



# Redux® 810

High strength, high peel, two-part epoxy paste adhesive

## Product Data

### Description

Redux® 810 is a multi-purpose, high shear and peel strength, two-part, toughened epoxy paste adhesive with corrosion-inhibiting properties.

### Features

- Available in cartridges with a static mixer and in tins
- Easy to mix
- Excellent high shear strength and very high peel properties
- Corrosion-inhibiting
- Toughened
- Non slump characteristic to 3mm thickness
- Gap filling
- Glue line control
- Service temperature up to 100°C / 212°F

Redux 810 is available in 200ml cartridges, in 3 litre packs, in 25 litre cans and 210 litre drums.

### Applications

- Metal, honeycomb and fibre-reinforced composite bonding applications.
- Structural repair.
- Bonding inserts and ferrules.
- Bonding aluminium and composite edge members.
- Fabrication of honeycomb sandwich panels using the cut and fold technique.

### Uncured Adhesive Properties

Property	Units	Part A	Part B	Mixed	Test Method
Colour		Yellow	Blue	Green	Visual
Viscosity @ 25°C	Pas	80 - 90	4 - 8	80 - 100	Bohlin Rheometer 0.50mm Gap 40mm Parallel Plate Strain = 0.01%
Viscosity @ 77°F	Poise	800 - 900	40 - 80	800 - 1000	
Density @ 25°C	g/cc	1.15	1.02	1.11	ASTMD1622
Density @ 77°F	lb/ft <sup>3</sup>	72	64	69	
Pot-life (100g @ 25°C)	mins			60	ASTMD2471-71
Pot-life (0.22 lbs @ 77°F)	mins			60	



# Redux 810

## Instructions For Use

### 1. Pretreatment

All substrates must be free of contamination and in as ideal a state for bonding as possible. Pretreatment varies depending on the chosen substrates. Please refer to the Hexcel Composites publication Redux Bonding Technology for optimum procedures.

### 2. Mixing

#### Peak Exotherm – Test Method ASTM D2471

Mix Ratio	Part A	Part B
By Weight	100	45
By Volume	100	50

Mass	50 g / 0.11 lb	100g / 0.22 lb	200 g / 0.99 lb
Time to max temp (mins)	145	60	35
Max temp. (°C / °F)	31 / 88	116 / 241	158 / 316

Redux 810 is available in cartridges with a static mixer and in tins. It can also be used with automatic mixing and dispensing equipment. Contact Hexcel Composites for equipment recommendations.

Part A and Part B should be combined in the correct ratio as shown above and mixed thoroughly until the two colours are completely blended.

Heat build-up, during or after mixing, is normal. The temperature rise depends on the amount of paste mixed and the container shape. Care should be taken to avoid an uncontrolled exothermic reaction. See peak exotherm data above.

### 3. Application

The mixed adhesive can be applied directly, or with a spatula, to the pretreated and dried substrates. An even contact pressure should be applied to the joint. The bonded parts should be held in contact until the adhesive has reached handling strength.

### 4. Curing

After application, the adhesive will reach handling strength after 5 hours @ 22°C / 72°F. At this time, the support tooling or pressure used during cure may be removed.

Handling Strength @ 22°C / 72°F – EN 2243-1				
After 5 hours	1.5 MPa		217 psi	
After 7 hours	18.5 MPa		2683 psi	
Time to full cure at various temperatures - EN2243-1				
22°C / 72°F	40°C / 104°F	70°C / 158°F	100°C / 212°F	120°C / 248°F
72 hrs	5 hrs	20 min	5 min	2 min

Cure Cycles		
Time	Temperature	Temperature
5 days	22°C	72°F
1 hour	70°C	158°F
< 30 mins	100°C	212°F
< 10 mins	120°C	248°F

### 5. Cleaning

Excess adhesive should be removed before it hardens. Many industrial solvents, such as acetone and denatured alcohol, are suitable for removing uncured adhesive. Before using solvents, please refer to the suppliers' Material Safety Data Sheets.

