

Structural Adhesives

Brake and Clutch Bonding

XD 5001

Brake bonding adhesive

Key properties

- Vinyl phenolic basis
- Can be applied by brushing, roller coating or spraying
- Golden brown colour when cured

Description

XD 5001 is a solution of a vinyl modified phenolic resin, designed specially for application as a friction lining adhesive, primarily for brake shoes. The adhesive viscosity is designed to give the correct rheology to prevent excessive flow during the drying of precoated linings. XD 5001 was formerly sold as HTA 1161H.

Typical product data

Property	Typical Data
Appearance	Clear brown liquid
Viscosity at 25 °C	1.9 - 2.7 Pas
Solids Content (160 °C)	39 - 43%
Primary solvents	Ethanol/Acetone
Specific Gravity	ca 0.99
Flash point	<20 °C

Processing

Pretreatment

The strength and durability of a bonded joint are dependent on proper pre-treatment of the surfaces to be bonded. Steel parts should be prepared by degreasing, followed by shot-blasting to a clean uniform matt surface. The friction material should be free of any loose materials and traces of grease. If metals other than steel are to be used for the process, then these should be pre-treated in an appropriate way. More detailed information on surface pre-treatments is given in Publication No A15.

Application of Product

XD 5001 is suitable for application by brushing, spraying or roller coating. When used as the primary adhesive, it is suggested that the product is coated onto the liner surfaces. A dried coating weight of 150 - 200gsm is typical.

Curing the adhesive

XD 5001 requires drying free of solvent at 20°C – 70°C, followed by a thermal cure at 150°C – 230°C. Solvent drying should be in a well-ventilated area, allowing at least 2 - 4 hours at 20°C or 5 minutes at 70°C. The dried parts may then be stored for several weeks before subsequent bonding operations, or may be bonded immediately.

During the bonding operation the coated lining and brake parts are positioned together under a pressure of 0.35 - 1.0MPa and heated to fuse and cure the adhesive layer. The pressure must be maintained in order to prevent bubbling of the adhesive as volatile products are released during the curing. Optimal curing conditions vary from 30 minutes at 150°C 15 minutes at 165°C to 5 minutes at 200°C. Fast curing by induction heating at temperatures up to 230°C are possible but prolonged heating must be avoided at these temperatures, otherwise the adhesive performance may be adversely affected.

Typical properties of the cured adhesive

The data quoted below is for guidance and does not constitute a specification.

- In tests on common friction lining materials XD 5001 has been shown to give shear test failures in the friction materials, both at 20°C and 200°C. Typical values obtained in these tests vary with friction lining type, but are typically in the range 14 - 19 kN at 20°C and 3-9 kN at 200°C on a 17.5 cm surface. (metal parts primed with XD 5005 dip coat).
- Steel / steel lap shear test joints (overlap 25mm width x 15mm length) bonded with XD 5001 adhesive, gives values greater than 9MPa at 23°C, and greater than 4MPa at 200°C

Storage

XD 5001 has an assigned shelf life of 18 months when stored between 6 and 28°C in original unopened containers. Storage at higher temperatures will reduce the shelf life. For example, if storage is at 40°C, it is recommended that the remaining life, at that point, be reduced by one quarter. The expiry date and standard storage conditions are quoted on the product label.

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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