MGS BP10
EPIKOTE™ Resin MGS BPR20
EPIKURE™ Curing Agent MGS BPH10

CHARACTERISTICS

Approval	DNVGL in preparation
Application	Fast setting bondings and repairs on composite structures
Operational temperature	-40°C up to 60°C after post-cure
Processing	at temperatures above 5°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

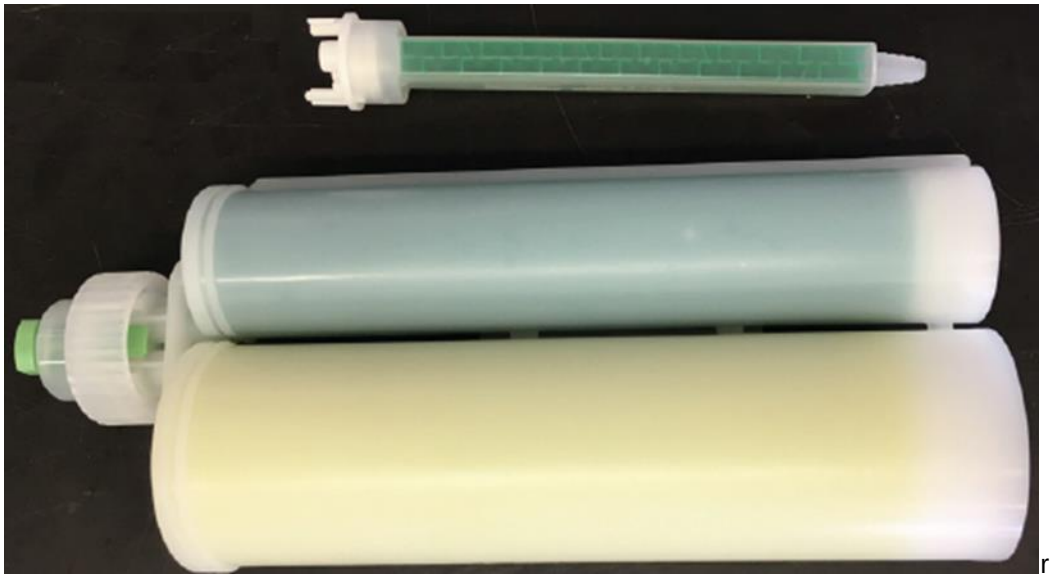
BP10 is a solvent-free epoxy-based bonding paste which was especially developed for fast setting bondings in composites applications and for bondings of composites. Performance on metal surfaces should be thoroughly tested in the individual application.
BP10 has a good degree of cure even at lower ambient 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 BP10 is a 470ml 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.
BP10 is only to be used with the supplied static mixers which provide good mixing and low pressure loss. The tip of the mixing nozzle can be cut for an adaption of the flow rate.

 r

The resin and curing agent components are strongly pigmented in order to make identification of correct mixing possible, especially at the very beginning of the mixing process.

We recommend processing as follows:

- Before use, cartridge should be conditioned at 20°C to 25°C.
- 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 5°C and 23°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 5 - 23 °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.

BP10 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 BPH10
Color		Yellow	Blueish-Green
Density[1)]	g/cm³	1.21	1.16
Viscosity[2)]	Pa·s	20	14
Mixed Density[1)]	g/cm³	1.17	
Pot life[3)]	min	8	
Ultimate T_G[4)]	°C	> 82	

