

MGS BP20

EPIKOTE™ Resin MGS BPR20

EPIKURE™ Curing Agent MGS BPH20

CHARACTERISTICS

Approval	DNV
Application	Fast setting bondings and repairs on composite structures, bonding of composites and metal
Operational temperature	-40°C up to 70°C after post-cure
Processing	at temperatures above 10°C
Features	Economical, clean and selective application by cartridges
Storage	Shelf life of 48 months in originally sealed containers
Usage category Annex VIII CLP	Professional and Industrial use

APPLICATION

BP20 is a solvent-free epoxy-based bonding paste which was especially developed for fast setting bondings in composites applications and for bondings of composites and metal.

BP20 has a good degree of cure even at lower ambient temperatures. To achieve full mechanical properties and thermal resistance, post-curing of at least 3h 60°C is recommended. However, good mechanical properties are already developed after initial curing of 24h RT.

Surface Preparation

No special surface preparation is required, but bonding surfaces should be dry and free from grease. If bonding surfaces shall be primed, a liquid mix of laminating resin should be used. Priming with bonding paste is not recommended and should be avoided.

Applying & Curing

Standard packaging of BP20 is a 400ml SBS (side by side) cartridge, respectively 195ml single (uTAH) cartridge including resin and curing agent, which facilitates easy and accurate application. The cartridges are also an ideal solution for repairs of bondings in the production and especially in operational environment. Besides the cartridges, the material is also available in small drums.





The resin and curing agent components are strongly colored in order to make identification of homogenous mixing possible, especially at the very beginning of the mixing process. BP20 is only to be used with the supplied static mixers which provide good mixing and low loss of pressure. The tip of the mixing nozzle can be cut for an adaptation of the flow rate.

We recommend processing as follows:

- Remove cap nut and plug.
- Squeeze out material until hardener and resin are on same level.
- Attach mixer and secure with cap nut.
- Reject the first 5-15 grams until color is homogenous.

Open time and processing times must be checked with the required bonding geometry, surface and environmental temperatures, humidity and peel ply in production.

The recommended temperature for application is between 15 and 30°C. Higher temperatures are possible but will shorten pot life. A temperature increase of 10°C will halve the pot life. At low temperatures reactivity is low, but viscosity will increase which especially will be noticed when working with a manual cartridge press.

Storage

We recommend storage at temperatures between 15-30 °C without exposure to direct sunlight. Please note that exposure to sun light, especially over longer time, can lead to color changes especially for the curing agent which however has no known effect on the processing and final properties of the product. BP20 shows no tendency to crystallize but lower temperatures will make processing more difficult.

In originally packed and closed cartridges the materials have a shelf life of minimum 4 years.

Due to selected raw materials, we expect minimal problems concerning skin irritation and allergies during processing. The relevant industrial safety regulations for the handling of epoxy resins and hardeners are to be observed.

TYPICAL PROPERTIES

Property	Unit	Resin BPR20	Curing Agent BPH20
Color		Yellow	Blueish-Green
Density ¹⁾	g/cm ³	1.21	1.14
Viscosity ²⁾	Pa·s	20	70
Mixed Density ¹⁾	g/cm ³	1.19	
Gel time ³⁾	min	100	
Pot life ⁴⁾	min	15	
Ultimate T _G ⁵⁾	°C	> 85	

These are typical values and should not be construed as specifications.

Measuring conditions:

- 1) measured at 23°C
- 2) measured at 25°C, rotational viscometer, shear rate 50 s⁻¹, plate 25mm, gap 0.5mm
- 3) measured at 20°C, rotational viscometer, oscillating measurement, gap 5mm
- 4) 100g mixture of BPR 20 and curing agent in water bath at 30°C
Pot life is a standardized lab test under fixed conditions which does not necessarily reflect real process conditions.
- 5) DSC, midpoint, 20K/min

