

KTP 83x Powder hardener Ultra slow epoxy system

KTP 83x hardeners features

- Designed for ultra slow systems or one component (1K) application
- Powder form
- Minimum cure @ 80 °C
- Clear resin after cure
- No Toxic / CMR components
- Epoxy resin + KTP 83x blends are non thixotropic low viscosity liquids
- Suitable for filament winding, bonding, preg process

Epoxy resin SR 1480

Appearance		Liquid	
Shelf life		2 years @ 20°C	
		Will not cristalize	
Viscosity (mPa.s)	@ 15 °C	2500 ± 500	Rheometer CP 50 mm Shear rate 10 s ⁻¹
	@ 20 °C	1400 ± 280	
	@ 25 °C	850 ± 160	
	@ 30 °C	500 ± 100	
	@ 40 °C	220 ± 45	
Density	@ 20 °C	1,15	Pycnometer ISO 2811-1

Hardeners KTP 83x

	KTP 835	KTP 833	KTP 831	
Aspect	White powder	White powder	White powder	
Relative reactivity	Fast	Standard	Slow	
Density	@ 20 °C	0,2	0,2	Pycnometer ISO 2811-1

Blends SR 1480 / KTP83x

		SR 1480 / KTP 835	SR 1480 / KTP 833	SR 1480 / KTP 831	
Mixing Ratio by Weight		100 / 13,5	100 / 13,5	100 / 13,5	
Aspect		White liquid	White liquid	White liquid	
Relative reactivity		Fast	Standard	Slow	
Viscosity (mPa.s)	@ 15 °C	7650	6 100	6400	Rheometer CP 50 mm Shear rate 10 s ⁻¹
	@ 20 °C	4800	4 000	4200	
± 20 %	@ 25 °C	3300	2 800	3100	
	@ 30 °C	2500	2 100	2400	
	@ 40 °C	1700	1 500	1700	
Density	@ 20 °C	1,1230	1,1786	1,1787	Pycnomètre ISO 2811-1 DIN 51423-2
Refractive index uncured	@ 25 °C	1,5509 ± 0,002	1,5500 ± 0,002	1,5494 ± 0,002	

Storage Stability of Blends

		SR 1480 / KTP 835	SR 1480 / KTP 833	SR 1480 / KTP 831
Storage	Ta < 23 °C	25 days May settle during storage	> 60 days May settle during storage	> 60 days May settle during storage
	@ 40 °C	3 days	10 days	> 20 days

Hot Process Curing Time:

	SR 1480 / KTP 835	SR 1480 / KTP 833	SR 1480 / KTP 831
@ 70 °C	9 h	13 h gel time	/
@ 80 °C	16 h	16 – 24 h	/
@ 90 °C	5 h	8 h	12 h
@ 100 °C	1,5 h	4 h	5 h
@ 120 °C	1 h	2 h	2 h
@ 130 °C	0,5 h	1 h	1 h

Storage & process:

The resin can settle during storage and must be stirred before use.

Avoid exposure to heat during storage and delivery

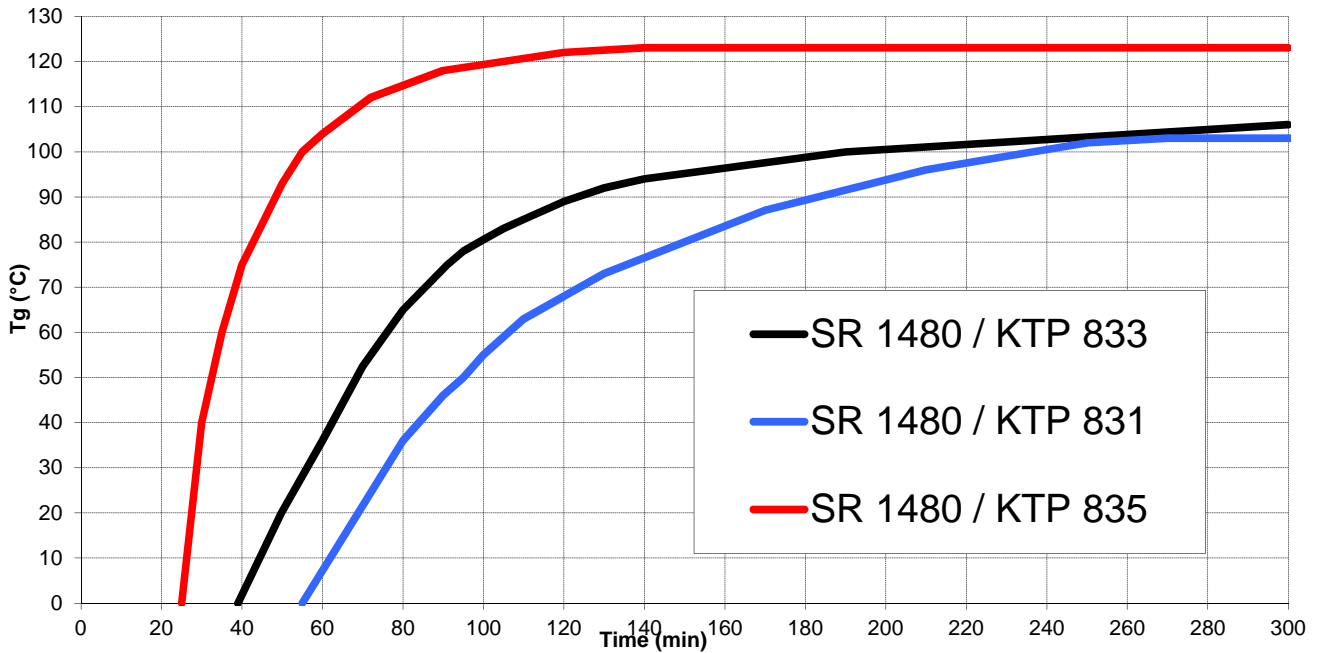
Store in a cool place, at less than 20 °C

