Redux® 200 series

Foaming adhesive films

Product Data

Description

The Redux 200 series is a range of foaming adhesive films presented in sheet form. They expand during the cure cycle to fill gaps and adhere strongly to all parts of the structure with which they come into contact.

Redux foaming adhesive films are compatible with Redux film adhesives as follows:-

Redux Foaming Adhesive Films		Compatible Redux Film Adhesives
206-NA	High foaming ratio	609 382H
212-NA		312 335
208/4-NA	Suitable with vacuum	308
208/5-NA	Higher foaming ratio Not suitable with vacuum	308A-NA 330
219/2-NA		319 322
219/3-NA	Low exotherm for thicker sections	

Features

- High strength at temperatures from -55°C to 260°C.
- Less than 1% volatiles emitted during cure.
- Suitable for aluminium and fibre-reinforced composite sandwich constructions.
- Expansion ratios from 1:1.9 to 1:4.

Applications

- Aluminium/aramid honeycomb core splicing or glass.
- Edge bonding of honeycomb core to close-out members.
- Gap filling between close-out members.

Form

Dry flexible films of dimensions 1.25 m x 0.2 m, and with a standard thickness of 1.52 mm, lined on both sides with protective films. A standard pack contains 8 sheets of the above dimensions.

Instructions for Use

Pretreatment

When the films are used for bonding sections of honeycomb in sandwich structures, there is generally no need to pretreat the edges of the core segments.

Aluminium honeycomb which has been machined, however, or has become soiled in any other way, should be thoroughly degreased before bonding (refer to the Hexcel publication, Redux Bonding Technology). For maximum bond strength the core segments should be cut slightly oversize (about one cell row or equivalent on each edge), and these edges flattened back, collapsing the overlapping cells to produce a continuous closed surface to the edges. There should be virtually no gap between this surface and the inner face of the panel edge members, to ensure that the film is held under pressure on assembly. After preparation, these closed edges of the core must be degreased by rinsing with a suitable solvent.

This type of preparation is not practicable with non-metallic honeycomb cores; these should be cut slightly oversize so that, when assembled, they exert an outward pressure on the panel edges. Solvent degreasing is not recommended, so it is essential when handling non-metallic honeycomb to take care to avoid any contamination.

Pretreat the edge members of sandwich panels in accordance with the instructions given for the adhesive used to bond the edge members to the facing skins. No additional pretreatment is needed for bonding with the films.

Application

Cut the film to size with a sharp knife before removing the protective covers. The width of the cut film should equal the full depth of the core, within the limits +0 - 1.25 mm.

After removing the protective covers, insert the cut film (single layers preferred) between the core and the inner face of each edge member as assembly of the panel proceeds - do not try to push the film into place after the pieces have been positioned. Spring the core segments and other panel components tightly together so that the film is held firmly in place and cannot sag as it is heated. Complete the panel assembly as quickly as possible to minimise the risk of it being disturbed, and apply clamps or other suitable means of restraint to prevent relative movement of the parts either before or during the cure cycle.

Curing

The recommended cure cycles are:

Adhesive	Cure Cycle
Redux 206-NA	60 minutes at 120°C± 5; heat up rate 5°C/min
Redux 212-NA	60 minutes at 120°C± 5; heat up rate 5°C/min
Redux 208/4-NA	60 minutes at 175°C± 5; heat up rate 5°C/min
Redux 208/5-NA	60 minutes at 175°C± 5; heat up rate 5°C/min
Redux 219/2-NA	60 minutes at 175°C± 5; heat up rate 5°C/min
Redux 219/3-NA	60 minutes at 175°C± 5; heat up rate 5°C/min

Variations from this cure cycle are possible and further information may be obtained from Hexcel on request.

When an autoclave is being used to bond assemblies containing Redux foaming films or any assembly containing unvented honeycomb core, it is recommended that the vacuum line should be opened to atmosphere before heat-up is commenced, and should be left open throughout the cycle. This will ensure more even expansion of the foam. When heating the assembly to curing temperature allow adequate time for heat to penetrate the whole assembly so that the adhesive is properly cured throughout the depth of the panel.

Performance Data

Following the recommended cure cycles as detailed above, the following typical performance data have been obtained. These results are for guidance only, they do not constitute specification minima for this product.

Product	Expansion ratio	Vertical flow	Aluminium double lap shear (1.6 mm gap)					
			22°C	80°C	100°C	120°C	150°C	220°C
206-NA	1: 4.0	-	3.7 MPa	2.0 MPa				
212-NA	1: 2.0	-	8.5 MPa		5.0 MPa			
208/4-NA	1: 2.0	<1mm	11.0 MPa			4.0 MPa		
208/5-NA	1: 2.2	<1mm	10.0 MPa			4.5 MPa		
219/2-NA	1: 2.0	<1mm	9.0 MPa				4.5 MPa	
219/3-NA	1: 1.9	<1mm	10.0 MPa				6.0 MPa	

Handling Precautions

In common with all Redux film adhesive products the 200 Series is particularly free from handling hazards for the following reasons:

- Film may be cut to shape with release paper covers in place, virtually no handling of the bare film is necessary.
- The film is virtually tack free and volatile free at temperatures below 22°C.
- No problems with splashing, leaking or spillage.

However, the usual precautions when handling synthetic resins should be observed and the use of clean polythene gloves is particularly recommended when handling film adhesives and pretreated components.

A Material Safety Data Sheet for the Redux 200 Series is available on request.

Storage

Redux foaming adhesive films may be stored for up to 3 months at temperatures of 20 to 27°C but storage at -18°C is recommended. Guaranteed life at this temperature is 12 months.

The film must be stored in a sealed polythene bag to protect against atmospheric moisture absorption and when removing from cold storage the package must be allowed to reach room temperature before breaking the polythene seal.

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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For More Information

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- 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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