



## SR 1710 Injection

### Structural epoxy system for Resin Transfer Moulding

#### Description

Two component epoxy system, specially design for Resin Transfer Moulding processes.( infusion, injection...)  
This system has a very low viscosity and a low reactivity hardener for large parts manufacturing.  
SR 1710 has very high mechanical properties, especially interlaminar shear strength. Excellent retention of the mechanical characteristics in a wet environment. Temperature resistance: Tg1 max = 100°C

#### Epoxy resin SR 1710 Injection

Aspect / colour		Yellow liquid
Viscosity (m.Pas)	@ 20 °C	1300
	@ 25 °C	800
Density (g/cm <sup>3</sup> )	@ 20 °C	1.152
Storage	25°C < ambient Temp. < 30°C	6 months
	10°C < ambient Temp. < 20°C	12 months

Approval n° :   
WP 0320005 HH  
**Germanischer Lloyd**

#### Hardeners

Reactivity type		<b>SD 8822</b> <b>« lent »</b>	<b>SD 8824</b> <b>« standard »</b>
Aspect / colour		Light yellow liquid	Light yellow liquid
Viscosity (m.Pas)	@ 20 °C	21	8
	@ 25 °C	15	6
Density (g/cm <sup>3</sup> )	@ 20 °C	0.935	0.942

#### SR 1710 inj / SD 882x Mix

		<b>SD 8822</b>	<b>SD 8824</b>
Viscosity of the mix (m.Pas)	@ 20 °C	250	205
	@ 25 °C	180	120
Mixing ratio by weight		<b>100 g / 35 g</b>	<b>100 g / 23 g</b>
Mixing ratio by volume		<b>100 ml / 43 ml</b>	<b>100 ml / 28 ml</b>






## Reactivity of the mix SR 1710 inj / SD 882x

		SD 8822	SD 8824
Exothermic temperature (°C) on 500 g mix	@ 20 °C	102	>215
	@ 25 °C	190	> 215
Time to reach the exothermic peak on 500 g mix	@ 20 °C	11 h	2 h 40'
	@ 25 °C	5 h	1 h 20'
Time to reach 50 °C on 500 g mix	@ 20 °C	10 h	2 h 30'
	@ 25 °C	3 h 50'	1 h 10'

## Packaging (in Kg)

Resin <b>SR 1710 Inj.</b>	Hardener <b>SD 8822</b>	Hardener <b>SD 8824</b>
224	8 x 9.8 or 3 x 26.2	8 x 6.44 or 2 x 25.8
28	9.8	6.44
12	4.2	2.76
5	1.75	1.15
2	0.7	0.46

## Safety Data

References	Symbol	Danger	Phrases Risks
<b>SR 1710 Inj.</b>		Xn : Harmful	36/38 22 40 51/53 43
		N : Dangerous for environment	
<b>SD 8822</b>		C : Corrosive	21/22 34 43


EEC Classification in accordance with Annex I of the Directive 67 / 548 / EEC

## Polymerisation

	SD 8822	SD 8824
Time to wait @ 20°C Before post-curing*	20 hours	6 hours
Minimum post-cure cycle	20 hours @ 50°C	24 hours @ 40°C
Advised post-cure cycle	16 hours @ 60°C	8 hours @ 60°C

\*have to be respected in case of thick laminate (> 3 mm).  
Limit the risk of exothermic reaction.

## Mechanical properties on cast resin

Curing cycles 	SR 1710 Inj. / SD 8822			SR 1710 Inj. / SD 8824				
	24 h @ amb.temp + 24 h @ 40 °C	24 h @ amb.temp + 16 h @ 60 °C	24 h @ amb.temp + 4 h @ 80 °C	24 h @ amb.temp + 24 h @ 40 °C	24 h @ amb.temp + 8 h 60 °C	24 h @ amb.temp + 16 h @ 60 °C	24 h @ amb.temp + 4 h @ 80 °C	
<b>Tensile</b>								
Modulus of elasticity	N/mm <sup>2</sup>	3650	3680	3070	3430	3460	3050	2890
Maximum resistance	N/mm <sup>2</sup>	70	85	76	78	88	85	79
Resistance at break	N/mm <sup>2</sup>	70	85	68	77	86	84	78
Elongation at max.load	%	2.2	3.1	5.1	2.8	4.6	4.8	5
Elongation at break	%	2.2	3.1	7	3	4.6	5.3	5.7
<b>Flexion</b>								
Modulus of elasticity	N/mm <sup>2</sup>	3740	3720	3420	3390	3390	3350	3140
Maximum resistance	N/mm <sup>2</sup>	115	136	125	127	135	129	126
Elongation at max.load	%	3.5	5.2	5.4	5	5.8	5.7	6.5
Elongation at break	%	3.5	7.3	10.3	6.8	7.6	8.3	8.9
<b>Compression</b>								
Compressive yield strength	N/mm <sup>2</sup>							
Offset compressive yield	%							
<b>Charpy impact strength</b>	KJ/m <sup>2</sup>	17	25	16	13	17	22	20
<b>Glass Transition / DSC</b>								
Tg1	°C	67	87	80	67	81	84	88
Tg1 max.	°C			101				96

Tests carried out on samples of pure cast resin, without prior degassing, between steel plates.

