

HexFlow® RTM6-2

180°C bi-component epoxy system for Resin Transfer Moulding and Infusion technologies

Product Data

Description

HexFlow® RTM6-2 is a two component resin designed for resin transfer moulding (RTM) and infusion processes and to fulfil the requirements of the aerospace industry. This system is designed for ease of transportation by road, air and sea.

HexFlow® RTM6-2 operates at service temperatures from -60°C up to 120°C (-75°F up to 248°F). At room temperature, after appropriate mixing, it is a brown translucent paste but its viscosity decreases quickly by increasing the resin temperature.

Advantages

- Transportable version of standard qualified HexFlow® RTM6
- Suitable for storage at +5°C or lower temperatures
- Same formulation as standard HexFlow® RTM6 after appropriate mixing
- High glass transition temperature
- Excellent hot/wet properties
- Easy to process (low injection pressure)
- Long injection window \geq 150 min at recommended injection temperature
- Low moisture absorption
- Short, simple cure cycles

Availability

HexFlow® RTM6-2 resin is available in kit form for part A and part B and in drums of up to 200 kg per component. HexFlow® RTM 6-2 resin is also available with a wide range of Injectex®, HexForce® and multiaxials fabrics (carbon, glass, aramid, hybrid).

Storage

- | | | |
|-----------------------------------------|----------------|--------------------------------|
| ■ Shelf Life (after mixing) | @ 23°C | 15 days maximum |
| ■ Guaranteed Shelf Life (after mixing) | @ \leq -18°C | 9 months for 25 kg can maximum |
| ■ Guaranteed Shelf Life (before mixing) | @ \leq +5°C | 12 months (Part A & Part B) |
| | @ 23 °C | 1 month (Part A & Part B) |

Transport classification

- 1) Prior to mixing air freight is possible
Product classifications:
 - HexFlow® RTM6-2 Part A: UN3082 division 9 GE III
 - HexFlow® RTM6-2 Part B: UN3077 division 9 GE III
- 2) After mixing: Air freight is totally forbidden
Product classification:
 - HexFlow® RTM6-2 Mono-Component: UN 3233 division 4.1 (type C)

Typical Resin Properties

RTM6-2 after mixing

Gel Time

Temperature (°C)	Time (min)
120	> 240
140	95
180	30
210	12
240	5

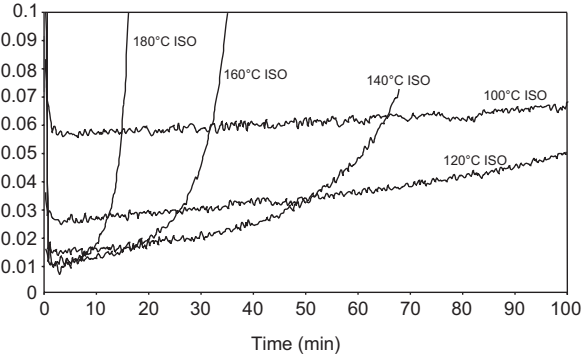


HexFlow® RTM6-2

Viscosity Profile

RTM6-2 after mixing

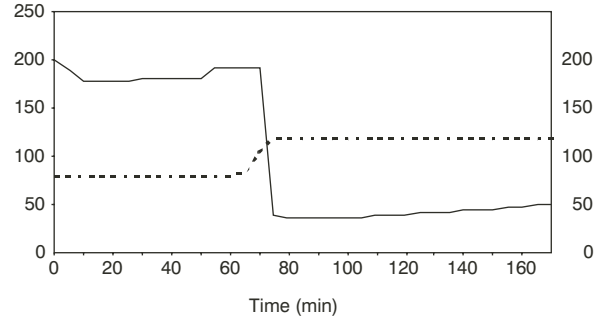
Complex viscosity (Pas)



HexFlow® RTM 6 Isothermal viscosity

Viscosity (mPa.s)

