

## Contents

PROBAT-FLUSS EXTRA	3
PROBAT-FLUSS EXTRA NS	4
PROBAT-FLUSS EXTRA Se	5
PROBAT-FLUSS EXTRA CARBON N	6
PROBAT-FLUSS REDOX	7
FLUXIT 150 WE	8
ALUFIX	9
MIKROSAL CU T 200	10
PROBAT-FLUSS LUNKERPULVER 200	11
ZINKAN	12
SUPERIEUR	13
CILLOLIN CU 160	14
ADVICE ON SPECIAL TYPES OF DANGER – RISK-PHRASES	15
SAFETY ADVICE – SAFETY-PHRASES	17



Qualitätsmanagement

ISO 9001:2008

Umweltmanagement

ISO 14001

Regelmäßige freiwillige

Überwachung

## PERFORMANCE ENSURED BY OUR PRODUCTS

We are  
**ISO 9001 and ISO 14001 certified.**  
That means:

We work with a  
**management system,**  
that aimed at:

optimising the  
communication  
structures

maintaining and  
increasing the  
customers'  
satisfaction

optimising all  
kinds of  
processes

keeping standards  
concerning our  
products and  
services

doing research &  
development

**continuous improvement**  
of our products and services

assuring and increasing  
the quality

meeting the increasing  
demands of our customers



SCHÄFER Chemische Fabrik GmbH

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaeferchem.de](mailto:kontakt@schaeferchem.de)

[www.schaeferchem.de](http://www.schaeferchem.de)

## PROBAT-FLUSS EXTRA

### Cleaning, covering and melting preparation for heavy metals

- 01 **Notes on Technology** Copper and its alloys tend in molten state to a high oxidation and absorption of gas. This leads to solidly ceramic inclusions as well as pores or shrinkage holes. Adherences, which are difficult to remove, sediment on the furnace walls and high-metal slag is formed on the bath surface. Only the application of highly active refining fluxes enables to remove the oxides from the melt and to reduce the share of metal in the slag.
- 02 **Application Range** Universally applicable melting preparation for cleaning, covering and melting of copper alloys, particularly bronze, brass, red brass and so on.
- 03 **Quality Characteristics** **PROBAT-FLUSS EXTRA**
- low-metal dross
  - neutral towards refractory materials
  - low melting point and, hence, hermetic cover of the melt
  - highly environmental-friendly compared to charcoal and charcoal-containing products
  - improvement of the material properties
  - degassing effect
- 04 **Addition Rate** 0.05 % - 0.2 % of the used material, depending on the degree of impurity.
- 05 **Product Application** The material can already be added during the melting process so that a hermetic cover can be formed at rising bath surface.
- After the melt-down, however, before the slag becomes thin fluid, add additional **PROBAT-FLUSS EXTRA**. The material is to be stirred thoroughly into the dross and removed immediately before casting.
- 06 **Typical Properties**
- |                       |                        |
|-----------------------|------------------------|
| Appearance:           | red powder             |
| Odour:                | odourless              |
| Reaction temperature: | ex approximately 800°C |
- 07 **Packaging** 25-kg-paper bags, 3-fold with plastics lining.
- 08 **Advice on Special Types of Danger** R36, S 22, S 26
- 09 **Storage and Shelf Life** Store in a cool place (below 32°C/90°F); keep container dry and tightly closed. The shelf life is at least 6 months if properly stored.

## PROBAT-FLUSS EXTRA NS

### Cleaning, covering and melting preparation

for Cu-containing alloys

- 01 **Notes on Technology** Copper and its alloys tend in molten state to a high oxidation and absorption of gas. This leads to solidly ceramic inclusions as well as pores or shrinkage holes. Adherences, which are difficult to remove, sediment on the furnace walls and high-metal slag is formed on the bath surface. Only the application of highly active refining fluxes enables to remove the oxides from the melt and to reduce the share of metal in the slag.
- 02 **Application Range** Universally applicable melting preparation for cleaning, covering and melting of high concentrated copper alloys, particularly red brass, nickel silver, cupronickel and brass.
- 03 **Quality Characteristics**
- |                              |   |
|------------------------------|---|
| <b>PROBAT-FLUSS EXTRA NS</b> | <ul style="list-style-type: none"><li>• low-metal dross</li><li>• reduces incrustations</li><li>• low melting point and, hence, hermetic cover of the melt</li><li>• highly environmental-friendly compared to charcoal and charcoal-containing products</li><li>• improvement of the material properties</li></ul> |
|------------------------------|---|
- 04 **Addition Rate** 0.05 % - 0.2 % of the used material, depending on the degree of impurity.
- 05 **Product Application** Use only dry material and tools. A partial quantity can be already added during the melting process so that a hermetic cover can be formed at rising bath surface.
- After the melt down, however, before the slag becomes thin fluid, add additional **PROBAT-FLUSS EXTRA NS**.
- The material is to be stirred thoroughly into the slag and removed immediately before pouring.
- The addition rate depends on the charge material's degree of impurity and on refractory lining. **PROBAT-FLUSS EXTRA NS** is basic.
- 06 **Typical Properties**
- |                       |                        |
|-----------------------|------------------------|
| Appearance:           | light grey powder      |
| Odour:                | odourless              |
| Reaction temperature: | ex approximately 800°C |
- 07 **Packaging** 20 kg paper bags, 3-fold with plastics lining.
- 08 **Advice on Special Types of Danger** R36, S 22-25-26
- 09 **Storage and Shelf Life** Keep container dry and tightly closed. If stored properly the shelf life is at least 6 months.



