
Technical Information

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BASF Aktiengesellschaft

Korantin® BH types

Korantin BH Solid Korantin BH 50

Corrosion inhibitors for acid pickling solutions used to remove oxides and scale from metals

Korantin BH types

Chemical nature

2-Butyne-1,4-diol, technical grade.
Korantin BH 50 contains 2.8 – 3.2 % hexamethylenetetramine to enhance its corrosion-inhibiting properties.

Properties

	Korantin BH Solid	Korantin BH 50
Physical form	colourless or yellowish flakes	clear, yellow liquid
Concentration (GC area; BASF-method)	> 98 %	50.5 %– 53.5 %
Solidification point (ISO 3013)	54 – 56 °C	
Bulk density (ISO 697)	0.4 – 0.6 g/cm ³	
Density (DIN 51757, hydrometer, 23 °C)		1.08 – 1.10 g/cm ³

The above information is correct at the time of going to press. It does not necessarily form part of the product specification.

A detailed product specification is available from your local BASF representative.

Solubility

Korantin BH 50 and Korantin BH Solid are miscible in all proportions with water and dilute acids. Korantin BH Solid is soluble in many organic solvents.

The Korantin BH types should not be dissolved in concentrated oxidizing acids, because they can decompose.

Storage

The Korantin BH types have a shelf life of approximately one year in sealed containers. Korantin BH Solid must be protected from air, moisture and sunlight, and it must not be stored for any length of time at temperatures in excess of 30 °C, as otherwise it is prone to caking and discoloration by oxidation. Korantin BH 50 can become turbid during storage and form a slight sediment, but this has no effect on its performance. The temperature should not be allowed to fall below 0 °C when Korantin BH 50 is being stored or transported, because this can cause the solution to saturate and precipitate. Korantin BH 50 can be reconstituted simply by heating it to approximately 40 °C and stirring, with no drop in performance.

Applications

The Korantin BH types are employed as corrosion inhibitors in acid pickling baths used to remove oxides and scale from metals.

Mode of action in acid solutions

The Korantin BH types prevent corrosion without impairing the ability of acid pickling solutions to remove rust, scale and other deposits from the metal.

The Korantin BH types perform particularly well on steel, but their performance on cast iron, especially cast iron that contains graphite, depends very much on the composition of the metal. Their performance on non-ferrous metals is influenced by factors such as the type of acid used, its concentration and its temperature. Their suitability for particular metals can only be confirmed by practical trials.

Hydrochloric acid

The Korantin BH types can be used in dilute hydrochloric acid at temperatures of up to 40 °C. We would recommend adding Protectol® KLC 50, an acid-resistant, cationic wetting agent, to acid cleaner solutions at rates of between 1 g and 5 g per litre at temperatures above 40 °C. Protectol KLC 50 enhances the corrosion-inhibiting effects of Korantin BH, and improves the detergency and wetting power of cleaners.

Comparative trials have shown that Korantin BH 50 is more effective than Korantin BH Solid as a corrosion inhibitor in dilute hydrochloric acid.

Sulphuric acid

The Korantin BH types perform well in dilute sulphuric acid at temperatures of up to 60 °C. The acid should be diluted at least 1:1 with water before Korantin BH is added, and the acid should be stirred into the water. At temperatures higher than 60 °C, we would recommend adding Lutensol® FA 12, an acid-resistant, nonionic wetting agent, at rates of between 1 g and 5 g per litre to enhance the corrosion-inhibiting effect, and to improve the detergency and the wetting power of the cleaner.

Other acids

The Korantin BH types can also be used as corrosion inhibitors in dilute phosphoric acid, in combination with mixtures of phosphoric acid and hydrochloric acid, and in combination with organic acids such as formic acid and acetic acid.

The Korantin BH types are broken down by nitric acid and rendered ineffective.

Levels of addition

Mineral acids such as hydrochloric acid and sulphuric acid should be diluted down to a concentration of 5 – 20% and applied at a temperature of between 20 °C and 60 °C. Korantin BH Solid is usually added at rates of between 0.5% and 2%, expressed as a proportion of the concentrated acid, but it may be necessary to add more at higher temperatures. Korantin BH 50 is added at rates of between 1.0% and 3.8%. The usual levels of addition for Korantin BH 50 in terms of the dilute acid are shown in the table below.

Acid concentration (%)	Korantin BH Solid (%)	Korantin BH 50 (%)
5	0.03 – 0.1	0.06 – 0.2
10	0.07 – 0.2	0.1 – 0.4
15	0.10 – 0.3	0.2 – 0.6
20	0.14 – 0.4	0.3 – 0.8

The Korantin BH types are consumed during pickling owing to drag-through, etc., and they have to be topped up occasionally along with the acid. The corresponding proportion of Korantin BH types must be added to the acid used to top up baths.

Examples

Pickling and descaling

Only small amounts of Korantin BH types need to be added to acid pickling solutions and descalers in order to passivate bare steel. The Korantin BH types do not have any effect on the rate at which deposits are removed. Mixtures of mineral acids and Korantin BH types have the advantage that they are effective on very uneven deposits.

The rate at which scale is removed can be increased by pumping the acid around the system, but the length of time required depends on the thickness of the scale and the accessibility of the internal surface of the plant being descaled. Between one and four hours are normally required at a temperature of 40 – 60 °C. The Korantin BH types can also be very effective on equipment made from bronze, copper, brass and aluminum, etc., as well as ferrous metals, but their performance needs to be tested in advance in practical trials.

Pickling

The times required to remove oxides from sheet metal and wire are very short: 1 – 3 minutes are usually sufficient at 50 – 60 °C. Usually, only a very small amount of Korantin BH types needs to be added in order to maintain the passivating effect. The level of addition depends on local operating conditions, and has to be determined in practical trials. The acid content of pickling baths has to be monitored, and the acid needs to be topped up from time to time.

Derusting

It is often very important to be able to salvage severely corroded nuts, bolts and machine parts, etc. They can be derusted with mixtures of mineral acids and Korantin BH types. It is sufficient to soak metal parts at room temperature or at temperatures of up to 60 °C for between 15 minutes and 4 hours, depending on the severity of corrosion. Parts can be derusted to a bright finish without losing their shape and without any loss of metallic iron.

Rinsing

It is important to rinse all parts thoroughly with hot water and to dry them after treating them with acid. After they have been rinsed, they can be treated with alkali solutions, mineral oil emulsions or passivators, etc., to prevent further corrosion.

Formulations

Suggested formulations are contained in our leaflet entitled Technical Cleaners (TI/ES 1167).

Safety

We know of no ill effects that could have resulted from using the Korantin BH types for the purpose for which they are intended and from processing them in accordance with current practice.

According to the experience that we have gained over many years and other information at our disposal, the Korantin BH types do not exert any harmful effects on health, provided that they are used properly, due attention is given to the precautions necessary for handling chemicals, and the information and advice given in our Safety Data Sheets are observed.

Labelling

According to European and German legislation, the products referred to in this leaflet have to be labelled as follows:

Korantin BH Solid:	Toxic, corrosive
Korantin BH 50:	Toxic, corrosive, sensitizing

Note

The information submitted in this publication is based on our current knowledge and experience. In view of the many factors that may affect processing and application, these data do not relieve processors of the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.

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