

PRODUCT DATA SHEET



TENCATE ADVANCED COMPOSITES

RS-36 Resin System

PRODUCT TYPE

177°C (350°F) Cure Epoxy Resin System

TYPICAL APPLICATIONS

- Satellite Structure
- Dimensionally stable structure

CURE SCHEDULE

90 minutes at 177°C (350°F), 3–5°F per minute ramp rate. Cool at 2°C (5°F) minute until below 60°C (140°F)

Autoclave or Vacuum bag processable

*See alternate cure schedule on page 5.

SHELF LIFE

Tack Life: Up to 14 days at ambient

Out Life: Up to 30 days at ambient

Frozen Storage Life:

12 months at -18°C (<0°F)

Tack life is the time during which the prepreg retains enough tack, drape, and handling for component lay-up.

Out life is the maximum time allowed at ambient temperature before cure.

* Ambient is 18–22°C (65–72°F).

* *Out life tested by SBS on a 15x15 cm (6x6 in.) laminate, cured in an autoclave. Users may need to separately evaluate out life limits on thicker, larger, and more complex parts.*

PRODUCT DESCRIPTION

RS-36 is an advanced modified epoxy system for structural composite applications. RS-36 offers an excellent balance of mechanical properties, low moisture absorption, high glass transition temperatures and a range of processing options. A higher Tg version, RS-36-1 with similar mechanical properties is available.

PRODUCT FEATURES/BENEFITS

- Excellent balance of Tg, toughness, modulus and mechanical properties
- Low moisture absorption and low outgassing
- Vacuum bag and autoclave processible
- Qualified for satellite and high modulus fiber applications

TYPICAL NEAT RESIN PROPERTIES

Density	1.24 g/cc	
Dry Tg by RDA (RS-36)	181°C (358°F)	
Dry Tg by RDA (RS-36-1)	190°C (374°F) ¹	
Gel Time	15–25 minutes at 177°C (350°F) per ASTM D 3532	
Moisture Absorption after 30 days at 82°C (180°F)	3.0%	
Outgassing (ASTM E 595)	TML	0.4 %
	CVCM	0.01%
	WVR	0.17 %
	TML-WVR	0.12 %

⁽¹⁾ Cure used for RS-36-1: 2–5°C (3–9°F) ramp to 123°C (275°F). Hold for 20 minutes under vacuum pressure. Apply 80–100 psi autoclave pressure, and hold for 120 minutes at 123°C (275°F). Then ramp to 190°C (375°F) and hold for 120 minutes.

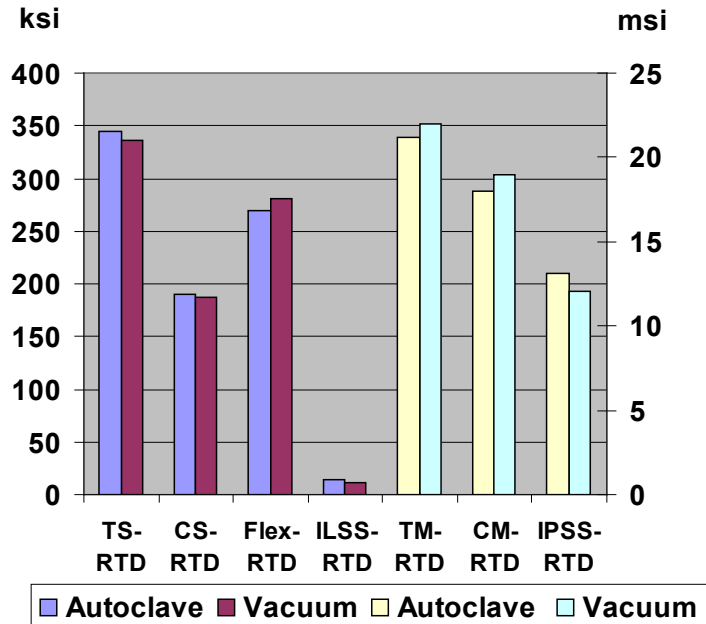
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TENCATE ADVANCED COMPOSITES

