POLYPOX®

High performance EP-systems

RTM - RIM - VARIM

Injection resin: POLYPOX E 760

Injection hardener: POLYPOX H 762
POLYPOX H 766

provisional specifications and characteristics

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1 description of the reaction moulding material

1.1 resin character and condition

- Epoxy resin and two epoxy hardeners
- with a very low viscosity and different potlifes
- solvent free and unfilled

1.2 intended application

Resin system to build statically and dynamically high loaded components.
Special high-capacity fiber composite reinforced with glass, carbon and aramid fiber laminate.

1.3 manufacturer

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1.4 trade name

EP-resin:	POLYPOX E 760
EP-hardener:	POLYPOX H 762
	POLYPOX H 766

1.5 storage conditions

The resins and hardeners can be stored in the original closed containers for at least 12 months. Keep cold and dry. In the resin crystalline separations can appear. These are visible by turbidity or solidifications. To restore the liquid source warm it up careful on 50-60°C. If completely clear liquids have formed, the product has to be homogenized and then the resin is useable without reduction in quality again.

1.6 processing

We recommend a processing temperature of at least 20-25°C. Please note that higher room temperature shortens reaction times, as well as at lower temperatures the viscosity of the reacted resin system greatly increases and with it the complete wetting of the reinforcement fabric is made more difficult. The relative air humidity should be below 70%.
Different processing conditions slightly influence the mechanical values of the finished part . (post curing cf. 1.8).

1.7 system modifier – additives and extras

The addition of thixotropic agents like cotton flock, fiber, colloid silica or pigment pastes is possible. Nevertheless, this must be checked thoroughly for every application case by the user.

1.8 curing conditions, post curing

This resin-hardener mix is a cold gelating system. After curing at room temperature (>20°C) the casting is workable and conditionally applicable.
You can improve the mechanical properties especially the heat distortion temperature by post-curing (at 50 – 150°C). The heat distortion temperature can improve from 40-60°C at room temperature curing to 60-90°C by post-curing.

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2 specifications

	POLYPOX® E 760	POLYPOX® H 762	POLYPOX® H 766
Density [g/cm³], 25°C	1,07 ± 0,05	0,96 ± 0,05	0,94 ± 0,05
Viscosity [mPa*s], 25°C	app. 1350	app. 40	app. 14
Epoxide equivalent weight [g/equiv.]	172 ± 10	-	-
Epoxide value [Equiv./100 g]	0,58 ± 0,02	-	-
Amine number [mg KOH/g]	-	app. 535	540 ± 15
H-equivalent weight [g/Equiv.]	-	55	55
Colour number [Gardner]	max. 2	(blue colored)	(blue colored)

Density: DIN EN ISO 1675 (method B)
Viscosity: UPPC-53018
dynamic viscosity (cone-plate)
following DIN 53018 – 76, T1 & T2

Epoxide- and H-equivalent weight:
DIN 16945

3 mixing ratio

	POLYPOX® E 760 : POLYPOX® H 762	POLYPOX® E 760 : POLYPOX® H 766
Parts by weight	100 : 32 ± 2	100 : 32 ± 2
Parts by volume	100 : 36 ± 2	100 : 36 ± 2

