

## PRODUCT INFORMATION

### CHEMOLINE 4 B

#### PRODUCT DESCRIPTION

**CHEMOLINE 4 B** is a self-vulcanizing black rubber lining based on Bromobutyl rubber (BIIR).

#### FIELDS OF APPLICATION

**CHEMOLINE 4 B** is used mainly for on-site and workshop rubber linings of steel components which are exposed to chemical loads. The field of applications are chemical plants, chlorine and steel industries, fertilizer manufacturing plants, phosphoric acid plants, mineral processing plants, power plants and environmental protection plants. Some typical examples of applications are the lining of storage tanks, agitated tanks, thickeners, as well as structural components of flue gas desulphurisation (FGD) plants such as absorbers, process tanks, clean gas ducts and chimneys.

#### APPROVALS

**CHEMOLINE 4 B** is approved (Z-59.22-159) by the German Institute of Construction Technology (DIBt) for steel storage vessels.

#### FEATURES

- Strong chemical resistance against mineral acids, bases, polar solvents and salt solutions
- Outstanding diffusion resistance to sulphur dioxide and saturated water vapour
- High thermal stability (max. +110°C)
- Application onto steel components
- On site rubber lining

#### CHEMICAL RESISTANCE

Information on the chemical resistance properties is available upon request.

#### SUBSTRATE

Substrates are components made of non-ferrous metals, cast iron, non-alloyed or austenitic steel. Components to be rubber lined shall be designed and manufactured in accordance with EN 14879-1.

#### SURFACE PRE-TREATMENT

All surfaces to be rubber lined must be dry and free of contaminants. All contaminants, including non-visible detectable contaminants, must be removed in accordance with DIN TR 55684 or EN ISO 8502. Non-alloyed steel surfaces shall be abrasive blasted to "Near White Metal" in accordance with EN ISO 12944-4. A surface preparation degree of SA 2½ (SSPC-SP 10; NACE No. 2) as specified in EN ISO 8501-1 and a "medium (G)" roughness degree as specified in EN ISO 8503-2 must be achieved. A minimum surface profile of  $R_z \geq 50 \mu\text{m}$  is required. To prevent flash rust, the primer must be applied immediately after the blasting and cleaning of the substrate or the component must be air conditioned to a relative humidity of  $\leq 40\%$ .

#### ENVIRONMENTAL CONDITIONS

Throughout the rubber lining process, the temperatures of the substrate and rubber lining materials shall be maintained within the range specified by TIP TOP. All surfaces shall be maintained at a temperature at least 3K above the dew point in order to prevent condensation.

#### ADHESIVE SYSTEM

**CHEMOLINE 4 B** is bonded onto steel components by using the two-coat primer system **PRIMER PR 500-1 & PRIMER S 500-2** in combination with **ADHESIVE TC 5000**. This bonding system requires a subsequent thermal treatment with a temperature of  $\geq +45^\circ\text{C}$ . In particular cases, and only with the verification of TIP TOP Application Technologies, the cold bonding system **PRIMER PR 304 / CEMENT BC 3004** with 4% **HARDENER E 40** can be used alternatively. When using the cold bonding system, the service temperature is limited to max.  $+90^\circ\text{C}$ .

#### APPLICATION METHOD AND CONSUMPTION

During the application of the product, the application instruction must always be observed.

Coat	Product	Application Method	Coverage [g/m <sup>2</sup> ]
1. Coat steel	<b>PRIMER PR 500-1</b>	Roll / Spray	ca. 150
2. Coat steel	<b>PRIMER S 500-2</b>	Brush	ca. 125
3. Coat steel	<b>ADHESIVE TC 5000</b>	Roll	ca. 150
4. Coat steel	<b>ADHESIVE TC 5000</b>	Brush	ca. 150
1. Coat rubber	<b>ADHESIVE TC 5000</b>	Brush	ca. 150

#### CLEANING

Clean all equipment with **SOLVENT CF-CE** immediately after use.

#### VULCANISATION

The details given in the application instruction must be observed during vulcanisation.

Place	Vulcanisation Method
On Site	Self-vulcanisation at ambient temperature ( $T > +25^\circ\text{C}$ ) within 3 - 4 month.
On Site	Vulcanisation with medium under operating conditions.
On Site	At higher operating temperatures and vacuum loads vulcanisation is carried out by means of steam (pressure) or hot water. In case of vacuum load, the <b>CHEMOLINE 4 B</b> must be fully vulcanised first.

The vulcanisation On Site is only allowed after consultation with the Application Technology Department of TIP TOP.