RS-36 Resin System

RS-36 / T700 24K



LAMINATE TYPE: TORAY T700 24K FIBER, UNIDIRECTIONAL LAMINATE

Property	Condition	Test Method	Autoclave	Vacuum
Tensile Strength (0°)	RTD	ASTM D 3039	345 ksi (2,380 MPa)	336 ksi (2,320 MPa)
Tensile Modulus (0°)	RTD	ASTM D 3039	21.2 Msi (146 GPa)	22.0 Msi (152 GPa)
Compressive Strength (0°)	RTD	ASTM D 3410	190 ksi (1,310 MPa)	187 ksi (1,290 MPa)
Compressive Modulus (0°)	RTD	ASTM D 3410	18.0 Msi (124 GPa)	19 Msi (131 GPa)
Flexural Strength	RTD	ASTM D 790	270 ksi (1,860 MPa)	281 ksi (1,940 MPa)
Flexural Modulus	RTD	ASTM D 790	18 Msi (124 GPa)	16 Msi (110 GPa)
In Plane Shear Strength	RTD	ASTM D 3518	18.0 ksi (124 MPa)	16.0 ksi (110 MPa)
In Plane Shear Modulus	RTD	ASTM D 3518	0.64 Msi (4.4 GPa)	0.69 Msi (4.8 GPa)
Interlaminar Shear Strength (SBS)	RTD	ASTM D 2344	14.5 ksi (100 MPa)	11.0 ksi (75 MPa)
Interlaminar Shear Strength (SBS)	ETW ⁽¹⁾	ASTM D 2344	10.6 ksi (73 MPa)	N/A

Data normalized to 60% fiber volume with exception of In-Plane Shear and ILSS.

⁽¹⁾ Condition 90°C (180°F), 98% RH, 14 days (Avg wt gain 0.64%)

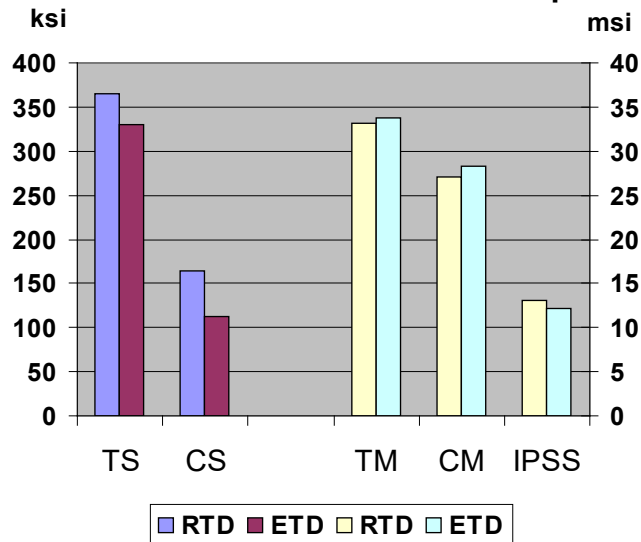
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TENCATE ADVANCED COMPOSITES

RS-36 Resin System

RS-36 / M40J 12K Unitape



M40J (12K) / RS-36 UDPP LAMINATE (140GSM) 0/90 DEGREE UNIDIRECTIONAL AMBIENT & 121°C (250°F) MECHANICAL PROPERTIES

Property	Condition	Test Method	Value
Tensile Strength 0°	RTD	ASTM D 3039	365 ksi (2,517 MPa)
Tensile Modulus 0°	RTD	ASTM D 3039	33.1 Msi (228 GPa)
Tensile Strength 90°	RTD	ASTM D 3039	7.2 ksi (50 MPa)
Tensile Modulus 90°	RTD	ASTM D 3039	1.05 Msi (7 GPa)
Tensile Strength, 0°	ETD	ASTM D 3039	330 ksi (2,275 GPa)
Tensile Modulus, 0°	ETD	ASTM D 3039	33.8 Msi (233 GPa)
Tensile Strength, 90°	ETD	ASTM D 3039	6.0 ksi (42 GPa)
Tensile Modulus, 90°	ETD	ASTM D 3039	1.0 ksi (6.6 GPa)
Compression Strength, 0°	RTD	SACMA SRM 1	165 ksi (1,138 MPa)
Compression Modulus, 0°	RTD	SACMA SRM 1	27.0 Msi (186 GPa)
Compression Strength, 0°	ETD	SACMA SRM 1	113 ksi (779 MPa)
Compression Modulus, 0°	ETD	SACMA SRM 1	28.3 Msi (195 GPa)
In-Plane Shear Strength, 0°	RTD	ASTM D 3518	13.1 ksi (90 MPa)
In-Plane Shear Modulus, 0°	RTD	ASTM D 3518	0.7 Msi (4.8 GPa)
In-Plane Shear Strength, 0°	ETD	ASTM D 3518	12.1 ksi (83 MPa)
In-Plane Shear Modulus, 0°	ETD	ASTM D 3518	0.6 Msi (4.1 GPa)
ILSS, 0°	RTD	ASTM D 2344	13.4 ksi (92 MPa)
ILSS, 0°	ETD	ASTM D 2344	9.2 ksi (63 MPa)
Outgassing (ASTM E 595)		ASTM E 595	0.17 0.01 0.10
<ul style="list-style-type: none"> • TML • CVCM • WVR 			