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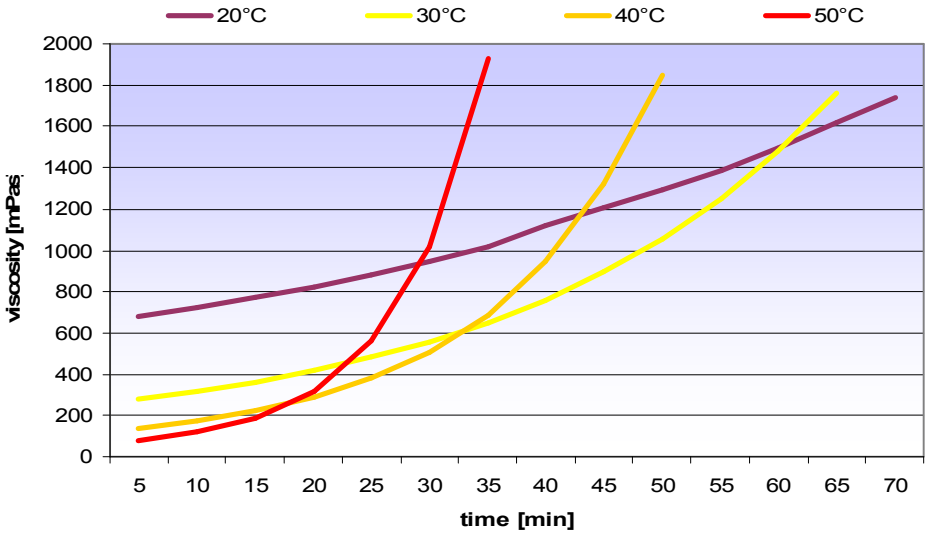
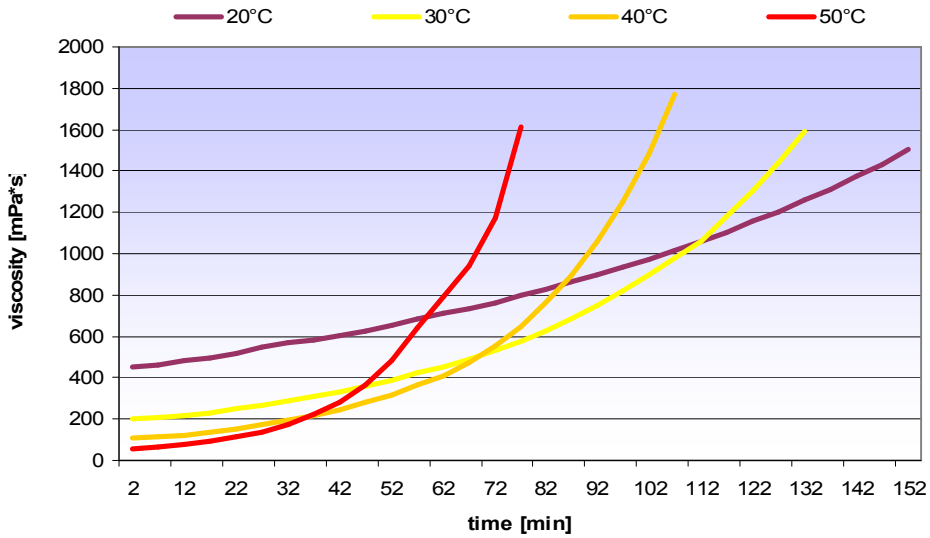
4 mixing viscosity vs. temperature

Method: dynamic viscosity (cone-plate), following DIN 53018 – 76, T1 & T2

POLYPOX E 760 – POLYPOX H 762



POLYPOX E 760 – POLYPOX H 766



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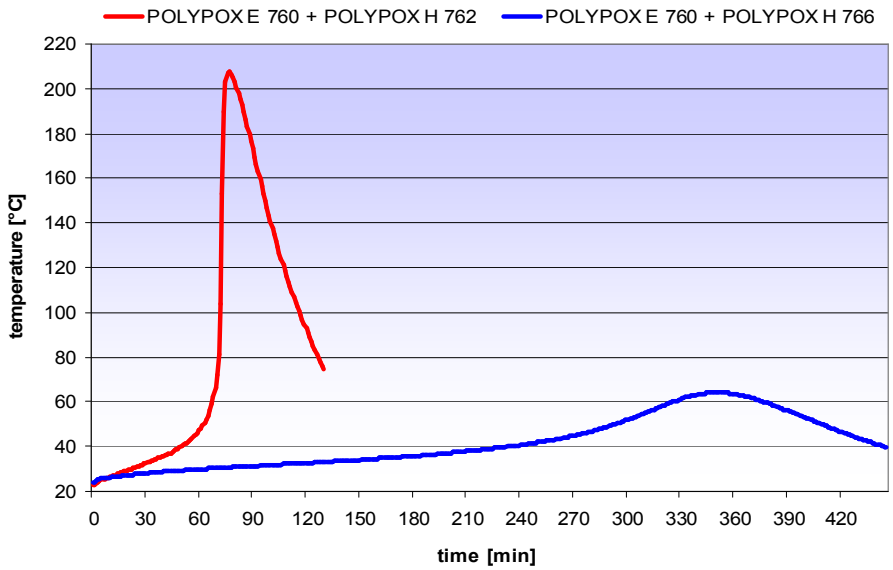
6 characteristic of the reaction

6.1 exothermic processing by UPPC test specification

Paper cup: measurements: Diameter at the bottom 45 mm, -top 70 mm, height 40 mm, tolerance ± 4 mm

Preparation: the resin and the hardener are stoichiometric mixed at a temperature of 23°C.



100 g ± 0,2 g resin hardener mix in the paper cup without isolating at 23°C room temperature. The measuring point is in the centre.

	POLYPOX®	
	H 762*	**H 766***
time to T_{max} [min]	80	350
T_{max} [°C]	210	65

* with POLYPOX E 760, mixing ratio 100 : 32 parts by weight

6.2 pot life and gel time

measuring instrument: Gelnorm®-Gel Timer TC (Gel Instrumente AG, CH-8800 Thalwil)

	POLYPOX®	
	H 762**	**H 766****
t [min], 23 °C	app. 70	app. 320

**100 g ± 0,2 g resin hardener mix in a paper cup without isolating at 23°C room temperature. The measuring point is in the centre.