#### SPARK TEST

The spark test (holiday test) of new rubber linings is carried out according EN 14879-4 by using a high voltage tester. For carrying out the spark test, only the high voltage testers of Elmed model Isotest IIRT, Isotest 3P or Isotest Inspect 35 as well as the test pistols of Wegener model WEG 20, WEG 22 or WEG 100 are allowed.

## CHEMOLINE 4 B

CHEMOLINE 4 B	Test Voltage [kV/mm]	Max. Test Voltage [kV]
unvulcanised	4.0	20.0
vulcanised	4.0	20.0

### SAFETY MEASURES

The material safety data sheets of the individual components, the safety instructions on the packing (label) as well as the legal requirements for handling hazardous materials must be observed.

### PACKING UNITS

The products are supplied in the following standard package sizes:

Product	Size	Article No.
ADHESIVE TC 5000	9 kg	525 2286
ADHESIVE TC 5000	25 kg	525 2224
PRIMER PR 500-1	4.5 kg	525 2470
PRIMER PR 500-1	9 kg	525 2327
PRIMER PR 500-1	25 kg	525 2334
PRIMER S 500-2	9 kg	525 2341
PRIMER S 500-2	25 kg	525 2358
SOLVENT CF-CE	10 l	595 9163

### PACKAGING OF RUBBER SHEETS

The rubber sheets are wrapped with PE-separating sheets on cardboard cores, and packed freely suspend in stable, stackable card boxes, to avoid pressure points.

CHEMOLINE 4 B is manufactured by extrusion in the following standard sizes:

Size (Tolerances according EN 14879-4)	Article No.
2 mm x 1100 mm x 10000 mm	528 2933
3 mm x 1100 mm x 10000 mm	528 2971
4 mm x 1100 mm x 10000 mm	528 3011
5 mm x 1100 mm x 10000 mm	528 3059
6 mm x 1100 mm x 10000 mm	528 3097

### STORAGE

The products must be stored in a cool and dry place, away from direct sunlight. The rubber sheets must be stored free of pressure, best in the original packaging. The rubber sheets may not receive any pressure points. At the specified storage temperatures a shelf life of the products is given of at least for the following periods:

Product	Temperature	Shelf Life
ADHESIVE TC 5000	5 - 20°C	12 Months
CHEMOLINE 4 B	≤ +5°C	6 Months
CHEMOLINE 4 B	≤ +25°C	1 Month
PRIMER PR 500-1	5 - 20°C	12 Months
PRIMER S 500-2	5 - 20°C	12 Months
SOLVENT CF-CE	5 - 25°C	60 Months

If the storage time is exceeded, the materials must be tested before use. Higher storage and transport temperatures will reduce the shelf life. The containers must be kept tightly closed. Liquid products must be stored frost-proof. In addition, the DIN 7716 must be observed.

Technical Data	Standard	Unit	Value
Polymer Base	ISO 1629 (ASTM D1418)	-	BIIR
Abrasion	ISO 4649 (ASTM D5963)	mm <sup>3</sup>	≤ 320*
Density	EN ISO 1183-1 (ASTM D792)	g/cm <sup>3</sup>	1.25 ± 0.02
Hardness - Shore A	ISO 7619-1 (ASTM D2240)	-	50 ± 5* / 55 ± 5*** / 60 ± 5****
Elongation at Break	DIN 53504 (ASTM D412)	%	≥ 500**
Tensile Strength	DIN 53504 (ASTM D412)	N/mm <sup>2</sup>	≥ 5**
Impact Resilience	DIN 53512	%	≥ 6*
Peel Strength to Steel	ISO 813 (ASTM D429)	N/mm	≥ 4
Temperature Range	-	°C	-40 up to +110

\* Press vulcanisation \*\* S2 dump-bell test piece after press vulcanization \*\*\* After pressure less vulcanisation (sample plates) \*\*\*\* After complete vulcanisation under operating conditions **Note:** The indicated temperatures are dependent on the present load and may vary

Information given in the fact sheet above corresponds to the current knowledge available to us regarding our products at the time of its drafting and is intended as a guideline for informational purposes. However, because of the multiple possibilities regarding possible applications, processing and on site conditions, any information given in the fact sheet above is not legally binding, in particular, without being limited to, such information shall not be interpreted as a warranty of merchantability or of fitness for a particular purpose. Customer therefore is advised to conduct its own testing or make an inquiry with our technical department before ordering. We reserve the right to change the product at any time, in particular, without being limited to, minor changes because of advancements in technology. If by way of exception, the information given in the fact sheet above is incorporated by reference into any contract concluded with us under German Law, such information, shall only be interpreted as determining the specific requirements of the contractual products as set out in § 434 BGB (German Civil Code) and shall not be interpreted as constituting a guarantee of condition.

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