

Technical Data Sheet

ACEBOND

DESCRIPTION

Is a One-Component Bonding Agent for Castable Polyurethane Elastomers and Thermoplastic Polyurethane Elastomers.

BENEFITS OF ACE BOND

BONDING CAPABILITIES :

ACEBOAND is a one-component bonding system for hot and cold-cure PUs and TPUs to all metals during the curing process at temperatures of 20°C to 135°C for cast elastomers and up to 200°C for TPUs.

ACEBOND will also bond PUs and TPUs to epoxies and fibreglass reinforced plastics, polyamides and other engineering thermoplastics, , PBT, PET, PPS, PPO, PEEK, PES, etc.

ACEBOND is free from MEK and Toluene.

IN-SERVICE BENEFITS :

ACEBOND is especially suitable for use in dynamic conditions where hydrolytic stability is important, exhibiting no failure in the cement to metal bond.

This is illustrated by tests where a 95° Shore A modified polyether TDI prepolymer / Ethacure 300 system was bonded to mild steel with Cilbond 48C. It showed 100% rubber tear with peel loads of $\geq 1000\text{N}/25\text{mm}$, when tested at 23°C after total immersion for 15 days in pressurised tap water at 105°C.

ACEBOND exhibits excellent salt-spray resistance, illustrated by bonding a polyether TDI prepolymer /Ethacure 300 to a mild steel substrate and tested at 35°C in a 5% salt solution for 700 hours. Results showed no edge corrosion or bond failure.

PROCESSING BENEFITS :

ACEBOND is formulated to give tack-free / non-blocking coatings. It will also bond without the need of a pre-bake, but will reliably withstand cycles of up to 24 hours at 100-110°C.

TYPICAL PHYSICAL PROPERTIES

Appearance: Colourless Liquid

Viscosity - No 3 Zahn Cup @ 26°C: 30 seconds

Viscosity - Din 4 @ 26°C: 50 seconds

Non-Volatile Solids: 21.5 % by weight

Specific Gravity, 26°C: 0.90 – 0.95

Moulding Temperature Range: 20 - 135°C (Cast Elastomers) and 150 – 230°C (TPU's)

Optimum Dry Coating Thickness : 25 micron for maximum adhesion and corrosion resistance.

Technical Data Sheet

ACEBOND

Typical Coverage at 25μ dry coating thickness: 15m² / Litre

Shelf Life: 12 Months from Date of Manufacture

WHERE TO USE

ACEBOND will bond all castable TDI, NDI and MDI prepolymer systems, MDI quasi systems, cold cure polyurethanes and TPU's to metals and plastics (including fabrics and cord) at temperatures of 20°C to 135°C for cast elastomers and up to and even above 200°C for TPU's.

It is especially suitable for use in dynamic conditions where hydrolytic stability is important, exhibiting no failure in the cement to metal bond.

END-USE APPLICATIONS

End applications for products using Cilbond 48C include :

- Rollers for the paper and textile industries, including rotationally cast PU rollers
- Solid tyres
- Carriage wheels
- Dunnage
- Pipe linings
- Pipe coatings
- Reinforced screen decks
- Belts
- Any product with an engineering bond between a PU elastomer and a metal or plastic substrate.

ACEBOND should also be considered for bonding PU's to a range of RFL-treated and untreated fabrics and cords such as polyamide, Aramid, polyester and carbon fibre, as used in hose and belt construction.

METAL SURFACE PREPARATION

ACEBOND must be applied to carefully prepared surfaces for it to be effective. Surfaces should ideally be grit-blasted with clean, filtered (200-400 micron) sharp alumina or steel grit and solvent degreased.

Alternatively, surfaces may be phosphated using well-established proprietary systems.

Good metal preparation is vital if the environment is continually wet, such as sub sea situations.

Most engineering plastics can be grit blasted, but it may be necessary to use finer grit (100-200μ) and use a lower air pressure to prevent plastic flow and any fibrillation.

For detailed recommendations on substrate preparation refer to Information Sheet A1.

Technical Data Sheet

ACEBOND

APPLYING ACEBOND

-AGITATION: ACEBOND should be stirred prior to use.

-BRUSHING: Application by brushing is normally undertaken without further dilution, but for coating large areas, dilution with MEK or the diluent blend shown below, improves flow and speed of application. The application of two thin coats is more consistent with good bonding than applying one thick coat.

-DIPPING: Dilute to a viscosity of 16-24 seconds using a Zahn No.2 cup at 25°C or 13-20 seconds using a Din 4 or Ford 4 Cup at 25°C. Use MEK if a fast drying coating is required, or MEK/Toluene blends if slow drying is required.

