

BASIC CHEMICALS | INORGANIC SPECIALTY CHEMICALS | COATING SYSTEMS

# TIB Chemicals





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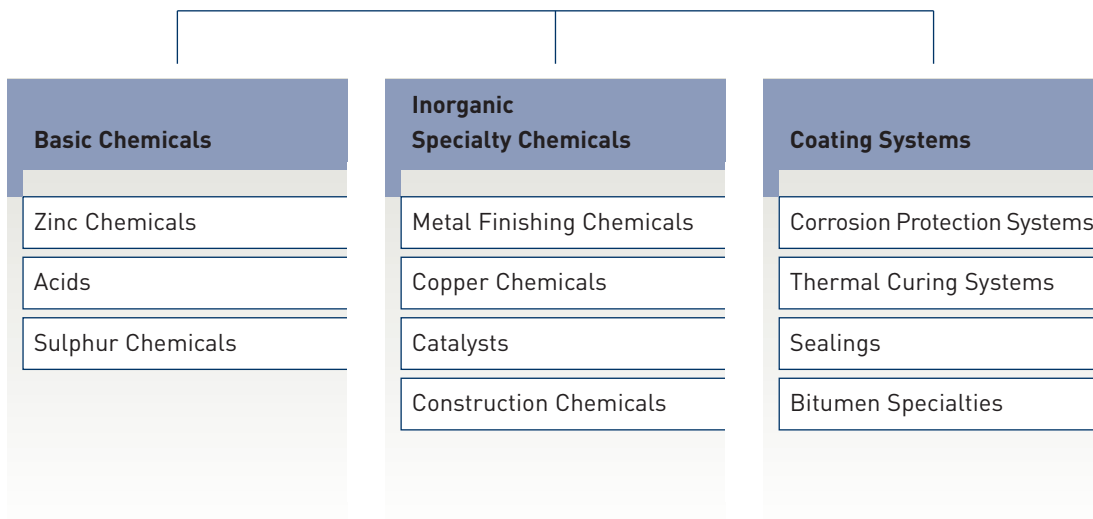


## Leaders in quality and service

TIB Chemicals originates from the merger of Goldschmidt TIB and Goldschmidt Quimica de Mexico. As manufacturer of specialised Basic Chemicals, innovative Inorganic Specialty Chemicals and Coating Systems, the company supplies to a worldwide market. The basis of our success is: Extensive knowledge and experience from a 130-year tradition paired with the competence and the inquiring mind of our employees. We support our clients with new, tailor-made solutions to increase their business success.



## TIB CHEMICALS



We specialise in the production of Basic Chemicals, Inorganic Specialty Chemicals and Coating Systems. Within these units, we develop a wide range of products that fulfil nearly all the requirements of companies needing chemicals for their manufacturing processes and products.

- ⚡ **Basic Chemicals** such as zinc chemicals, acids or sulphur chemicals, for chemical companies, the metal industry, the hot dip galvanising industry, the electroplating industry, the textile and plastic industries, for water treatment and for the production of food and beverages
- ⚡ **Inorganic Specialty Chemicals** based on the elements tin, zinc, copper and bismuth. These special compounds are used as electroplating chemicals in the electronics and metal industries, as copper chemicals in the automotive and chemical industries, as catalysts in the resin and paint industry, and also in chromate reduction for the construction industry
- ⚡ **Coating Systems** based on two component liquid polyurethane and epoxy systems, which have been developed as anticorrosion protection for the pipeline industry, for the valve-making industry, as well as for sewage outfall, water treatment and power plants. Thermal curing systems for electroplating, tool manufacturing and the packaging industry. Sealing compounds for gas and heating systems. Furthermore, modification and oxidation of bitumen as well as the production of bitumen-based systems for road surfaces



## Top quality for high demands

Our products offer a multitude of potentials and advantages, but they have one thing in common: They are of excellent quality. Our main production site is located in Germany, in modern plants operated by our well-trained and highly qualified employees.

We have established a quality management system that is directly responsible to the managing board. In Mannheim, we have already been certified to ISO 9001 since 1995. In addition to the external customer audits, we have about 20 internal audits per year. Our quality system guarantees that we continuously work for quality improvement, resulting in process optimisation at short notice.

## Perfect solutions for individual requirements

Providing advantages in competition for our business partners is the main target of TIB Chemicals. Together with our customers, we develop products exactly fitting their needs, thus increasing the quality of their products and decreasing production costs. For example, we design catalysts that accelerate the reaction process or manufacture products for the protection against corrosion that are also resistant to aggressive environments.

Customised applications often require completely new solutions. We design on behalf of our customers. Based on the requests of our customers, our scientific research departments develop products and manufacturing processes for future business success.

Our employees are ready to develop on-site for our customers. Thus, we know best how to integrate the newly developed products into the existing manufacturing process.



## Flexible deliveries for special cases

We deliver according to the needs of our customer taking advantage of our warehousing policy: Be it a large or small, standard or specialised delivery, our products will arrive at our partners in the shortest possible time.

## Worldwide and on the spot

The largest production facilities of TIB Chemicals are located in Mannheim (Germany) and San Luis Potosi (Mexico); the sales and marketing organisation operates globally. Customers all over the world appreciate us as a competent, reliable and future-oriented partner.

## Smooth logistics in all directions

We are close to our customers. The headquarters of TIB Chemicals is situated in Germany, in the heart of Europe. The location has an excellent infrastructure with a direct connection to the motorway and the ports of Mannheim, one of the biggest inland ports of Europe. We offer our port and rail connections to support our customers who benefit from a secure and punctual, environmentally friendly as well as economical service.





