

PLUS ENDFEST 2K-EPOXY

SOLVENT-FREE TWO-COMPONENT ADHESIVE BASED ON EPOXY RESIN

UHU

PRODUCT DESCRIPTION

Solvent free 2-component epoxy resin adhesive for heavy-duty requirements. Working time (open time) is approximately 90 minutes. Hardens at room temperature after 12 hours. Shock-resistant and resistant to age and humidity. Also available in the user-friendly double-syringe for easy ejection of the 2 components in the right mixing ratio.

FIELD OF APPLICATION

Glues metal, glass, porcelain, ceramic, wood, marble, stone, concrete, thermosets, glass fiber, reinforced plastics, hard-pvc, rubber, Styrofoam® and more. Not suitable for large glass surfaces, PE, PP styrofoam and soft PVC.

PROPERTIES

Resistance:

UHU plus joins are resistant to moisture, oil, dilute acids and alkalis and many solvents. Moisture, dilute acids and alkalis have very little effect on bond strength, even in the event of lengthy exposure. No universally valid data can be given as there are always many factors, such as the possibility of corrosion, duration of exposure and temperature, that affect the assembly. Some solvents, such as methylene chloride and trichloroethylene (Warning! Precautions must always be taken when using these substances!), soften the adhesive over a period of time. This effect can be made use of for dissolving adhesive joints.

UHU plus is resistant to ageing and weathering. The adhesive is not affected by even extremely low temperatures. At temperatures below -60°C , resistance to combined tension and shearing is reduced to approximately 75-80% of the value measured at room temperature; if the samples are heated up to room temperature once more, the original bond strength is also regained.

- solvent free 2-component epoxy resin adhesive for heavy-duty requirements
- mixing ratio: 1:1 (by volume).

- working time (open time) approx. 90 minutes
- hardens at room temperature after 12 hours
- shock-resistant
- resistant to age and humidity

PREPARATION

Personal safety: When using UHU plus endfest, contact of the adhesive with the skin should be avoided as much as possible.

Cleanliness makes the work easier. The hands should be cleaned using soap and water – never solvent – as soon as possible.

Once hardened, UHU plus endfest is, like most synthetic materials, physiologically safe and has no smell or taste. It is not recommended that this product is used to stick together parts that are likely to come into contact with foodstuffs, as it has not been authorised for this by appropriate American or German authorities.

Preliminary surface treatment: The surfaces to be stuck together must be cleaned very thoroughly before the adhesive is applied.

It is worth first using abrasive cloth (abrasive rating 100), then degreasing using cellulose moistened with a grease solvent such as acetone. Special preliminary treatments to achieve the best possible bond strengths are described in DIN Regulation 53281 (Sheet 1). (This may be obtained from Beuth-Verlag GmbH in Berlin.)

Aluminium and its alloys should be pre-treated using the "pickling" process. The cleaned parts are dipped in a caustic solution at $60 - 65^{\circ}\text{C}$ for 30 minutes.

This solution has the following composition:

27.5 parts by weight of concentrated sulphuric acid (density: 1.82 g/cm^3)

7.5 parts by weight of dichromate of sodium ($\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2\text{H}_2\text{O}$)

65.0 parts by weight of water

After pickling, the parts should be rinsed thoroughly and left to dry in a warm air current.

For other metals, see DIN 53281, Sheet 1.

Rubber: Surfaces made of vulcanised natural or synthetic rubber should be treated with concentrated sulphuric acid (density 1.82 g/cm^3) for between 2 and 10 minutes, depending on the quality of the rubber. The parts should then be very thoroughly rinsed to remove all trace of acid, and dried. If hairline cracks are visible on the treated surface when the part is flexed, this indicates that the surface has been sufficiently pre-treated.

Glass, porcelain and similar materials normally only need to be degreased using solvent. For wood, care must be taken to ensure that the surface is free of dust. Hardened plastics (duroplasts) such as phenolic resin (Bakelite®), melamine, urea, resorcin, polyester and epoxy resins should be roughened with an abrasive cloth (abrasive rating 100) and degreased as above.

UHU plus endfest is not suitable for use with thermoplastic plastics such as polyethylene, polypropylene, polystyrene and soft PVC.

Tools: For mixing it is best to use a plastic cup (in polyethylene, for example) or an unwaxed paper cup. Alternatively, small quantities may be mixed on a glass plate or something similar, using a wooden or metal spatula. Mixing should continue until the paste is of an even colour and the components are thoroughly combined.

Note: This information is the result of carefully executed tests. This Technical Data Sheet has been prepared to the best of our knowledge to provide you with advice when gluing. We cannot be held responsible for the results or any damage suffered, as the variety of factors involved (type and combination of materials and working method) are beyond our control. Users have to carry out their own checks and trials. Liability can only be accepted for the consistently high quality of our product.

As soon as possible after mixing, the paste should be applied to the surfaces to be stuck together in order to achieve the best possible bond. The adhesive is applied using a wooden or metal spatula, or a short-haired brush. For large areas, a fine-toothed spatula should be used as this ensures an even application. For use in mass production, we will be pleased to point out manufactures of dosing, mixing and processing machinery.