Measures undertaken according to Afnor norms :


Tension: NF T 51-034

Flexion : NF T 51-001

Charpy impact strength: NF T 51-035

Glass transition : Measure by DSC. Tg1: 1<sup>st</sup> point à 10°C / mn, Tg 1 max.: 2<sup>nd</sup> passage 180°C

## Mechanical properties of laminates based on SR 1710 resin

Systems		SR 1710 Inj./ SD 8822		SR 1710 Inj./ SD 8824	
		24h @ amb.temp + 16 h @ 60°C		24h @ amb.temp + 16 h @ 60°C	24h @ amb.temp + 24 h @ 40°C
Curing cycles 					
<b>Laminate</b>					
Reinforcement		3300		3300	3300
Number of layers		15		15	15
Glass content ratio by weight (Wf)		73		75	75
<b>Flexion</b>					
Modulus of elasticity	N/mm <sup>2</sup>	25 700		30000	28500
Maximum resistance	N/mm <sup>2</sup>	690		778	745
Elongation at maximum load	%	3.2		3.2	3.3
<b>Shear strength</b>					
Shear stress	N/mm <sup>2</sup>	63		61	61
<b>Charpy impact strength</b>					
	KJ/m <sup>2</sup>	210		222	223
<b>Water absorption</b>					
	%Weight	+ 0.17		+ 0.15	+ 0.13
	t				
<b>Glass transition</b>					
Tg 1	°C	83		87	71
Tg1 max.	°C	96		95	

### Tests carried out in accordance with AFNOR norms:

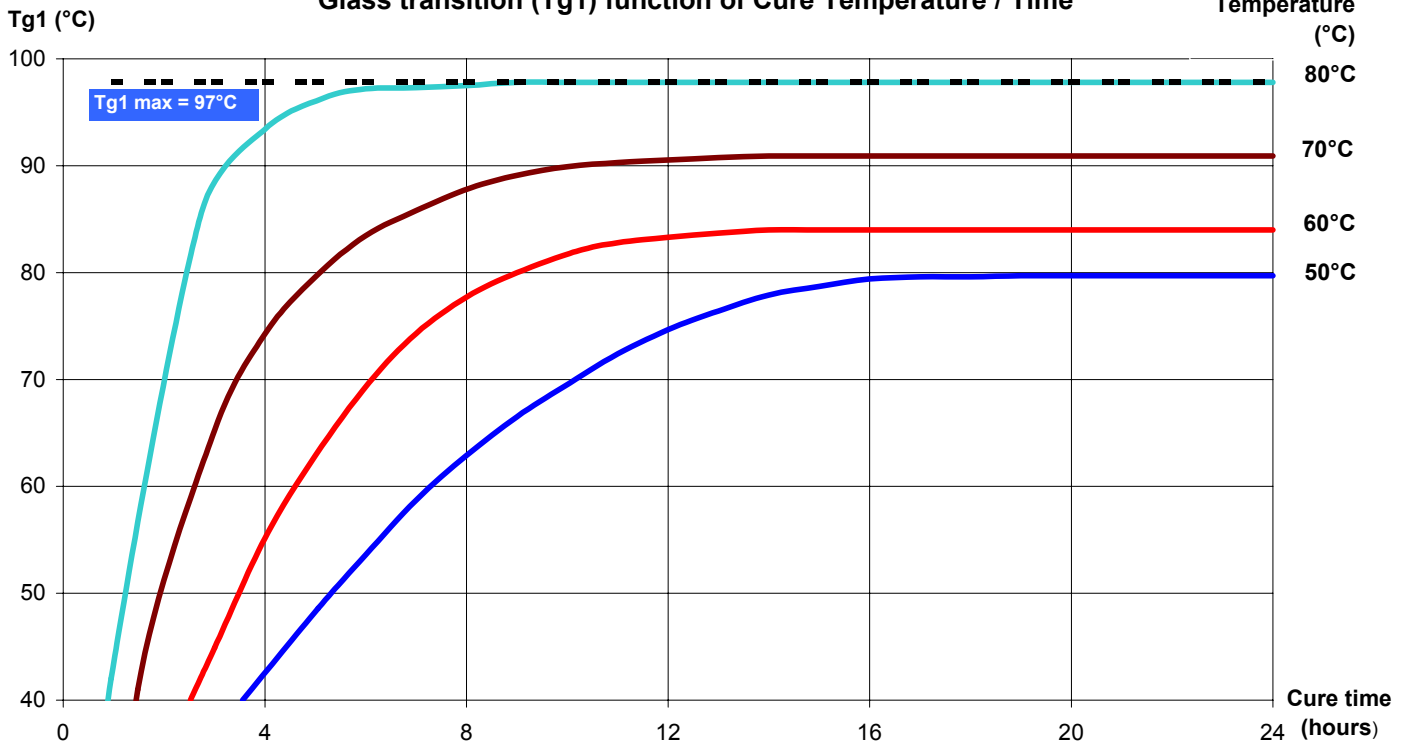
#### Cast resin :