## Occupational health and safety standards for a maximum of safety

The welfare of our employees is of highest priority. Occupational health and safety is an essential part of the operational process at TIB Chemicals. Our qualified and trained personnel ensure the safety and well-being of our employees through regular health and safety controls. We make every effort to provide a safe and environmentally friendly working place.

## Environmental protection beyond the guidelines

Just to fulfil the high environmental guidelines is not sufficient for us. In addition, we demand from ourselves to always respect nature and to deal as carefully and efficiently as possible with raw materials and energies. Recycling management is of high priority for TIB Chemicals. For example, we extract zinc from zinc-rich stripping solutions and we recycle copper etching solutions coming from our customers in the electronics industry.

We have our own waste disposal depot, which renders the business of recycling for our customers especially economical and cost effective. We manage our own water treatment plant, from which the water is discharged directly into the Rhine. This means we not only take on a high responsibility but we also aim at better production conditions on the background of a modern risk management.

## Accelerated growth due to motivated employees

High demands on quality and service, new products and competence motivate our employees who are involved in the business success as shareholders: This is the basis for the positive development of our company. For years now, we have grown considerably with growth rates above the industrial average. With a yearly production of more than 400.000 tons of chemicals, TIB Chemicals generates revenues of over € 100 million.



## Responsible and future-oriented

We attribute our success to our corporate structure. TIB Chemicals is an owner-managed company. We work effectively, with great passion and engagement. We assume a social responsibility for our employees that is answered with loyalty; in turn, we gain in efficiency compared to our competitors.

TIB Chemicals combines the advantages of both a small and a large company. Our business units develop quickly and flexibly. The chains of communication are short. Contact to our customers is close and special requests are met without problems. Our three business units form a strong entity in an international group with a solid financial basis, a tight organisation and with the competence of a large company, to the benefit of our customers.



## Chemicals for multifunctional applications

TIB Chemicals produces Basic Chemicals, Inorganic Specialty Chemicals and Coating Systems that can be used in all chemical manufacturing processes.

The following pages will show our complete product range. You will find detailed information about the products of our business lines: zinc chemicals, acids, sulphur chemicals, metal finishing chemicals, copper chemicals, catalysts, construction chemicals, corrosion protection systems, thermal curing systems, sealings and bitumen specialties.



## Zinc Chemicals – high-value products for industrial use, hot-dip galvanising and zinc plating

Zinc Chloride products from TIB Chemicals have been proven for decades mainly as versatile basis materials, for example for the manufacture of bactericides, fungicides, plastic stabilisers, zinc carboxylate and various classes of these products. We produce zinc chloride powder and solutions in concentrations from 35 to 65 %. Furthermore, TIB Chemicals adapts the product specifications to the individual customer demands. Our zinc chloride is also the basis material for the production of our flux product range. These fluxes are mainly used for pretreatment of steel surfaces prior to hot-dip galvanising. Furthermore, they are used for soldering and welding of various metals. We manufacture a highly diversified flux range. We offer fluxes for hot-dip galvanising of many different materials.

Additionally, we offer the recycling of spent flux baths and the utilisation of zinc filter dust, zinc ashes and zinc-rich stripping solutions. We also carry out toll manufacturing of zinc chloride components, if requested.

### PRODUCTS

#### ZINC CHLORIDE

**Zinc chloride solution, 35–65 %**

tank truck,  
tank wagon, IBC

**Zinc chloride powder**

steel drum, plastic pail

#### FLUXES FOR HOT DIP GALVANISING

**TIB Flux D 1100**

zinc ammonium chloride double salt

**TIB Flux 60**

standard flux

**TIB Flux 60 SP**

flux with acid buffer

**TIB Flux SK**

flux for acid correction

**TIB Flux Ferrokill**

flux for iron precipitation

**TIB Flux 69 S**

low-fume flux

**TIB Flux 72**

low-fume flux

**TIB Flux 73 S**

low-fume flux

**TIB Flux RA**

low-fume flux

**TIB Flux RSP**

low-fume flux with acid buffer

**TIB Flux RK**

low-fume flux for acid correction



## Acids – for diverse applications

In our sulphuric acid plant, we produce sulphuric acid with contents between 10 and 99 % of highest quality and purity. Sulphuric acid is used in nearly all branches of industry, for example in the agro industry, in cosmetic and dye works, in waste gas scrubbers, and in the metal and paper industries. As battery acid with a content of 37 % and low heavy metal impurities, it is used for batteries in cars, ships and generators. Additionally, our sulphuric acid plant produces environmentally friendly energy.

The 30–32 % hydrochloric acid from TIB Chemicals is used in nearly all branches of industry. The most important applications are water and wastewater treatment, the photo and paper industry, the hot dip galvanising as well as the food- and beverage-producing industry. Our customers receive sulphuric and hydrochloric acid by ship, tank truck or wagon, as requested.

### PRODUCTS

#### ACIDS

|  |                            |
|--|----------------------------|
| <b>Hydrochloric acid 30/32 %</b>       | hydrochloric acid solution |
| <b>Hydrochloric acid approx. 20 %</b>  | hydrochloric acid solution |
| <b>Sulphuric acid, technical grade</b> | concentration of 20–99 %   |
| <b>Sulphuric acid, special quality</b> | concentration of 96 %      |
| <b>Sulphuric acid, chemically pure</b> | concentration of 20–99 %   |
| <b>Battery acid</b>                    | concentration of 37/38 %   |



## Sulphur Chemicals – specific and versatile

Our sulphur chemicals plant produces a large variety of products in various versions, for a multitude of applications.

Approved since a long time in the development of radiographs, photographs and movies as well as for leather manufacturing, nowadays our sulphur chemicals gain more and more importance also for the production of food additives, as oxygen scavengers for oil exploitation and as fertiliser additives in agriculture.