APPLICATION

Mixture ratio: (by volume) 1:1 (other mixing ratios possible)

Directions for use:

After the two components have been mixed, UHU plus endfest hardens with almost no loss of volume to form a duroplastic synthetic resin. The parts to be assembled usually need to be fixed under pressure. It is not necessary to apply extreme pressure. Hardening takes place by evaporation. The working consistency is so designed that a good bond is achieved at room temperature with a minimal amount of movement. The UHU plus endfest system enables the user to achieve a harder or softer final product by varying the quantity of hardener used:

- a) The mixing ratio 100 parts binder by weight + 50 parts hardener by weight produces a harder end product with slightly greater resistance to heat, water and chemical substances.
- b) The mixing ratio 100 parts binder by weight + 80 parts hardener by weight (equal lengths of strips from the tubes) is the normal mixing ratio for universal applications.
- c) The mixing ratio 100 parts binder by weight + 120 parts hardener by weight produces an end product that is flexible and resists peeling better, although it is less resistant to heat, water and chemical substances.

Within these limits, any mixing ratio is possible depending on requirements. A higher proportion of hardener reduces the working life of the mixture and its hardness.

Temperatures below 18°C slow down the hardening process and result in poor adhesion; extra warmth (heater, infrared radiator or similar) is therefore needed when working in cold places or in the open air.

Particularly strong adhesion is achieved if hardening takes place at a higher temperature, in the region of 70 to 180°C. The following table shows the relationship between time and temperature for minimum hardening times:

45 minutes at 70 °C
30 minutes at 80 °C
20 minutes at 90 °C
10 minutes at 100 °C
7 minutes at 120 °C
6 minutes at 140 °C
5 minutes at 150 - 180 °C

Temperatures should not exceed 200°C either during hardening or when the assembly is subsequently put under pressure, as this would affect firmness and the stability of the substance. Dosing and mixing:

Precise dosing and thorough mixing are essential for good bonding and even joins.

The normal mixing ratio is 1:1 by volume (equal lengths of strands from the tube), which is equivalent to 100 parts binder by weight + 80 parts hardener by weight.

Small variations in the proportions of binder and hardener make virtually no difference.

Open time: 90 mins. (Period of usability at 20°C room temperature)

Stains/residue: Cleaning:

Apparatus should be cleaned before the adhesive has hardened – acetone and nitro thinners are suitable solvents for this. The same applies to soiled clothing.

Points of attention: Protective precautions:

UHU Plus endfest contains solvents. Some solvents, such as methylene chloride and trichloroethylene (Warning! Precautions must always be taken when using these substances!), soften the adhesive over a period of time. This effect can be made use of for dissolving adhesive joins. Appropriate precautions should therefore be taken during storage or when working with the adhesive.

When using UHU plus endfest, contact of the adhesive with the skin should be avoided as much as possible.

Cleanliness makes the work easier. The hands should be cleaned using soap and water – never solvent – as soon as possible. For mass production, the workplace must be well ventilated. Once hardened, UHU plus is, like most synthetic materials, physiologically safe and has no smell or taste. It is not recommended that this product is used to stick together parts that are likely to come into contact with foodstuffs, as it has not been authorised for this by appropriate American or German authorities.

TECHNICAL PROPERTIES

Temperature resistance: Between -40 and +100°C (dependent on material and construction; higher temperatures may also be possible - see chart).

Temperatures should not exceed 200°C either during hardening or when the assembly is subsequently put under pressure, as this would affect firmness and the stability of the substance. UHU plus is resistant to ageing and weathering. The adhesive is not affected by even extremely low temperatures. At temperatures below -60°C, resistance to combined tension and shearing is reduced to approximately 75-80% of the value measured at room temperature; if the samples are heated up to room temperature once more, the original bond strength is also regained.

Chemicals resistance: many solvents, oil, dilute acids, alkalis and many solvents. Moisture, dilute acids and alkalis have very little effect on bond strength, even in the event of lengthy exposure. No universally valid data can be given as there are always many factors, such as the possibility of corrosion, duration of exposure and temperature, that affect the assembly. Some solvents, such as methylene chloride and trichloroethylene (Warning! Precautions must always be taken when using these substances!), soften the adhesive over a period of time. This effect can be made use of for dissolving adhesive joins.

TECHNICAL SPECIFICATIONS

Appearance: binder: opaque; hardener: honey coloured

Chemical base: binder: epoxy resin; hardener: aliphatic amines

Bonding technique: Wet adhesion

Viscosity: binder: 40.000; hardener: 30.000 mPa.s.

Solid contents: approx. 100 %

Density: approx. binder: approx. 1.2; hardener approx. 0.96 g/cm³

Specifications:

Consistency - binder: High viscosity; hardener: medium viscosity

Flame point [°C] - binder: approx. 210; hardener: approx. 110

Firm to the touch: 6 hours

Firm enough to use: 12 hours

Final firmness: 24 hours

STORAGE CONDITIONS

Please store the product at a dry and frost free place.

PHYSIOLOGICAL PROPERTIES

The dried adhesive is inert, completely neutral and physiologically indifferent.

PACK SIZES

Tube of binder, tube of hardener, 33g, 163g

Double-chamber-cartridge, 25g

Double-chamber-syringe with static mixer 15g