



# Vasavibala Resins (P) Ltd.

POLYMER DIVISION  
Manufacturers of Unsaturated Polyester Resins

## TECHNICAL BROCHURE – UNSATURATED POLYESTER RESINS

### GRADE : VBR 2301M – ORTHO HELMET RESIN

VBR 2301M is a medium reactivity; medium viscous orthophthalic based laminating resin designed for the production of helmet products. This resin shows good wet out and rapid trim times in open mould process. This resin is suitable for use in spray-up and hand lay-up applications. It resists impact and thermal cracking.

#### PROPERTIES OF LIQUID RESIN

Appearance	Pale yellowish clear Liquid
Colour (on Gardner Scale, max)	2
Viscosity at 25° C, cps (Brookfield Viscometer LV DV II + Pro Spindle 62, rpm 50)	600 – 900
Specific gravity at 25° C gm/ml	1.12 – 1.14
Acid value, mg KOH/gm	23 – 27
Volatile content, %	32 – 36
Shelf life at 25° C, months	3
Gel time at 25° C, minutes*	10 – 20
Peak exotherm, °C**	160 – 170

\* Mix VBR 2301M Resin - 100 gm, VBR 1201 – 1.5 ml, VBR 1204 - 1.5ml

\*\* Under insulated Condition for 100 gm mixture.

**Caution :** VBR 1201 should never be independently mixed with VBR 1204, as this would cause explosion.

#### PROPERTIES OF UNREINFORCED CURED RESIN CASTING

The specimens are prepared by separately mixing 1.5% each of VBR 1201 and VBR 1204 with VBR 2301M and casted in a closed cell of specified dimension. These castings are cured for 24 hrs at room temperature and post cured at 90°C for 4 hrs.



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<b>PROPERTIES OF RESIN CASTING</b>	
Barcol Hardness	35 – 40
Tensile Strength, N/mm <sup>2</sup>	50 – 55
Flexural Strength, N/mm <sup>2</sup>	80 - 85
Heat distortion temperature, °C	58 – 62
Water Absorption at 25°C over a period of 700 hrs, %	0.50
Elongation at break, %	1.8 – 2.2

## **TEST METHODS**

IS 6746 – 1994

## **APPLICATION**

VBR 2301M reinforced with glass fiber gives laminates with excellent mechanical properties.

VBR 2301M is specifically meant for the fabrication of small to large FRP articles where high production rates at room temperatures are required. This resin is well suited for use in thick sections. VBR 2301M is suitable for wide range of applications in the chemical and transportation industries where both heat and weather resistance is prime criteria.

## **STORAGE**

VBR 2301M should be stored in closed containers inside covered area. The storage temperature not exceeding 30°C is preferable. At higher storage temperature, the shelf life decreases sharply. It should not be exposed to direct sunlight, heat radiation and moisture; these may cause premature gelation. VBR 2301M is guaranteed for 3 months from the date of manufacture provided the storage conditions are strictly adhered to.

## **PACKING**

35 Kg. HDPE carbuoys and 220 Kg. coated steel barrels.