Thanks to our extensive business experience, our high quality standards and, not least, through our flexibility, we have the ability to adapt our products to new applications or to develop innovative solutions in cooperation with our customers.

Supported by our long-term partners, we further provide the expected qualified and reliable service regarding the logistics chain.

## PRODUCTS

| SULPHUR CHEMICALS                               |  |   |
|---|--|---|
| <b>Agro N Fluid</b>                             | ATS content 52–53 %  |   |
| <b>Ammonium hydrogensulphite solution (ABS)</b> | standard concentration approx. 70 %  | NH <sub>4</sub> HSO <sub>3</sub>                              |
| <b>ABS solution – catalysed quality</b>         | standard concentration approx. 70 %  | NH <sub>4</sub> HSO <sub>3</sub>                              |
| <b>Ammonium sulphide solution</b>               | standard concentration approx. 40 %  | (NH <sub>4</sub> ) <sub>2</sub> S                             |
| <b>Ammonium sulphite solution</b>               | standard concentration approx. 35 %  | (NH <sub>4</sub> ) <sub>2</sub> SO <sub>3</sub>               |
| <b>Ammonium thiosulphate solution (ATS)</b>     | standard concentration approx. 60 %  | (NH <sub>4</sub> ) <sub>2</sub> S <sub>2</sub> O <sub>3</sub> |
| <b>Ammonium thiosulphate AHL solution</b>       | standard concentration approx. 60 %  | (NH <sub>4</sub> ) <sub>2</sub> S <sub>2</sub> O <sub>3</sub> |
| <b>Ammonium thiosulphate crystals (ATS)</b>     | solid product  | (NH <sub>4</sub> ) <sub>2</sub> S <sub>2</sub> O <sub>3</sub> |
| <b>Ammonium thiosulphate mixtures</b>           | standard mixtures: 80/20 and 90/10   |   |
| <b>Ammonium thiosulphate Agro 20 N</b>          | Nitrogen content min. 20 %   |   |
| <b>Rapid Fixer</b>                              | individual formulation, solid product  |   |
| <b>Potassium sulphite solution</b>              | standard concentration approx. 45 %  | K <sub>2</sub> SO <sub>3</sub>                                |
| <b>Potassium thiosulphate solution (KTS)</b>    | standard concentration approx. 50 %  | K <sub>2</sub> S <sub>2</sub> O <sub>3</sub>                  |
| <b>Sodium hydrogensulphide flakes</b>           | content approx. 70/72 %  | NaHS  |
| <b>Sodium hydrogensulphide solution</b>         | in concentrations of 30–45 %   | NaHS  |
| <b>Sodium hydrogensulphite solution (NBS)</b>   | standard concentration approx. 38–40 %   | NaHSO <sub>3</sub>  |
| <b>Sodium sulphide flakes</b>                   | content approx. 60/62 %  | Na <sub>2</sub> S   |
| <b>Sodium tetrasulphide solution</b>            | standard concentration approx. 40 %  | Na <sub>2</sub> S <sub>4</sub>                                |
| <b>Sodium thiosulphate (NTS)</b>                | crystalline and anhydrous quality  | Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>                 |
| <b>TIB Chrome 22</b>                            | 2,2-ethylenedithiodiethanol<br>HO-CH <sub>2</sub> -CH <sub>2</sub> -S-CH <sub>2</sub> -CH <sub>2</sub> -S-CH <sub>2</sub> -CH <sub>2</sub> -OH | C <sub>6</sub> H <sub>14</sub> O <sub>2</sub> S <sub>2</sub>  |
| <b>TIB Stim 40 WLT</b>                          | standard concentration approx. 40 %  |   |
| <b>TIB Stim 50</b>                              | standard concentration approx. 50 %  |   |
| <b>Unifyl B</b>                                 | solid product  |   |
| <b>Unislip</b>                                  | solid product  |   |



## Metal Finishing Chemicals – advanced raw materials for innovative formulations

TIB Chemicals is the world's leading producer and distributor of metal methanesulphonates, offering – now for decades – high-quality metal finishing chemicals for most plating processes. Whether metal salts for the formulation of electroplating baths or organic intermediates for the preparation of special additives, it is always worth having a look at our product portfolio. One of our specialised skills is to adapt our products to the specific requirements of our customers, for example in terms of tailored concentration ratios. We are continuously searching for new ideas to help our customers solve their problems. Wherever in the world a process provider develops a new metal finishing bath, TIB Chemicals is one of the most preferred contacts regarding the supply management of the chemicals required, even if they are all new. Moreover, we are in a position to offer our customers the option of exclusive toll manufacturing.

### PRODUCTS

#### METAL METHANSULPHONATES

|   |  |
|---|--|
| <b>Stannous methanesulphonate solution</b>      | up to 300 g/l Sn, 70 g/l free acid approx., with or without a stabiliser |
| <b>Copper(II) methanesulphonate solution</b>    | up to 125 g/l Cu, 50 g/l free acid approx.                               |
| <b>Silver(I) methanesulphonate solution</b>     | up to 275 g/l Ag, 50 g/l free acid approx.                               |
| <b>Bismuth(III) methanesulphonate solution</b>  | 210 g/l Bi, 250 g/l free acid approx.                                    |
| <b>Lead(II) methanesulphonate solution</b>      | up to 450 g/l Pb, 15 g/l free acid approx.                               |
| <b>Chromium(III) methanesulphonate solution</b> | 100 g/l Cr, 50 g/l free acid approx.                                     |
| <b>Iron(II) methanesulphonate solution</b>      | 120 g/l Fe, 80 g/l free acid approx.                                     |
| <b>Cobalt(II) methanesulphonate solution</b>    | 120 g/l Co, 10 g/l free acid approx.                                     |
| <b>Nickel(II) methanesulphonate solution</b>    | 120 g/l Ni, 30 g/l free acid approx.                                     |
| <b>Indium(III) methanesulphonate solution</b>   | 120 g/l In, 30 g/l free acid approx.                                     |
| <b>Zinc methanesulphonate solution</b>          | 120 g/l Zn, 50 g/l free acid approx.                                     |
| <b>Sodium methanesulphonate solution</b>        | 120 g/l Na as well as crystalline  |
| <b>Potassium methanesulphonate solution</b>     | 200 g/l K as well as crystalline   |

