

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

#### IN-SERVICE BENEFITS :

- **Superior Temperature Resistance** - Bond retention from - 50°C to over 200°C
- **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 35°C
- **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 160°C
- **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 180°C
- **Glycol / water Resistance** - No loss of bond when tested for 300 hours at 120°C 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 160°C 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) 200°C if necessary.

### TYPICAL PHYSICAL PROPERTIES OF CILBOND 20

Appearance	<i>Black Mobile Liquid</i>
Viscosity - DIN 4 Cup @ 26°C	<i>25 seconds</i>
Concentration (Non-Volatile Solids)	<i>24% by weight</i>
Specific Gravity @ 26°C	<i>0.95</i>
Flash Point (Abel Pensky)	<i>+ 5°C</i>
Bonding Temperature Range	<i>120 - 230°C</i>
Recommended Dry Film Thickness	<i>min. 15 microns</i>
Typical Coverage @ 15 microns	<i>15 m<sup>2</sup> / Litre</i>
Shelf Life @ 26°C	<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 (200-400 $\mu$ ) or blasting to a grey-white finish should yield excellent bonding surfaces with ferrous metals and for non-ferrous metals sharp 200-400 $\mu$  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 @ 26°C :	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 @ 26°C :	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 1.5 - 2.5 bar with a Fluid Pressure of 0.5 - 1.0 bar. Use a nozzle size of 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.

*Continued on Page 3*

## 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 (dry coating thickness)  
**Superior Environmental Resistance** : 20 – 30 microns (dry coating thickness)

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

The coating thickness is usually achieved with two coats.

**DRYING** At room temperature (23°C) 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 90°C) 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 160°C. 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 120 - 230°C, but it is most effective at 150 - 180°C.

**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 >200°C, as shown by its resistance to long-term heat ageing tests at 200°C.

Bond formation is rapid and **Cilbond 20** shows excellent bonding when tested hot at 170°C 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 10L, 25L and 200L containers. 250ml 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.kommerlinguk.com](http://www.kommerlinguk.com) or e-mail [sales@kommerlinguk.com](mailto:sales@kommerlinguk.com)

Vamac® is a registered trademark of DuPont Performance Elastomers