

Description

RDN-114 is a high-performance, highly toughened epoxy resin system designed for primary and secondary aerospace structures operating in high-heat and high-humidity environments.

With a flexible cure range of 130°C to 180°C, it achieves a high dry and wet T_g while enabling out-of-autoclave or autoclave processing with porosity levels below 1%.

RDN-114 meets flammability requirements for aircraft interior applications. It passes 12-second and 60-second vertical burn tests with controlled flame propagation, burn length, and after-flame/extinguishment times.

Thanks to its low curing temperature combined with high T_g, excellent mechanical properties, and damage tolerance, RDN-114 provides a compelling solution for reducing manufacturing costs. It allows the use of low-cost tooling, shorter cycle times, lower energy consumption, and overall cost reduction for aerospace structures.

Features & Benefits

- 45 days out life at 21°C
- Flame retardant: FAR 23-25 compliant (12s & 60s vertical burn)
- OOA curing with <1% porosity
- Up to 214°C dry T_g
- High toughened formulation
- Controlled flow
- Excellent tack and drape characteristics
- Hand Lay-up, ATL & AFP suitable prepregs

Neat Resin & Matrix properties

Uncured T_g: (-4) to 3°C

Density: 1.257 g/cm³

Tack: Moderate

Cured Dry T_g (DMA, following a 3h cure @130°C):

- ✓ T_{g, Onset} 153°C
- ✓ T_{g, Peak} 189°C

Cured Wet T_g (DMA, following a 3h cure @130°C) ⁽¹⁾:

- ✓ T_{g, Onset} 130°C
- ✓ T_{g, Peak} 191°C

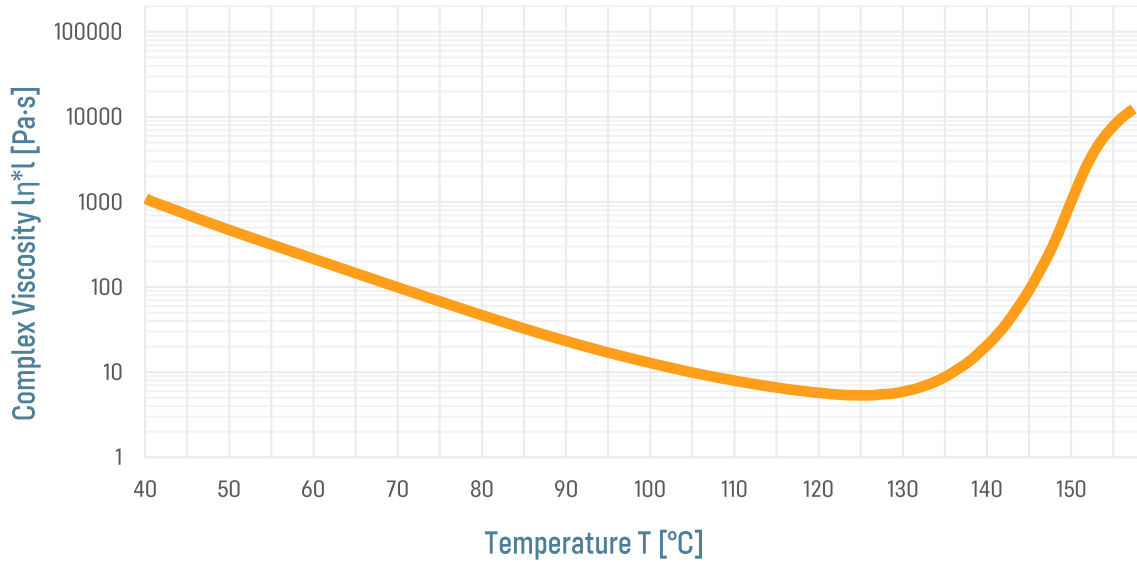
(1) Wet – 14 days immersion in water at 70°C

Cured Dry T_g (DMA, following a 3h cure @130°C + 3h post-cure @180°C):

