

CILBOND 41 is a One-Component Solvent-Based Bonding Agent for Low-Temperature Curing Castable and RIM Polyurethane Systems to a variety of substrates

BENEFITS OF CILBOND 41

BONDING CAPABILITIES :

Cilbond 41 is an effective one-part bonding system for castable polyurethane elastomers and RIM polyurethanes to a variety of substrates including mild steel, stainless steel, brass, aluminium, acrylic plastics, ABS, GRP, epoxies and concrete.

IN-SERVICE BENEFITS :

When used as a two component adhesive with **Cilcure B**, improved environmental resistance is achieved and the system will bond fusion bonded epoxies, cured elastomers such as NR, CR, PU, etc and very fast curing polyurethanes, as used in rotational casting systems and many sprayed elastomers.

Furthermore, the water resistance of **Cilbond 41 + Cilcure B** is exceptional. A modified 95°A ether TDI prepolymer cured with Ethacure 300 bonded to mild steel will withstand boiling water at 220°F without loss of adhesion for >200 hours.

Cilbond 41 can also be used at temperatures of less than 68°F (under controlled conditions), making on-site bonding possible.

END-USE APPLICATIONS OF CILBOND 41

End applications for products using **Cilbond 41** include :

- Rollers for the paper, metal decorating and textile industries
- Solid tyres
- Carriage wheels
- Dunnage
- 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 41

Appearance	<i>Hazy Colourless to Pale Yellow Liquid</i>
Viscosity - No 3 Zahn Cup @ 78°F	<i>14 seconds</i>
Non-Volatile Solids	<i>18.0% by weight</i>
VOC Content	<i>82.0% by weight (6.0 lbs per US Gallon)</i>
Volume Solids	<i>15.1%</i>
Weight per Gallon	<i>7.3 lbs</i>
HAP Content	<i>0.1% (0.0lb HAP / US Gallon solid)</i>
Specific Gravity @ 78°F	<i>0.87</i>
Flash Point (Abel Pensky)	<i>17.6°F (-8°C)</i>
Bonding Temperature Range	<i>68 - 212°F</i>
Recommended Dry Coating Thickness	<i>0.6 – 1.0 mil (15 – 25 micron) for maximum adhesion.</i>
Typical Coverage at 0.6 mil (dry)	<i>610ft² / US Gallon</i>
Shelf Life	<i>24 Months from Date of Manufacture</i>

WHERE TO USE CILBOND 41

Cilbond 41 is used to bond castable PU elastomers to a variety of metals and engineering plastics substrates, where the curing temperature of the PU is between 68°F and 195°F.

The ability of **Cilbond 41** to form dependable bonds between castable PU's and concrete makes the product particularly useful for sprayable or cast coatings in external applications.

For improved environmental resistance, bonded components should be either aged at ambient temperatures for several weeks or, if possible, given a post cure at 120 - 160°F for several hours. Rollers, wheels and solid tyres, wear parts, cable connectors are all suitable application areas. If the environmental conditions are severe, such as continuous water immersion, then **Cilbond 41** and **Cilcure B** is preferred. See separate section below.

THE USE OF CILBOND 41 WITH CILCURE B

Cilcure B is an additive used to give **Cilbond 41** superior environmental resistance and the ability to bond rotationally cast PU's to metals, PVC and even cured rubber compounds. This 2 part system can also be the first choice for bonding PU to concrete and fusion bonded epoxy coatings.

Using **Cilbond 41** and **Cilcure B** as a primer under **Cilbond 41** gives a versatile system for tough environments.

Mixing Ratio of Cilbond 41 : Cilcure B - Weight : Weight	
100 : 5	100 : 8
Room temperature rotational casting Improved environmental resistance	Bonding to cured rubbers Post vulcanisation bonding Excellent environmental resistance

The **Cilcure B** must be added to well stirred **Cilbond 41** and the mixture stirred gently for a few minutes. Stand for a few minutes and stir again before use. Keep the mixture covered or sealed from the atmosphere when not in use and use the mixture within 8 hours. Do not use the mixture once it becomes viscous or gelatinous.

The details on how to apply **Cilbond 41** and **Cilcure B** are basically the same as for **Cilbond 41**, except that the parts should be moulded with the PU within 24 - 30 hours. In most cases it is quite feasible to cast the PU once the coating has been dried for 20 minutes, unless higher boiling solvents have been used when the drying time must be extended.

