

Product information

VESTALITE® P 311

(PRELIMINARY)

GENERAL DESCRIPTION

VESTALITE® P 311 is a polyurethane based resin formulation specially designed as matrix for fast curing prepreg applications. It gives room temperature stable, dry and non-tacky prepregs, which can be formed thermoplastically at 70 - 100°C and cured at temperatures between 140 and 180°C.

APPLICATION

Uncatalyzed: Developed for Autoclave Technology and lower volume.

Catalyzed: High volume and automated production of structural FRP compounds like leaf springs, body panels and parts of exposed surface applications. Specifically developed for Prepreg Compression Molding (PCM).

BENEFITS

- Suitable for the production of thick parts – very low exothermy
- Fast curing possible / 5 min at 150°C
- Excellent surface quality
- High toughness and ductility
- UV stable
- Storage stable and non-tacky at room temperature
- Automated preforming without binder
- Thermoplastic behavior for preforming

PRODUCT DATA

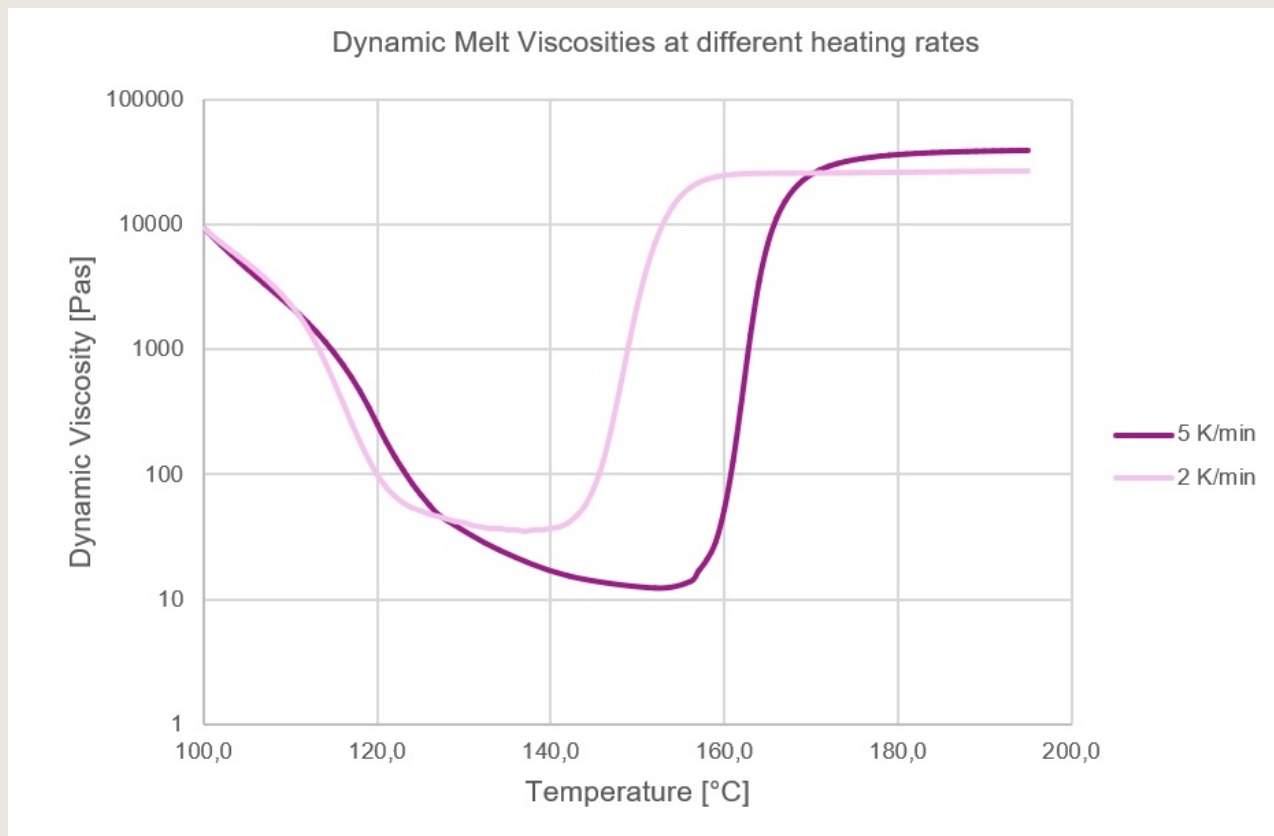
VESTALITE® P 311 Resin System	Value	Unit	Standard
Solids	60 - 65	%	Calculated
Color	0 - 1.5	Gardner	DIN EN ISO 4630
Viscosity at 23°C	200 - 4000	mPa*s	ISO 3219, OECD 114
Exothermic Peak	159 - 168	°C	DSC [10K/min]
Geltime at 140°C	350 - 450	s	Geltimer (Plate)
Shelf Life at 23°C	6 - 8	week	
at -18°C	> 1	year	