SCHÄFER Chemische Fabrik GmbH

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaeferchem.de](mailto:kontakt@schaeferchem.de)

[www.schaeferchem.de](http://www.schaeferchem.de)

## PROBAT-FLUSS EXTRA SE

### Desulphurization preparation for copper alloys

- 01 **Notes on Technology** Copper and its alloys tend in molten state to a high oxidation and absorption of gas. This leads to solidly ceramic inclusions as well as pores or shrinkage holes. Adherences, which are difficult to remove, sediment on the furnace walls and high-metal slag is formed on the bath surface. Only the application of highly active refining fluxes enables to remove the oxides from the melt and to reduce the share of metal in the slag. Sulphur as an interfering element also can lead to hard inclusions.
- 02 **Application Range** Applicable for all copper alloys to reduce the sulphur content, particularly for sulphuric scrap.
- 03 **Quality Characteristics**
- |                     |  |
|---------------------|--|
| <b>PROBAT-FLUSS</b> | • reduction of the sulphur content       |
| <b>EXTRA SE</b>     | • cleaning of the melt                   |
|                     | • improvement of the material properties |
- 04 **Addition Rate** 0.05 % - 0.2 % of the used material, depending on the degree of impurity.
- 05 **Product Application** Use only dry material and tools. A partial quantity is melt with the feedstock. After the melt down, additional material can be added and stirred into the melt with a tool, if required.  
In the event of a high sulphur content, the melt can be desulphurized repeatedly by adding **PROBAT-FLUSS EXTRA SE** into the pouring ladle or the launder.
- 06 **Typical Properties**
- |                       |                        |
|-----------------------|------------------------|
| Appearance:           | black powder           |
| Odour:                | odourless              |
| Reaction temperature: | ex approximately 800°C |
- 07 **Packaging** 25 kg paper backs, 3-fold with plastics-lining.
- 08 **Advice on Special Types of Danger** R36, S 22-25-26
- 09 **Storage and Shelf Life** Keep container dry and tightly closed. If stored properly the shelf life is at least 6 months.

## PROBAT-FLUSS EXTRA CARBON N

### Abdeckmittel

für Kupfer- und Kupferlegierungen (Kohlenstoffträger)

- 01 **Notes on Technology** Copper and its alloys tend in molten state to a high oxidation and absorption of gas. This leads to solidly ceramic inclusions as well as pores or shrinkage holes. Adherences, which are difficult to remove, sediment on the furnace walls and high-metal slag is formed on the bath surface. To avoid oxygen feed an effective covering of the melt, supported by reducing conditions, has proved to be successful.
- 02 **Application Range** **PROBAT-FLUSS EXTRA CARBON N** is suitable for the covering of copper and copper alloy melts. A reducing atmosphere is obtained and thus, the melt is prevented from oxidizing at simultaneous deoxidizing effect.
- 03 **Quality Characteristics** **PROBAT-FLUSS EXTRA CARBON N**
- consists of approximately 90 % carbon
  - no humidity
  - low content of ash
  - uniform grain size (1-5 mm)
  - deoxidizing portions
  - lower sulphur content than in commercial charcoal
- 04 **Addition Rate**
- 05 **Product Application** **PROBAT-FLUSS EXTRA CARBON N** is put into the furnace together with the used material during the melting process. Thus, an oxidation of the metal is prevented and the deoxidizing effect of the oxides is diminished. If the alloy produces a lot of slag, incrustations are prevented.
- After the melting process, add **PROBAT-FLUSS EXTRA CARBON N** until a close cover is obtained. Due to the low burn out, a reducing effect is obtained and the oxidation of the melt prevented while a deoxidizing effect is obtained by deoxidizing elements.
- By brass or nickel silver alloys the melt and slag must be treated with **PROBAT-FLUSS EXTRA** or **PROBAT-FLUSS EXTRA NS**.
- 06 **Typical Properties** Appearance: black-grey, granular  
Odour: odourless  
Reaction temperature: ex approximately 700°C
- 07 **Packaging** 25 kg paper bags, 2-fold.
- 08 **Advice on Special Types of Danger** R22, S20
- 09 **Storage and Shelf Life** Keep container dry and tightly closed. If stored properly the shelf life is at least 6 months.



SCHÄFER Chemische Fabrik GmbH

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaeferchem.de](mailto:kontakt@schaeferchem.de)

[www.schaeferchem.de](http://www.schaeferchem.de)

## PROBAT-FLUSS REDOX

### Highly efficient refining flux

for all copper alloys; particularly suitable for the treatment of copper alloys with heavily oxidizing alloy elements (e. g. aluminium bronze)

- 01 **Notes on Technology** Cast aluminium bronzes and cast multi-component aluminium bronzes have the tendency to a high oxidation and gas absorption in the liquid state. This leads to solid ceramic inclusions and pores or shrinkage holes. Adherences, which are difficult to remove, deposit on the furnace walls. Furthermore, a metal-rich, heavy slag is formed on the bath surface. Only the use of highly active refining fluxes makes it possible to remove the oxides from the melt and to reduce the metal portion in the slag.
- 02 **Application Range** **PROBAT-FLUSS REDOX** is a highly effective covering and cleansing preparation for all copper alloys, e. g. cast multi-component aluminium bronzes according to DIN 1714 and Al-containing alloys.
- 03 **Quality Characteristics** **PROBAT-FLUSS REDOX**
- removes oxides from the metal melt
  - reduces the gas absorption
  - produces a low-metal slag
  - improves the technological and mechanical properties
  - improves the flowability and casting behaviour
  - minimizes the environmental impact
- 04 **Addition Rate** 0.05 % bis – 0.2% depending on the degree of impurity and the used material.
- 05 **Product Application** Apply **PROBAT-FLUSS REDOX** onto the metal heel and add the used material onto it. After the melting process, the slag can be additionally treated with the refining flux.
- 06 **Typical Properties**
- |                       |                        |
|-----------------------|------------------------|
| Appearance:           | white powder           |
| Odour:                | odourless              |
| Reaction temperature: | ex approximately 860°C |
- 07 **Packaging** 25 kg paper bags, 3-fold with plastics lining.
- 08 **Advice on Special Types of Danger** R21, R32, S3, S22, S23, S 36/37, S45, S60
- 09 **Storage and Shelf Life** Store in a cool place (below 32°C/90°F); keep container dry and tightly closed. The shelf life is at least 6 months if properly stored.