Tension : NF T51-034  
 Flexion : NF T51-001  
 Compression: NF T 51-101  
 Charpy NF T51-501  
 Impact Strength  
 Glass transition: DSC Tg 1 = 1° pt  
 @ 10°C / mn

#### Laminate :

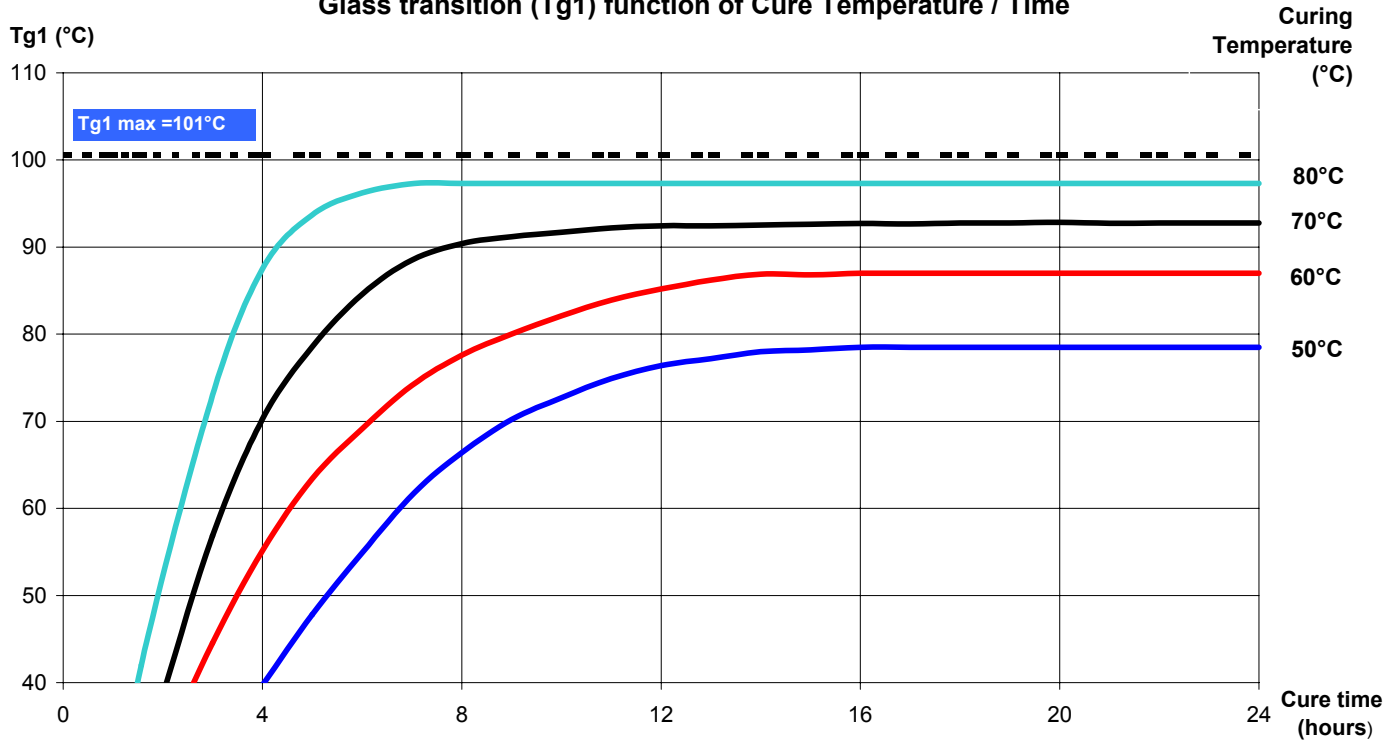
Flexion : NF T57-105  
 Charpy Impact Strength NF T57-108  
 Shear strength 3 NF T 57-104  
 Pts flexion  
 Water absorption Internal. Polymerisation according to cycle, machining, weighting, time spent in distilled water at 70 °C / 48 hours, weighting 1 hour after emerging, drying 24 h at 40°C, weighting, mechanical tests on 10 samples  
 Glass transition: DSC Tg 1 = 1° pt @ 10°C / mn  
 Reinforcement Twill 2/2 E Glass, weight 300 g/m<sup>2</sup>  
 3300