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

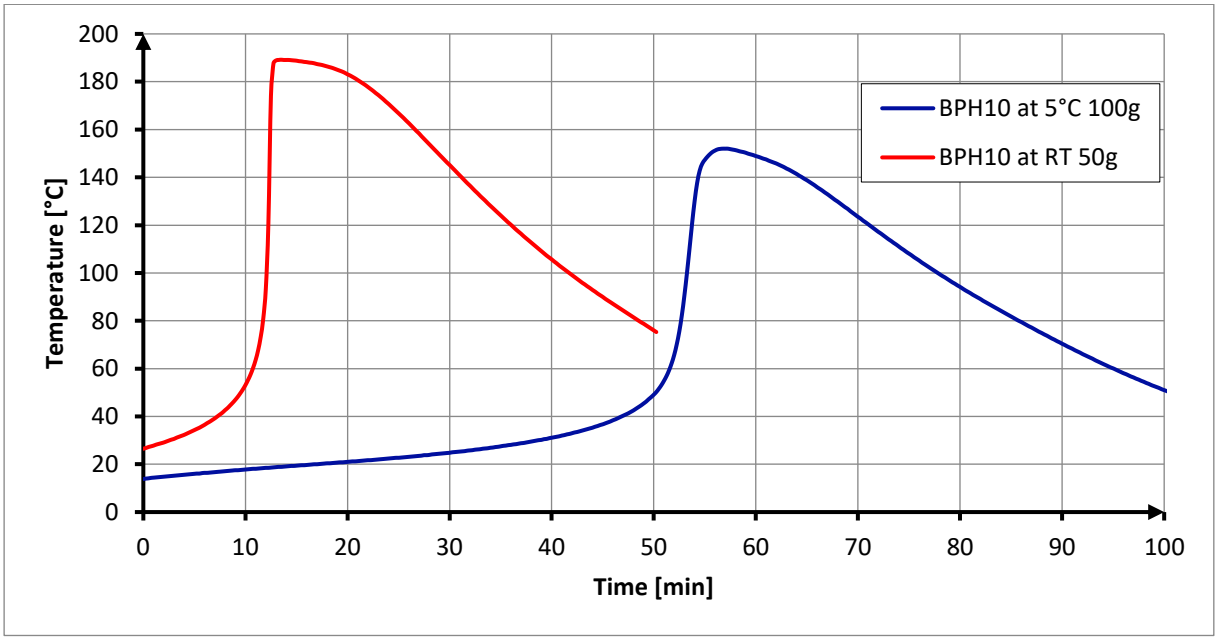
Measuring conditions:
1) measured at 23°C
2) measured at 25°C, rotational viscometer, shear rate 50 s^{-1}, plate 25mm, gap 0.5mm
3) 100g mixture of BPR 20 and curing agent in water bath at 30°C
4) DSC midpoint, 20K/min after a cure of 3h180°C

MIXING RATIO

	Parts curing agent BPH10 per 100 parts resin BPR20
Parts by weight	46 ± 2
Parts by volume	50 ± 2

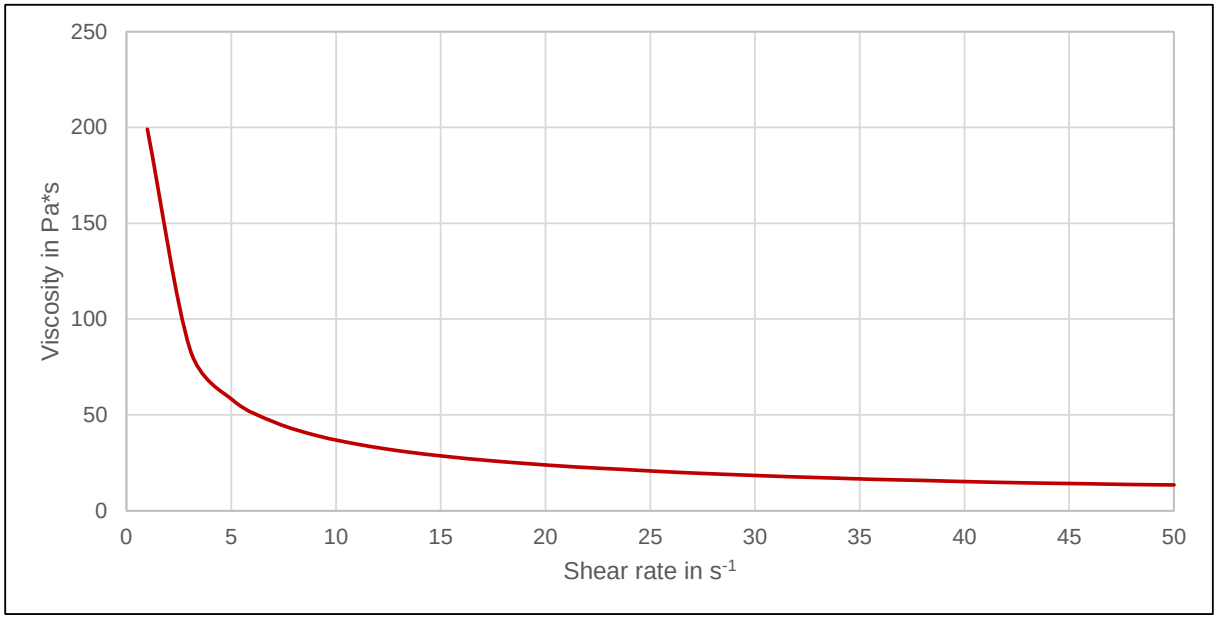
The cartridges are already prepared with the correct mixing ratio.
In case the material is used in small drums, the mixing ratio stated must be observed very carefully and resin and curing mixed very thoroughly. Adding more or less curing agent will not result in a faster or slower reaction, but in incomplete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