## FLUXIT 150 WE

### Cleansing and covering preparation

for brass alloys in continuous casting

- 01 **Notes on Technology** Copper and its alloys tend in molten state to a high oxidation and absorption of gas. During continuous casting, this leads to solidly ceramic inclusions. Partially alloy elements are burnt, e. g. zinc. Only the application of highly active refining fluxes enables to protect from oxides and to reduce the application of covering preparations enables the share of metal in the slag. Additionally covering with liquid fluxes supports the sliding properties of the gravity die.
- 02 **Application Range** **FLUXIT 150 WE** is suitable for all brass alloys with a copper content of up to 70 %, if the salt is liquid even more.
- 03 **Quality Characteristics** **FLUXIT 150 WE**
- protects the metal surfaces in the vertical continuous casting from oxides
  - produces smooth bolt respectively ingot surfaces
  - reacts completely fumeless and causes no air pollution
- (Not suitable for injection nozzles made of graphite or SiC; we propose injection nozzles made of chrome graphite or chrome alloy steel).
- 04 **Addition Rate** Care ist o be taken that a complete protective cover layer is always available.
- 05 **Product Application** **FLUXIT 150 WE** is added after the mold has been given an initial casting stream. The casting speed may exceed 200 mm/minute.
- For mould coating we recommend our fully colloidal graphite coating **CILLOLIN-CU 130**. This product is of excellent coating adherence and supports the sliding properties of bars in the continuous casting.
- 06 **Typical Properties** Appearance: white powder  
Odour: odourless
- 07 **Packaging** 25 kg paper bags, 3-fold with plastics lining.
- 08 **Advice on Special Types of Danger** R60, R61, S20, S36, S45, S53, S60
- 09 **Storage and Shelf Life** Store in a cool place (below 32°C/90°F); keep container dry and tightly closed. The shelf life is at least 6 months if properly stored. Thickenings can be loosened by slightly knocking on the bag.



SCHÄFER Chemische Fabrik GmbH

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaeferchem.de](mailto:kontakt@schaeferchem.de)

[www.schaeferchem.de](http://www.schaeferchem.de)



## ALUFIX

### Aluminium remover, cleansing and covering preparation

for copper alloys

- 01 **Notes on Technology** Aluminium is only welcomed in a few copper alloys as a part of the alloy. The maximum tolerance limit for most brass alloys and all copper-tin alloys is 0.01 %. Also this maximum limit should, if possible, not be reached. Aluminium is entrained into copper alloys very often due to the aluminium containing recycled scrap of special alloys. An indication for this is the formation of suddenly occurring single clear spots on the oxidizing surface which otherwise solidifies full of fissures. The fewer such clear spots are present, the less is the amount of aluminium content. The mechanical properties are reduced essentially by aluminium and the entrapped oxide skins will lead to porosity.
- 02 **Application Range** **ALU FIX** is suitable for all copper and copper alloys to reduce the share of aluminium.
- 03 **Quality Characteristics** **ALU FIX**
- complete removal of aluminium out of the melt by a simultaneously cleaning and covering of the melt
  - has also proved to be very effective for alloys, which don't contain any aluminium, as cleansing preparation
  - improvement of the mechanical properties
- 04 **Addition Rate** It is difficult to determine in advance the correct dosage of **ALU FIX**, because of the great differences of aluminium content. Generally speaking 0.2-0.5 % are sufficient to remove even traces of aluminium from the melt. If, however, aluminium is supposed to be introduced already at the start of charging, then 0.05-0.2 % **ALU FIX** should be added to the feedstock.
- 05 **Product Application** After completion of the melting process a test block is taken to verify whether there is still aluminium in the melt. If aluminium is still contained an additional quantity of 0.5 % of **ALU FIX** is to be stirred thoroughly into the melt. In the event of aluminium containing scrap, the product is to be melted together with the raw material. This treatment should be carried out for a duration of 10-15 minutes. Then the aluminium test is to be repeated. If our product is used for cleaning aluminium-free copper alloys, then the dosage should be 1-2 % of **ALU FIX** which should be fed to the charge in 2-3 partial quantities or eventually by the use of an immersion bell. Care is to be taken that our product is thoroughly stirred into the melt.
- The material is particularly suitable for rotary furnaces, whereby the addition rate is depending on the aluminium content as already described. One half of the material is to be added during the charging. The second half is to be added onto the melt surface after the maximum temperature is reached and then it is to be thoroughly stirred with the slag.
- 06 **Typical Properties** Appearance: red powder  
Odour: odourless
- 07 **Packaging** 25 kg paper bags, 3-fold with plastics lining.
- 08 **Advice on Special Types of Danger** R23, R24, R25, S36, S37, S45
- 09 **Storage and Shelf Life** Store in a cool place (below 32°C/90°F); keep container dry and tightly closed. The shelf life is at least 6 months if properly stored.

## MIKROSAL CU T 200

### Preparation for the grain refinement

of copper and its alloys  
(particularly brass) based on boron

- 01 **Notes on Technology** A highly effective grain refinement is achieved by the use of **MIKROSAL CU T 200**. The effect of the preparation based on the formation of finest boride crystals in the melt, which act as crystallizers for the solidified brass. They are highly active due to their formation in the melt.
- 02 **Application Range** Before the casting, the tablets are put into the melt by means of a well coated (e. g. **PYRONOL**) immersion bell. A step-wise addition of **MIKROSAL CU T** is possible.
- 03 **Quality Characteristics** **MIKROSAL CU T 200**
- offers completely dense and micro-shrinkage-free casting
  - increases all technological values
  - ensures a clean and irreproachable surface of the coating part
  - permits an essentially better flux of the melt
- 04 **Addition Rate** 0.1 – 0.2 % of the metal weight (e. g. 200 g for 200 kg melt).
- 05 **Product Application** Care is to be taken that the recommended addition of **MIKROSAL CU T** is worked under up to the lower third of the melt. A uniform effect within the entire melt is obtained by constantly moving the immersion bell.
- 06 **Typical Properties** Appearance: grey tablets (size between 200 to 1.500 g, depending on the customers' requirements)  
Odour: odourless
- 07 **Packaging** In card boxes with water-vapour-tight foil.
- 08 **Advice on Special Types of Danger** R20, R22, S2, S20, S21, S22, S25
- 09 **Storage and Shelf Life** Store in a cool place (below 32°C/90°F); keep container dry and tightly closed. The shelf life is at least 6 months if properly stored.