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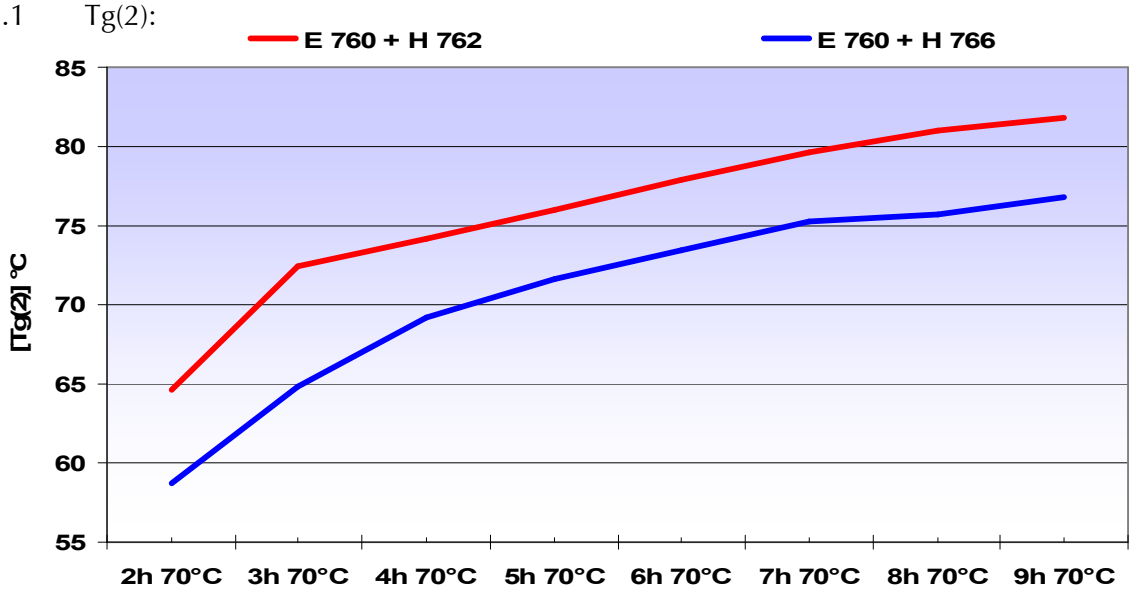
7 glass transition temperature

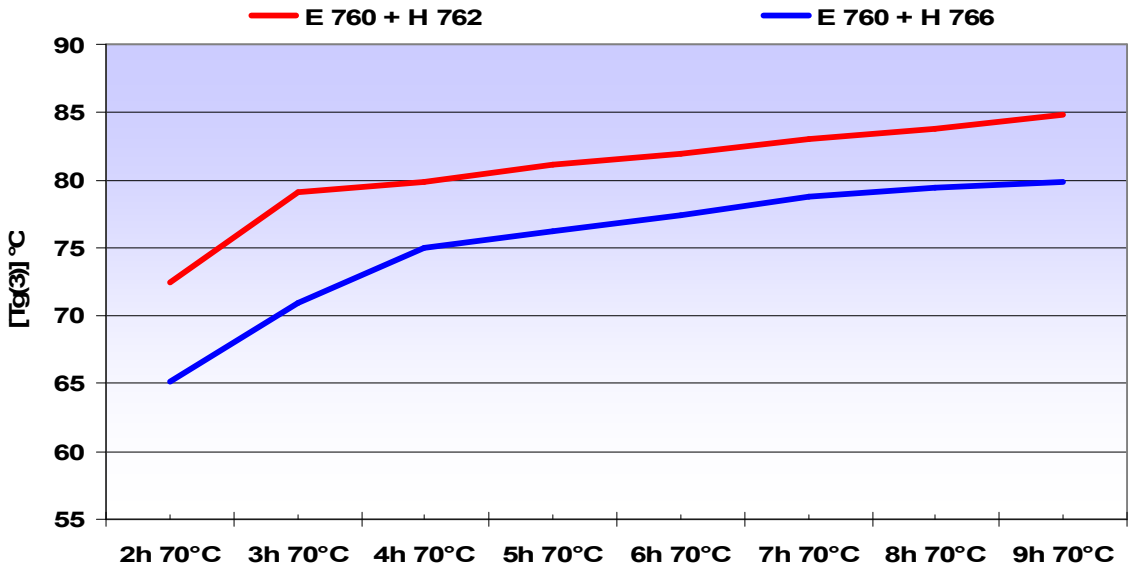
measuring instrument: Mettler Toledo (CH-Schwerzenbach), DSC822[e]
measuring principle: Dynamic Differential Calorimeter (DSC) following DIN 65467, part A, increase in temperature 10 K/min.