#### FLUOROBORATES

|   |            |
|---|------------|
| <b>Stannous fluoroborate solution</b>   | 320 g/l Sn |
| <b>Copper(II) fluoroborate solution</b> | 210 g/l Cu |
| <b>Lead(II) fluoroborate solution</b>   | 500 g/l Pb |

| PYROPHOSPHATES           |  |
|--------------------------|--|
| Stannous pyrophosphate   | crystalline as well as solution of 150 g/l Sn      |
| Copper(II) pyrophosphate | crystalline as well as solution of up to 67 g/l Cu |
| Zinc pyrophosphate       | crystalline  |

| MORE TIN PRODUCTS             |  |
|-------------------------------|--|
| Stannous chloride             | anhydrous powder, crystalline dihydrate as well as solution of up to 500 g/l Sn                            |
| Stannous sulphate             | crystalline, powder as well as solution of 125 g/l Sn  |
| TIB Stanal TS                 | stannous sulphate-based formulation for the acid immersion tin plating of aluminium surfaces               |
| TIB Stannocolor               | stannous sulphate-based formulation for the anodic colouring of aluminium surfaces                         |
| TIB SpeedPlate                | stannous sulphate-based formulation for the acid immersion tin plating of copper and copper alloy surfaces |
| Stannous oxide                | black tin oxide  |
| Sodium hexahydroxystannate    | crystalline as well as solution of 125 g/l Sn  |
| Potassium hexahydroxystannate | crystalline as well as solution of 160 g/l Sn  |
| TIB Polystan K                | potassium stannate-based formulation for the alkaline immersion tin plating of aluminium surfaces          |
| Stannic sulphide              | solid lubricant for dispersion plating processes, also available as suspension                             |

| MORE COPPER PRODUCTS             |  |
|----------------------------------|--|
| Copper(II) oxide EPG             | black copper oxide, electroplating grade |
| Copper(II) sulphate solution EPG | 70 g/l Cu, electroplating grade          |

| ACIDS                   |                                  |
|-------------------------|----------------------------------|
| Sulphuric acid          | up to 98 %, battery acid grade   |
| Methanesulphonic acid   | 70 %, electroplating grade       |
| Methanedisulphonic acid | 50 %, electroplating grade       |
| Fluoroboric acid        | 50 %, electroplating grade       |
| Sulphosuccinic acid     | up to 70 %, electroplating grade |

| <b>ORGANICS</b>                      |   |
|--------------------------------------|---|
| <b>TIB Suract A40</b>                | diisoamylestersulphosuccinate   |
| <b>TIB Suract B30</b>                | cocoamidopropylbetaine  |
| <b>TIB Suract B30 C</b>              | cocos dimethylamine oxide   |
| <b>TIB Suract B30 D</b>              | decamine dimethylamine oxide  |
| <b>TIB Suract B30 L</b>              | lauryl/myristyldimethylamine oxide  |
| <b>TIB Suract B30 M</b>              | myristyldimethylamine oxide   |
| <b>TIB Suract B30 P</b>              | polysiloxane betaine  |
| <b>TIB Suract B35</b>                | cocoamidopropylamine oxide  |
| <b>TIB Suract B38 C</b>              | capryl/caprinamidopropylbetaine   |
| <b>TIB Suract B38 S</b>              | cocoamidopropylbetaine  |
| <b>TIB Suract B40</b>                | capryliminodipropionate   |
| <b>TIB Suract N19</b>                | fatty alcoholethoxylate C9-C11, 6 EO                                      |
| <b>TIB Suract E00 P</b>              | polyetherpolysiloxane   |
| <b>TIB Suract ETG</b>                | 2,2-ethylenedithiodiethanol   |
| <b>TIB Suract TPB</b>                | solubilised benzalacetone   |
| <b>TIB Suract TPB 10</b>             | solubilised benzalacetone, 10 %   |
| <b>TIB Suract NOS 10</b>             | alkylphenoethoxylate sulphate   |
| <b>TIB Suract NOS 25</b>             | alkylphenoethoxylate sulphate   |
| <b>TIB Suract Trigonellin 50</b>     | nicotinic acid betaine, 50 %  |
| <b>TIB Suract DRY</b>                | aqueous solution of modified fatty acid amides                            |
| <b>TIB Suract CR</b>                 | proprietary aqueous formulation, contains surfactants                     |
| <b>TIB Suract RHEO 10</b>            | fatty acid amidoalkylbetaine  |
| <b>TIB Suract AC 28N</b>             | fatty acid diethanolamine condensate                                      |
| <b>TIB Suract 595</b>                | modified organic siloxane   |
| <b>TIB Suract CAP</b>                | coconut fatty acid amidoethanolpolyethoxylate                             |
| <b>TIB Suract IM AN</b>              | imidazoline derivative  |
| <b>TIB Suract RA BE</b>              | diethanolamine formulation  |
| <b>TIB Lux OV</b>                    | stabiliser for hydrogen peroxide formulations                             |
| <b>TIB Lux OV 21</b>                 | dto., showing a higher cloud point  |
| <b>TIB Lux AN 66</b>                 | naphthoethoxypropoxylate  |
| <b>TIB Lux BN 13</b>                 | naphthoethoxylate   |
| <b>TIB Stanno Plus</b>               | additive for the anodic colouring of aluminium surfaces                   |
| <b>TIB SpeedPlate Plus</b>           | additive for immersion tin plating bath formulations                      |
| <b>TIB Stanal CP</b>                 | additive for nitric acid-based pickling bath degreasers                   |
| <b>TIB Stanal CL</b>                 | additive for sulphuric acid-based pickling bath degreasers                |
| <b>TIB Stanal TP</b>                 | additive for sulphuric acid-based immersion tin plating bath formulations |
| <b>Thiourea</b>                      | powder  |
| <b>Potassium methanedisulphonate</b> | crystalline   |