SCHÄFER Chemische Fabrik GmbH

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaeferchem.de](mailto:kontakt@schaeferchem.de)

[www.schaeferchem.de](http://www.schaeferchem.de)

## PROBAT-FLUSS LUNKERPULVER 200

### Preparation for the application on the riser of the casting part

to increase the re-feeding effect

- 01 **Notes on Technology** The effectiveness of feed tubes in the sand casting can be increased if they are covered whereby the heat emission by radiation and convection is reduced. This effect is enforced by an exothermic reaction.
- 02 **Application Range** **PROBAT-FLUSS LUNKERPULVER 200** is suitable for all casting alloys used in sand casting.
- 03 **Quality Characteristics** **PROBAT-FLUSS LUNKERPULVER 200**
- leads to a densely fed casting part as the riser or feed tube retains its melt temperature for a long time due to the resulting heat
  - prevents shrinkage holes and pore formation in the casting part and reduces the tendency to hot tears
  - allows the solidification direction to be influenced
- 04 **Addition Rate** Depending on the riser or feed tube diameter, the thickness of the flux layer should be several cm.
- 05 **Product Application** **PROBAT-FLUSS LUNKERPULVER 200** ignites after being scattered on the feed tube or riser, immediately after filling the mould. The reacted flux remains on the feed tube until the casting part has solidified completely and afterward it can be removed easily.
- 06 **Typical Properties** Appearance: dark red powder  
Odour: odourless
- 07 **Packaging** 25 kg paper bags, 3-fold with plastics lining.
- 09 **Advice on Special Types of Danger** R15, R48, R20, R22, S7, S8, S16, S33, S43.
- 08 **Storage and Shelf Life** Store in a cool place (below 32°C/90°F); keep container dry and tightly closed. The shelf life is at least 6 months if properly stored.

## ZINKAN

### Refining, deoxidizing and melting preparation

for zinc and zinc alloys

- 01 **Notes on Technology** When melting zinc and zinc alloys, metal oxides are formed on the bath surface due to air contact. Therefore the addition of a suitable refining and deoxidizing preparation is necessary to remove impurities and reduce the loss of metal.
- 02 **Application Range** **ZINKAN** is a universally applicable melting preparation for cleaning the melt, deoxidizing of zinc oxides and zinc as well as for reducing the metal content of the zinc drosses.
- 03 **Quality Characteristics** **ZINKAN**
- has a low melting temperature
  - offers optimal oxidation protection
  - is fumeless and environment-friendly
  - produces low-metal dross
  - is neutral towards zinc
- 04 **Addition Rate** 7 – 10 % of the estimated weight of the dross is necessary for the dross treatment. In case of extreme impurities, an addition of up to 15 % of the dross weight may be necessary.
- For the cleaning and covering of the melt 0.1 % up to 0.5 % of the metal weight is necessary, depending on the degree of impurity.
- 05 **Product Application** **ZINKAN** can be already added with the raw materials to bind the impurities during the beginning melting process and to reduce the oxidation with atmospheric oxygen. Care is to be taken for an even covering of the melt surface. Stir **ZINKAN** intensively with the dross for deoxidizing and reducing the share of metal. After the completion of the reaction and before the casting, skim off the dry, low-metal dross.
- 06 **Typical Properties**
- |                       |                         |
|-----------------------|-------------------------|
| Appearance:           | red powder              |
| Odour:                | odourless               |
| Reaction temperature: | ex approximately 385 °C |
- 07 **Packaging** 50 kg paper bags, fibre close bags.
- 08 **Advice on Special Types of Danger** R34, S7/8-20-22-26-28-36/37-45
- 09 **Storage and Shelf Life** Keep container dry and tightly closed as hygroscopic. The shelf life is at least 6 months if properly stored.



SCHÄFER Chemische Fabrik GmbH

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaeferchem.de](mailto:kontakt@schaeferchem.de)

[www.schaeferchem.de](http://www.schaeferchem.de)

## SUPERIEUR

### Cleansing and deoxidizing preparation

for lead and lead-tin alloys of  
less than 10 % tin

- 01 **Notes on Technology** Molten lead alloys tend to oxidation and formation of specific heavy drosses if they are not suitably covered during the melting process. When casting, the oxides and slag particles remain included in the casting part and settle around the grain boundaries. As a consequence of this the mechanical properties are impaired and fissures and fractures can arise. If, as is the case with most lead alloys, hardening alloy elements are added, they tend to oxidize first and to change the composition of the complete alloy. This change in analysis may even make the alloy unusable for certain purposes. The presence of merely small quantities of impurities can already highly reduce the casting ability of lead alloys. Care must be particularly taken that aluminium and zinc are not added as only 1 % of these materials affects the process negatively. Apart from the fact that scrap material can only be used if their composition is known, it is necessary to cover the metal bath with a suitable covering and purifying agent as **SUPERIEUR**.
- 02 **Application Range** **SUPERIEUR** is a covering and cleansing preparation for lead and lead alloys of at least 10 % tin. It is a powder which can be not only successfully used as covering preparation, but also for the meltdown of drosses and other residues.
- 03 **Quality Characteristics** **SUPERIEUR**
- removes oxides, impurities and non-metal inclusion from the metal
  - improves the flowability and reduced the danger of insufficient flowability
  - ensures a low-metal dross
  - can be used simply and economically
- 04 **Addition Rate** The addition rate depends on the size of the melt surface and can vary, hence, between 0.1 and 0.2 %.
- 05 **Product Application** Half of the quantity should be applied as soon as the raw material is liquid. I required, add further quantity to keep a complete protective covering. As soon as the raw material is completely molten, add the remaining quantity by means of a perforated immersion bell or stir it into. After completion of the reaction, stir the melt and skim it off. Avoid iron absorption by coating the immersion bell with **PYRONOL**
- 06 **Typical Properties** Appearance: black powder  
Odour: odourless
- 07 **Packaging** 25 kg paper bags, 3-folig with plastics lining.
- 08 **Advice on Special Types of Danger** R20/22, S2, S20/21, S22, S25
- 09 **Storage and Shelf Life** Store in a cool place (below 32°C/90°F); keep container dry and tightly closed. The shelf life is at least 6 months if properly stored.