0° tensile and compression properties normalized to 60% fiber volume.
ETD is done at 121°C (250°F).

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TENCATE ADVANCED COMPOSITES

RS-36 Resin System

MATERIAL: M55JB 6K UNIDIRECTIONAL TAPE

Property	Condition	Method	RS-36 Results		RS-36-1 Results	
Tensile Strength 0°	RTD	ASTM D 3039	296 ksi	2041 MPa	293 ksi	2021 MPa
Tensile Modulus 0°	RTD	ASTM D 3039	45.4 Msi	313 GPa	45.0 Msi	310 GPa
Compression Strength 0°	RTD	ASTM D 695 Mod.	144 ksi	993 MPa	140 ksi	966 MPa
Compression Modulus 0°	RTD	ASTM D 695 Mod.	42.7 Msi	294 GPa	43 Msi	297 GPa
Interlaminar Shear Strength 0°	RTD	ASTM D 2344	10.9 ksi	75 MPa	9.9 ksi	68 MPa

Data normalized to 60% Fiber Volume except for ILSS.
Nominal CPT 0.004 inches

MATERIAL: T300 1K PW FABRIC PREPREG

Property	Condition	Method	RS-36 Results		RS-36-1 Results	
Tensile Strength 0°	RTD	ASTM D 3039	112 ksi	772 MPa	106 ksi	731 MPa
Tensile Modulus 0°	RTD	ASTM D 3039	9.8 Msi	68 GPa	9.9 Msi	68 GPa
Compression Strength 0°	RTD	ASTM D 695 Mod.	127 ksi	876 MPa	96 ksi	662 MPa
Compression Modulus 0°	RTD	ASTM D 695 Mod.	9.8 Msi	68 GPa	9 Msi	62 GPa
Interlaminar Shear Strength 0°	RTD	ASTM D 2344	12.7 ksi	88 MPa	11.8 ksi	81 MPa

Data normalized to 60% Fiber Volume except for ILSS.
Nominal CPT 0.005 inches

MATERIAL: T300 3K PW FABRIC PREPREG

Property	Condition	Method	RS-36 Results		RS-36-1 Results	
Tensile Strength 0°	RTD	ASTM D 3039	134 ksi	924 MPa	113 ksi	779 MPa
Tensile Modulus 0°	RTD	ASTM D 3039	10.1 Msi	70 GPa	10.2 Msi	70 GPa
Compression Strength 0°	RTD	ASTM D 695 Mod.	107 ksi	738 MPa	143 ksi	986 MPa
Compression Modulus 0°	RTD	ASTM D 695 Mod.	8.9 Msi	61 GPa	9.8 Msi	68 GPa
Interlaminar Shear Strength 0°	RTD	ASTM D 2344	11.4 ksi	79 MPa	13.2 ksi	91 MPa

Data normalized to 60% Fiber Volume except for ILSS.
Nominal CPT 0.008 inches for RS-36 & 0.005 inches for RS-36-1 (Spread 3K)

