

TB1327

Anaerobic Adhesive – Medium Strength Nutlock

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Product Description:

The **Three Bond 1327** is a one-component, solvent free anaerobic reactive adhesive/sealant which has been specially developed for locking and sealing threaded parts with medium strength when cured. **TB1327** cures spontaneously with the exclusion of oxygen and in the presence of metallic, particularly ferrous, ions.

Product Benefits:

- Eliminates mechanical locking parts such as spring or toothed washers, nylon nuts etc.
- Reduces required fastening on torque
- Screws of inferior accuracy can be used
- Completely seals against oil, water and most chemicals
- Excellent vibration resistance

Typical Applications

- To lock and seal threaded fasteners to prevent loosening under dynamic loads, particularly in applications where disassembly with hand tools is required for servicing.

Product Information

Physical Properties

Properties	Result	Unit
Colour	Red	
Base	Methacrylate	-
Viscosity @ 25°C	150	mPa.s
Density @ 25°C	1.11	g/cm ³
Fixturing time @ 25°C (15%)	≤ 50	minute
Final hardening @ 25°C	≤ 24	hours
Break-loose torque (M10xP1.5) tightening torque 0Nm	20~30	Nm
Prevailing torque (M10xP1.5) tightening torque 0Nm	20~25	Nm
Shear strength pin and collar (0.02mm gap)	20~30	N/mm ²
Optimum clearance	0.02~0.05	mm
Maximum clearance	0.5	mm
Effective temperature range	-60~150	°C
Shelf life @ 25°C	12	months

Curing Performance

The setting speed will vary according to the type of surface finish encountered. Active surfaces such as iron, nickel and steel facilitate quick curing, semi-active surfaces such as aluminium, brass, stainless steel and zinc moderately quick curing, whilst inactive surfaces such as cadmium, chrome plate, zinc chromate and titanium are slow curing,

The gap between the parts to be bonded can also affect the cure speed. As the gap increases the time required to fully cure also increases. Thin bondlines, normally less than 0.02mm are fast curing. Bondlines of the specified optimum thickness will give normal cure times whilst larger up to and beyond the maximum specified gap will require longer to cure and also for fixation. Several hours will be needed before parts exceeding the specified maximum gap are fixtured.

Temperature	% Cure	Cure Time
25°C	15	30~50 min
25°C	50	3~8 hours
25°C	100	24 hours
80°C	100	30 min
100°C	100	20 min
120°C	100	10 min

M10 x P1.5; 2000cyc/min, 2mm, 4.5G, x 30 days

Temperature Performance

The cured adhesive is effective over the temperature range of -60~150°C. At 150°C it will retain 30~50% of its original strength. After cooling to room temperature the original adhesion strength will be recovered. Tests also indicate that exposure to high temperatures for long periods has no adverse effects. Bonds kept at 120°C for 3000 hours showed no decrease in bond strength after cooling to room temperature.

Handling

Cleaning of works

Whilst the presence of a small amount of oil on the fitting surfaces does not affect the practical bonding strength, in order to fully utilise the performance of the adhesive, it is recommended to eliminate oil and dirt from the work. Oil and grease can be effectively removed by cleaning with organic solvent, although the use of hydrocarbon cleaners and light oils should be avoided due to residual deposits.

Surface Finish

Rougher surfaces generally produce higher bond strengths. For surface finishes below 0.15µm, cleanliness is extremely important to obtain a high strength. Surface finishes above 3.2µm create excessive gaps, which reduces the bond strength. The recommended finish range is 0.3 ~ 2.0µm.

Priming

Where cure speed is unacceptably long, or large gaps are present, the use of a primer, such as **TB3095C**, is recommended to improve the cure speed. This also ensures reliable curing of the adhesive. Primer can be spray, brush or dip applied and must be dry before the adhesive is applied. Assembly must then take place within 3 minutes otherwise the parts will require cleaning and retreating.

Applying the Adhesive

The **TB1300 Series** adhesives may be applied directly from the container. It may be applied with a brush from a holding container although the transfer of remaining fluid to the stock container should be avoided so as to avoid contamination. A range of automatic precision dispensing machines is available.

- When locking threaded parts ensure at least 5 threads are wetted, otherwise inadequate or variable bond strength may occur.
- Excessive adhesive coming out of the joints does not set and therefore should be wiped off with a cloth.

Assembly

Parts should be assembled taking care to ensure the adhesive wets the entire area to be bonded. Threaded parts must be tightened within 5 minutes. Allow assemblies to cure as recommended and parts should be fixtured (15% strength) before they are disturbed. Larger gaps require longer cure times and at temperatures below 10°C the adhesive will take too long to cure and not reach sufficient bond strength.

Disassembly Procedure

TB1327 forms a medium strength permanent bond when cured which under normal situations can be disassembled using hand tools. If the bond strength is too strong, for instance with large bonded areas, the bond can be weakened by the application of heat (300 ~ 350°C). The parts should be disassembled whilst at temperature. There are no solvents available to dissolve the cured adhesive in bonded joints. Once disassembled, cured adhesive can be removed mechanically or with methylene chloride. It should be noted that this substance will erode plastics and is harmful. Wiping with an organic solvent will remove the uncured adhesive outside the joint.

Solvent Resistance

Chemical resistance to commonly used fluids and gases such as water, water-glycol mixtures, diesel, gasoline, engine oil and hypoid oil is excellent. In most cases it is recommended to test the adhesive in the presumed application before production, particularly where high temperatures are involved. The adhesive is not recommended for sealing against strong acids, hydroxides, chlorine, oxygen and ozone.

Effect on Plastics

Uncured fluid adhesive before setting may affect some plastics. It is recommended to carry out a preliminary test when contact is expected. Plastics such as polycarbonate, ABS, acryl resin, styrol as well as natural rubber are readily affected. Others such as polyamide and polymethylene oxide show good compatibility.

Safety

Three Bond 1300 Series anaerobic products have been proven to be safe to handle as long as normal hygienic practices are observed. Repeated or prolonged skin contact may cause irritation. Contact with skin in such conditions should be avoided by using gloves or barrier cream. If there is a possibility of product splashing into the eyes it is recommended that eye protection is provided.

Storage

Since the adhesive sets through chemical reaction, storing it at high temperatures may shorten the service life. If stored in a cool place, well ventilated and not in direct sunlight in its original container, the adhesive will remain usable for its specified shelf life. If kept in a refrigerated area at 5-8°C the life is extended to a year or longer.

Health and Safety:

Material Safety Data Sheets available on request.

DISCLAIMER

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