

CILBOND 20 is a High-Performance One-Component Rubber to Metal Bonding Agent

BENEFITS OF CILBOND 20

BONDING CAPABILITIES :

Cilbond 20 is a very high-performance one-component bonding system developed for bonding **Vamac® G** and **Natural Rubber** compounds to metals and polar plastic substrates.

The full bonding capabilities of **Cilbond 20** as a one-component bonding system are shown below:

- | | |
|-------------------------------------------------------------------------------|-----------------------------------------------|
| • Natural Rubber (NR) | • Styrene Butadiene Rubber (SBR) |
| • Polychloroprene Rubber (CR) | • Polybutadiene (BR) |
| • Synthetic Polyisoprene Rubber (IR) | • Polyepichlorohydrin (ECO) |
| • Polyacrylate (ACM) | • Chlorosulphonated Polyethylene (CSM / ACSM) |
| • Ethylene Acrylate / Vamac® G (AEM) | • Nitrile Elastomers (HNBR / XNBR) |
| • Fluoroelastomers -peroxide cured (FKM – including metal oxide-free systems) | |

IN-SERVICE BENEFITS :

- **Superior Temperature Resistance** - Bond retention from - 58°F to over 390°F
- **Exceptional Salt-spray Resistance** - DIN 50021 tests have shown < 2mm edge failure on 30% stressed components after 1000 hours salt-spray in 5% salt at 95°F
- **3-Cycle Testing** - Bond testing showed <2mm edge failure after 1152 hours of 3-cycle testing.
- **Glycol Testing** - No loss of bond and no blisters when tested for 1000 hours in glycol mixtures at temperatures up to 320°F
- **Acid and Alkali Resistant**
- **Superior Chemical Resistance** - Resistant to mineral oils, kerosene, petroleum spirits, unleaded fuels, synthetic ester turbo oil and hydraulic fluids (including brake fluid) up to at least 355°F
- **Glycol / water Resistance** - No loss of bond when tested for 300 hours at 248°F in 50/50 glycol/water

PROCESSING BENEFITS :

- Well dried parts show almost zero mould fouling or staining.
- Excellent pre-bake resistance of up to 30 minutes at 320°F prior to bonding, depending on the effect the compound has on pre-bake resistance.
- Dried Cilbond 20 coatings do not chip during normal processing / handling, and although they may mar, this does not affect bonding quality.
- Components can be swaged without causing bond failure at the points of the metal strain.
- Elastomers can be injection moulded at up to (or even above) 392°F if necessary.

TYPICAL PHYSICAL PROPERTIES OF CILBOND 20

Appearance	<i>Black Mobile Liquid</i>
Viscosity - DIN 4 Cup @ 78°F	<i>25 seconds</i>
Viscosity – Zahn 3 Cup @ 78°F	<i>12 seconds</i>
Concentration (Non-Volatile Solids)	<i>24% by weight</i>
VOC Content	<i>76% by weight (6.2 lbs per US Gallon)</i>
Volume Solids	<i>16.8%</i>
Weight per Gallon	<i>8.1 lbs</i>
HAP Content	<i>54% (20.5 lb HAP / US Gallon solid)</i>
Specific Gravity @ 78°F	<i>0.95</i>
Flash Point (Abel Pensky)	<i>41°F (5°C)</i>
Bonding Temperature Range	<i>248 - 445°F</i>
Recommended Dry Film Thickness	<i>min. 15 microns / 0.6 mil</i>
Typical Coverage @ 15 microns / 0.6 mil	<i>ca. 610 ft² / US Gal</i>
Shelf Life @ 78°F	<i>12 Months from Date of Manufacture</i>

METAL SURFACE PREPARATION

For optimum bonding with **Cilbond 20**, all metal surfaces must be contaminant free.

Grit-blasting with sharp chilled iron grit (200-400µ) or blasting to a grey-white finish should yield excellent bonding surfaces with ferrous metals and for non-ferrous metals sharp 200-400µ aluminium oxide is recommended. All parts to be bonded should ideally be degreased before and after grit-blasting to maximise the environmental resistance.

Other methods of metal preparation, including phosphate and chromate conversion coating, or acid and alkaline pre-treatments will also give excellent bonds.

NOTE: - careful attention to all phases of metal preparation is the single most important factor in obtaining high quality bonds. For detailed recommendations on substrate preparation refer to **Information Sheet A1**.

APPLYING CILBOND 20

AGITATION Stir thoroughly before use, preferably with a high-speed propeller type stirrer.

BRUSHING Dilution is not normally required if applying by brush. For coating large areas dilute with approx. 10-15% Toluene, Xylene or MEK. Two thin coats are preferred to one thick coat.