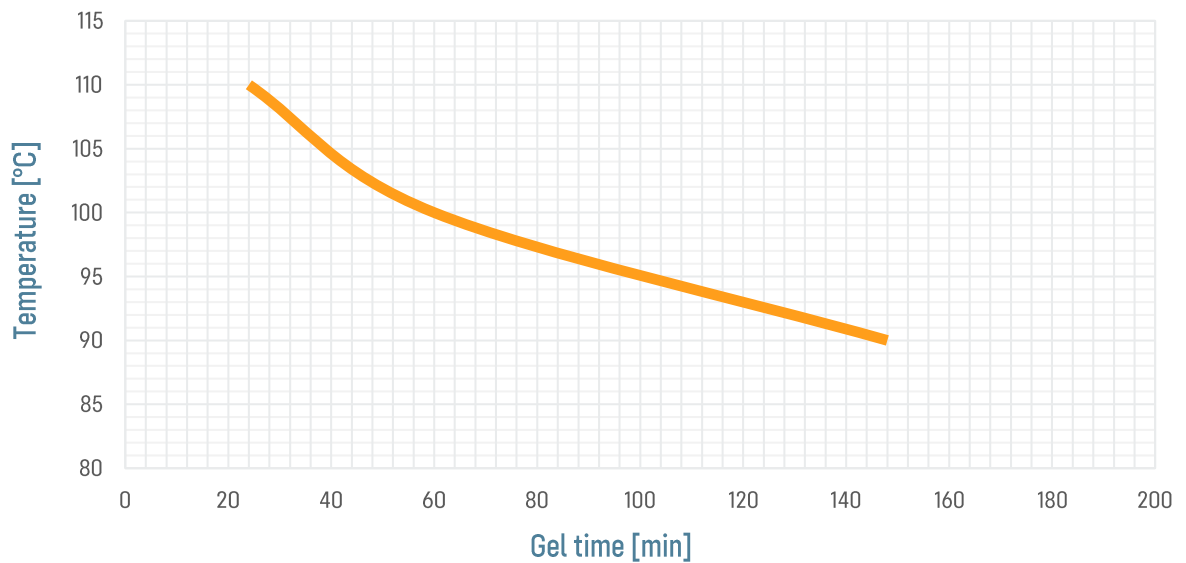
- ✓ T_{g, Onset} 190°C
- ✓ T_{g, Peak} 214°C

Viscosity profile

Dynamic Complex Viscosity of RDN-114 @ 2°C/min



Gel Time



Cure Cycles & Properties

	POSSIBLE CURE CYCLES ⁽²⁾
	100°C – 1 hour + 130°C – 3 hours
T_g dry, Onset °C (DMA)	153
T_g dry, Peak °C (DMA)	189

(2) Temperature must be measured by the lagging thermocouple attached to the part.