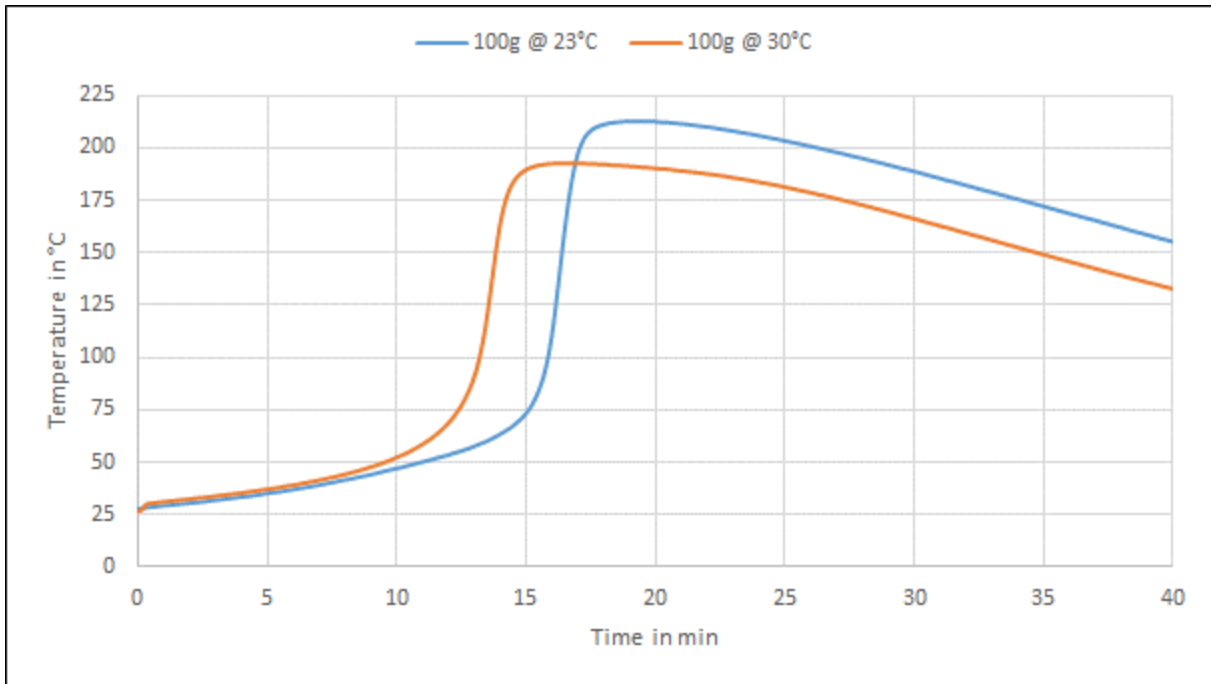
MIXING RATIO

	Parts curing agent BPH20 per 100 parts resin BPR20
Parts by weight	45 ± 2
Parts by volume	50 ± 2

The cartridges are already prepared with the correct mixing ratio.

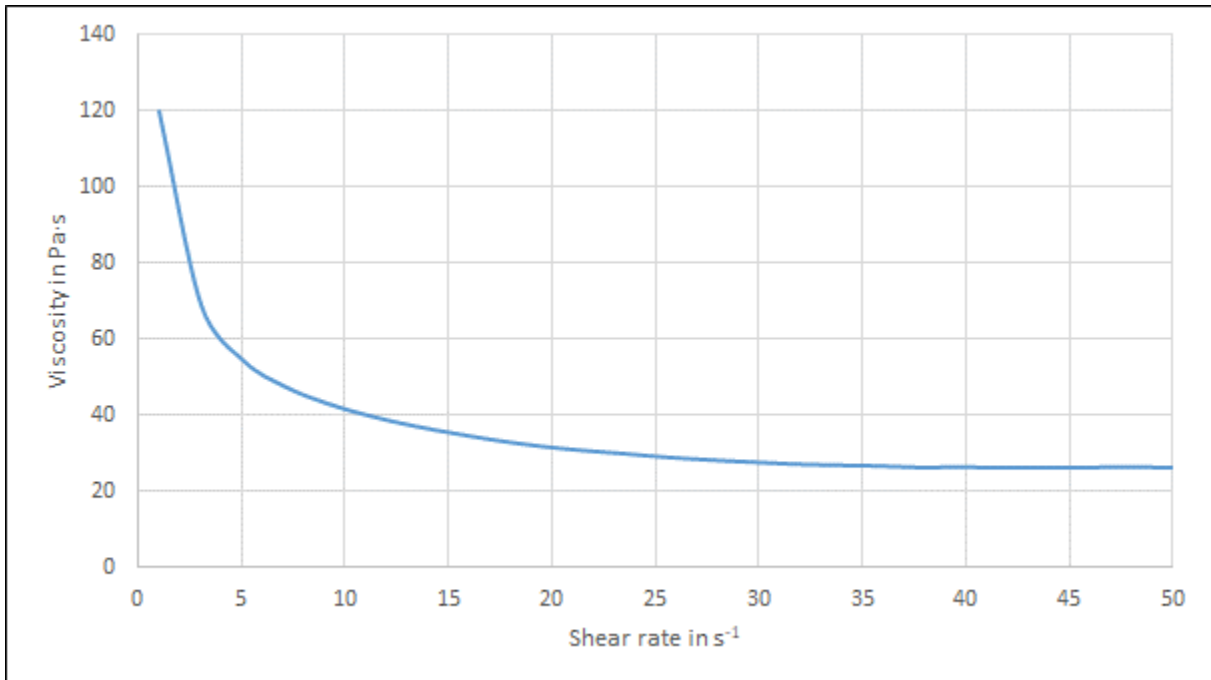
In case the material is used in small drums, the mixing ratio stated must be observed very carefully and resin and curing mixed very thoroughly. Adding more or less curing agent will not result in a faster or slower reaction, but in incomplete curing which can't be corrected in any way.