## CILLOLIN CU 160

### Heat conduction, fully colloidal gravity die coating

with improved sedimentation characteristics

- 01 **Notes on Technology** The choice of a coating for the rigid and movable parts of a gravity dies is of the utmost importance for the quality of the casting part. The structure of the used coating has a direct influence on the flowability and the mould filling of the melt which flows into the gravity die. The coating highly influences the established casting surface and regulates the solidification by its thermal conductivity. Coatings in continuous and discontinuous gravity die casting should be convenient to use, have a uniform consistency and high adhesive strength.
- 02 **Application Range** **CILLOLIN CU 160** is suitable for use on all gravity die materials in CU-gravity die casting.
- 03 **Quality Characteristics** **CILLOLIN CU 160**
- ensures excellent adhesion, especially regarding movable parts of the gravity die
  - produces a uniform surface structure
  - reduced the downtime caused by cleaning or milling
  - ensures the highest level of dimensional accuracy
  - prevents sedimentation from occurring too rapidly by means of a thixotropic agent
  - facilitates the removal of completed casting parts
- 04 **Addition Rate** Dilute with softened water at a ratio of 1:3 up to 1:10.
- 05 **Product Application** Before application, clean the gravity die thoroughly (e. g. with a wire brush). New gravity dies should thoroughly be degreased before use. Therefore use a hot caustic soda solution, petroleum or similar solvent. After that, heat the gravity die on the rear and then apply **CILLOLIN CU 160** thinly and uniformly, using a spray gun, a fine hair brush or a piece of lamb's skin. **CILLOLIN CU 160** can also be used as protective coating for crucibles and casting tools.
- 06 **Typical Properties** Appearance: black, pasty  
Odour: odourless
- 07 **Packaging** Concentrate – homogenized in cans of 25, 10, 5 and 1 kg.
- 08 **Advice on Special Types of Danger** Not applicable.
- 09 **Storage and Shelf Life** Store in a cool place (below 32°C/90°F); keep container dry and tightly closed. The shelf life is at least 6 months if properly stored.



**SCHÄFER Chemische Fabrik GmbH**

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaeferchem.de](mailto:kontakt@schaeferchem.de)

[www.schaeferchem.de](http://www.schaeferchem.de)

**ADVICE ON SPECIAL TYPES OF DANGER – RISK PHRASES**

(Appendix I No. 1.3 to the Ordinance on Hazardous Substances)

R1	Explosive when dry.
R2	Risk of explosion by shock, friction, fire or other sources of ignition.
R3	Extreme risk of explosion by shock, friction, fire or other sources of ignition.
R4	Forms very sensitive explosive metallic compounds.
R5	Heating may cause an explosion.
R6	Explosive with or without contact with air.
R7	May cause fire.
R8	Contact with combustible material may cause fire.
R9	Explosive when mixed with combustible material.
R10	Flammable.
R11	Highly flammable.
R12	Extremely flammable.
R13 (obsolete)	Extremely flammable liquefied gas. (The Ordinance on Hazardous Substances of 26 <sup>th</sup> October 1993 does not contain this risk phrase any more).
R14	Reacts violently with water.
R15	Reacts violently with water, liberating extremely flammable gases.
Merck R 15.1	Reacts with acid, liberating extremely flammable gases.
R16	Explosive when mixed with oxidising substances.
R17	Spontaneously flammable in air.
R18	In use, may form flammable/explosive vapour air-mixture.
R19	May form explosive peroxides.
R20	Harmful by inhalation.
R21	Harmful in contact with skin.
R22	Harmful if swallowed.
R23	Toxic by inhalation.
Riedel-de Haen R 23K	Also toxic by inhalation.
R24	Toxic in contact with skin
Riedel-de Haen R 24K	Also toxic in contact with skin.
R25	Toxic if swallowed.
Riedel-de Haen R 25K	Also toxic if swallowed.
R26	Very toxic by inhalation
Riedel-de Haen R 26K	Also very toxic by inhalation.
R27	Very toxic in contact with skin.
Riedel-de Haen R 27A	Very toxic in contact with the eyes.
Riedel-de Haen R 27K	Also very toxic in contact with skin.
Riedel-de Haen R27AK	Also very toxic in contact with the eyes.
R28	Very toxic if swallowed.
Riedel-de Haen R 28K	Also very toxic if swallowed.
R29	Contact with water liberates toxic gases.
R30	Can become highly flammable in use.
R31	Contact with acids liberates toxic gases.
Merck R 31.1	Contact with bases liberates toxic gases.
R32	Contact with acids liberates very toxic gases.
R33	Danger of cumulative effects.
R34	Causes burns.
R35	Causes severe burns.
R36	Irritating to eyes.
Riedel-de Haen R 36A	Irritating to tears.
R37	Irritating to respiratory system.
R38	Irritating to skin.
R39	Danger of very serious irreversible effects.
R40	Possible risks of irreversible effects.
R41	Risk of serious damage to eyes.
R42	May cause sensitisation by inhalation.
R43	May cause sensitisation by skin contact.
R44	Risk of explosion if heated under confinement.
R45	May cause cancer.

