

## Structural Adhesives

### XD 4465 / XB 5304

## Two component polyurethane adhesive for sandwich panel lamination and general industrial applications

#### Key properties

- Bonds wide variety of substrates
- Ideal for bead extrusion
- Good environmental resistance
- Resistant to foaming during application

#### Description

XD 4465 with XB 5304 is a polyurethane adhesive specially formulated for the manufacture of sandwich panels and similar large laminated constructions.

The mixed adhesive will cure at ambient temperatures greater than 10°C and can be accelerated by heating. XD 4465/XB5304 bonds well to a wide variety of metals, foamed plastics, plywood and to GRP/SMC.

#### Typical product data

	XD 4465	XB 5304	Mixed Adhesive
Colour (visual)	Beige paste	Brown liquid	Beige paste
Specific gravity	ca. 1.4	ca. 1.2	ca. 1.4
Viscosity (Pas at 23°C)	ca. 12	ca. 0.3	ca. 5.5
Pot Life (100 gm at 23°C)	-	-	90
(5 kg at 23°C)	-	-	47

#### Processing

##### Pretreatment

The strength and durability of a bonded joint are dependant on proper treatment of the surfaces to be bonded. At the very least, joint surfaces should be cleaned with a good degreasing agent such as acetone or other proprietary degreasing agents in order to remove all traces of oil, grease and dirt. Low-grade alcohol, gasoline (petrol) or paint thinners should never be used. The strongest and most durable joints are obtained by either mechanically abrading or chemically etching ("pickling") the degreased surfaces. Abrading should be followed by a second degreasing treatment

Mix ratio	Parts by weight	Parts by volume
XD 4465	100	100
XB 5304	20	23

Resin and hardener should be blended until they form a homogeneous mix.

##### Application of adhesive

The resin/hardener mix may be applied with roller, comb or extrusion bar, to the pretreated and dry joint surfaces. A layer of adhesive 0.2 to 0.4 mm thick (250-500g/m<sup>2</sup>) will normally impart the greatest strength and ensure gap filling.

The joint components should be assembled and clamped as soon as the adhesive has been applied. An even contact pressure throughout the joint area will ensure optimum cure.

### Mechanical processing

Specialist firms have developed metering, mixing and spreading equipment that enables the bulk processing of adhesive. We will be pleased to advise customers on the choice of equipment for their particular needs.

### Equipment maintenance

All tools should be cleaned with hot water and soap before adhesives residues have had time to cure. The removal of cured residues is a difficult and time-consuming operation.

If solvents such as acetone are used for cleaning, operatives should take the appropriate precautions and, in addition, avoid skin and eye contact.

### Times to minimum shear strength

Temperature °C	15	23	23	30	50
Relative humidity (%)	65	65	90	65	65
Open time (mins)	167	120	100**	80	25
Cure time for LSS > 1N/mm <sup>2</sup> *	6 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	-	2 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>
Cure time for LSS <sup>1</sup> > 10N/mm <sup>2</sup>	25	11	-	6	2 <sup>3</sup> / <sub>4</sub>

LSS = Lap shear strength. <sup>1</sup> Aluminium samples \* Handling strength

**Sensitivity to humidity** It should be noted that increasing RH will have an effect on the open time of a PUR adhesive system. See above \*\*.

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### Typical cured properties

Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 170 x 25 x 1.5 mm strips of aluminium alloy. The joint area was 12.5 x 25 mm in each case. The figures were determined with typical production batches using standard testing methods. They are provided solely as technical information and do not constitute a product specification.

#### Roller peel strength (ISO 4578)

Cured 7 days at 23°C 5.8 N/mm at 23°C

#### Glass transition temperature (TMA)

39°C

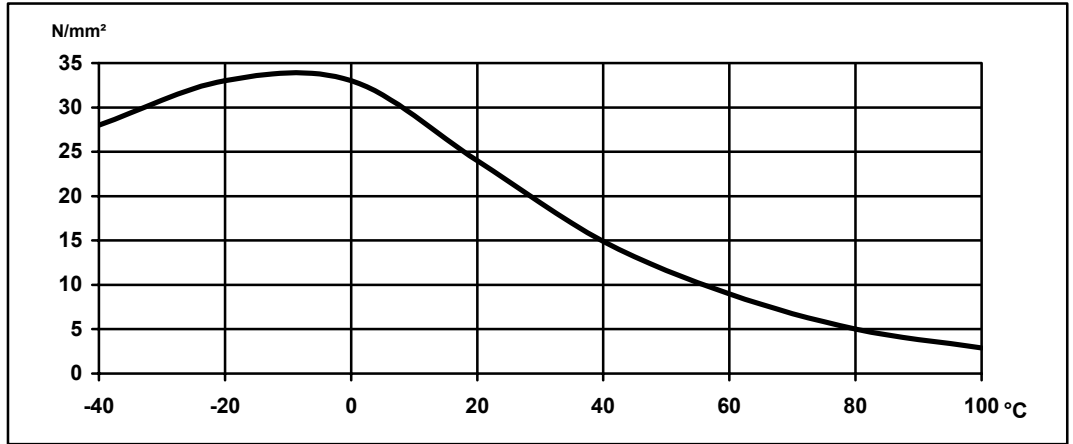
#### Mechanical properties

Cured 7 days at 23°C and tested at 23°C

E-Modulus (ISO R527/1) 22.7 MPa  
Tensile-strength (ISO R527/1) 8.7 MPa  
Elongation at break 46.1 %

**Lap shear strength versus temperature (ISO 4587) (typical average values)**

Cure: 7 days at 23°C



**Adhesion properties**

Cured 7 days at 23°C and tested at 23°C in wedge-test

Epoxy - primed aluminium to:	
- Birch plywood:	Wood failure
- Polystyrene foam:	Foam failure
- PVC foam:	Foam failure
- Polyurethane foam:	Foam failure
- Mineral wool	Mineral failure
Epoxy - primed steel to:	
- Birch plywood:	Wood failure
- Polystyrene foam:	Foam failure
- Mineral wool:	Mineral wool failure
Corona treated GRP to:	
- Birch plywood:	GRP/wood failure
- Polystyrene foam:	Foam failure
Birch plywood to:	
- Polystyrene foam	Foam failure

**Water immersion resistance at 23°C**

Cure: 7 days at 23°C

Substrate - chromic acid pickled aluminium



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**Storage**

XD 4465 and XB 5304 hardener may be stored for up to 3 years and 1½ years respectively at room temperature provided storage is in original sealed containers. The expiry date is indicated on the label.

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**Handling precautions****Caution**

Our products are generally quite harmless to handle provided that certain precautions normally taken when handling chemicals are observed. The uncured materials must not, for instance, 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, since people with particularly sensitive skin may be affected. The wearing of impervious rubber or plastic gloves will normally be necessary; likewise the use of 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. These precautions are described in greater detail in the Material Safety Data sheets for the individual products and should be referred to for fuller information.

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