



Technical Data Sheet

NM Laminering 625

Utg: 2011-04-21

Ers: 2011-05-09

Rev: 2011-05-18

General Description

NM Laminering 625 is an optimized epoxy system with high Tg, good wetting, very high strength and very low vapor pressure.

NM Laminering 625 can be used for injection, but is optimized for hand lay-up.

NM Laminering 625 has a very low vapor pressure and therefore, the system is almost odorless. Vacuum gives no gas.

Curing can be done at room or at elevated temperature. Post curing should proceed earliest after one day at room temperature.

Processing Instructions

The mixture of components is very important, poor mixing may result in soft spots.

Mix thoroughly in a container, transfer the mixture into a clean container and mix further. Dosage should always be made on a scale with sufficient accuracy or a well calibrated dosage system.

Application is best done with a roller, but can also be done with a brush.

Surface Preparation

Film forming release agent is recommended, for example Marbocote 220. Wax-based release agents are normally not recommended and test should be performed before use of these types.

Curing

NM Laminering 625 should first cure at room-temperature (20 – 23°C / 68 – 73°F) for 12 - 24 hours before post-curing.

A typical curing cycle could be one day at 23°C / 73°F and then a post-cure at 50°C / 122°F for 16 hours, or alternatively four hours at 100°C / 212°F.

It is important that the temperature is ramped up slowly to the final curing temperature. Normal increases are between 0.1 - 0.3°C per minute. It is often a combination of thickness and laminate structure, which determines the speed. The optimum cure cycle must be determined for each case.

NM Laminering 625 can be stored for a longer period at room-temperature and be post-cured later.

NM Laminering 625 can be used in combination with our hardener:

NM Härdare 650 B, approx. 180 min. pot-life.

NM Härdare 650 F, approx. 90 min. pot-life.

NM Härdare 650 M, approx. 120 min. pot-life.

Completion Work

By hand lay-up, it is important that before further treatment as laminating, filling, etc. occurs, it is done when the surface is still tacky.

A dry surface must be sanded to ensure adhesion to the next layer.

Typical Properties

Resin NM Laminering 625
Hardener NM Härdare 650 M

Mixing ratio

Resin – Hardener 100 – 35 by weight
 100 – 42.5 by volume

Density: 1099 kg/m³

Density, Resin: 1160 kg/m³

Viscosity, Resin: 1.5 – 1.7 Pa·s

Appearance, Resin: Clear liquid

Colour (Gardner ISO 4630): ≤2

Density, Hardener: 955 kg/m³

Viscosity, Hardener: 40 – 50 mPa·s

Appearance, Hardener: Clear liquid

Colour (Gardner ISO 4630): ≤3

Mixed viscosity:	at °C / °F	mPa·s
ISO 12058-1	18 / 64	1300 – 1400
	25 / 77	600 – 700
	40 / 104	200 – 250
	60 / 140	50 – 70

Viscosity build up	from °C / °F	mPa·s	minutes
ISO 12058-1	18 / 64	to 1500	15 – 20*
	18 / 64	to 3000	85 – 90*
	25 / 77	to 1500	60 – 70
	25 / 77	to 3000	100 – 110
	40 / 104	to 1500	45 – 55
	40 / 104	to 3000	60 – 70
	60 / 140	to 1500	20 – 25
	60 / 140	to 3000	25 – 30

*The viscosity of the system causes short times at low temperatures.

Pot-life	from °C / °F	minutes
(Tecam, 100 ml, 65% RH)	18 / 64	160 – 180
	25 / 77	110 – 130
	40 / 104	40 – 45

Gel time	at °C / °F	minutes
(Hot plate)	25 / 77	140 – 180
	40 / 104	75 – 95
	60 / 140	25 – 40
	80 / 176	10 – 15
	100 / 212	4 – 6
	120 / 248	2 – 3

