

## PB 360 GS / DM 07

### Sprayable epoxy foam 2K



#### 2K system

**PB 360 GS:**

Epoxy foam base for sprayable process

**DM 07:**

Very fast hardener, new generation CMR free

#### Advantages

##### **PB 360 GS / DM 07**

Process by casting or spraying

Manufacturing "in situ" of a low density epoxy foam and composites complex.

Low density laminate for Surfboards, sports goods, light weight engine, automotives...

Increase the density of foams (PVC, PET..) and honey comb for local strengthening

Thermal insulation.

Fast cure, fast process

Easy mixing ratio 2/1 by volume

Excellent thermal resistance (tg onset 100 °C)

Density 360 Kg / m<sup>3</sup>

No handling of hollow microspheres.


Good adhesion onto many type of materials.

Homogeneous density.


Very low water absorption.

CMR free

## Epoxy Resin

		<b>PB 360 GS</b> Epoxy foam base <i>E 1652.60</i>	
Appearance		Viscous liquid	
Colour		White	
Chemical nature		Epoxy resin. Reactions product between Alcohols and epichlorhydrine.	
Viscosity	@ 15 °C	35 700	
( ± 20 % m.Pas )	@ 20 °C	16 150	
	@ 25 °C	8 500	
	@ 30 °C	5 040	
	@ 40 °C	2 240	
C green content	%	 26 % maximum	
Density	@ 20 °C		
Pycnomètre (± 0.01 g/cm <sup>3</sup> )		1.169	
Helium (± 0.001 g/cm <sup>3</sup> )		1.169	
Refractive index	@ 25 °C	1.5647	
± 0.0005			
Storage	AT 0 -25 °C	Store in cool place Keep away from sunlight	
		Shelf life: 12 months	

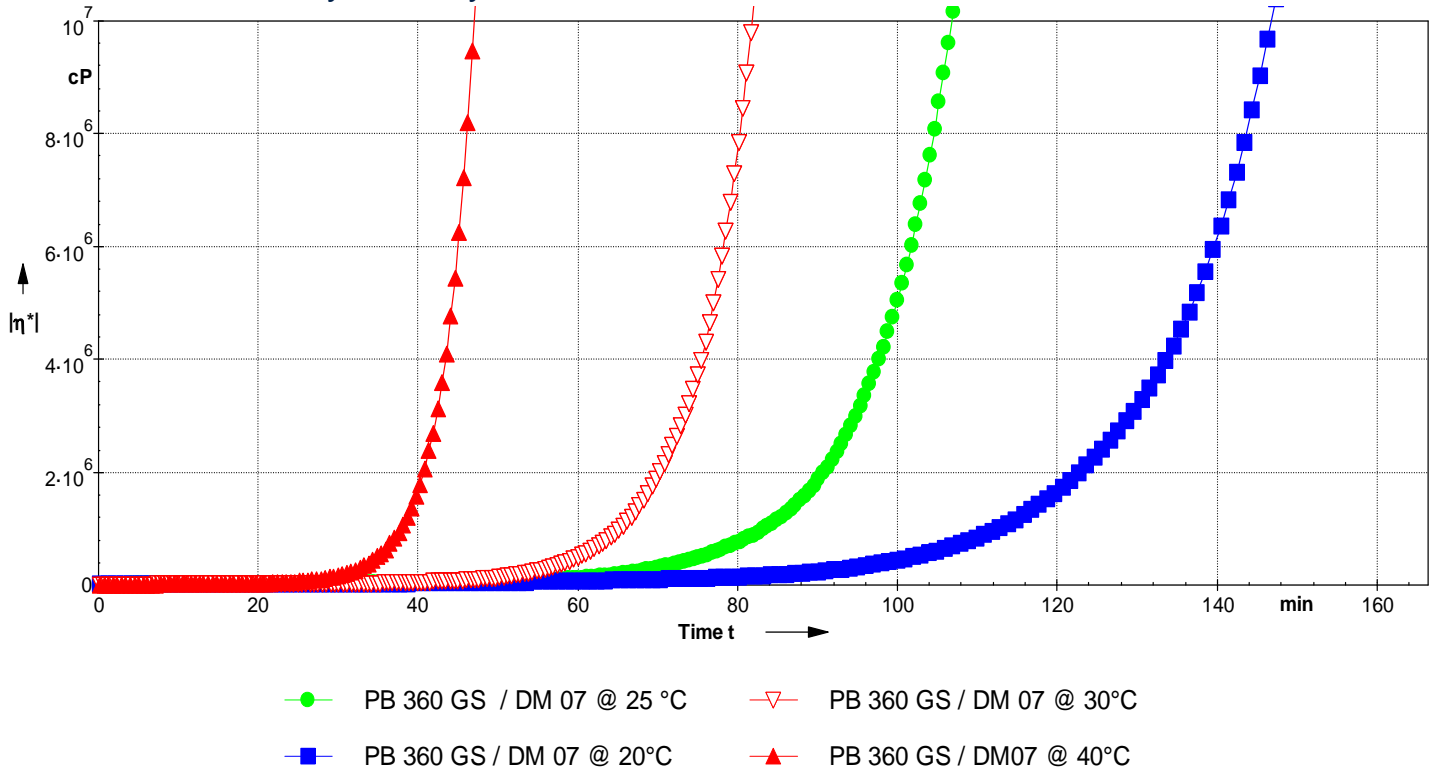
## Hardener DM 07

Color		Orange	
Gardner color		3 – 11	
Reactivity type		Ultra fast	
C green content		 13 % maximum	
Viscosity	@ 15 °C	2430	
± 20 % mPa.s	@ 20 °C	1400	
	@ 25 °C	850	
	@ 30 °C	540	
	@ 40 °C	240	
Density	@ 20 °C		
Pycnometer ± 0.01		1.04	
Helium ± 0.001		1.035	
Refractive index	@ 25 °C	1.5520	
± 0.001			
Storage:	2 years @ 23 °C		
Hardener may absorb moisture and carbon dioxide when left in open containers, which could result in increased viscosity, discoloration, reduction of reactivity, and/ crystallization of the products. These product should be kept tightly sealed in their original containers when not in use, and stored in a cool, dry place.			