## Copper Chemicals – for high demands

Copper Chemicals from TIB Chemicals are used wherever certain specifications are required. For example, we produce propellant components for pyrotechnical inflators for the automotive supplying industry.

TIB Chemicals furthermore offers process chemicals for complex catalysis and synthesis processes. A balanced and solid raw material mix provides the basis of our product range: We recycle used copper etch solutions of the electronics industry and utilise pure copper metal in various forms.

### PRODUCTS

#### PROPELLANT COMPONENTS

|  |   |
|--|---|
| <b>Basic Copper Nitrate (BCN), compacted</b>   | dicopper(II) trihydroxynitrate, bulk density > 0.5 g/cm <sup>3</sup>          |
| <b>Basic Copper Nitrate (BCN), uncompacted</b> | dicopper(II) trihydroxynitrate, bulk density < 0.5 g/cm <sup>3</sup>          |
| <b>Copper(II) oxide special ultrafine</b>      | specific surface area (BET) > 8 m <sup>2</sup> /g, particle size 98 % < 25 µm |
| <b>Copper(II) oxide special ultrafine 30</b>   | specific surface area (BET) > 25 m <sup>2</sup> /g                            |
| <b>Copper(II) hydroxide special</b>            | BET > 75 m <sup>2</sup> /g  |

#### PROCESS CHEMICALS

|   |   |
|---|---|
| <b>Copper(II) acetate monohydrate</b>   | approx. 32 % Cu                                       |
| <b>Copper(II) hydroxycarbonate</b>      | approx. 55 % Cu, bulk density > 1.5 g/cm <sup>3</sup> |
| <b>Copper(II) hydroxycarbonate wet</b>  | approx. 47 % Cu, moisture content 11–16 %             |
| <b>Copper(II) chloride pearls</b>       | approx. 64 % Cu, Ø particle size 100–200 microns      |
| <b>Copper(II) chloride dihydrate</b>    | approx. 37 % Cu, crystalline                          |
| <b>Copper(II) chloride anhydrous</b>    | approx. 47 % Cu, moisture content < 1 %, crystalline  |
| <b>Copper(II) chloride solution</b>     | concentrations upon request                           |
| <b>Copper(II) citrate</b>               | approx. 37 % Cu                                       |
| <b>Copper(II) hydroxide</b>             | approx. 64 % Cu                                       |
| <b>Copper(II) nitrate trihydrate</b>    | approx. 26 % Cu, technical grade, crystalline         |
| <b>Copper(II) nitrate solution</b>      | concentrations upon request                           |
| <b>Copper(II) oxychloride</b>           | approx. 57 % Cu                                       |
| <b>Copper(II) oxide</b>                 | approx. 78 % Cu                                       |
| <b>Copper(II) oxide HSSA</b>            | specific surface area (BET) > 60 m <sup>2</sup> /g    |
| <b>Copper(II) sulphate pentahydrate</b> | approx. 25 % Cu                                       |



## Catalysts – the decisive Plus for reactions

The most important task of a catalyst is to accelerate the reaction. But this is only one of the requirements a modern catalyst has to meet. Additionally, catalysts enable the achievement of special reaction profiles, reduction of reaction temperatures and improved product colours. Some catalysts ensure high reactivity at low or only at high temperatures, delayed action, or extremely quick catalysis. We support you with TIB Catalysts to master your technical challenges.

In cooperation with our customers, we develop individual solutions. Thus, catalysts can be perfectly adapted to the individual requirements and technical conditions, to obtain optimal performance. Based on our long-lasting experience in catalysis under industrial conditions, our TIB Catalysts are not only reliable companions but also pioneers for new products and more efficient processes. With their help, our customers are able to offer progressive solutions, perfectly suited to the market requirements.

### PRODUCTS

#### SULPHONIC ACID CATALYSTS

|                     |  |
|---------------------|--|
| <b>TIB KAT MSA</b>  | methanesulphonic acid (70 and 99 %)        |
| <b>TIB KAT SP</b>   | methanesulphonic acid – blend              |
| <b>TIB KAT MP</b>   | blocked methanesulphonic acid              |
| <b>TIB KAT MDSA</b> | methane disulphonic acid                   |
| <b>TIB KAT HES</b>  | hydroxyethane sulphonic acid (40 and 70 %) |
| <b>TIB SSSA</b>     | sodium sulposuccinate                      |
| <b>TIB KAT S70</b>  | sulphosuccinic acid (40 and 70 %)          |

#### INORGANIC TIN CATALYSTS

|                      |   |
|----------------------|---|
| <b>TIB KAT 50</b>    | stannous phosphite                            |
| <b>TIB KAT 109</b>   | TIB KAT 129 plasticiser blend                 |
| <b>TIB KAT 129</b>   | stannous octoate                              |
| <b>TIB KAT P 129</b> | stannous octoate on silica carrier            |
| <b>TIB KAT 160</b>   | stannous oxalate                              |
| <b>TIB KAT 162</b>   | stannous chloride, anhydrous                  |
| <b>TIB KAT 188</b>   | stannous oxide                                |
| <b>TIB Blend 98</b>  | SnCl <sub>2</sub> dihydrate on silica carrier |