Recommended autoclave cure cycle

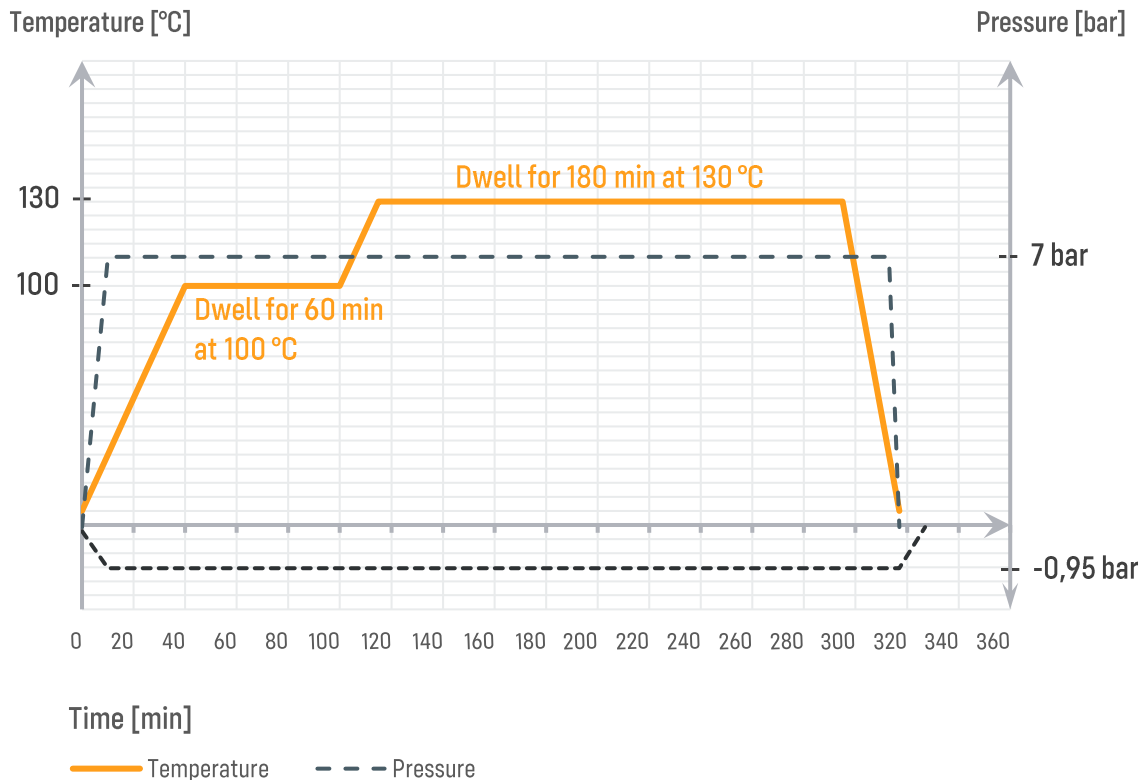
Vacuum bag pressure Minimum of 950mbar

Autoclave pressure 2-7 bar

Ramp rate 1 to 3°C/minute

Recommended cure cycle 60 minutes at 100°C +180 minutes at 130°C

Cool down Maximum of 5°C/minute to 60°C



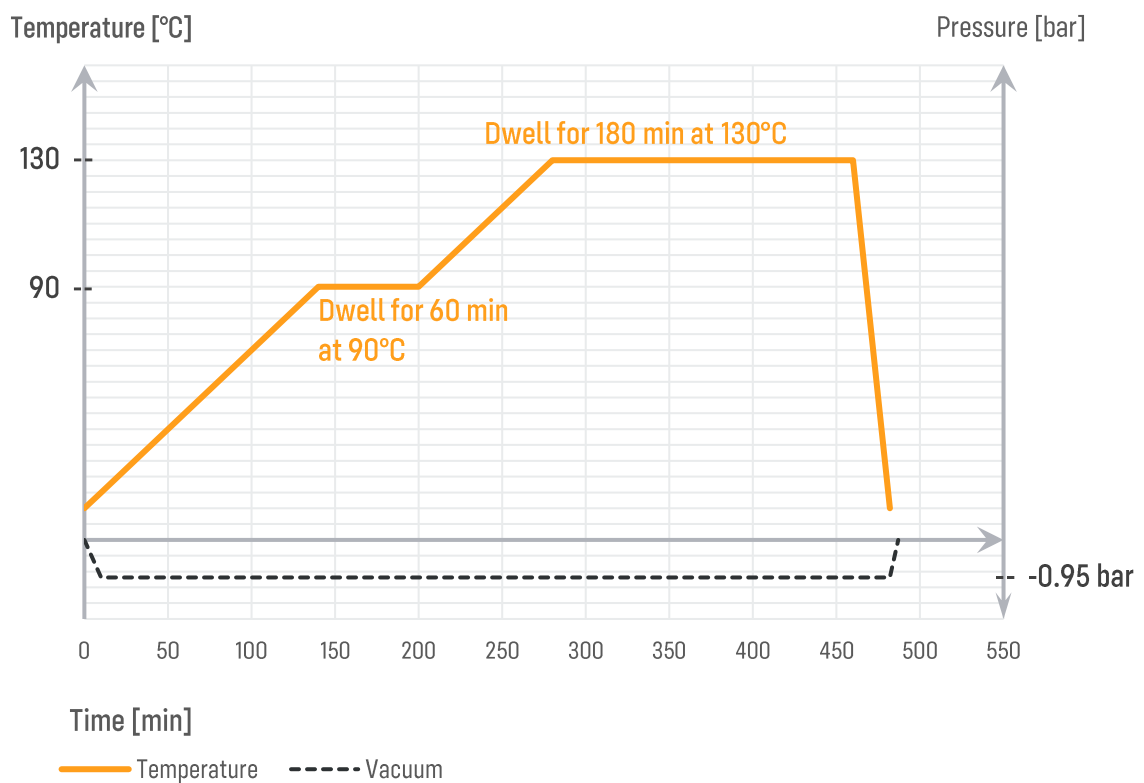
Oven cure cycle #1

Vacuum bag pressure Minimum of 950mbar

Ramp rate 0.3 to 1°C/minute

Recommended cure cycle 60 minutes at 90°C + 180 minutes at 130°C

Cool down Maximum of 5°C/minute to 60°C



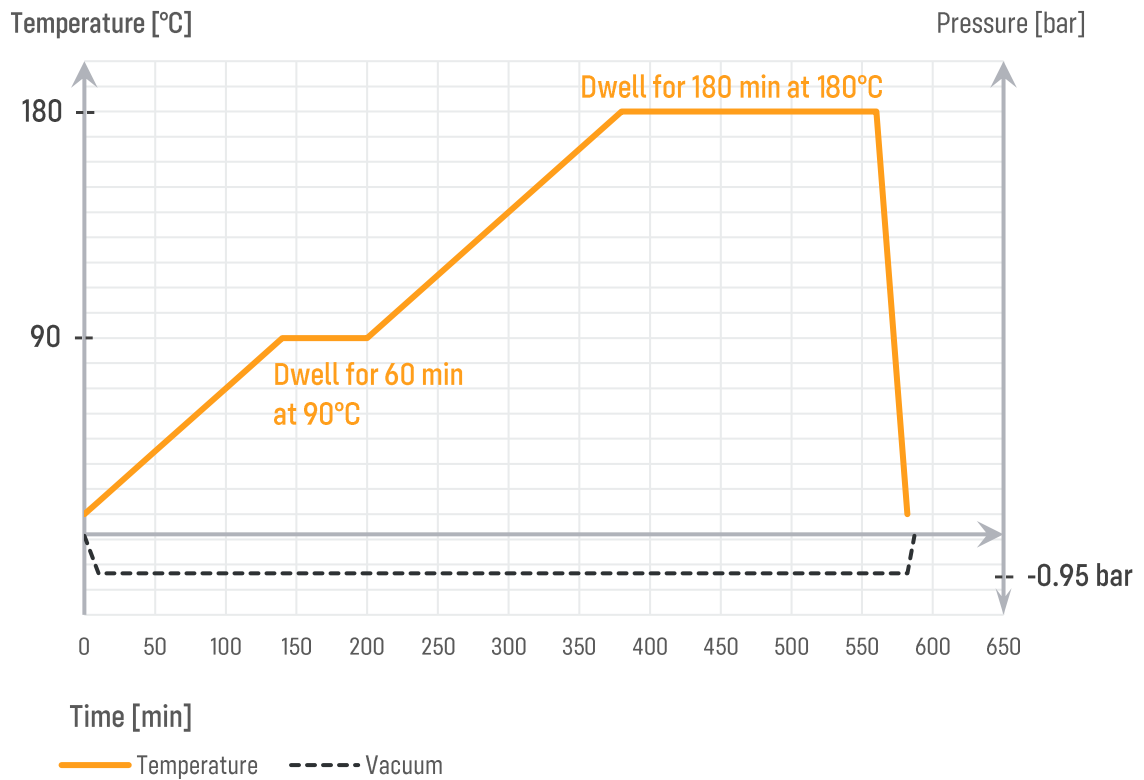
Oven cure cycle #2

Vacuum bag pressure Minimum of 950mbar