Temperature °C



— Viscosity - - - - - Temperature

Viscosity for a standard injection cycle

Viscosity evolution versus storage time at 80°C

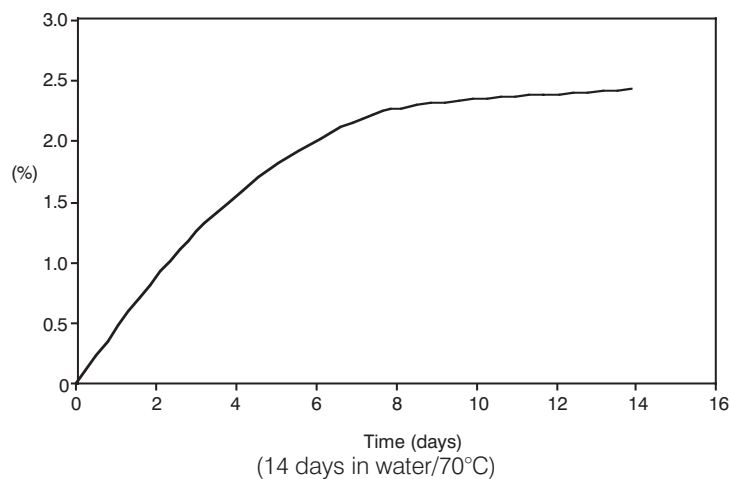
RTM6-2 after mixing

	Initial viscosity 120°C (mPa.s)	Viscosity after 2h at 120°C (mPa.s)
T0	33	59
T0 + 2h30 80°C	32	59
T0 + 5h00 80°C	33	63
T0 + 7h30 80°C	35	75
T0 + 10h00 80°C	38	89

T0: time to reach 80°C.

Water Pick-up (neat resin)

RTM6-2 after mixing



Neat Resin Properties

RTM6-2 after mixing

	Tensile	Flexure
Strength (MPa)	75	132
Modulus (MPa)	2890	3300
Strain (%)	3.4	-
Standard specifications	ASTM D638	ASTM D790

Uncured resin density: 1.11 g/cm³ at 25°C
 Cured resin density: 1.14 g/cm³ at 25°C
 Fracture toughness
 (G_{1C}/ASTM D 5045): 89 J/m²
 Coefficient of Thermal Expansion: 52.7 e-6 /K

Properties on Composite Laminate

Composition of the laminate: Injectex® G0926: 5H Satin weave of 370g/m², HR 6K
 Epoxy bindered fabric
 Fibre volume fraction: 57%
 HexFlow® RTM6-2 resin
 Injection pressure of 1 bar + vacuum in mould
 Cure cycle 120 min at 180°C - no postcure

Dry/RT Properties

	Tensile (warp)	ILSS (warp)	Compression (warp)	In Plane Shear
Strength (MPa)	900	67	680	95
Modulus (GPa)	69	-	60	4.3
Standard Specifications	ISO 527-4 Type 3	EN 2563	EN 2850 A1	EN 6031

Values obtained for G0926 SD (AS4C J) E01 RTM6

Wet/70°C Properties

	Tensile (warp)	ILSS (warp)	Compression (warp)	In Plane Shear
Strength (MPa)	895	44	370	73
Modulus (GPa)	65	-	62	3.5
Standard Specifications	ISO 527-4 Type 3	EN 2563	EN 2850 A1	EN 6031

Values obtained for G0926 SD (AS4C J) E01 RTM6



HexFlow® RTM6-2

Process Specification

Mixing:

- Mix ratio in weight: Part A: 100, Part B: 68.1 (for volume mix ratio or any other details please contact Hexcel Technical Support)
- Preheat temperature for Part A: 60-80°C, Preheat temperature for Part B: 85 ± 5°C (for around 12 hours)
- Pour part B into part A and mix together at defined mix ratio
- Stir slowly at a maximum of 80°C for 30 minutes

Injection:

- Preheat resin at 70 - 80°C in the injection pot
- Preheat the mould at 120°C
- Inject the resin (80°C) under vacuum/low pressure (1 to 5 bar)

Degasing can be done if necessary

Standard Cure and Post-cure Cycle

Recommended cure cycle : 120 min at 180 °C - no postcure

Cure Cycle Possibilities

	Cycle N°1 (*)	Cycle N°2 (*)
Temperature 180 °C	120 min	90 min
DMA dry - Glass Transition		
- E' onset value	202 °C	194 °C
- E'' peak	210 °C	206 °C
- Tan δ peak	215 °C	211 °C
Moisture weight gain (70°C/85%RH, equil)	0.80 %	0.84 %
DMA wet - Glass Transition		
- E' onset value	160 °C	155 °C
- E'' peak	170 °C	175 °C
- Tan δ peak	175 °C	190 °C

(*) Laminate Data G0926 SD (AS4C J) E01 RTM6

Important

All information is believed to be accurate but is given without acceptance of liability. Users should make their own assessment of the suitability of any product for the purposes required. All sales are made subject to our standard terms of sale which include limitations on liability and other important terms.

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Hexcel is a leading worldwide supplier of composite materials to aerospace and other demanding industries. Our comprehensive product range includes:

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- Carbon, glass, aramid and hybrid prepregs
- RTM Materials
- HexTOOL® composite tooling material
- Structural Film Adhesives
- Honeycomb Cores
- Engineered Core

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