## ORGANOTIN CATALYSTS

|                        |   |
|------------------------|---|
| <b>TIB KAT 208</b>     | dioctyltin di-(2-ethylhexanoate) solution |
| <b>TIB KAT 214</b>     | dioctyltin mercaptide                     |
| <b>TIB KAT 216</b>     | dioctyltin dilaurate (DOTL)               |
| <b>TIB KAT 217</b>     | dioctyltin oxide – blend                  |
| <b>TIB KAT 218</b>     | dibutyltin dilaurate (DBTL)               |
| <b>TIB KAT 218 E</b>   | DBTL – 50 % aqueous emulsion              |
| <b>TIB KAT P 218</b>   | DBTL on silica carrier                    |
| <b>TIB KAT 219</b>     | dibutyltin dicarboxylate (DBTL type)      |
| <b>TIB KAT 220</b>     | monobutyltin tris-(2-ethylhexanoate)      |
| <b>TIB KAT 221</b>     | dibutyltin dineodecanoate                 |
| <b>TIB KAT 223</b>     | dioctyltin diketonoate                    |
| <b>TIB KAT 224</b>     | proprietary formulation                   |
| <b>TIB KAT 225</b>     | lauryl stannoxane                         |
| <b>TIB KAT 226</b>     | dibutyltin diketonoate                    |
| <b>TIB KAT 226 V80</b> | TIB KAT 226/VTMO blend                    |
| <b>TIB KAT 229</b>     | dioctyltin diacetate (DOTA)               |
| <b>TIB KAT 232</b>     | dioctyltin oxide (DOTO)                   |
| <b>TIB KAT 233</b>     | dibutyltin diacetate (DBTA)               |
| <b>TIB KAT 233 S</b>   | dibutyltin acetate-type (DBTA)            |
| <b>TIB KAT 234</b>     | dibutyltin maleate                        |
| <b>TIB KAT 238</b>     | dibutyltin dichloride                     |
| <b>TIB KAT 244</b>     | dibutyltin sulphide                       |
| <b>TIB KAT 248</b>     | dibutyltin oxide (DBTO)                   |
| <b>TIB KAT 248 LC</b>  | dibutyltin oxide, low chloride (DBTO)     |
| <b>TIB KAT 250</b>     | monobutyltin dihydroxychloride            |
| <b>TIB KAT 251</b>     | organotin oxide                           |
| <b>TIB KAT 256</b>     | monobutyltin oxide (MBTO)                 |
| <b>TIB KAT 315</b>     | proprietary formulation                   |
| <b>TIB KAT 317</b>     | dibutyltin (bisoctylmaleinate)            |
| <b>TIB KAT 318</b>     | dioctyltin dineodecanoate                 |
| <b>TIB KAT 319</b>     | dibutyltin mercaptide                     |
| <b>TIB KAT 416</b>     | TIB KAT 233/TES blend                     |
| <b>TIB KAT 420</b>     | proprietary formulation                   |

## Catalysts

### ZINC-BASED CATALYSTS

|                    |                      |
|--------------------|----------------------|
| <b>TIB KAT 616</b> | zinc neodecanoate    |
| <b>TIB KAT 620</b> | zinc octoate         |
| <b>TIB KAT 623</b> | zinc acetylacetonate |
| <b>TIB KAT 634</b> | zinc oxalate         |
| <b>TIB KAT 635</b> | zinc acetate         |

### BISMUTH-BASED CATALYSTS

|                    |                                    |
|--------------------|------------------------------------|
| <b>TIB KAT 716</b> | bismuth carboxylate                |
| <b>TIB KAT 717</b> | proprietary bismuth-based catalyst |
| <b>TIB KAT 718</b> | proprietary bismuth-based catalyst |
| <b>TIB KAT 719</b> | bismuth methanesulphonate          |
| <b>TIB KAT 720</b> | bismuth carboxylate                |
| <b>TIB KAT 722</b> | bismuth carboxylate                |
| <b>TIB KAT 789</b> | bismuth oxide                      |

### METAL CO-CATALYSTS – SICCATIVES

|                       |                              |
|-----------------------|------------------------------|
| <b>TIB KAT K15</b>    | potassium octoate/DEG        |
| <b>TIB KAT K15 TG</b> | potassium octoate/tetraglyme |
| <b>TIB KAT 808</b>    | copper naphenate             |
| <b>TIB KAT 812</b>    | cer octoate                  |
| <b>TIB KAT 815</b>    | iron acetylacetonate         |
| <b>TIB KAT 816</b>    | zirkonium octoate            |

### FILTRATION AIDS, ADSORPTIVE MATERIALS

|                    |                                   |
|--------------------|-----------------------------------|
| <b>TIB Tinex P</b> | natural alumosilicate             |
| <b>TIB Tinex T</b> | synthetic, amorphous silicic acid |

### MONOMERS AND ADDITIVES

|                |   |
|----------------|---|
| <b>AOA</b>     | antioxidant   |
| <b>SI 2000</b> | OH-functional, actived polydimethylsiloxane                     |
| <b>SnS2</b>    | lubricant additive, additionally as suspension in oil available |



## Construction Chemicals – for a safe chromate reduction

Since 2005, only cements and cement-containing mixtures with a soluble chromium(VI) content below 2 ppm are allowed to be brought into the market. Stannous salts, and here especially stannous sulphate, have been proven to be very efficient reducing agents. The use of TIB Chemicals' stannous sulphate, or of formulations based on this compound, offers additional advantages:

TIB Chemicals stannous sulphate

- ❑ efficiently lowers the Cr(VI) content at low dosage rates
- ❑ has no influence on the cement properties
- ❑ is easily dosable, reducing the necessary technical effort

TIB Chemicals offers

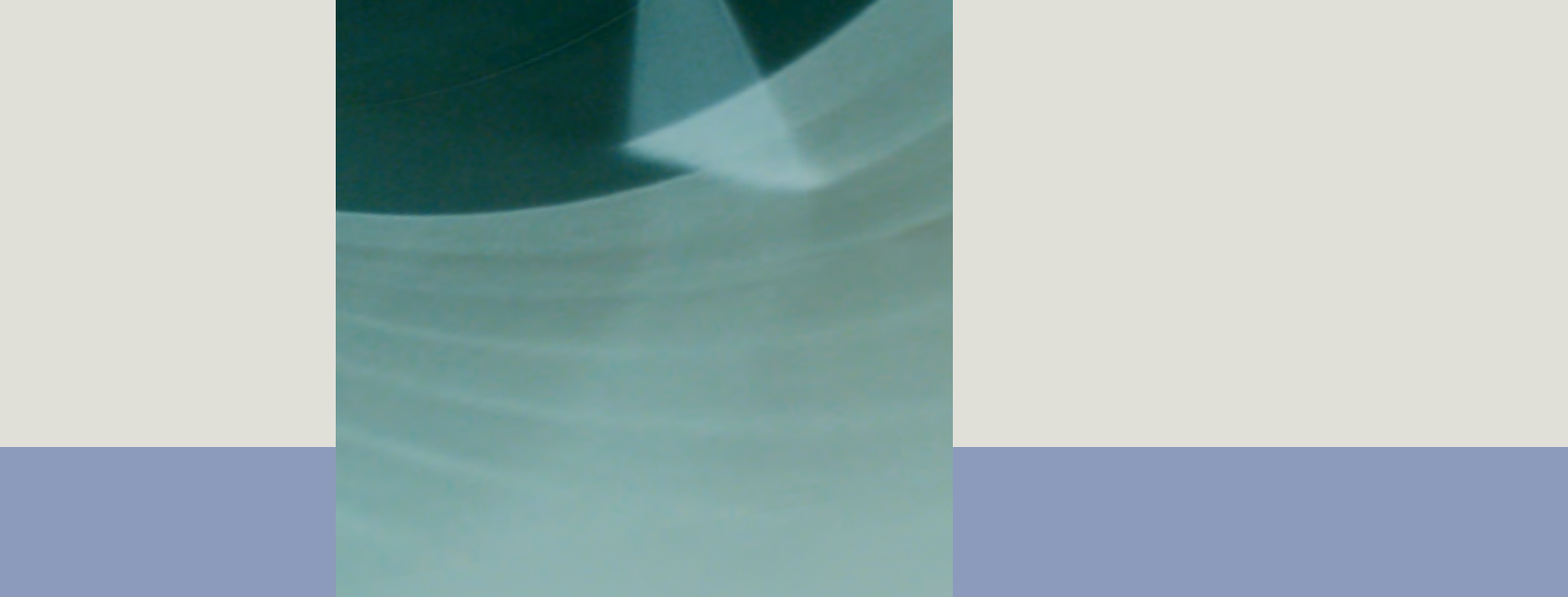
- ❑ a reliable technical service
- ❑ high supply security, as we produce in two independent plants
- ❑ high product safety through strict analytical controls

The Inorganic Specialty Division has developed a range of products that cover the diverse application conditions in cement and mortar plants. For example, we offer stannous sulphate in crystalline and in powder form. Both products have the same reducing power, but different application advantages. Additionally, we offer liquid, easy-to-dosate Reducing Agents. Solid formulations, which allow easy mixing in solid dry mix products, are also part of our portfolio.

### PRODUCTS

#### FOR THE CEMENT AND MORTAR INDUSTRY

|                                      |  |
|--------------------------------------|--|
| <b>Stannous sulphate powder</b>      |  |
| <b>Stannous sulphate crystalline</b> |  |
| <b>Stannous sulphate solution</b>    | 19 % SnSO <sub>4</sub> , available stabilised and non-stabilised |
| <b>REDOX S10</b>                     | 10 % SnSO <sub>4</sub> as solid mixture                          |
| <b>REDOX S80</b>                     | 80 % SnSO <sub>4</sub> as solid mixture                          |
| <b>REDOX S95</b>                     | 95 % SnSO <sub>4</sub> as solid mixture                          |
| <b>REDOX L60</b>                     | 60 % SnSO <sub>4</sub> as dispersion                             |
| <b>Stannous chloride dihydrate</b>   | crystalline, 52 % tin  |
| <b>Stannous chloride solution</b>    | liquid, 41 or 50 % SnCl <sub>2</sub>                             |



## Corrosion Protection Systems – PROTEGOL® high-performance coatings

In the oil and gas energy sector, the valve making industry, for manufacturing of pipes, in coatings for industrial manufacturing or for refurbishment in the field. TIB Chemicals is a leading supplier of high-performance protection coatings, both nationally and internationally, under the trademark PROTEGOL®.

TIB Chemicals manufactures over 50 high-quality performance multi-component PROTEGOL® coatings based on liquid polyurethane or epoxy systems, which fully meet the specific application requirements of the industry while at the same time providing long-term durable corrosion protection. PROTEGOL® coating systems offer excellent chemical and mechanical properties combined with ease of application.