TEMPERATURE DEVELOPMENT



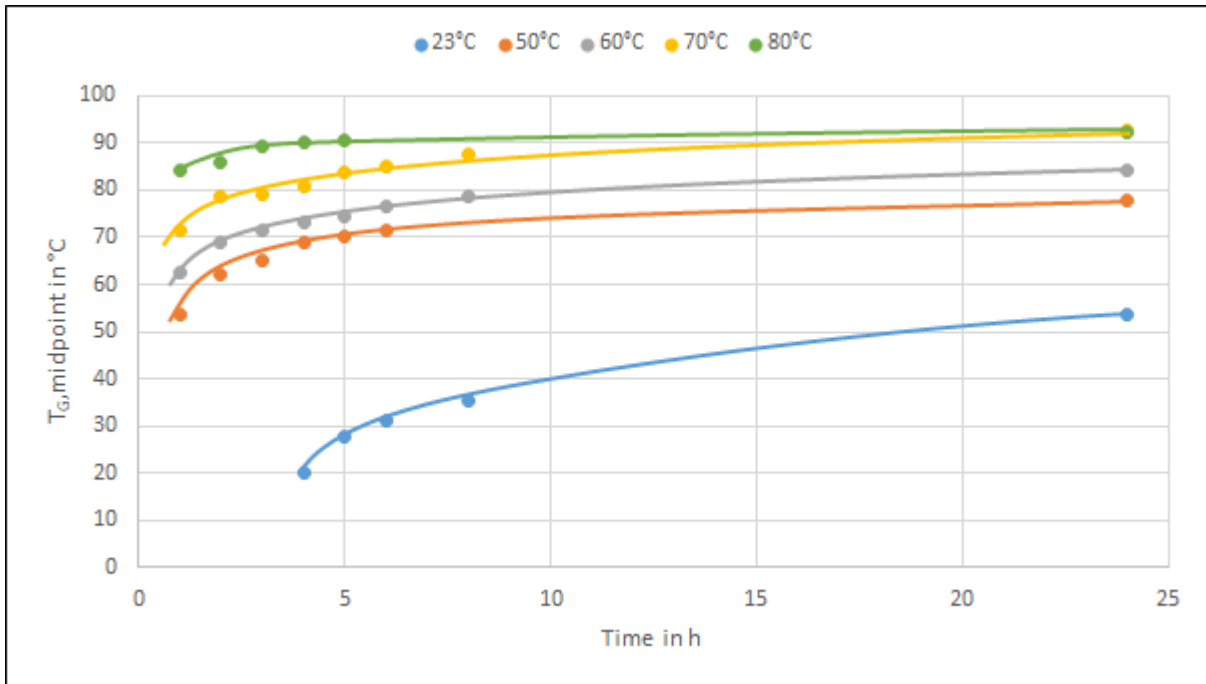
Measuring conditions: 100g of mixture at indicated temperature

VISCOSITY



Measuring conditions: Rotational viscometer, 25mm plate, gap 0.5mm

T_g DEVELOPMENT



Measuring conditions: DSC-measuring heat rate: 20°C/min, sample mass 10-20 mg

MECHANICAL DATA

Single lap shear test¹⁾ DIN EN ISO 1465	Bond line [mm]	0.5	3.0
	Lap Shear Strength¹⁾ [MPa]	~ 32	~ 17
Peel strength DIN EN ISO 11339	> 2 N/mm		
Tensile test²⁾ DIN EN ISO 527-2	Tensile strength [MPa]	~ 63	
	Tensile modulus [GPa]	~ 3.5	
	Tensile strain at break²⁾ [%]	~ 2.7	
All specimens cured 5h 80°C			

1) Lap shear Strength strongly depends on specimen configuration, especially laminate thickness

2) Tensile strain at break results strongly depends on specimen quality, especially void content

All tests accomplished at standard climate

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