Exothermic reaction will occur with 1 cm casting @ 70 °C

The resin viscosity evolves depending on duration of storage and temperature

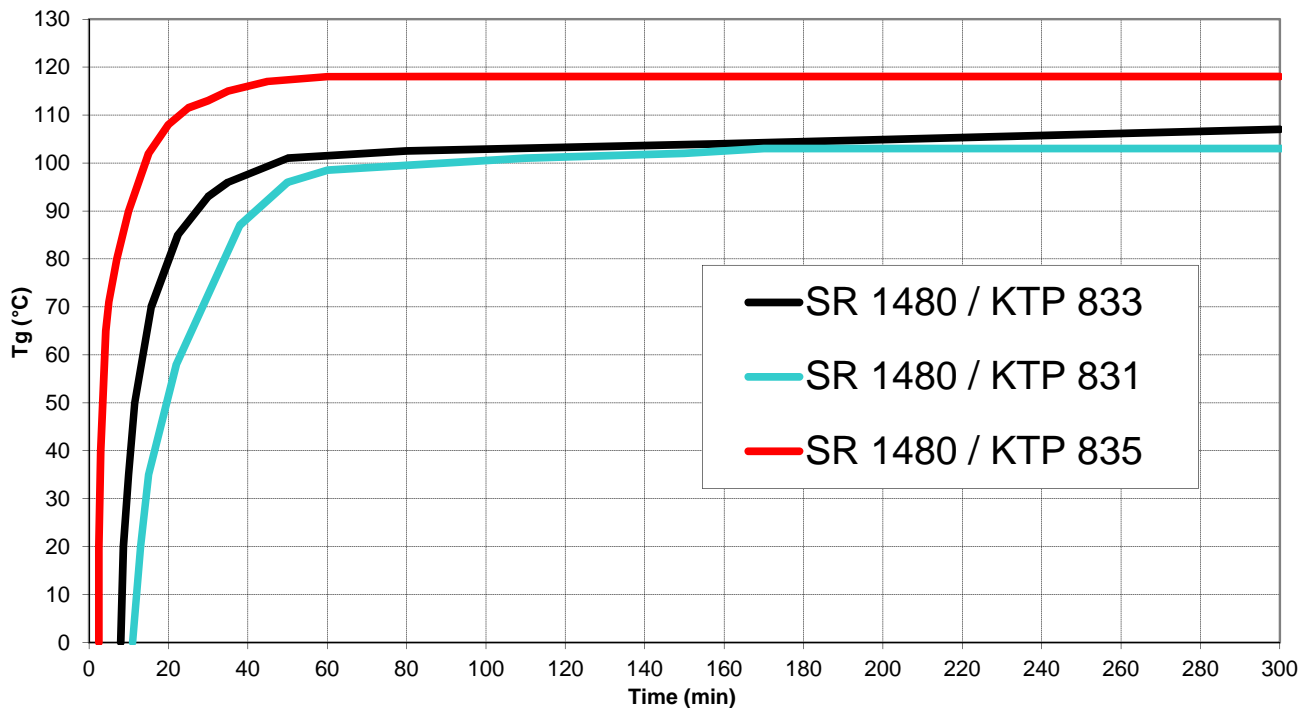
Hot process kinetics: Tg / curing time / @ 100 °C