R 46	May cause heritable genetic damage.
R 47 (obsolete)	May cause birth defects. (The Ordinance on Hazardous Substances of 26 <sup>th</sup> October 1993 does not contain this risk phrase any more).
R 48	Danger of serious damage to health by prolonged exposure.
R 49	May cause cancer by inhalation.
R 50	Very toxic to aquatic organisms.
R 51	Toxic to aquatic organisms.
R 52	Harmful to aquatic organisms.
R 53	May cause long-term adverse effects in the aquatic environment.
R 54	Toxic to flora.
R 55	Toxic to fauna.
R 56	Toxic to soil organisms.
R 57	Toxic to bees.
R 58	May cause long-term adverse effects in the environment.
R 59	Dangerous for the ozone layer.
R 60	May impair fertility.
R 61	May cause harm to the unborn child.
R 62	Possible risk of impaired fertility.
R 63	Possible risk of harm to the unborn child.
R 64	May cause harm to breast-fed babies.
R 65	Harmful: may cause lung damage if swallowed.
R 66	Repeated exposure may cause skin dryness or cracking.
R 67	Vapours may cause drowsiness and dizziness.

## COMBINED RISK PHRASES

R 14/15	Reacts violently with water, liberating extremely flammable gases.
R 15/19	Contact with water liberates toxic, extremely flammable gas.
R 20/21	Harmful by inhalation and in contact with skin.
R 21/22	Harmful in contact with skin and if swallowed.
R 20/22	Harmful by inhalation and if swallowed.
R 20/21/22	Harmful by inhalation, in contact with skin and if swallowed.
R 21/22	Harmful in contact with skin and if swallowed.
R 23/24	Toxic by inhalation and in contact with skin.
R 24/25	Toxic in contact with skin and if swallowed.
R 23/25	Toxic by inhalation and if swallowed.
R 23/24/25	Toxic by inhalation, in contact with skin and if swallowed.
R 24/25	Toxic in contact with skin and if swallowed.
R 26/27	Very toxic by inhalation and in contact with skin.
R 27/28	Very toxic in contact with skin and if swallowed.
R 26/28	Very toxic by inhalation and if swallowed.
R 26/27/28	Very toxic by inhalation, in contact with skin and if swallowed.
R 36/37	Irritating to eyes and respiratory system.
R 37/38	Irritating to respiratory system and skin.
R 36/38	Irritating to eyes and skin.
R 36/37/38	Irritating to eyes, respiratory system and skin.
R 39/23	Toxic: danger of very serious irreversible effects through inhalation.
R 39/24	Toxic: danger of very serious irreversible effects in contact with skin.
R 39/25	Toxic: danger of very serious irreversible effects if swallowed.
R 39/23/24	Toxic: danger of very serious irreversible effects through inhalation and in contact with skin.
R 39/23/25	Toxic: danger of very serious irreversible effects through inhalation and if swallowed.
R 39/24/25	Toxic: danger of very serious irreversible effects in contact with skin and if swallowed.
R 39/23/24/25	Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
R 39/26	Very toxic: danger of very serious irreversible effects through inhalation.
R 39/27	Very toxic: danger of very serious irreversible effects in contact with skin.
R 39/28	Very toxic: danger of very serious irreversible effects if swallowed.
R 39/26/27	Very toxic: danger of very serious irreversible effects through inhalation and in contact with skin.
R 39/26/28	Very toxic: danger of very serious irreversible effects through inhalation and if swallowed.

SCHÄFER Chemische Fabrik GmbH

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaferchem.de](mailto:kontakt@schaferchem.de)

[www.schaferchem.de](http://www.schaferchem.de)



R 39/27/28	Very toxic: danger of very serious irreversible effects in contact with skin and if swallowed.
R 39/26/27/28	Very toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
R 40/20	Harmful: possible risk of irreversible effects through inhalation.
R 40/21	Harmful: possible risk of irreversible effects in contact with skin.
R 40/22	Harmful: possible risk of irreversible effects if swallowed.
R 40/20/21	Harmful: possible risk of irreversible effects through inhalation and in contact with skin.
R 40/20/22	Harmful: possible risk of irreversible effects through inhalation and if swallowed.
R 40/21/22	Harmful: possible risk of irreversible effects in contact with skin and if swallowed.
R 40/20/21/22	Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed.
R 42/43	May cause sensitisation by inhalation and skin contact.
R 48/20	Harmful: danger of serious damage to health by prolonged exposure through inhalation.
R 48/21	Harmful: danger of serious damage to health by prolonged exposure in contact with skin.
R 48/22	Harmful: danger of serious damage to health by prolonged exposure if swallowed.
R 48/20/21	Harmful: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.
R 48/20/22	Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R 48/21/22	Harmful: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed.
R 48/20/21/22	Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
R 48/23	Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R 48/24	Toxic: danger of serious damage to health by prolonged exposure in contact with skin.
R 48/25	Toxic: danger of serious damage to health by prolonged exposure if swallowed.
R 48/23/24	Toxic: danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.
R 48/23/25	Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R 48/24/25	Toxic: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed.
R 48/23/24/25	Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
R 50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R 52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

## SAFETY ADVICE CONCERNING DANGEROUS CHEMICAL SUBSTANCES (S-PHRASES)

S1	Keep locked up.
S 2	Keep out of reach of the children.
S 3	Keep in a cool place.
S 4	Keep away from living quarters.
S 5	Keep contents under ..(appropriate liquid to be specified by the manufacturer).
Merck S 5.1	Keep under water.
Merck S 5.2	Keep under petroleum.
Merck S 5.3	Keep under paraffin oil.
Riedel-de Haen S 5A	Keep under paraffin oil..
Riedel-de Haen S 5B	Keep under petroleum.
Riedel-de Haen S 5C:	Keep under protection liquidity.
S 6	Keep under ..(inert gas to be specified by the manufacturer).
Merck S 6.1	Keep under nitrogen.
Merck S 6.2	Keep under argon.