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TENCATE ADVANCED COMPOSITES

RS-36 Resin System

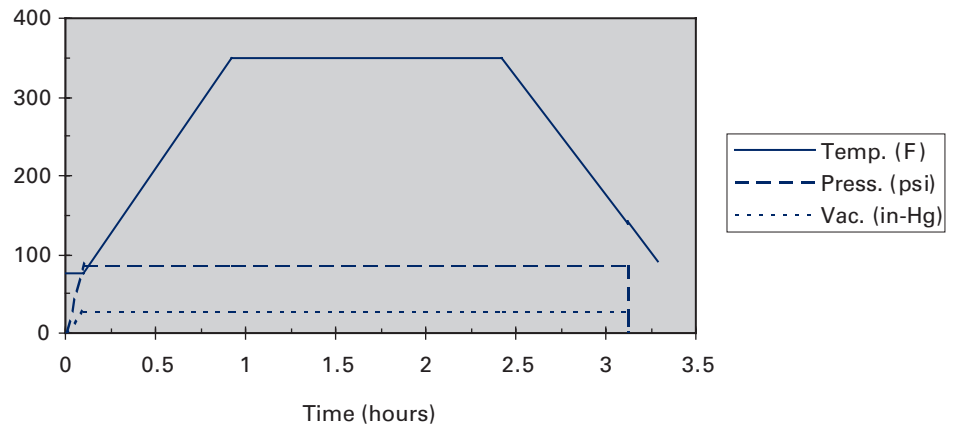
PROCESSING RS-36 CURE CYCLES

Recommended processing for RS-36 is described below. Special moisture control procedures and bleed bagging materials required for cyanate ester resin systems are not necessary for RS-36.

TYPICAL RS-36 CURE PARAMETERS

- Apply vacuum and leak check. For autoclave or press cycles apply pressure of 45-85 psi.
- Heat to 177°C (350°F) (5°C/+10°F) at 2°C (5°F) per minute \pm 3°F/1.5°C per minute.
- Hold at 177°C (350°F) for 90 minutes (+15 min/-0 min).
- For autoclave cures at 40–85 psig, vent to atmosphere at 20 psig or maintain dynamic vacuum, depending on structural application.
- Cool at 5°F/min to below 60°C (140°F). Release vacuum and autoclave pressure.

Typical RS-36 Cure Profile



*ALTERNATE CURE SCHEDULE FOR HIGHER TG.

Apply full vacuum and do not vent (optional) throughout the cure

- Autoclave ramp rate target 3°F/~1.5°C minute throughout cure (1–5°F/min OK)
- Ramp autoclave from ambient to 230+/-10°F (110°C)
- Hold at 230+/-10°F for 30–35 minutes
- Ramp to 285+/-10°F (140°C)
- Hold at 285+/-10°F for 60–65 minutes
- Ramp to 365+/-5°F (185°C)
- Hold at 365+/-5°F for 120–130 minutes
- Cool at 1–5°F/min to 66°C (<150°F) release pressure and remove

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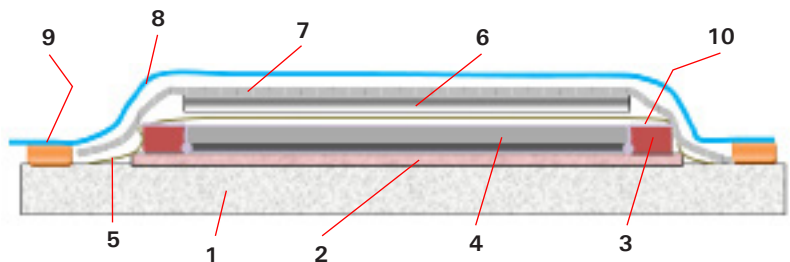
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COMPOSITE LAMINATE STACKING SEQUENCE

LIST OF MATERIALS

1. Tool – aluminum, steel, Invar, composite
(tool plates must be release coated or film covered)
2. Release coat or film – Frekote 700NC or 770NC, FEP, TEDLAR
3. Silicone Edge Dams – Thicker than laminate
4. Laminate
5. Release coat or film – Frekote 700NC or 770NC, FEP, TEDLAR
6. Caul plate – aluminum, steel, Invar, silicone rubber sheet
(metal caul plates must be release coated or wrapped)
7. 2.2 osy polyester breather – 1 or more
8. Vacuum bag
9. Vacuum sealant
10. Glass yarn string - (alternatively or additionally breather may wrap over top of dam to contact edge)



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