Ramp rate 0.3 to 1°C/minute

Recommended cure cycle 60 minutes at 90°C + 180 minutes at 180°C

Cool down Maximum of 5°C/minute to 60°C



Post-cure

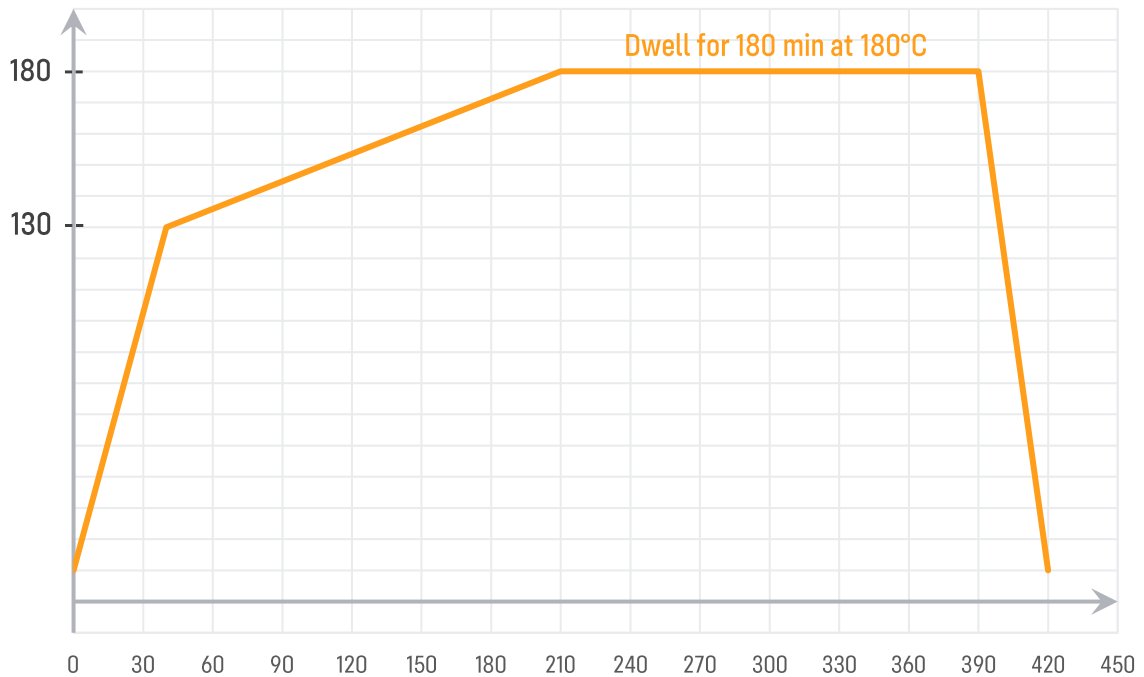
To obtain the higher service temperature of the material post-curing can be used according to one of the following cycles:

	POSSIBLE POST-CURE CYCLES ⁽³⁾		
	140°C – 3 h	150°C – 3 h	180°C – 3 h
T_g dry, Onset °C (DMA)	157	172	190
T_g dry, Peak °C (DMA)	208	211	214

(3) Temperature must be measured by the lagging thermocouple attached to the part.

Heat the parts to 130°C at a speed of no more than 3°C/minute.
 Parts may also be loaded into a pre-heated oven without tooling.
 Ramp rate from 130°C to post-cure temperature 0.3°C/minute
 Cool down Maximum of 5°C/minute to 60°C

Temperature [°C]



Time [min]

— Temperature

Cured Woven Prepreg Properties

Physical Properties	Units	RDN-114.200PSC
Weave/Fiber		Plain/ 200 gsm / 12K-HS
Nominal Resin content	wt%	38
Theoretically Calculated Cured Ply Thickness	mm	0.209

Mechanical Properties

All tensile and compression data are normalized to Vf = 55%

Cure Cycle: 60 min at 100°C + 180 min at 130°C; Vacuum 0.95 bar; Pressure 5 bar (Autoclave)