**SCHÄFER Chemische Fabrik GmbH**

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaeferchem.de](mailto:kontakt@schaeferchem.de)

[www.schaeferchem.de](http://www.schaeferchem.de)

<b>Merck S 6.3</b>	Keep under carbon dioxide.
<b>Riedel-de Haen S 6A</b>	Keep under inert gas.
<b>Riedel-de Haen S 6B</b>	Keep under nitrogen.
<b>Riedel-de Haen S 6C</b>	Keep under argon.
<b>S 7</b>	Keep container tightly closed.
<b>S 8</b>	Keep container dry.
<b>S 9</b>	Keep container in a well-ventilated place.
<b>S 10 (obsolete)</b>	Keep content moistly. (The Ordinance on Hazardous Substances of 26 <sup>th</sup> October 1993 does not contain this safety phrase any more).
<b>S 11(obsolete)</b>	Avoid the access of air. (The Ordinance on Hazardous Substances of 26 <sup>th</sup> October 1993 does not contain this safety phrase any more).
<b>S 12</b>	Do not keep the container sealed.
<b>S 13</b>	Keep away from food, drink and animal feeding stuffs.
<b>S 14</b>	Keep away from ..(incompatible materials to be indicated by the manufacturer).
<b>Merck S 14.1</b>	Keep away from reducing agents, heavy metal compounds, acids and alkaline metals.
<b>Merck S 14.2</b>	Keep away from oxidizing and acid substances as well as from heavy metal compounds.
<b>Merck S 14.3</b>	Keep away from iron.
<b>Merck S 14.4</b>	Keep away from water and alkaline solutions.
<b>Merck S 14.5</b>	Keep away from acids.
<b>Merck S 14.6</b>	Keep away from alkaline solutions.
<b>Merck S 14.7</b>	Keep away from metals.
<b>Merck S 14.8</b>	Keep away from oxidizing and acid substances.
<b>Merck S 14.9</b>	Keep away from combustible organic substances.
<b>Merck S 14.10</b>	Keep away from acids, reducing agents and combustible substances.
<b>Merck S 14.11</b>	Keep away from combustible material. (corresponds to S17!).
<b>S 15</b>	Keep away from heat.
<b>S 16</b>	Keep away from sources of ignition -- No smoking.
<b>S 17</b>	Keep away from combustible material.
<b>S 18</b>	Handle and open container with care.
<b>S 20</b>	When using, do not eat or drink.
<b>S 21</b>	When using, do not smoke.
<b>S 22</b>	Do not breathe dust.
<b>S 23</b>	Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).
<b>Merck S 23.1</b>	Do not breathe gas.
<b>Merck S 23.2</b>	Do not breathe vapour.
<b>Merck S 23.3</b>	Do not breathe aerosol.
<b>Merck S 23.4</b>	Do not breathe smoke.
<b>Merck S 23.5</b>	Do not breathe vapour / aerosol.
<b>Riedel-de Haen S 23A</b>	Do not breathe gas.
<b>Riedel-de Haen S 23B</b>	Do not breathe smoke.
<b>Riedel-de Haen S 23C</b>	Do not breathe aerosol.
<b>S 24</b>	Avoid contact with the skin.
<b>S 25</b>	Avoid contact with the eyes.
<b>S 26</b>	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
<b>S 27</b>	Take off immediately all contaminated clothing.
<b>S 28</b>	After contact with skin, wash immediately with plenty of ..(to be specified by the manufacturer).
<b>Merck S 28.1</b>	After contact with the skin, wash immediately with plenty of water.
<b>Merck S 28.2</b>	After contact with the skin, wash immediately with plenty of water and soap.
<b>Merck S 28.3</b>	After contact with the skin, wash immediately with plenty of water and soap; preferably also wash with polyethylene glycol 400.
<b>Merck S 28.4</b>	After contact with the skin, wash immediately with plenty of polyethylene glycol 400 and ethanol (2:1); after that wash with plenty of water and soap.
<b>Merck S 28.5</b>	After contact with the skin, wash immediately with plenty of polyethylene glycol 400.
<b>Merck S 28.6</b>	After contact with the skin, wash immediately with plenty of polyethylene glycol 400 and ethanol (2:1); after that wash with plenty of.
<b>Merck S 28.7</b>	After contact with the skin, wash immediately with plenty of water and acid soap.
<b>Riedel-de Haen S 28A</b>	After contact with the skin, wash immediately with plenty of copper sulphate solution 2%.
<b>Riedel-de Haen S 28B</b>	After contact with the skin, wash immediately with plenty of polyethylene glycol.
<b>Riedel-de Haen S 28C</b>	After contact with the skin, wash immediately with plenty of polyethylene glycol / ethanol

**SCHÄFER Chemische Fabrik GmbH**

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaferchem.de](mailto:kontakt@schaferchem.de)

[www.schaferchem.de](http://www.schaferchem.de)

(1:1).