**Epoxy system SR 1710 / SD 8824**  
**Glass transition (Tg1) function of Cure Temperature / Time**



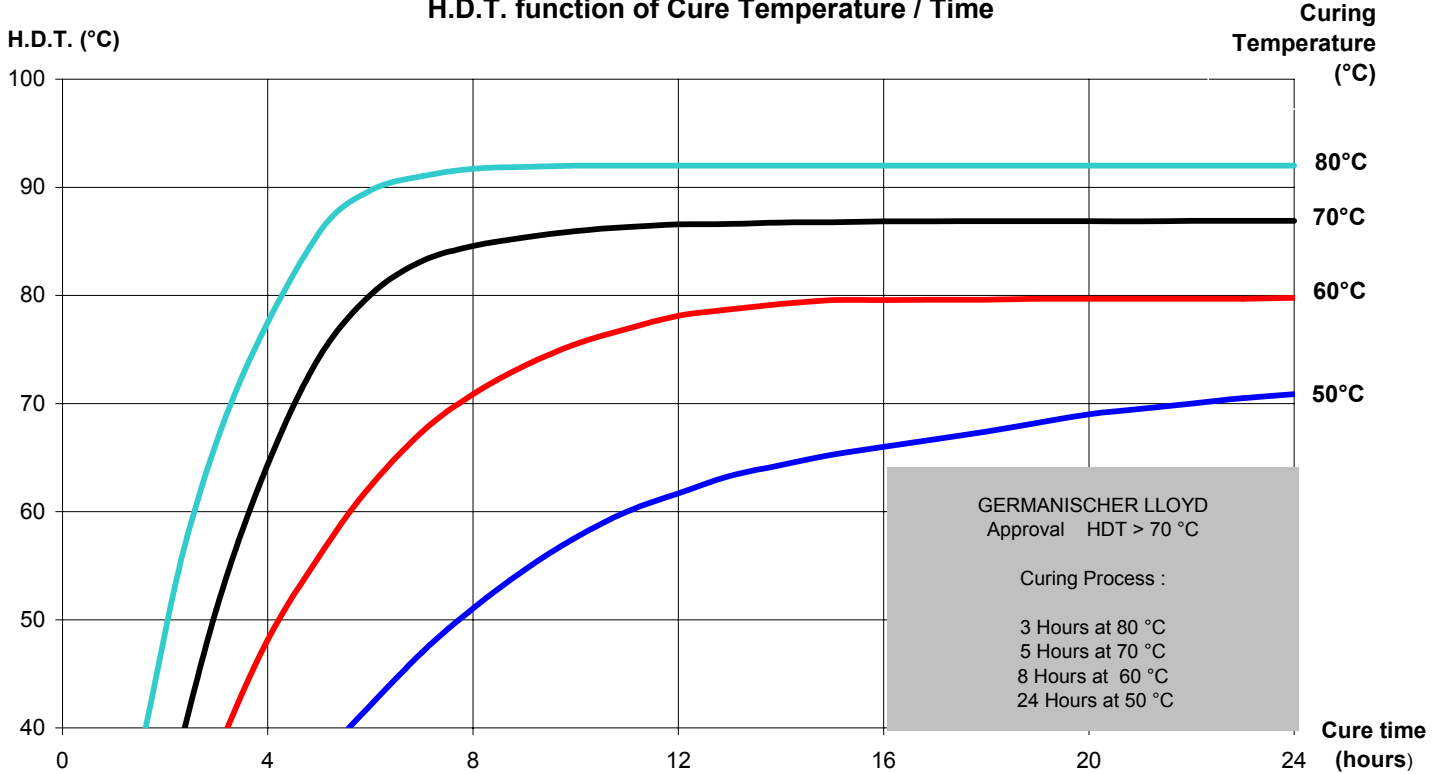
Glass transition measured by DSC according to standard ISO 11357-2 : 1999.  
 Tg1 : 1<sup>st</sup> point at 20°C/mn (Onset method) - Tg1 max : second run -5°C/180°C under N<sub>2</sub>

