



# Water- and Oil-Soluble Rust Inhibitor with High Performance on Various Metals

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TOPICS

Multi-Metal Rust Inhibitor: SANHIBITOR NO.70

Rust affects most metals, compromising their appearance and leading to deterioration. To prevent this, measures are taken not only for finished products but also from the metal processing stage.

Introducing a rust inhibitor that has evolved with unique technology to provide exceptional rust prevention across a wide range of metals.

## Rust Occurrence in Japan is About 10 Times Higher Than in the UK

Rust, commonly seen on old iron, is a result of metal oxidation. When metal reacts with water (H<sub>2</sub>O) and oxygen (O<sub>2</sub>) in the air, it forms oxides or hydroxides, leading to rust formation.

While some metals, such as gold, are highly resistant to oxidation, most metals require rust prevention treatment to maintain their integrity.

Rust not only degrades the appearance of metal but also adversely affects safety, such as by reducing the strength of structures. Therefore, various measures are taken to prevent rust on all kinds of metals.

In Japan, where humidity is high, rust formation is said to be about 10 times more frequent than in the UK. Consequently, the country spends billions of yen annually on rust prevention.

## Rust Inhibitors: An Easy-to-Use Rust Prevention Method among Various Options

There are various rust prevention methods including surface treatments like coating and plating. Among them, rust inhibitors are widely used due to their ease of application. Unlike other methods, rust inhibitors do not require specialized equipment, can be applied regardless of metal shape, and are effective even in hard-to-reach areas. Some inhibitors also reduce wear during metal processing.

When selecting a rust inhibitor, factors such as whether the machining fluid is water- or oil-based and the required rust prevention duration are considered (see table1).

One particularly effective type is the adsorptive film-type rust inhibitor, which adheres to metal surfaces to form a protective layer. It can be applied directly or added to machining fluids. Since its adhesion is moderate, it can be easily removed when necessary, such as before further processing or coating.

Rust inhibitors are available in two main types: water-soluble and oil-soluble. Water-soluble inhibitors mix well with metalworking fluids and

cooling water, while oil-soluble inhibitors are used in machining oils and lubricants.

## SANHIBITOR NO.70: A Multi-Functional Rust Inhibitor

Sanyo Chemical has been developing rust inhibitors since the 1960s, including a wide range of water-soluble rust inhibitors. Among them, SANHIBITOR NO.50, an adsorptive film-type rust inhibitor developed in 1964, remains a long-standing product widely used in industrial settings. Building on its proven performance, Sanyo Chemical launched SANHIBITOR NO.70 in April 2024, further enhancing its capabilities.

SANHIBITOR NO.70 leverages Sanyo Chemical's surfactant technology and proprietary AOA technology to optimize the balance between water- and oil-solubility, making it suitable for both applications.

By optimizing its structure, SANHIBITOR NO.70 strongly adheres to metal surfaces and forms a dense protective film, offering high rust resistance for various metals, including steel, copper, and aluminum.

Traditional water-soluble rust inhibitors often generate foam, which can interfere with metal-working processes. However, SANHIBITOR NO.70 has a controlled moderate level of hydrophobicity, providing excellent anti-foaming properties, making it more user-friendly in water-based machining fluids.

Additionally, in post-processing steps such as plating or coating, residual rust inhibitors can cause defects. This is especially problematic for oil-soluble inhibitors, which tend to remain on the metal surface. SANHIBITOR NO.70 is designed for easy removal, preventing plating or coating failures.

Another key advantage is its versatility—one solution can be used across continuous processes, eliminating the need to switch lines between ferrous and non-ferrous metals. This reduces the time and effort required for line changeovers, simplifies management, and minimizes labor costs.

Moreover, SANHIBITOR NO.70's multifunctionality allows it to reduce the need for addi-

tional additives such as lubricants and defoamers. Since the product itself has emulsifying properties, it can also act as an emulsifier in emulsion-type water-based machining oils.

Since its launch, SANHIBITOR NO.70 has been gaining industry attention for its versatility and high performance.

## Contributing to Industry Development While Reducing Environmental Impact

The metal processing industry is increasingly shifting toward water-based machining fluids for environmental reasons. Additionally, as lightweight materials such as aluminum become more common, the demand for rust inhibitors compatible with non-ferrous metals is rising. SANHIBITOR NO.70 embodies the accumulated technologies of Sanyo Chemical and achieves performance to meet these new needs.

Aligned with the UN Sustainable Development Goals (SDGs), SANHIBITOR NO.70 contributes to Goal 9 (Industry, Innovation, and Infrastructure) and Goal 12 (Responsible Consumption and Production). Furthermore, by promoting water-based metalworking fluids, it plays a role in reducing environmental impact.

As a company with decades of experience in rust inhibitors, Sanyo Chemical remains committed to expanding their applications and supporting the growth of various industries.



■ Table 1. Rust Inhibitors and Their Characteristics

Category	Rust Preventive Film Type		Representative Inhibitors	Film Characteristics
Water-Soluble Rust Inhibitors	Oxide Film Type		Chromates, Molybdates, Tungstates, Nitrites	Forms a thin, dense film (30-200Å) with excellent adhesion and rust resistance
	Precipitate Film Type	Aqueous Ion Type	Polyphosphates, Zinc Salts	Forms a thick, porous film with moderate adhesion to metal
		Metal Ion Type	Mercaptobenzothiazole, Benzotriazole	Forms a relatively dense and thin film
	Adsorptive Film Type		Alkanolamines, Fatty Acid Salts, Alkylamine Ethylene Oxide Adducts, Alkyl Phosphate Esters	Forms a protective layer in acidic and aqueous environments, but adhesion is weak on non-clean surfaces
Oil-Soluble Rust Inhibitors (Adsorptive Film Type)			Petroleum Sulfonates, Sorbitan Esters, Alkenyl Succinic Anhydrides, Alkyl Naphthalene Sulfonates	Forms a protective layer in mineral oils
Vapor Phase Rust Inhibitors			Diisopropylammonium Nitrite, Dicyclohexylammonium Nitrite	Rust inhibitors vaporize and form an ultra-thin protective layer on metal surfaces

■ Table 2. SANHIBITOR NO.70 Properties

Appearance	Color (Hazen)	pH (1% aq. solution)	Kinematic Viscosity (40°C, mm <sup>2</sup> /s)	Solubility (25°C)		Flash Point (°C)	Effective on Metals
				Water	Mineral oil		
Pale yellow liquid	10	11.0	320	Uneven dissolution*	Uniform dissolution	150	Iron, Copper, Brass, Solder, Aluminum

Note: These values are representative.

\*The solution can be adjusted to a transparent uniform solution by neutralizing with alkyl fatty acids.

Please contact our company's sales representative when handling our products.

Please also refer the "Safety Data Sheet" (SDS) in advance. It is the responsibility of the user to determine its suitability and safety for the intended use.