

CILBOND 45SF is a Clear One-Component Solvent-Based Bonding Agent for Castable Polyurethane Elastomers and Thermoplastic Polyurethane Elastomers (PU's And TPU's).

BENEFITS OF CILBOND 45SF

BONDING CAPABILITIES :

Cilbond 45SF is a one coat bonding system for PU's and TPU'S to all metals during the curing process.

Cilbond 45SF will also bond polyurethane elastomers to polyamides and other engineering thermoplastics, such as Hytrel[®], polyester, PES, PPS and PPO, at 80°C or above.

IN-SERVICE BENEFITS :

Cilbond 45SF is especially suitable for use in dynamic conditions where hydrolytic stability is important. Components produced using a dry coating thickness of 25 microns will show no sign of edge corrosion after 400 hours salt spray tests. The environmental resistance to hot and cold water, fluids is excellent.

PROCESSING BENEFITS :

Cilbond 45SF is able to withstand long pre-bake cycles.

END-USE APPLICATIONS OF CILBOND 45SF

End applications for products using Cilbond 45SF include :

- Rollers for the paper and textile industries
- Solid tyres
- Carriage wheels
- Pipe linings and pipe coatings
- Any product with an engineering bond between a PU elastomer and a metal or plastic substrate.

TYPICAL PHYSICAL PROPERTIES OF CILBOND 45SF

Appearance	<i>Clear Liquid</i>
Viscosity - No 3 Zahn Cup @ 26°C	<i>30 seconds</i>
Non-Volatile Solids	<i>24% by weight</i>
Specific Gravity, 26°C	<i>0.92</i>
Flash Point (Abel Pensky)	<i>-2°C</i>
Moulding Temperature Range	<i>80 - 205°C</i>
Optimum Dry Coating Thickness	<i>≥25 micron for maximum adhesion and corrosion resistance.</i>
Typical Coverage at 20µ dry coating thickness	<i>15m² / Litre</i>
Shelf Life	<i>24 Months from Date of Manufacture</i>

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METAL SURFACE PREPARATION

Cilbond 45SF must be applied to carefully prepared surfaces for it to be effective. Surfaces should ideally be grit-blasted with clean, filtered, sharp alumina or steel grit (200-400 μ), and solvent degreased.

Alternatively, surfaces may be phosphated using well-established proprietary procedures. **Cilbond 45SF** will also bond to zinc and passivated zinc coatings, fusion bonded epoxy (FBE) and many other surfaces. Good substrate preparation is vital if the environment is continually wet such as sub sea situations and/or involves severe dynamic fatigue.

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

APPLYING CILBOND 45SF

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.

SPRAYING We recommend an HVLP gun using 1.5 Bar air-pressure and a nozzle size of 1 - 1.5mm. Dilute to a viscosity of 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 the diluent shown below. If fibrillation (cob-webbing) occurs, use diluent containing more higher boiling solvent, such as MPA. **Cilbond Diluent 4000** is an ideal diluent for **Cilbond 45SF**.

If MEK is used as the main diluent, beware of chilling the metals (due to rapid evaporation) and subsequent condensation of water, which may lead to a micro-porous film.

ROLLER COATING Dilute to 35 - 45 seconds on a DIN 4 or Ford 4 cup at 25°C for most roller application processes. Dilution with a high boiling solvent like MPA may be necessary to achieve the best finish and to reduce the skinning of the bonding agent in the applicator.

DRYING Dry each coat for at least 45 minutes and the final coat for at least 1 hour at room temperature (25°C). At below 20°C extend the drying time accordingly. Forced drying may be used provided care is taken to prevent blistering of the films so we recommend temperatures below 60°C in the early stages of drying. Pre-warming the parts *before* coating will also aid drying (60°C is recommended).

PRE-BAKING Pre-baking is required to develop good bonding to the substrate, especially to metals. The minimum pre-bake is ca. 1 hour at ca. 100°C and a **typical recommended pre bake is 2 hours at 100-110°C**, though longer pre bakes (4-8 hrs at 100°C) do maximise bond strengths, percentage bond retention, heat resistance and environmental resistance.

The **Cilbond 45SF** coating should not be pre-baked for more than 48 hours at temperatures of ca. 100°C, 24 hours at 110°C or 15 hours at 120°C.

If a pre-bake at 130°C is used, it must be carefully controlled.

COATING THICKNESS For general purpose applications use a dry coating thickness of **20 microns**. For severe environments or dynamic fatigue applications, use **≥ 25 microns**. Under these conditions it is possible to achieve bonds with no edge-failure after 400 hour salt-spray tests.

APPLYING CILBOND 45SF (continued)

DILUENTS

The best diluent is the following blend, where parts are by weight:

- 86 parts Methyl ethyl ketone (MEK)
- 7 parts Methyl proxitol acetate (MPA)
- 7 parts Ektapro (EEP), ethoxy ethyl propionate.

This solvent blend is available from CIL as **Cilbond Diluent 4000**. For many applications it is possible to dilute with low moisture content MEK, provided that the **Cilbond 45SF** is agitated whilst adding the MEK. If cob-webbing occurs whilst spraying, the addition of mixtures of MEK and high boiling ethers and or esters, such as MPA will reduce it.

STORAGE

Coated parts may be stored for long periods of time (several weeks) provided they are protected from dust and moisture.

ADDITIONAL INFORMATION – LOW TEMPERATURE BONDING

For low temperature bonding it is possible to use either :-

Cilbond 45SF + Cilcure B at a ratio of between 100 : 5 and 100 : 10 (weight : weight)

When used with **Cilcure B**, the system has >8 hour pot-life. Dried coatings have an open-time of up to 24 hours prior to PU casting. Using **Cilcure B** will give bonded components exceptional solvent and water resistance (at a ratio of 100 : 10), although coatings will yellow in UV / sunlight.

or

Cilbond 45SF + IPDI at a ratio of 100 : 5 (weight : weight)

When used with **IPDI**, the system has >12 hour pot-life. Dried coatings have an open-time of up to 36 hours prior to PU casting. Using **IPDI** will give bonded components excellent UV stability and good bonding to aromatic and aliphatic polyurethanes, including low-temperature slow-curing systems.

With both systems bonds should be conditioned for at least 7 days prior to using in a tough environment.

PACKAGING

Cilbond 45SF is supplied in 10L, 25L and 200L containers. 250ml trial samples are also available upon request.

FURTHER INFORMATION

For more information on **Cilbond 45SF** or for details of our other products please visit www.cilbond.co.uk or e-mail sales@polycil.co.uk

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