RESIN PROPERTIES AFTER PREPREG STEP

VESTALITE® P 311 Resin System	Value	Unit	Standard
Tack	zero		
Volatiles	< 5	%	Weight Constancy
Exothermic Peak	158 - 160	°C	DSC [10K/min]
Shelf Life at 23°C	25	week	
at -18°C	>>1	year	
Curing Conditions:	at 170°C	60	min
	at 180°C	30	
Curing Conditions (catalyzed*):	at 140°C	10	min
	at 150°C	4 - 5	
	at 160°C	3	
	at 180°C	2	

*DBN: 1,5-Diazabicyclo[4.3.0]non-5-ene

VISCOSITY BUILD UP (5K/min)



MATERIAL PROPERTIES

NEAT FORMULATION

Neat Resin properties		Value	Unit	Standard
Tensile Modulus	E_t	3400	MPa	DIN EN ISO 527-2
Tensile Stress at Break	σ_{tB}	85	MPa	DIN EN ISO 527-2
Tensile Strain at Break	ϵ_{tB}	2,3	%	DIN EN ISO 527-2
Poisson's ratio	ν	0,34	-	DIN EN ISO 527-1
Flexural Modulus	E_f	3300	MPa	DIN EN ISO 178
Flexural Strength	σ_{fB}	115	MPa	DIN EN ISO 178
Flexural Strain at Break	ϵ_{fB}	3,6	%	DIN EN ISO 178
Glass Transition Temperature (DSC)	T_g	140	°C	DIN EN ISO 11357-2
Fracture Toughness	K_{Ic}	1.7	MNm ^{-3/2}	ASTM D 5045-99
Chemical Shrinkage		0.9	%	pVT Method
CTE < T_g (20 - 130 °C)	α	60	ppm/k	TMA [1K/min]
> T_g (150 - 190°C)		195		
Density	ρ	1.13	g/cm ³	OECD 109

LAMINATE PROPERTIES

Glass Fiber Reinforced Laminates*		Value	Unit	Standard
Interlaminar Shear Strength (ILSS)	τ_M	80	MPa	DIN EN ISO 14130
Inerlaminar fracture toughness energy	G_{Ic}	2100	J/m ²	DIN EN 6033
Carbon Fiber Reinforced Laminates**				
Interlaminar Shear Strength (ILSS)	τ_M	90	MPa	DIN EN ISO 14130
Interlaminar fracture toughness energy	G_{Ic}	1500	J/m ²	DIN EN 6033

*Reinforcement: Glass Fiber-UD-NCF 591g/m²; Fiber Volume Content: 55 ± 2%

**Reinforcement: Carbon Fiber-UD-NCF 330 g/m²; Fiber Volume Content: 48 ± 2%

SAFETY AND HANDLING

For the most current Safety and Handling information, please refer to the Material Safety Data Sheet of VESTALITE® P 311 Resin.

Marl, December 12, 2019; This data sheet replaces all former issues.

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