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Gel time at 23°C / 74°F

(Thin layers: 0.4-0.7 mm)	Start:	hours
	End:	3 - 4
		5 - 6

Glass transition temperature (DSC, 20 K/min)	Curing	T_G onset, °C	T_G, °C	T_G, °F
	2 days 25°C	49 – 51	51 – 54	124 – 129
	8 days 25°C	58 – 60	60 – 64	140 – 147
	7 days 23°C	56 – 58	58 – 60	136 – 140
	1 month 23°C	58 – 60	60 – 64	140 – 147
	2 months 23°C	59 – 61	61 – 65	142 – 149
	3 months 23°C	60 – 63	62 – 66	144 – 151
	4 months 23°C			
	24 h 23°C + 10 h 40°C	61 – 65	63 – 67	145 – 153
	24 h 23°C + 20 h 40°C	64 – 68	66 – 70	151 – 158
	24 h 23°C + 10 h 50°C	72 – 76	75 – 79	167 – 174
	24 h 23°C + 15 h 50°C	74 – 77	76 – 80	169 – 176
	24 h 23°C + 10 h 60°C	83 – 87	85 – 89	185 – 192
	24 h 23°C + 15 h 60°C	84 – 86	85 – 88	185 – 190
	24 h 23°C + 2 h 80°C	87 – 91	92 – 96	198 – 205
	24 h 23°C + 8 h 80°C	96 – 100	100 – 104	212 – 219
	24 h 23°C + 1 h 90°C	84 – 88	90 – 94	194 – 201
	24 h 23°C + 4 h 90°C	96 – 100	102 – 106	216 – 129
	24 h 23°C + 1 h 100°C	91 – 95	100 – 104	212 – 219
	24 h 23°C + 4 h 100°C	98 – 102	104 – 108	219 – 226

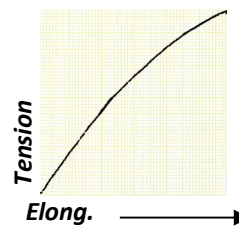
Tensile strength (ISO 527)		Curing:	7 days 23°C	15 h 50°C	8 h 80°C
	Tensile strength	MPa	53 – 54	75 – 78	76 – 79
	Elongation at break	%	2.0 – 2.2	3.7 – 4.2	6.5 – 7.5
	E-modulus	GPa	2.8 – 2.9	2.3 – 2.5	2.2 – 2.4

Flexural strength (ISO 178)		Curing:	7 days 23°C	15 h 50°C	8 h 80°C
	Flexural strength	MPa	72 – 88	133 – 135	124 – 137
	Elongation at break	%	1.8 – 2.2	4.5 – 4.7	4.7 – 5.0
	E-modulus _{Flexural}	GPa	4.3	3.0 – 3.1	2.7 – 2.9

Tension/Elongation at flex.



Tension/Elongation at tension



Water absorption (ISO 62)	Submerged	Curing:	7 days 23°C	8 h 80°C
	4 days 23°C	→	+0.40 – 0.45 %	+0.30 – 0.35 %
	10 days 23°C		+0.63 – 0.68 %	+0.50 – 0.55 %
	30 minutes 100°C		+0.55 – 0.60 %	+0.40 – 0.46 %
	60 minutes 100°C		+0.68 – 0.75 %	+0.60 – 0.66 %

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Properties of cured laminate

Test pieces made of 16 layers of 300 grams E-glass fabric 0/90°. Fibre volume: 45-46%. Cured for 10 at 80°C.

Flexural strength

(ISO 178)

Flexural strength	MPa	Unconditioned	580 – 620
Elongation at break	%		3.8 – 5.0
E-modulus _{Flexural}	GPa		21 – 25

After 30 days in water at +23°C

Flexural strength	MPa	542 – 550
Elongation at break	%	4.2 – 4.4
E-modulus _{Flexural}	GPa	22 – 23

Tensile strength

(ISO 527)

Tensile strength	MPa	Unconditioned	360 – 390
Elongation at break	%		1.7 – 2.0
E-modulus _{Tensile}	GPa		33 – 39

Normal packing: 27.0 kg
 6.75 kg
 1.350 kg

Cleaning solvent: Acetone

Disclaimer

This product's technical specifications are developed by experience in field and laboratory by us.

We reserve the right to change products as well as data. Current data sheets are available at our website and with us. We cannot assume responsibility for use in areas that we do not know. The user shall always evaluate products for their intended use and we guarantee only the material properties. For every product we offer reference objects separately.