DIPPING For dip application of **Cilbond 20**, dilution is necessary to reduce the viscosity to a level where correct film formation may be achieved. Dilute with Toluene or Xylene to the following viscosities :

Viscosity Guide @ 78°F :	DIN 4 or Ford 4 Cup	: 18 - 24 seconds
	Zahn Cup No 2	: 24 - 28 seconds

At these viscosities **Cilbond 20** may require 30 - 50 parts Diluent to 100 parts **Cilbond 20**. If faster drying or a thicker coat is required, replace all or part of the diluent with MEK or MIBK. After dilution, stirring on a continuous basis is recommended.

SPRAYING For spray applications, Xylene is the preferred diluent, especially for eliminating cob webbing / fibre formation. Dilute to the following viscosities :

Viscosity Guide @ 78°F :	DIN 4 / Ford 4 Cup	: 13 - 20 seconds
	Zahn Cup No 2	: 16 - 24 seconds

This may require as much as 30 - 40 parts Diluent to 100 parts **Cilbond 20**.

MEK/Xylene and MIBK/Xylene blends are also effective diluents for spraying, especially where automated rapid processing is employed. After dilution, stirring on a continuous basis is recommended.

Typically, use an Air Pressure of 22 – 36 psi (1.5 - 2.5 bar) with a Fluid Pressure of 7 - 14 psi (0.5 - 1.0 bar). Use a nozzle size of 0.02 - 0.05 in (0.5 - 1.2mm) when using an HVLP system, which is the preferred method of spray application. Note that excessive air pressure can cause fibrillation / cob-webbing.

ROLLER-COATING Dilution is not normally required if applying by roller.

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APPLYING CILBOND 20 (continued)

DILUTION

Toluene and Xylene are the main diluents for **Cilbond 20**. Other diluents include MEK, MIBK, other ketones and trichloroethane.

MEK / Xylene and MIBK / Xylene blends are also effective diluents for spraying.

Regardless of which diluent is chosen, it is imperative that **Cilbond 20** is stirred vigorously whilst diluent is being added, otherwise gelling may result.

FILM THICKNESS

It is vital to lay down as uniform a film of **Cilbond 20** as possible to obtain optimum and uniform bond strength results.

We recommend the following :

General Purpose Bonding : 15 - 20 microns / 0.6 - 0.8 mil (dry coating thickness)

Superior Environmental Resistance : 20 - 30 microns / 0.8 - 1.4 mil (dry coating thickness)

Insufficient dry film thickness will generally result in cement-metal failure and so a minimum dry film thickness of 15 microns / 0.6 mil is recommended.

The coating thickness is usually achieved with two coats.

DRYING

At room temperature (73°F) drying takes 30 - 45 minutes. If the temperature is abnormally low, longer times will be required. Forced drying can be used to reduce the drying times and large volumes of warm air (up to 190°F) will reduce the drying time to <5 minutes.

PRE-BAKING

Cilbond 20 exhibits excellent pre-bake resistance and though this is partly compound dependent, **Cilbond 20** can resist pre-bakes up to or even over 30 minutes at 320°F. There are occasions where bonding is improved with the use of a pre-bake.

MOULDING

Cilbond 20 resists wiping and mould fouling and may be used with all moulding methods including compression, transfer, injection and extrusion moulding.

Temperatures required to bond may vary from 250 - 450°F, but it is most effective at 300 - 355°F.

STORAGE

Coated parts may be stored for several weeks if protected from contamination.

ADDITIONAL INFORMATION – VAMAC[®] BONDING

Cilbond 20 was developed primarily for Vamac[®] G bonding, where in-service temperatures may reach >390°F, as shown by its resistance to long-term heat ageing tests at 390°F.

Bond formation is rapid and **Cilbond 20** shows excellent bonding when tested hot at 338°F direct from the mould and after any post-cure and gives excellent bonds with or without long post-cure schedules.

ADDITIONAL INFORMATION – PRIMER APPLICATIONS

Cilbond 20 will act as a very high-performance primer under many cover-coats, such as **Cilbond 80ET**, and bonds will show similar characteristics to **Cilbond 20** when used as a one-component system.

WHERE TO USE CILBOND 20

End applications for **Cilbond 20** include :

- High-performance engine and suspension mountings, including hydromounts
- TVD's, bushings, hydrobushes and other couplings
- Hoses / hose couplings
- Seals and gaskets
- Belts, including high-performance timing belts
- Rollers and wheels
- Pump linings, including progressing cavity pump stators
- Tank linings
- Other rubber to metal bonded components requiring a heat and dynamic fatigue resistant bond

PACKAGING

Cilbond 20 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 20** or for details of our other products please visit www.cilbond.com or e-mail sales@cilbond.com

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