## Storage

At 5-27°C / 41 – 81°F, Part A and Part B have a shelf life of 12 months, when stored in sealed containers. The expiry date can be found on the label.

**Mechanical Bonding Performance**

**Tensile Lap Shear Strength – Test Method EN2243-1**

Test Temperature		Conditioning	5 days @ 22°C / 72°F		1 hour @ 70°C / 158°F	
°C	°F		MPa	psi	MPa	psi
-55	-67	Dry	23.9	3466	48.9	7092
22	72	Dry	41.3	5990	46.6	6759
60	140	Dry	25.8	3742	37.8	5482
80	176	Dry	16.2	2350	24.0	3481
100	212	Dry	6.9	1001	11.2	1624
22	72	60°C / 140°F – 95%RH – 30 days	33.9	4917	35.6	5163
40	104	60°C / 140°F – 95%RH – 30 days	17.5	2538	16.3	2364
22	72	Salt Spray 2000 hours	35.3	5120	35.5	5149
Test Temperature		Conditioning	1 hour @ 100°C / 212°F		1 hour @ 120°C / 248°F	
°C	°F		MPa	psi	MPa	psi
22	72	Dry	43.3	6280	38.1	5526
60	140	Dry	29.7	4308	22.8	3307

**Bell Peel Strength – Test Method EN 2243-2**

Test Temperature		Conditioning	5 days @ 22°C / 72°F		1 hour @ 70°C / 158°F	
°C	°F		N/25mm	lbf / 1in	N/25mm	lbf / 1in
22	72	Dry	333	75	234	53
60	140	Dry	317	71	213	48
80	176	Dry	141	32	131	29
100	212	Dry	36	8	41	9

**Climbing Drum Peel Strength – Test Method EN 2243-3**

Test Temperature		Conditioning	5 days @ 22°C / 72°F		1 hour @ 70°C / 158°F	
°C	°F		N/76mm	lbf-in / 3in	N/76mm	lbf-in / 3in
22	72	Dry	615	69	643	72

**Flatwise Tensile Strength – Test Method EN 2243-4**

Test Temperature		Conditioning	5 days @ 22°C / 72°F		1 hour @ 70°C / 158°F	
°C	°F		MPa	psi	MPa	psi
22	72	Dry	8.4	1218	7.4	1073

**Insert Shear Strength – Test Method AIRBUS S360M1M0006000**

Test Temperature		Conditioning	5 days @ 22°C / 72°F		1 hour @ 70°C / 158°F	
°C	°F		N	lb	N	lb
22	72	Dry	9419	2117	9774	2197
40	104	70°C/158°F – 70%RH, equilibrium	9366	2106	8962	2015

**Cured Neat Resin Properties**

Test	Method	5 days at 22°C / 72°F		1 hour at 70°C / 158°F	
Tensile Strength @ 22°C / 72°F, Dry	ISO R527	27.5 MPa	3988 psi	40 MPa	5802 psi
Tensile Modulus @ 22°C / 72°F, Dry	ISO R527	2.01 GPa	291 ksi	1.73 GPa	251 ksi
Elongation at break @ 22°C / 72°F, Dry	ISO R527	2.47%		5.53%	
Poisson's Ratio @ 22°C / 72°F, Dry		0.68		0.53	
Shore D Hardness @ 22°C / 72°F, Dry	ISO R868	77		79	
Tg onset, Dry	DMTA	59°C	138°F	72°C	162°F
Tg tan δ, Dry	DMTA	70°C	158°F	89°C	192°F
Tg onset, 60°C / 140°F - 95%RH, 30 days	DMTA	43°C	109°F	44°C	111°C
Tg tan δ, 60°C / 140°F - 95%RH, 30 days	DMTA	53°C	127°F	54°C	129°C
Compressive Strength @ 22°C / 72°F, Dry	ASTM D695	47.5 MPa	6889 psi	35.5 MPa	5149 psi
Compressive Strength @ 60°C / 140°F, Dry	ASTM D695	10 MPa	1450 psi	10 MPa	1450 psi



## Handling and Safety Precautions

Redux products are safe to use providing that certain precautions, normally taken when handling chemicals, are observed. The uncured materials must not be allowed to come into contact with foodstuffs or food utensils, and measures should be taken to prevent the uncured materials from coming in contact with the skin.

