITIONS

It should be stored in a dry, clean and cool place (15-25 °C) in closed packages. The shelf life of the product is valid for this temperature range and it should not be forgotten that it will shorten at high temperatures. Products with the same charge number and date must be stored together.

Another factor that affects the life of unsaturated polyester resins containing styrene is sunlight. Styrene must be polymerized in the sunlight and products that are considered to shorten the life of the product should be avoided from direct sunlight contact.

## MORE INFORMATION

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