7.1 glass transition Tg in dependence on the curing conditions

7.1.1 Tg(2):



7.1.2 Tg(3):



7.2 Tg – potentially

With injection resin POLYPOX E 760 prove the hardeners POLYPOX H 762 – H 766 potential glass transition temperatures (postcuring: 10 min, 180°C) from 80 °C to 90 °C.

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8 water absorption of the cured casting resin

DIN ISO 175-2

Test piece: 50 mm x 50 mm x 4 mm; 23 °C; storage in desalinated water.
Tempered: 120 h , 60 °C

	POLYPOX®	
	H 762*	**H 766***
$W_{3L\ (23°C/168h)}$ [%]	0,4	0,5

* with POLYPOX E 760, mixing ratio 100 : 32 parts by weight

9 mechanical data of the unreinforced cured casting resin

- tensile test:
  tensile strength/ elongation at break/ tensile modulus of elasticity
  DIN EN ISO 527-2; test body 1B; 6 pieces per test
- flexural test:
  flexural strength, flexural modulus of elasticity
  DIN EN ISO 178; 6 pieces per test

9.1 curing conditions: 10 h, 80°C

	POLYPOX®	
	H 762*	**H 766***
tensile strength, s [MPa]	75-85	60-70
elongation at break, e_b [%]	4-5	5-6
extension, ε_{max} [%]	4-5	4-5
tensile modulus of elasticity, E_f [MPa]***	3500-4000	2900-3100
flexural strength, sf [MPa]	100-120	100-110
flexural modulus of elasticity, E_f [MPa]	3500-4000	2800-3000

* with POLYPOX E 760, mixing ratio 100 : 32 pbw
*** tested with v= 5 mm/min.

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9.2 curing conditions: 5 h, 50°C

	POLYPOX®	
	H 762*	**H 766***
tensile strength, s [MPa]	70-80	70-80
elongation at break, e_b [%]	4-5	3-4
extension, ε_{max} [%]	2-3	3-4
tensile modulus of elasticity, E_f [MPa]***	3600-3900	3500-3800
flexural strength, sf [MPa]	110-120	100-110
flexural modulus of elasticity, E_f [MPa]	3100-3500	3200-3400

* with POLYPOX E 760, mixing ratio 100 : 32 pbw
*** tested with v= 5 mm/min.

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10 protection of labour in contact with epoxy reaction moulding material

UPPC AG provides its customers with a product specific Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) to cover potential health effects, safe handling, storage, use and disposal information. UPPC strongly encourages its customers to review the MSDS or SDS on its products and other materials prior to their use.

Most epoxy products are hazardous and show more or less a noxious potential. The most important factor in dealing with epoxy systems is the avoidance of direct skin contact, or inhaling of steam during processing.

10.1 technical and organisational safety precautions

- Work with a fresh air supply (window and doors open), or effective exhaust device in steam and dust emission
- Avoid spraying whilst bottling and pouring, or while mixing of the components ,avoid spraying
- After addition of the hardener, process quickly, because while hardening high temperatures can be reached
- Do not splash on hot surfaces do not splash
- Do not leave containers to stand open
- Arrange a washing facility in the working area
- Provide an ocular shower or ocular rinse bottle provide

10.2 personally safety precautions

- Ocular protection: Rack glasses.
  In terms of splashing: tight-fitting protective goggles
- Hand guard: Gloves from: Nitril, butyl rubber.
  While wearing protective gloves, cotton gloves are recommended for wear underneath.
- Skin protection: see hygiene measures
- Breath protection: With spray gun procedure:
  Particle-filtering safety mask (P2).
- Body protection: Body protection (e.g., plastic apron and facial protection or better chemicals protection suit) must be carried on application in the injection procedure!

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10.3 hygienic measures

- Store no food in the working area, as well as neither eat, drink, sniff nor smoke!
- Avoid contact with eyes, skin and clothes!
- After ending work and before breaks clean hands thoroughly!
- Remove epoxy resin from the skin only with a suitable cleaning agent.
- By no means use solvents for skin cleaning!
- Use Skin care products before/during and after work!
- Change and clean dirty clothes!
- Dirty protective gloves are to be thrown away!

10.4 first aid

- With every first aid measure: Follow self protection and immediately inform doctor.
- After eye contact: wash immediately for15 minutes under running water with spread eyelids, or use an ophthalmic irrigation flask to rinse. Always visit an ophthalmologist!!
- After skin contact: Take off immediately dirty clothes. Clean with a lot of soap and water .Use no solvents!
- On inhaling: Fresh air!
- On swallowing: No release vomiting, give nothing to drink
- First aid assistant: A trained first aid assistant must be named by the production management and be communicated all employees

Any technical recommendations given by us whether orally or in writing are not binding on us, also with regard to any rights of third parties. Prospective users should conduct their own trials to determine whether our products are suitable for the intended purpose. Our liability is governed by our general conditions of sale

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