-SPRAYING: Dilute to 16-24 seconds on a Zahn No 2 cup or 13-20 seconds on a DIN 4 or Ford 4 cup at 25°C, using up to 30% of the diluents shown below.

A nozzle size of 1.0 – 1.5mm and an air-pressure of 1.5 bar is recommended. Excessive air-pressures may lead to cob-webbing. If cob-webbing (fibrillation) occurs, use more diluent containing more higher boiling solvent, such as MPA.

If MEK is used as the sole diluent, beware of chilling the sprayed metal parts (due to rapid MEK evaporation) and subsequent condensation of water, which may lead to a micro porous film. It is normally preferred to use a diluent made up from MEK and toluene in the ratio of ca. 3:1 by weight or volume.

-DILUENTS: See separate section below on the recommended diluent blends for brushing or spraying.

-ROLLER COATING: The viscosity of ACEBOND may be too low for some roller application processes.

-DRYING: Dry each coat for at least 45 minutes, and the final coat for at least 60 minutes at room temperature of $\geq 23^{\circ}\text{C}$. At below 20°C , extend the drying time accordingly.

Forced drying may be used (and is recommended for cold-cast PU's with little or no exotherm), if care is taken to prevent blistering of the films, but use low temperatures (of up to 60°C) in the early stages of drying. Pre-warming parts to $\sim 60^{\circ}\text{C}$ prior to coating will also reduce drying time. For cold cast PU's, where no heat input is possible, the final coat should be left to dry for several hours, preferably overnight, prior to casting the PU.

Alternatively, consider Cilbond 41 for low temperature on-site bonding.

-PRE-BAKING Pre-baking is not usually required to develop good bonding to the substrate however if a pre-bake is necessary, CIL recommend using 1 hour at $100-110^{\circ}\text{C}$. The maximum prebake is 24 hours at $100-110^{\circ}\text{C}$ and pre-bakes at $>120^{\circ}\text{C}$ should be carefully controlled.

-COATING THICKNESS: For general-purpose applications use a dry coating thickness of 15 microns. For dynamic fatigue or severe environment applications use a dry coating of ≥ 25 microns.

-PU CASTING: Cast the PU as directed by the PU manufacturer. For hot cast PU's, always heat the coated metals up to the mould temperature/casting temperature. For cold cast PU's and rotational casting it is important, in order to maximise the environmental resistance, to either extend the drying time (as described above) or preferably, heat the coated parts at $60-70^{\circ}\text{C}$ for 30–60 minutes, prior to casting the PU and for very fast curing PU systems the moulding process can be conducted

Technical Data Sheet

ACEBOND

after the metals have cooled down, if it is absolutely necessary.

-POST-CURES: Post curing is not required with ACEBOND, but any post cure specified for the PU, will generally enhance the bond strength and the environmental resistance of the bond.

-STORAGE: Coated parts can be stored for up to 7 days, provided they are protected from dust and moisture, but ideally the PU should be cast within 48 hours.

DILUENTS

It is normal to dilute ACEBOND to suit the application process. For Brushing add between 10-20% of the recommended Solvent. For Spraying / Dipping add between 20-50%, although this is a guide only :

Methyl Ethyl Ketone (MEK) :

Brushing: MEK is fast drying, so it is used mainly for brush application to relatively small components.

Spraying / Dipping: May cause excess chilling and cob-webbing/fibre formation. Works best with HVLP systems

Acetone :

Brushing: Yes, at 10-20% but use for small parts only. Acetone can cause severe chilling of the metals.

Spraying / Dipping: Do not use acetone for normal spray applications, though it can be used for tumble spraying.

MEK / Toluene (with MEK content $\geq 60\%$) :

Brushing: A good all round diluent for brushing.

Spraying / Dipping: A good all round diluent for spraying, especially with HVLP guns.

Glycol Ethers (MPA etc.) :

Brushing: Use for brushing large areas. These diluents are very slow drying, so extend drying time by at least 2 hours.

Spraying / Dipping Gives excellent spray properties, but extend the drying time by at least 2 hours.

ACEBOND Diluent :

Brushing: Excellent diluent, but extend drying time by 2 hours

Spraying / Dipping: Excellent diluent, but extend drying time by 2 hours.

Toluene, MIBK or Butyl Acetate :

Brushing: DO NOT USE ON THEIR OWN – may cause polymer precipitation.

Spraying / Dipping: DO NOT USE ON THEIR OWN – may cause polymer precipitation

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Technical Data Sheet

ACEBOND

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