

**KORING 311-3***Corrosion Inhibitor Concentrate for Metal Preservation***General:**

KORING 311-3 concentrate is a brownish liquid containing corrosion inhibitors, passivators and auxiliaries. We recommend diluting the concentrate with distilled, demineralized or deionized water. It is also possible to use tap water, but the efficiency will be slightly reduced. However, care must be taken to ensure that the water used has pH of at least 7. The resulting solution serves as a means for washing metal products and their simultaneous preservation against corrosion. It is mainly used for the removal of machining emulsions and the inter-operative preservation of semi-finished products or as a rinse agent for the final preservation of products when they are not exposed to water or condensed moisture. It is also effective at stopping incipient pitting or intergranular corrosion. In some cases, a concentrated solution is used. It is also used for the preservation of museum collections in cases where it is required that the corrosion on the surface is preserved but no longer continues. The product is intended for all metals and their alloys, only for aluminium (Al) alloys it is necessary to test the change of colour of the alloy due to passivation reactions. It is also used to increase the durability and to disinfect machining emulsions.

**Methods of Application:**

The agent can be used in several ways:

- a) A concentrate is used for immersion method, to remove corrosion layers from the surface of copper or zinc and their alloys. That is, the corrosion-damaged object is immersed in the concentrate and left there until the unwanted layers are removed. The process can be intensified mechanically, for example by brushing or circulating the bath. At the end of the process, rinse with water so that the inhibitors are not completely washed off. Alternatively, the excess inhibitor is removed by blowing air or using absorbent material (cloth). The purpose is to leave only a micro layer of inhibitors and passivators on the surface of the metal product, as these are sufficient for sufficient protection against further corrosion. Thicker layers would lead to a change in colour appearance without increasing corrosion protection.
- b) It is also used in a concentrated form, where it is directly applied to the areas that need to be protected. For example, to welds of a previously coated product (galvanized, etc.), to additionally sanded surfaces or drilled holes in a painted product, etc. Also to washed and degreased parts that need long-term protection. The product is applied using an aerosol spray, spray with a mechanical sprayer, a spray gun, a high-pressure washer (high-pressure cleaner), a brush or a cloth soaked in the product.
- c) KORING 311-3 is used more often in diluted form as a rinsing, cleaning and preservative agent. It is diluted with water of pH 7 and above in a ratio of 1:20 to 1:8. The solution can be used in industrial spray washers, in hand wash tables, for high pressure washing and for immersion washing. By these methods, washing of the product surface and its simultaneous preservation (passivation) is achieved in one step. Or it is simply applied in a suitable manner to the surface of the washed product (spray, brush, cloth, pouring) to achieve corrosion protection.
- d) Since KORING 311-3 has antimicrobial properties, it can be used in water circuits where microbial contamination is a risk. In this case, it is diluted with water in a ratio of 1:20 to 1:8. The solution prevents the growth of microorganism colonies and at the same time protects the metal components of the circuit against corrosion.
- e) If it is used to increase the life of machining emulsions operating in the alkaline pH range, then a field test is required to determine what concentration is appropriate for the emulsion and machining process. At the same time, the machine tool will be protected against corrosion.

The protection time of the diluted product (the concentrate has multiples of the above times) against corrosion is, depending on the material used: in dry conditions where no moisture precipitation on the product surface occurs, up to 12 months, in heated roofed buildings approximately 3 months. Where moisture condensation occasionally occurs it is approximately 3 weeks. These data are approximate and may vary depending on the material to be protected and previous machining fluids or contamination used. (For example, steel products packaged in boxes can have a protection period of up to several years.)

**Warning:**

1. The corrosion inhibitors and passivators used are water soluble. Therefore, if they are washed with water or exposed to condensed moisture, they will be washed away and their preservative effect will be lost.
2. These corrosion protection times are approximate because the effectiveness of inhibitors and passivators depends on the type of material to be treated, its chemical composition and the machining fluids used previously.
3. If the machining fluids had pH of less than 7, the corrosion protection effect may be greatly reduced.
4. The water used for dilution must have pH of at least 7.
5. The agent is designed for intermediate preservation. Therefore, for some contaminations, its washing ability may not be sufficient. In particular, it is contamination with oils or certain emulsions. In this case, it is necessary to use anti-corrosive liquids with a stronger washing and degreasing effect. For example, one of the KORING 761 series products.

6. If anti-corrosion additives have been included in the contamination on the surface of the product, it is necessary to check in advance that there is no unwanted chemical reaction between these additives and the corrosion inhibitors in the KORING 311-3 solution.
7. Depending on the concentration of the agent used and the composition of the aluminium alloy, passivation reactions can lead to a colour change on the surface of the product.
8. The agent has the ability to dissolve paint.
9. Test the suitability of this product and its effects before use.
10. Dilution with water may cloud the solution. Cloudiness does not affect the corrosion protection performance.
11. Do not expose KORING 311-3 and its solutions to temperatures above 70°C.
12. Do not store in PET containers and styrene copolymers. It interferes with some rubber compounds.
13. KORING 311-3 concentrate is flammable.
14. Use personal protective equipment when working. When handling the concentrate, use protective goggles, alcohol resistant gloves, alcohol vapour respirator. Wear gloves and safety glasses when working with diluted product.

#### **Packaging:**

KORING 311-3 concentrate is supplied in 10 l, 25 l, 30 l plastic (PE) canisters and 200 l drums.

#### **Advantages:**

Ease of application, high anti-corrosion efficiency, versatility in the technologies used, biodegradability. The liquid simultaneously serves as a washing and anti-corrosion preservative. It has an antimicrobial effect.

#### **Storage Life:**

Storage life of products is 12 months in the closed packaging at temperatures up to 30 °C without being exposed to direct sunlight.