

Intermediates



## BASF's high quality intermediates for the rubber industry



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 **BASF**  
We create chemistry

## **BASF – We create chemistry**

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. The employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into five segments: Chemicals, Performance Products, Functional Materials & Solutions, Agricultural Solutions and Oil & Gas.

## **BASF Intermediates**

The BASF Group's Intermediates division develops, produces and markets a comprehensive portfolio of about 700 intermediates around the world. Its most important product groups include amines, diols, polyalcohols, acids and specialties. Intermediates are for example used as starting materials for coatings, plastics, pharmaceuticals, textiles, detergents and crop protectants. Innovative intermediates from BASF help to improve both the properties of final products and the efficiency of production processes. The ISO 9001 certified Intermediates division operates plants at production sites in Europe, Asia and North America.

## **BASF's portfolio for the rubber industry**

BASF supplies a range of intermediates for the rubber and tire industries. Its commitment to chemistry makes BASF a reliable partner to the tire and rubber industries.



## **Koresin® - The tackifier for rubber industry with over 70 years of product expertise**

### **Outstanding Advantages**

Koresin is the tackifiers' industry benchmark offering superior performance such as:

- High initial and long-term tackiness of rubber compounds
- Compatible with all current rubber formulations
- Processing flexibility
  - Degree of tackiness can be adjusted
  - Tackiness can be maintained for up to several weeks when needed
- Koresin has no negative influence on the
  - Vulcanization kinetics
  - Properties of the vulcanized rubber
- Proven effectiveness also in formulations with high loading of silica filler

### **Koresin Applications**

Koresin is successfully applied in the manufacturing of

- Quality and premium tires of all kind
  - For cars, trucks and special vehicles
  - For OEM, replacement and re-treading
  - In light, medium, heavy and speed use operations
  - In earth and air transport rubber compounds
- Other industrial and technical rubber goods, such as
  - Conveyor belts
  - Power transmission belts
  - Hoses
  - Cable / roll coverings
  - Lining materials



### **Koresin Specifications and Properties**

#### **Specifications**

Test criteria	Specification	Test method
Ubbelohde dropping point	140 – 160°C	DIN 51801
Ring and ball softening point	135 – 150°C	DIN 52011
Solubility in hydrocarbons	Soluble	BASF method

#### **Properties**

Physical form	Yellow to brown pellets
Odor	Almost odorless
Softening point (ball and ring / DIN 52011)	135 – 150°C
Dropping point (Ubbelohde / DIN 51801)	140 – 160°C
Density (20°C)	1.02 – 1.04 g/cm <sup>3</sup>
Solubility	Soluble in hydrocarbons

## tert.-Butylamine (tBA)

### Competitive Advantages

- Unique and advanced technology to ensure high and constant quality
- With this unique technology BASF circumvents the environmental disadvantages of alternative processes
- BASF is the only global producer of tBA with plants in Belgium, China and the U.S.
- Local production plant in Nanjing, China to quickly serve Asian customers



### tert.-Butylamine Applications

tert.-Butylamine is mainly used in the following industries:

- Rubber chemicals
- Agrochemicals
- Pharmaceuticals

### BASF Specifications

Formula	$C_4H_{11}N$
Molecular weight	73.1
Freezing point	-67°C
Boiling point	44°C
Assay	99.5% min. (GC)
Water	0.1% max.
Color	25 APHA
Suspended matter	None

## Morpholine

### Prolonged Advantages

- Global presence with well-established sales network in Asia
- Advantages in logistics and availability from Ludwigshafen Germany
- Partner for customers worldwide
- Variety package availability: 200-kg bag or 20-mt ISO-bulk

### Morpholine Applications

Morpholine is applied in:

- Ultraviolet (UV) curing
- Optical brighteners
- Rubber vulcanization accelerators
- Pharmaceuticals and agrochemicals
- Water treatment
- Corrosion inhibition and many more

### Morpholine Specifications

Formula	$C_4H_9NO$
Molecular weight	87.1
Freezing point	-4.9°C
Boiling point	129°C
Assay	99.0% min. (GC)
Water	0.05% max. (DIN51777)
Color	15 APHA max. (DIN EN 1557)



## Alkali Metals and Specialty Alcoholates

### Alkali Metals and Specialty Alcoholates Characteristics

- Chemical reagents
- Strong bases
- Enable selective chemistries
- Selectivity is required in higher value transformations

### Applications

The Alkali Metals and Specialty Alcoholates serve multiple market segment:

- Styrene butadiene rubbers – used to modify anionic polymerization chemistry in sSBR production
- Pharmaceuticals
- Agrochemicals
- Electronics
- Oil and Gas
- CASE
- Foundry materials

### Available Product Portfolio

Potassium tert-butoxide (Powder and THF solution)  
Potassium tert-amylate (Toluene and cyclohexane solution)  
Potassium iso-propylate (Solution in isopropanol)  
Potassium 3,7-dimethyl-3-octylate (Solution in heptane)  
Potassium ethylate (Solution in ethanol)  
Sodium tert-butoxide (Powder and THF solution)  
Sodium tert-amylate (THF solution)  
Sodium mentholate (Solution in hexane)

## Our Global Expertise in Amines

With about 300 different amines, BASF has the world's most diverse portfolio of this type of chemical intermediates. Along with alkyl-, alkanol- and alkoxyalkyl- amines, the company offers heterocyclic and aromatic as well as specialty amines. The range is completed by an expanding portfolio of chiral amines of high optical and chemical purity. The versatile products are used mainly to manufacture process chemicals, pharmaceuticals and crop protection products, as well as cosmetic products and detergents. They also serve to produce coatings, special plastics, composites and special fibers.

BASF is value-added partner for the rubber industry and, in particular, has the broadest amines portfolio for rubber processing chemicals and the tire industry.

#### **Accelerators**

tert.-Butylamines (tBA)  
Cyclohexylamine (CHA)  
Dicyclohexylamine (DCHA)  
Aniline  
Dibutylamine  
Diethylamine  
Dimethylamine (DMA)  
Ethylenediamine (EDA)  
Piperidine  
Morpholine

#### **Antidegradants**

Aniline  
Mononitrobenzene (MNB)

#### **Tackifier**

Koresin®