**Epoxy system SR 1710 / SD 8822**  
**Glass transition (Tg1) function of Cure Temperature / Time**



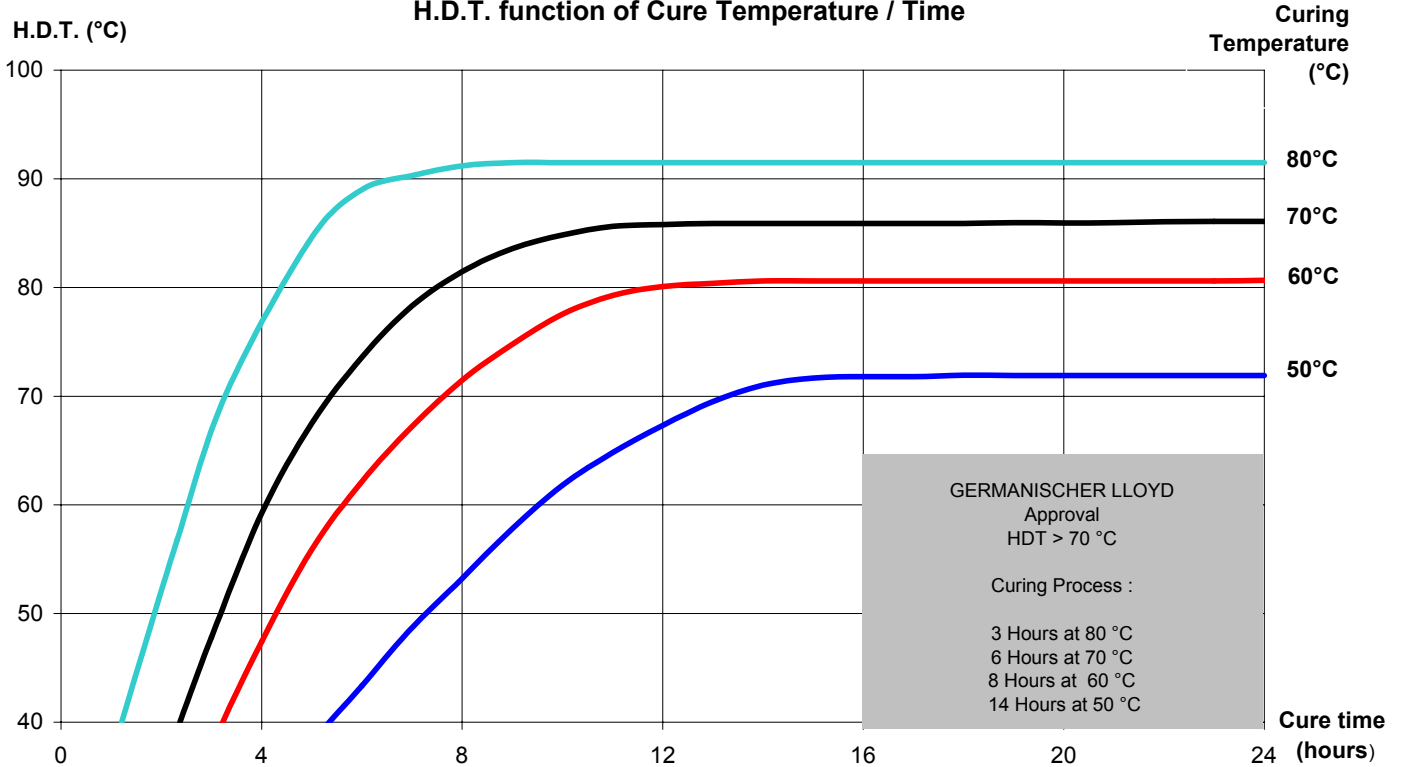
Glass transition measured by DSC according to standard ISO 11357-2 : 1999.  
 Tg1 : 1<sup>st</sup> point at 20°C/mn (Onset method) - Tg1 max : second run -5°C/180°C under N<sub>2</sub>

**Epoxy system SR 1710 / SD 8822**  
**H.D.T. function of Cure Temperature / Time**



HDT : (Heat Deflection Temperature) according ISO 75-2 : 1993 (F)

**Epoxy system SR 1710 / SD SD 8824**  
**H.D.T. function of Cure Temperature / Time**



HDT : (Heat Deflection Temperature) according ISO 75-2 : 1993 (F)