Redux® 775

Vinyl phenolic structural adhesive

Product Data

Description

Redux 775 was adopted as the world's first metal-to-metal bonding process to be officially approved for use in the manufacture of aircraft primary structures in 1943.

It is available either as a film or as a two component system, Redux 775 “Liquid” and Redux 775 “Powder”, both systems requiring heat and pressure for curing.

Features

- Outstanding long term weathering and corrosion resistance
- Outstanding resistance to commonly used aircraft fluids
- Insensitive to atmospheric moisture before and after curing
- High shear and peel strength in the temperature range -55°C to +70°C

Applications

- Metal to metal bonding
- Rubber bonding
- Wood bonding

Form

Product Description	Areal Weights g/m²	Support	Roll Width mm	Standard Roll m²
Redux 775 film	366	No	610	25

Redux 775 is also available as L & P (liquid & powder) two component system.

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 varies significantly depending on the substrates used, please refer to the Hexcel Composites publication Redux Bonding Technology for optimum procedures.

If there is to be a delay between the pretreatment and bonding of aluminium, the pretreated surface should be protected with Redux 101 surface pretreatment protection solution to conserve the optimum bonding surface. This will enable bonding to be delayed for up to 2 weeks without deterioration of the pretreated surface. The correct application of Redux 101 should not alter the bonding performance of Redux 775.

Application

Redux 775 Film

1. Allow sufficient time for the adhesive to warm to room temperature (15°C to 27°C) before removing the protective polythene.
2. Cut the film to the shape and size required.
3. Remove the release paper and position the adhesive on the prepared bonding surface.
4. Remove the polythene backing sheet.
5. Complete the joint assembly and apply pressure, at ⊕700 kN/m², while the adhesive is being cured. For sandwich structures the pressure application should be selected to suit the type of core used. After the adhesive has cured it is advisable to maintain pressure on the bonded assembly until it has cooled sufficiently to be handled without discomfort.

Redux 775 Liquid and Powder

1. Apply Redux 775 liquid at the rate of approximately 100 gm/m² to both of the prepared adherend surfaces, using a brush or roller to give as uniform a coating thickness as possible.
2. Immediately, apply Redux 775 Powder either by dipping the coated component into a powder reservoir or by sprinkling enough powder onto the liquid coating to cover completely. In either case, excess powder should then be removed by lightly tapping the inverted component.
3. The coated surfaces must then be left for at least 30 minutes at 22°C to allow solvent evaporation before closing the joint. Coated components may be stored for periods up to 72 hours at 22°C before completing the bonding process.

This procedure results in an application rate of approximately 100 to 120 gm of powder per m² of adherend surface. After solvent evaporation from the liquid component, that should result in a Powder:Liquid ratio of 1.25:1 to 1.4:1 and the total weight of adhesive in the joint will be approximately 400 gm/m².

Curing

Redux 775 (both Film and Liquid & Powder) emits some water vapour during cure so it is essential that a pressure of at least 700 kN/m² is maintained on the joint during the curing process. Higher pressures are recommended for thicker adherends to ensure complete mating of the two surfaces.

To complete the curing process, 30 minutes at 150± 5°C is required in the glue-line. Curing schedules should allow time for heat to penetrate through the adherends to the glue-line. When the cure schedule is complete it is recommended that components are cooled to below 70°C before releasing pressure. If cured in an autoclave, it is necessary to apply vacuum throughout the curing process to remove volatiles.

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 775 prepared and cured as recommended and under the conditions indicated. They do not and should not constitute specification minima.

Metal Bonding Strengths

Redux 775 at areal weights indicated in the tables were used to bond Alclad 2024-T3 aluminium test specimens; the aluminium was pretreated in accordance with DTD 915B (ii) (chromic/ sulphuric acid pickling). Redux 101 primer was used after the pretreatment. The honeycomb tests used Hexcel's 7.9-1/4-40(5052)T aluminium honeycomb.

Redux 775 Film

Test	Test Temperature °C	Redux 775 366 g/m²
Tensile Shear Strength MPa	22 70	37 21
Metal to Metal Peel N/25mm	22	275

Redux 775 L & P (P:L ration = 1.3:1)

Test	Test Temperature °C	Redux 775 366 g/m²
Tensile Shear Strength MPa	22	31
Metal to Metal Peel N/25mm	22	270

Volatiles

Redux 775 Film and Redux 775 L & P emit volatile constituents during the curing process. Ensure that hot press or autoclave areas are well ventilated.

Handling and safety precautions

Redux 775 Film
In film form Redux 775 is relatively free from handling hazards since it is virtually dry (tack free) and protected on both sides by polythene. Nevertheless the usual precautions when handling synthetic resins should be observed - avoid direct contact with skin and clothing. In case of accidental contact wash with plenty of warm soapy water.

Keep away from food and food containers.

Redux 775 Liquid
Redux 775 liquid is highly flammable. It should be kept well away from all sources of heat and must not be exposed to naked flames or sparks.

Redux 775 liquid is toxic if swallowed and should be kept well away from food and food containers.

Avoid contact with skin, eyes and clothing, avoid breathing vapours. In case of accidental skin contact, wash with warm, soapy water. In case of eye contact, give prolonged irrigation with water and summon medical aid. If the operator feels unwell, medical advice should be sought.

Redux 775 Powder
Observe the usual precautions when handling synthetic resin materials. Avoid contact with skin and clothing, avoid breathing dust, and keep away from food and food containers.

A Material Safety Data Sheet for Redux 775 is available on request.

Storage

Redux 775 Film
Store in original packaging whenever possible. If stored at 0-5°C in a refrigerator the adhesive will maintain performance characteristics for 12 months. After removal from the refrigerator the film may be stored in the workshop at temperatures below 25°C for up to 6 months.

Redux 775 Liquid
Storage at 0-5°C is recommended. At this temperature the product will maintain its performance characteristics for up to 12 months. At room temperature (15 to 25°C) the product gradually increases in viscosity and, whilst adhesive performance characteristics may be maintained for up to 6 months, a change in processing characteristics may become evident after 2 to 3 months.

Redux 775 Powder
Provided it is kept dry and free from contamination, Redux 775 Powder has an indefinite storage life at normal room temperature.

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 775 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:

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