<b>Riedel-de Haen S 28D</b>	After contact with the skin, wash immediately with plenty of water and soap.
<b>S 29</b>	Do not empty into drains.
<b>S 30</b>	Never add water to this product.
<b>S 31 (obsolete)</b>	Keep away from explosive substances. (The Ordinance on Hazardous Substances of 26 <sup>th</sup> October 1993 does not contain this safety phrase any more).
<b>S 33</b>	Take precautionary measures against static discharges.
<b>S 34 (obsolete)</b>	Avoid shock and friction. (The Ordinance on Hazardous Substances of 26 <sup>th</sup> October 1993 does not contain this safety phrase any more).
<b>S 35</b>	This material and its container must be disposed of in a safe way.
<b>Merck S 35.1</b>	This material and its container must be disposed of by treating them with 2 % caustic soda.
<b>S 36</b>	Wear suitable protective clothing.
<b>S 37</b>	Wear suitable gloves.
<b>S 38</b>	In case of insufficient ventilation, wear suitable respiratory equipment.
<b>S 39</b>	Wear eye/face protection.
<b>S 40</b>	To clean the floor and all objects contaminated by this material, use ..(to be specified by the manufacturer).
<b>Merck S 40.1</b>	Clean the floor and all contaminated objects with plenty of water.
<b>Riedel-de Haen S 40A</b>	Clean the floor and all contaminated objects with iodine coal.
<b>S 41</b>	In case of fire and/or explosion, do not breathe fumes.
<b>S 42</b>	During fumigation/spraying wear suitable respiratory equipment (appropriate wording to specified by the manufacturer).
<b>S 43</b>	In case of fire, use ..(indicate in the space the precise type of fire-fighting equipment. If water increases the risk, add - 'Never use water').
<b>Merck S 43.1</b>	Use water for blowing out.
<b>Merck S 43.2</b>	Use water or a powder extinguishing agent for blowing out.
<b>Merck S 43.3</b>	Use a powder extinguishing agent for blowing out. Don't use water.
<b>Merck S 43.4</b>	Use carbon dioxide for blowing out. Do not use water.
<b>Merck S 43.6</b>	Use sand for blowing out. Do not use water.
<b>Merck S 43.7</b>	Use common salt for blowing out. Do not use water.
<b>Merck S 43.8</b>	Use sand, carbon dioxide or a powder extinguishing agent. Do not use water.
<b>Riedel-de Haen S 43A</b>	Use sand for blowing out (never use water).
<b>S 44 (obsolete)</b>	If you feel unwell, seek medical advice (show the label when possible) (The Ordinance on Hazardous Substances of 26 <sup>th</sup> October 1993 does not contain this safety phrase any more).
<b>S 45</b>	In case of accident or if you feel unwell, seek medical advice immediately (show the label when possible).
<b>S 46</b>	If swallowed, seek medical advice immediately and show container/label.
<b>S 47</b>	Keep at temperature not exceeding ..°C (to be specified by the manufacturer).
<b>FU-Sicherheitsdatenbank S 4730</b>	Do not keep at temperatures above 30°C.
<b>FU-Sicherheitsdatenbank S 4740</b>	Do not keep at temperatures above 40°C.
<b>S 48</b>	Keep wetted with ..(appropriate material to be specified by the manufacturer).
<b>Merck S 48.1</b>	Keep wetted with water.
<b>Riedel-de Haen S 48A</b>	Keep wetted with water.
<b>S 49</b>	Keep only in the original container.
<b>S 50</b>	Do not mix with ..(to be specified by the manufacturer).
<b>Merck S 50.1</b>	Do not mix with acid.
<b>Merck S 50.2</b>	Do not mix with alkaline solution.
<b>Merck S 50.3</b>	Do not mix with strong acids, strong bases, heavy metals and other fluxes.
<b>S 51</b>	Use only in well ventilated areas.
<b>S 52</b>	Not recommended for interior use on large surface areas.
<b>S 53</b>	Avoid exposure -- obtain special instructions before use.
<b>S 54 (obsolete)</b>	Before releasing to sewage plants seek the permission of the corresponding authorities. (The Ordinance on Hazardous Substances of 26 <sup>th</sup> October 1993 does not contain this safety phrase any more).
<b>S 55 (obsolete)</b>	Before releasing to the canalisation or in bodies of water treat according to the state of the art. (The Ordinance on Hazardous Substances of 26 <sup>th</sup> October 1993 does not contain this safety phrase any more).
<b>S 56</b>	Dispose of this material and its container at hazardous or special waste collection point.

**SCHÄFER Chemische Fabrik GmbH**

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaeferchem.de](mailto:kontakt@schaeferchem.de)[www.schaeferchem.de](http://www.schaeferchem.de)

<b>S 57</b>	Use appropriate container to avoid environmental contamination.
<b>S 58 (obsolete)</b>	Dispose of as hazardous waste. (The Ordinance on Hazardous Substances of 26 <sup>th</sup> October 1993 does not contain this safety phrase any more).
<b>S 59</b>	Refer to manufacturer/supplier for information on recovery/ recycling.
<b>S 60</b>	This material and its container must be disposed of as hazardous waste.
<b>S 61</b>	Avoid release to the environment Refer to special instructions/Safety data sheets.
<b>S 62</b>	If swallowed do not induce vomiting: seek medical advice immediately and show this container or label.
<b>S 63</b>	In case of accident by inhalation: remove casualty to fresh air and keep at rest.
<b>S 64</b>	If swallowed, rinse mouth with water (only if the person is conscious).

## COMBINED SAFETY PHRASES

<b>S 1/2</b>	Keep locked up and out of reach of the children:
<b>S 3/7</b>	Keep container tightly closed and keep in a cool place.
<b>S 3/7/9 (obsolete)</b>	Keep container tightly closed and in a cool and well-ventilated place.
<b>S 3/9 (obsolete)</b>	Keep container in a cool and well-ventilated place.
<b>S 3/9/14</b>	Keep in a cool, well-ventilated place away from... (incompatible materials to be indicated by the manufacturer).
<b>S 3/9/14/49</b>	Keep only in the original container in a cool, well-ventilated place away from ..(incompatible materials to be indicated by the manufacturer).
<b>S 3/9/49</b>	Keep only in original container in a cool, well-ventilated place.
<b>S 3/14</b>	Keep in a cool place away from ..(incompatible materials to be specified by the manufacturer).
<b>S 7/8</b>	Keep container tightly closed and dry.
<b>S 7/9</b>	Keep container tightly closed and in a well-ventilated place.
<b>S 7/47</b>	Keep container tightly closed and at temperature not exceeding ..°C (to be specified by the manufacturer).
<b>S 20/21</b>	When using, do not eat, drink or smoke.
<b>S 24/25</b>	Avoid contact with skin and eyes.
<b>S 29/56</b>	Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point.
<b>S 36/37</b>	Wear suitable protective clothing and gloves.
<b>S 36/37/39</b>	Wear suitable protective clothing, gloves and eye/face protection.
<b>S 36/39</b>	Wear suitable protective clothing and eye/face protection.
<b>S 37/39</b>	Wear suitable gloves and eye/face protection.
<b>S 47/49</b>	Keep only in the original container at a temperature not exceeding ..°C (to be specified by the manufacturer).



**SCHÄFER Chemische Fabrik GmbH**

Bonner Str. 20, 53773 Hennef/Sieg (Germany)

Phone: 0 22 42 / 91 33 90, Fax: 0 22 42 / 837 09

Email: [kontakt@schaeferchem.de](mailto:kontakt@schaeferchem.de)

[www.schaeferchem.de](http://www.schaeferchem.de)