We develop and manufacture high-performance innovative coating systems, in close cooperation with engineering companies, oil and gas companies, applicators and raw material suppliers, in order to develop systems that generate the respective product requirements in environmentally friendly ways. Thus, we not only meet the specific customer requests and also supply systems that correspond to international standards.

### PRODUCTS

#### PROTEGOL® POLYURETHANE SYSTEMS

|                          |
|--------------------------|
| PU 32-10                 |
| PU 32-27                 |
| PU 32-35 RRG             |
| PU 32-45                 |
| PU 32-55                 |
| PU 32-55 TD              |
| PU 32-10 L               |
| PU 32-55/45 L            |
| PU 32-60                 |
| PU Offshore weld coating |

#### PROTEGOL® EPOXY SYSTEMS

|                   |
|-------------------|
| EP 32-89          |
| EP 32-89 L        |
| EP 32-99          |
| EP 32-97          |
| EP 130 HT         |
| EP 131 HT         |
| EP TB 55          |
| EP TB 55 AS       |
| EP-Flowcoat 06 LT |
| EP-Primer         |

## Thermal Curing Systems – PROTEFAN® for long-lasting protection

For over 40 years, TIB Chemicals has now been manufacturing reliable products for the market: Hot dip coatings for the surface protection of electroplating plants and for the tool industry, and stoving varnishes for interior drum lining. All PROTEFAN® products are easy and efficient to apply.

PROTEFAN® plastisols are designed for application on tools and glass flasks, resulting in a pore-free and durable surface protection.

PROTEFAN® dip coatings protect tubes, galvanised racks and steel-accu vessels against wear. These coatings also provide chemical resistance, impact resistance and flexibility. They are suitable for use in many galvanising procedures.

PROTEFAN® stoving varnishes for internal drum linings provide high chemical resistance and excellent adhesion properties.

### PRODUCTS

| PROTEFAN® |   |
|-----------|---|
| 4000      |   |
| 4013HS    |   |
| 4015HS    |   |
| 4110      |   |
| 4115      |   |
| 4125      | plastisols with high chemical and acid resistance                         |
| 4300      |   |
| 4350      | plastisols, decorative  |
| 4050      | electrical isolation/decorative   |
| 6000      | foamplastisol for interior drum sealing                                   |
| 10-1      | stoving varnishes for interior drum lining, with matt or shiny appearance |
| 200       |   |
| 100-30    | primer  |



## Sealings – PRODORAL®R 6-1 and PRODORAL®H for internal domestic gas lines and heating systems

PRODORAL®R 6-1 and PRODORAL®H are sealants with a proven and reliable quality record, now well known and established in the market as brand-name products for many years.

PRODORAL®R 6-1 seals thread connections in internal gas pipes while PRODORAL®H is used for heating systems, for example under floor heating. These procedures ensure complete safety with fast application, providing an economic and environmentally friendly solution.

Both PRODORAL®R 6-1 and PRODORAL®H are designed as fillers in the event of leaking lines. They seal any kind of leakage and at the same time guarantee durability and reliability.

We offer to our customers the full service package, including not only a sealing solution but also the required know-how and all the necessary materials as well as a full local training programme.

### PRODUCTS

#### PRODORAL®

**PRODORAL®R 6-1** solvent-free plastic dispersion

**PRODORAL®H** silicate-containing solution



## Bitumen Specialties – for heavy loads

Bitumen is one of the most important binders for asphalt road construction and a basic material for the production of many innovative products within this type of construction. TIB Chemicals processes over 150.000 tons of bitumen compounds each year, the majority being for toll manufacturing associated with road construction products. By oxidation and modification of bitumen, bituminous products are produced for a variety of applications, for example for use in structural and civil engineering, as sealing compounds, or for application as surface treatment on asphalt and concrete substrates, for roads, railway track constructions, and air field pavements and aprons.

For many decades, TIB Chemicals has been manufacturing material systems under the trademark PROMAK®, which are binders for coating systems and used as anti-slip surface treatments resulting in coarse as well as fine surface textures. These systems have also been developed for runways, not only to improve the friction but also to provide an effective protection against volatile fuels.

The product systems displaying the trademark REINAU® include sealing compounds based on bitumen designed for concrete and/or asphalt traffic paths. As hot-applied system, they provide diverse elasticities and densities fulfilling the high chemical and mechanical requirements while providing a safe and efficient method of application.

### PRODUCTS

#### BITUMEN SPECIALTIES

|  |
|--|
| REINAU® 1401 joint sealing compound        |
| REINAU® 1614 joint sealing compound        |
| REINAU® SNV 164                            |
| REINAU® pavement sealing compound          |
| REINAU® joint sealing compound             |
| REINAU® rail joint sealing compound        |
| REINAU® rail embedding compound            |
| REINAU® crack filling compound             |
| REINAU® plastic resin primer               |
| PRDODOFIX® FC 1 rapid cure pourable mortar |
| PROMAK® A                                  |
| PROMAK® A primer                           |
| PROMAK® PF                                 |
| PROMAK® B                                  |
| PROMAK® B plus                             |

|  |
|--|
| PRODORIT® plastic resin primer                 |
| PRODORIT® J filling compound                   |
| PRODORIT® adhesive                             |
| PRODORIT® silo, roofing and insulating varnish |
| PRODOMULS® bitumen emulsion                    |
| PRODODIN® oxidised bitumen                     |
| PRODODIN® BN sealing compound                  |
| PRODODIN® bitumen solution 17-22               |
| PRODODIN® BF coating 27-01                     |
| PRODODIN® bitumen grinded                      |
| PROMAK® US settling compound                   |
| PROMAK® slurry                                 |

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*TIB Chemicals Plant, Mannheim*

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Metal Finishing Chemicals



Copper Chemicals



Catalysts



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