Using a cover coat of **Cilbond 41** over a primer coat of **Cilbond 41** and **Cilcure B** gives the user the combined benefits of both, in that the **Cilbond 41** and **Cilcure B** gives the system improved bonding to metals, plastics and especially to elastomers, gives improved environmental resistance, whilst the **Cilbond 41** cover coat gives the user a long open time in that parts can be stored prior to moulding the PU.

METAL SURFACE PREPARATION

Cilbond 41 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 procedures. For detailed recommendations on substrate preparation refer to **Information Sheet A1**.

APPLYING CILBOND 41

AGITATION Stir well before use and occasionally during use. Use an earthed, hand-held or mechanical metal stirrer.

BRUSHING Application by brushing is normally undertaken without dilution, but for coating large areas, dilution with 5 - 10% of the diluents shown below, improves flow and speed of application.

DIPPING Dilute to a viscosity of 16 - 24 seconds using a Zahn No 2 cup at 78°F or 13 - 20 seconds using a Din 4 or Ford 4 Cup at 78°F using up to 10% of the diluents below. Acetone is recommended if a fast drying coating is required. The CIL recommendation is to add butyl acetate to **Cilbond 41** at a mix ratio of between 2:1 to 3:2 by weight of Cilbond 41:butyl acetate.

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 78°F, using up to 10% of the diluents shown below. If fibrillation (cob-webbing) occurs, use more diluent or use more higher boiling solvent. Acetone is not recommended for spraying.

If MEK is used as the sole diluent, beware of chilling of the sprayed metal parts and subsequent condensation of water, which may lead to a micro porous film.

For best spraying quality, CIL recommends using an HVLP spray system (0.04–0.06 in nozzle size and 22 psi air pressure). Dilute with butyl acetate at a mix ratio of 2 : 1 to 3 : 2 by weight of Cilbond 41 : Butyl Acetate.

ROLLER COATING Dilute to 13 – 20 seconds on a DIN 4 or Ford 4 Cup at 78°F, for most roller application processes. Dilution with up to 10% of the diluents shown below gives a fast application. Over rolling should be avoided.

DRYING Dry each coat for at least 30 minutes and the final coat for at least 1 hour at a room temperature of 78°F. At below 68°F extend the drying time accordingly. Forced drying is not normally required and is not normally recommended, but may be used if care is taken to prevent blistering of the films. Pre-warming parts 140°F prior to coating with Cilbond 41 will help drying.

PRE-BAKING Pre-baking is not a requirement of **Cilbond 41**, though a short pre-bake of up to 2 hours at 195 - 210°F will not affect bonding.

COATING THICKNESS For general-purpose applications use a dry coating thickness of 0.6 mil. For dynamic fatigue or severe environments use a dry coating thickness of ≥1.0 mil.

DILUENTS Diluents may not be necessary with **Cilbond 41**, but if required choose from the following :

Diluents	Min. Drying time	Comments
MEK	20 mins	The most versatile diluent for brushing and dipping.
Acetone	20 mins	Only for dipping, can cause severe metal chilling
MIBK	35 mins	
Butyl acetate	45 mins	First recommendation for spraying
Glycol ether acetates including PMA (MPA)	1 – 4 hours	Reduces fibrillation on spraying, but drying times are extended to several hours.

Always stir the **Cilbond 41** whilst adding any diluent.

STORAGE Coated parts may be stored for long periods of time (several weeks) provided they are protected from dust and moisture. If parts are stored for long periods an additional fresh coat may be required.

PU CASTING Cast the PU following recommendations from the PU supplier. Allow bonds to develop for >24 hours before applying any stress or immersion in any fluid.

CLEANING OF EQUIPMENT

Dried films of **Cilbond 41** will clean off equipment using acetone, MEK or MIBK.

When using **Cilbond 41** with **Cilcure B**, dried films will initially dissolve in the same solvents, but cured films may be difficult to remove unless methylene chloride or other aggressive solvents are employed.

PACKAGING

Cilbond 41 is supplied in 2.5, 6.5 and 55 US Gallon containers. ½ pint trial samples are also available upon request.

FURTHER INFORMATION

For more information on **Cilbond 41** or for details of our other products please visit www.cilbond.com or e-mail sales@cilbond.com