From ambient temperature up to 100 °C (10 °C / min ramp or 8 min to achieve the curing temperature)



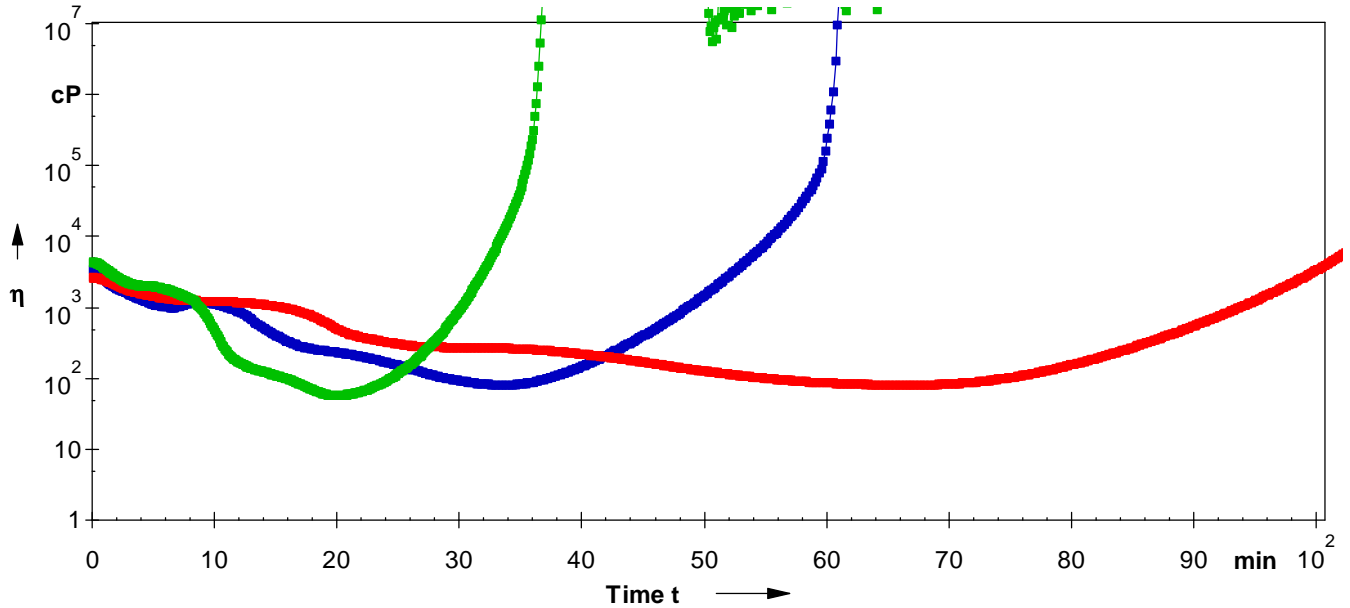
Hot process kinetics: Tg / curing time / @ 120 °C

From ambient temperature up to 120 °C (10 °C / min ramp or 10 min to achieve the curing temperature)



Viscosity evolution of a 1 mm thick layer @ 100 °C:

From ambient temperature up to 100 °C (10 °C / min ramp or 8 min to achieve the curing temperature)