Impervious rubber or plastic gloves should be worn in addition to eye protection. The skin should be thoroughly cleansed at the end of each working period by washing with soap and warm water. The use of solvents is to be avoided. Disposable paper - not cloth towels - should be used to dry the skin. Adequate ventilation of the working area is recommended.

Before using Redux 810, please consult the Material Safety Data Sheet.

## Release Certification

The Quality System at Hexcel Composites Duxford has been certified to ISO9001 by Lloyds 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 810 on request.

## 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.

Performance values given in this data sheet are based on experimental, routine Quality Control and Specification testing results obtained under laboratory conditions. They are typical values expected for Redux 810 prepared and cured as recommended and under the conditions indicated. They do not and should not constitute specification minima.

Copyright Hexcel Composites  
Publication RTU 132 (Nov 2002)

For further information, please contact your nearest sales office, or visit our website at [www.hexcelcomposites.com](http://www.hexcelcomposites.com)

### Australia

Suite 2, 86 Grimshaw Street  
Greensborough, Victoria 3088  
Tel: **61** 3 9432 7100  
Fax: **61** 3 9432 7200

### China

Room B707, Yin Hai Bldg.  
250 Cao Xi Rd  
Shanghai 200233  
Tel: **86** 21 6483 6741/2  
Fax: **86** 21 6483 6744

### Japan - Joint Venture

DIC - Hexcel Limited  
Room 603, Santsu-Mori Bldg.  
2-22-1 Nishi - Shimbashi  
Minato-Ku, Tokyo 105  
Tel: **81** 3 5401 0271  
Fax: **81** 3 5401 0270

### USA

101 East Ridge Drive, Suite 102  
Danbury, CT 06810  
Tel: **1** 203 798 8311  
Fax: **1** 203 798 8161

### Austria

Industriestrasse 1  
A-4061, Pasching  
Tel: **43** (0)7229 7720  
Fax: **43** (0)7229 772299

### France

ZI La Plaine, B.P.27 Dagneux  
01121 Montluel CEDEX  
Tel: **33** (0)4 72 25 26 27  
Fax: **33** (0)4 72 25 27 30

### Spain

Bruselas, 10 - 16  
Polig. Ind. "Ciudad de Parla"  
28980 Parla, Madrid  
Tel: **34** 91 664 4900  
Fax: **34** 91 698 4914

### USA

42705 Grand River  
Suite 201  
Novi, MI 48375  
Tel: **1** 248 344 8688  
Fax: **1** 248 305 9760

### Belgium

Rue Trois Bourdons, 54  
B-4840 Welkenraedt  
Tel: **32** 87 307 411  
Fax: **32** 87 882 895

### Germany

Postfach 1560  
21655 Stade  
Tel: **49** 4141 7879-00  
Fax: **49** 4141 7879-01

### United Kingdom

Duxford, Cambridge  
CB2 4QD  
Tel: **44** (0)1223 833141  
Fax: **44** (0)1223 838808

### USA

2350 Airport Freeway, Suite 550  
Bedford, TX 76022-6027  
Tel: **1** 817 315 3939  
Fax: **1** 817 571 8629

### Brazil

Av. J. Guilhermino, 474/72  
S.J.Campos, SP 12210-130  
Tel: **55** 12 3941 2242  
Fax: **55** 12 3923 1186

### Italy

Via San Cristoforo, 44  
21047 Saronno (VA)  
Tel: **39** 02 96709082  
Fax: **39** 02 9600809

### USA

11711 Dublin Blvd.  
Dublin, CA 94568-2832  
Tel: **1** 925 551 4900  
Fax: **1** 925 828 9202

### USA

16310 NE 80th Street, Suite 102  
Redmond, WA 98052  
Tel: **1** 425 558 4400  
Fax: **1** 425 861 5847