TEMPERATURE DEVELOPMENT



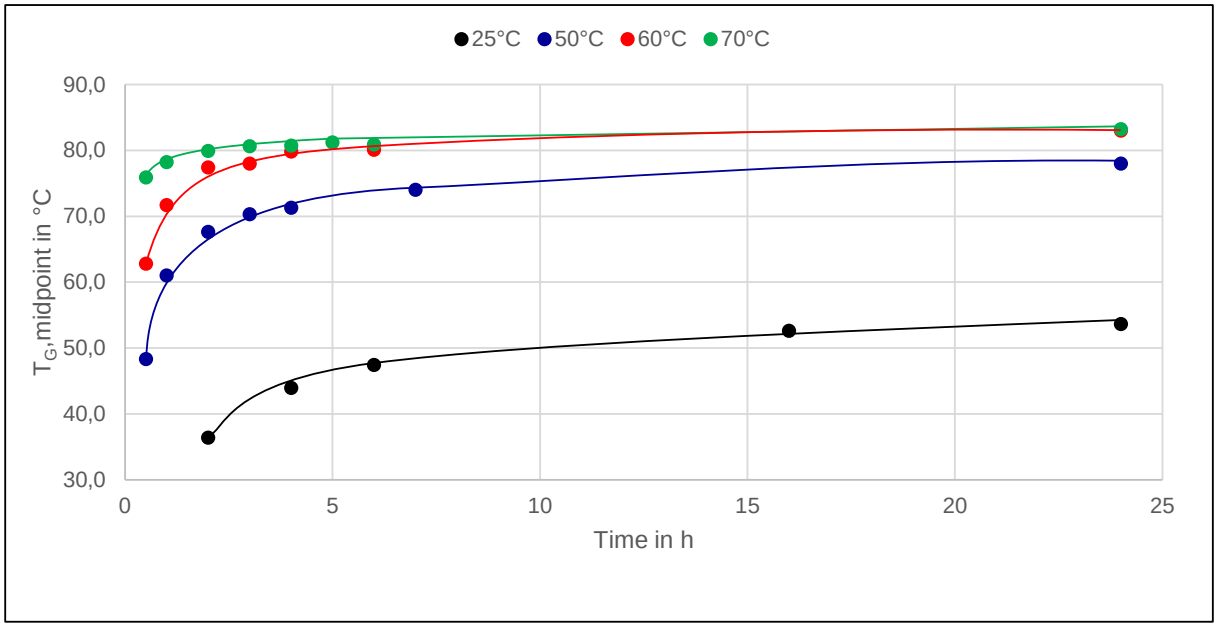
Measuring conditions:
100g mixture conditioned at 5°C and measured in climate chamber at 5°C
50g mixture conditioned at RT and measured in fume hood at RT

VISCOSITY



Measuring conditions:
Rheometer, Parallel plate d=25mm, measuring gap 0.5mm, 23°C

T_G DEVELOPMENT



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

MECHANICAL DATA

Single lap shear test[1)] DIN EN ISO 1465	**Bond line [mm]**	0.5	3.0
	Lap Shear Strength[1)] **[MPa]**	~ 26	~ 15
Peel strength DIN EN ISO 11339	> 2 N/mm		
Tensile test[2)] DIN EN ISO 527-2	**Tensile strength [MPa]**	~ 72	
	Tensile modulus [GPa]	~ 4,4	
	Tensile strain at break[2)] **[%]**	~ 2.6	
All specimens cured 4h 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