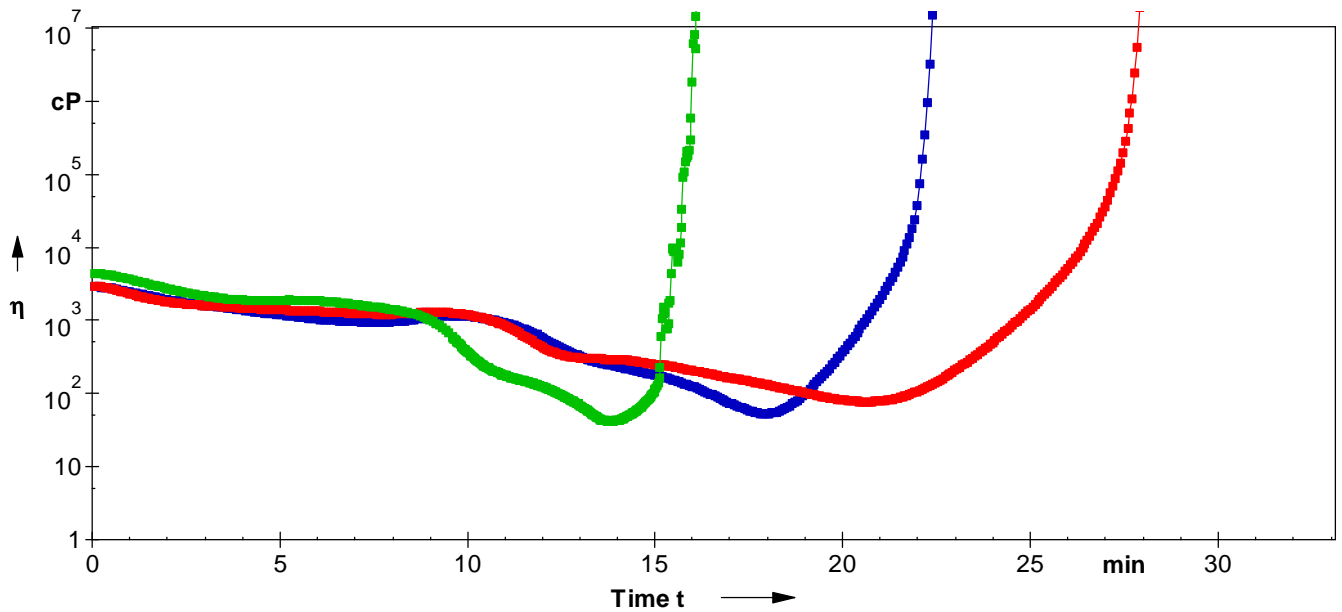


- η Viscosity SR 1480 / KTP 833 @ 100 °C
- η Viscosity SR 1480 / KTP 831 @ 100 °C
- η Viscosity SR 1480 / KTP 835 @ 100 °C

Suivi de réticulation

Viscosity increase for 1 mm thickness film @ 120 °C:

From ambient temperature up to 120 °C (10 °C / min ramp or 10 min to achieve the curing temperature)



- η Viscosity SR 1480 / KTP 833 @ 120 °C
- η Viscosity SR 1480 / KTP 831 @ 120 °C
- η Viscosity SR 1480 / KTP 835 @ 120 °C

Suivi de réticulation

Mechanical Properties of Casted Systems

Curing cycle	SR 1480 / KTP 835			SR 1480 / KTP 833		SR 1480 / KTP 831		
	6 h 80 °C	4 h 100 °C*	2 h 120 °C	4 h 100 °C*	2 h 120 °C	4 h 100 °C*	2 h 120 °C	
Tension								
Modulus of elasticity	N/mm ²	3 600	3 200	3 200	3500	3400	3700	3700
Maximum resistance	N/mm ²	87	91	82	85	86	88	69
Resistance at break	N/mm ²	87	91	81	80	81	86	69
Elongation at max. load	%	4.0	5.5	5.0	3.5	3.5	4.6	2.3
Elongation at break	%	4.2	5.7	5.5	3.8	3.9	5.7	2.3
Flexion								
Modulus of elasticity	N/mm ²	3500	3100	3100	3400	3300	3300	3200
Maximum resistance	N/mm ²	143	145	147	148	145	146	145
Elongation at max. load	%	5.3	5.9	6.1	5.3	6.1	6.0	6.0
Elongation at break	%							
Charpy impact strength								
Resilience	kJ/m ²	23	30	21	19	23	37	31
Glass transition								
Tg 1 / onset	°C	106	129	124	103	106	103	100

* Curing cycle: Temperature ramp 10 °C / min, from ambient temperature (25 °C) until 100 °C or 120 °C

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

Tensile:	ISO 527-2
Flexion:	ISO 178
Compression:	ISO 604
Shear:	ASTM D732-93
Charpy impact strength:	NF T 51-035
DSC glass transition:	ISO 11377-2:1999 -5°C to 180°C under nitrogen gas
	T _{G1} or Onset: 1 st run at 20 °C / min
	T _{G1} maximum or Onset: 2 nd run at 20 °C / min
Glass transition DTMA:	ISO 11357-1 - T _G onset G' Temperature ramp 0 °C to 180 °C @ 2 °C / min
	ASTM D4065 - T _G peak G'' Temperature ramp 0 °C to 180 °C @ 2 °C / min
Density:	ISO 2811-1
Viscosity:	ISO 3219 - Rheometer - CP 50 mm - Shear rate 10 s ⁻¹
Gel time:	Crossing of the G'G'' curves method
Green Carbon content:	ASTM D6866 or XP CEN/TS 16640 Avril 2014

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