Mechanical Properties	Units	Method	RDN-114.200PSC		
			RTD (23°C)	ETW ⁽⁴⁾ (80°C)	ETW ⁽⁴⁾ (120°C)
Glass Transition Temperature	°C	ASTM D7028	159/185		
Tg Dry, DMA (Onset/Peak)			132/159		
Tg Wet ⁽⁴⁾ DMA (Onset/Peak)					
Tensile strength [0°]	MPa	ASTM D3039	1160	1180	-
Tensile modulus [0°]	GPa		71	72	-
Tensile strength [90°]	MPa		1060	-	-
Tensile modulus [90°]	GPa		70	-	-
Compression strength [0°]	MPa	ASTM D6641	790	-	525
Compression modulus [0°]	GPa		61	-	55
Compression strength [90°]	MPa		740	520	-
Compression modulus [90°]	GPa		62	56	-
In-plane Shear Strength	MPa	ASTM D3518	79	45	-
In-plane Shear Strength (Ultimate)	MPa		120	-	-
In-plane Shear Modulus	GPa		3.96	-	3.10
ILSS	MPa	ASTM D2344	67	45	35
Open Hole Tension [QI]	MPa	ASTM D 5766	437	-	-
Open Hole Compression [QI]	MPa	ASTM D 6484	323	-	-
CAI (6.67 J/mm)	MPa	ASTM D 7137	231	-	-

(4) Wet – 14 days immersion in water at 70°C

Cure Cycle: 60 min at 100°C + 180 min at 130°C; Vacuum 0.95 bar; Pressure 7 bar (Autoclave)

Post-Cure: 180 min at 180°C

Mechanical Properties	Units	Method	RDN-114.200PSC
			RTD (23°C)
Glass Transition Temperature	°C	ASTM D7028	208/224
Tg Dry, DMA (Onset/Peak)			143/168
Tg Wet ⁽⁴⁾ DMA (Onset/Peak)			
Compression strength [0°]	MPa	ASTM D6641	770
Compression modulus [0°]	GPa		60
Compression strength [90°]	MPa		720
Compression modulus [90°]	GPa		62
In-plane Shear Strength	MPa	ASTM D3518	75
In-plane Shear Strength (Ultimate)	MPa		110
In-plane Shear Modulus	GPa		3.54
ILSS	MPa	ASTM D2344	70

Flame Properties

Cure Cycle: 60 min at 100°C + 180 min at 130°C; Vacuum 0.95 bar; Pressure 7 bar (Autoclave)

Post-Cure: 180 min at 180°C

Thickness: 2,5 mm

Flame Properties	Units	Method	RDN-114.200PSC		
			Standard requirements	Result	
After flame time	s	Vertical Bunsen Burner Test (60s) - AITM 2.0002 A [NADACP]	≤15	15	Pass
Drips	#		≤3	0	
Time of drip (s)	s		-	0	
Burn length (mm)	mm		≤152	29	
After flame time	s	Vertical Bunsen Burner Test (12s) - AITM 2.0002 A [NADACP]	≤15	0	Pass
Drips	#		≤5	0	
Time of drip (s)	s		-		
Burn length (mm)	mm		≤203	1	

Outgassing Properties

Cure Cycle: 60 min at 100°C + 180 min at 130°C; Vacuum 0.95 bar; Pressure 7 bar (Autoclave)

Thickness: 2.5 mm

Properties	Units	Method	RDN-112.200PSC		
			Standard requirements	Result	
TML	%	ECSS-Q-ST-70-02C	-	0.185	Pass
RML	%		≤1.000	0.089	
CVCM	%		≤0.100	0.001	

AVAILABILITY

RDN-114 is available as a fabric prepreg or unidirectional prepreg:

- Based on glass or carbon fiber
- Based on UD and standard woven fabrics
- Based on lightweight fabrics with spread yarn

STORAGE

Out life at 21°C – 45 days ⁽⁵⁾

Storage at -18°C – 12 months ⁽⁴⁾

Handling: Prepregs must be kept sealed in a polythene bag which must not be opened until thawed to room temperature.

Safety: Refer to Material Safety Data Sheet (MSDS) for complete handling instructions

(4) Accumulated time out of the freezer before the part is cured

(5) Prepregs must be kept sealed in a polythene bag which must not be opened until thawed.

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