Redux® 335

Adhesive film for bonding metallic and composite components

Product Data

Description

Redux 335 is a film adhesive curing at 120°C. It is available in a range of standard areal weights from 100 to 300 g/m^2. It is available either unsupported or with knitted and/or matt carrier for additional glueline thickness control.

Features

- Cures in 60 minutes at 120°C for optimum properties
- Good lap shear performance at temperatures ranging from -55°C to 100°C
- Excellent peel properties from -55°C to 80°C
- Excellent properties in sandwich structures from -55°C to 80°C
- Good performance with 120°C - curing fibre reinforced composites in either co-cure or secondary bonding processes
- Good drape at temperatures as low as 10°C
- Less than 1% volatile content

Applications

- Aluminium to Aluminium bonding
- Fibre-reinforced composite to composite bonding
- Aluminium honeycomb sandwich bonding
- Aramid honeycomb sandwich bonding

Form

Blue film adhesive, available supported and unsupported at the following weights and dimensions:

Product Description	Areal Weights g/m^2	Support	Standard Roll m^2
Redux 335U	150	None	50
Redux 335U	300	None	50
Redux 335K	150	Woven nylon	50
Redux 335K	300	Woven nylon	50
Redux 335M	150	Matt	50
Redux 335M	300	Matt	50

The film is protected on one side by white polythene and on the other side by release paper.

Instructions For Use

Pretreatment

It is essential that all substrates to be used are free of contamination and are in as ideal a state for bonding as possible. As pretreatment will significantly vary dependent on substrates being used, please refer to the Redux Bonding Manual (Publication No. RGU 034) for optimum procedure.

The Redux Bonding Manual refers to the use of primers for the protection of certain pretreated surfaces prior to bonding. In the case of the Redux 335 range, the recommended primers are Redux 112 or Redux 140. Application, drying and curing conditions for Redux primers are available in the Redux Primers Data Sheet.

Application

1. Allow sufficient time (e.g. for a full roll, about 24 hours) for the adhesive to warm to room temperature (15-27°C)
2. Cut the film to the shape and size required.
3. Remove the release paper and position the exposed film surface against the prepared bonding surface.
4. Remove the polythene backing sheet.
5. Complete the joint assembly and secure against relative movement of the parts while the adhesive is being cured.

Please refer to the Redux Bonding Manual for further details.

Curing

Redux 335 should be cured at 120± 5°C for 60 minutes to obtain optimum properties. Enough time should be allowed for heat to penetrate through the assembled parts to ensure that the adhesive reaches that temperature before timing starts. A cure pressure of around 350 kPa and heat up rate of approximately 5°C per minute is recommended during cure. After curing it is recommended that components are cooled to below 70°C before releasing the pressure.

Mechanical Properties

All the performance values given in this data sheet are based on experimental results obtained during testing under laboratory conditions. They are typical values expected for Redux 335 prepared and cured as recommended and under the conditions indicated. They do not and should not constitute specification minima.

Metal Bonding Strengths

Redux 335 was used to bond Alclad 2024-T3 Aluminium test specimens; the Aluminium was pretreated in accordance with DTD 915B (ii) [chromic/ sulphuric acid pickling] . The honeycomb tests used Hexcel's 7.9-1/4-40(5052)T Aluminium honeycomb.

Redux 335 (Unsupported)

Test	Test Temperature °C	Redux 335U 150g/m²	Redux 335U 300g/m²
Lap Shear Strength MPa	22 60 90	43 30 17	47 36 17.5
Bell Drum Peel N/25mm	22	233	222
Climbing Drum Peel N/76mm	22	710	1445

Redux 335K (Knitted carrier) and Redux 335M (Matt carrier)

Test	Test Temperature °C	Redux 335K 150g/m²	Redux 335K 300g/m²	Redux 335M 150g/m²	Redux 335M 300g/m²
Lap Shear Strength MPa	22	26	39	34	42
	60	19	30	24	27
	90	9	13	11	12
Bell Drum Peel N/25mm	22	232	324	216	264
Climbing Drum Peel N/76mm	22	434	920	74	355

Notes

Storage

Redux 335 has been formulated for maximum storage life consistent with its high performance. Certain precautions, however, will help to enhance that storage life as follows:

1. When stored at room temperature (less than 27°C) it should be kept on a horizontal mandrel passed through the tube core on which the roll is wound. This avoids the risk of local thinning of the film under the weight of the roll.

2. When storing under refrigeration the original packaging should be retained if possible. When returning to the refrigerator after use it is essential to protect the film with a water vapour barrier packaging material such as polythene.

3. On withdrawal from the refrigerator the water vapour barrier packaging should not be removed until the roll of adhesive has reached room temperature. This may take up to 24 hours depending on the size of the roll and the temperature involved. (Failure to observe this will result in the film becoming damp).

4. The film should be handled with care whilst in the frozen state since it will be brittle and easily cracked.

On receipt, Redux 335 will have a storage life of at least 12 months at -18°C plus an additional shop life of 1 month at below 27°C.

Volatile content

Redux 335 has a very low volatile content, usually well below 1%. In practice, the loss in weight when cured is negligible and emission of volatile products is not of practical significance.

Handling precautions

In common with all Redux adhesives in film form, Redux 335 is particularly free from handling hazards for the following reasons:

- Film is covered on both sides by protective release paper and polythene sheet which are not removed until final component assembly. It should be cut to shape before removing the protective coverings and virtually no handling of the film is necessary.
- Low to medium tack at normal room temperature. The film is dependent on elevated temperature for wetting-out the adherend surfaces.
- Volatile-free at normal room temperature.
- Splash-free, leak-free, spillage-free.

However, the usual precautions necessary when handling synthetic resins should be observed. A Material Safety Data Sheet for Redux 335 is available on request.

Release Certification

The Quality System at Hexcel Composites Duxford has been certified to ISO 9001 by Lloyd's Register Quality Assurance, and is approved by the UK Civil Aviation Authority and Ministry of Defence. Certificates of Conformity and Test Reports can be issued for batches of Redux 335 on request.

Important

For More Information

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

- Carbon Fibre
- RTM Materials
- Honeycomb Cores
- Continuous Fibre Reinforced Thermoplastics
- Carbon, glass, aramid and hybrid prepregs
- Reinforcement Fabrics
- Structural Film Adhesives
- Honeycomb Sandwich Panels
- Special Process Honeycombs

For US quotes, orders and product information call toll-free 1-800-688-7734

For other worldwide sales office telephone numbers and a full address list please go to:

http://www.hexcel.com/contact/salesoffices