## Mix properties

		PB 360 GS / DM 07
Weight ratio		100 g / 45 g
Volume ratio		100 ml / 50 ml 2 / 1
Gel time		@ 20 °C 135' @ 25 °C 95' @ 30 °C 70' @ 40 °C 40'
Mix % bio-based Carbon content*		 <b>22 % maximum</b>
Density Helium	kg / m <sup>3</sup>	<b>390</b> Free expansion @ 23°C
Glass transition by DSC Tg 1 onset maximum	°C	93 °C

### Increase of viscosity on a layer of 1mm thick @ 20, 25, 30 & 40 °C



## Mechanical properties on cast resin 10 mm and a density of 380 kg / m<sup>3</sup>

		<b>PB 360 GS</b> <b>/ DM 07</b> <i>Density = 380 kg / m<sup>3</sup></i>	
		AT + 24 hrs 40 °C	AT + 8 hrs 60 °C
<b>Curing cycle</b>			
<b>Flexion</b>			
Modulus of elasticity	N/mm <sup>2</sup>	495	490
Maximum resistance	N/mm <sup>2</sup>	7.3	11.0
Elongation at max.load	%	1.5	2.4
Elongation at break	%	1.5	2.4
<b>Shear strenght</b>			
Maximum resistance	N/mm <sup>2</sup>	4.7	6.1
<b>Compressive</b>			
Compressive yield strength	N/mm <sup>2</sup>	10.3	11.7
Offset compressive yield	%	13.9	13.7
<b>Glass Transition</b>			
Tg1 onset	°C	71	90
Tg1 onset maximum	°C		93

### **Exothermic parameters**

Thermal conductivity of substrate.

Open or closed moulding.

Temperature of components and ambient temperature.

Geometry, laminate thickness, volume and mass of the casting.

For casting onto a laminate that is curing, the heat produced by the resin can influence the reactivity of the foaming system, on a thick laminate.

### **PB epoxy foam:**

#### **Recommendations for use**

- In order to homogenise the PB resins, mix thoroughly with a helicoidal agitator before quantity determination (take a special care to the side and bottom of the drum).
- The expansion is much faster than the polymerisation: mixing and spraying operations must be done as quick as possible.

#### **Industrial equipment:**

Best result with heatable low-pressure mix-metering systems with a static mixing head.

Feel free to ask for specific information

#### **Foaming agent :**

Immediately after the mixing of the PB 360 GS resin and hardener DM 07, a chemical reaction occurs and causes the release of the foaming agent which is hydrogen.

Hydrogen is an extremely flammable gas.

Hydrogen is lighter than air: the relative air density = 1 hydrogen = 0.07

Hydrogen and the air has a broad range explosion

Lower Explosive Limit is 4 vol% in the air

Upper Explosive Limit is 74 vol%. in the air

The hydrogen / air mixture can be ignited with very low energy ignition sources (e.g., static sparks ) and burns with a hot, non-luminous flame that is difficult to see.

Do not smoke while handling product.

Work far from all sources of sparks and open flames.

Ensure adequate ventilation to prevent localized accumulation of high concentrations of hydrogen.

The resin PB 360 GS reacts with acids, bases or strong oxidizers and may cause a release of hydrogen.

Ensure that the packages are properly closed after use to avoid contamination.

Hydrogen has no toxicological effect and no known ecological impact.

**Tests carried out on samples of pure cast resin, without prior degassing, between steel plates.****Measures undertaken according to the following norms:**

Tension :	NF EN Iso 527 - 2
Flexion :	NF EN Iso 178
Charpy impact strength:	NF T 51-035
Shear Strength	ASTM D 732 – 93 punch tool
Compressive	NF EN ISO 844
Water absorption:	Internal. Polymerisation according to cycle, machining, weighing, time spent in distilled water at 70 °C / 48 hours, weighing 1 hour after emerging,
Glass transition DSC :	ISO 11357-2 : 1999 -5°C to 180°C under nitrogen gaz Tg1 or Onset : 1st point at 20 °C/mn Tg1 maximum or Onset : second passage
Glass transition DTMA:	ISO 11357-1 - TG onset G' Temperature ramp 0°C to 180 °C @ 2°C/min ASTM D4065 - TG peak G''

**Physical tests according standard ::**

Gardner color:	NF EN ISO 4630 Visual method
Refractive index :	NF ISO 280
Viscosity:	NF EN ISO 3219 Rheometer 50 mm, shear 10s <sup>-1</sup>
Density:	NF EN ISO 2811-1 Pyknometer
Gel time :	Cross G' G'' / rheometer CP50 - Shear rate 10 s <sup>-1</sup>
GreenCarbon content:	ASTM D6866 or XP CEN/TS 16640 Avril 2014

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