

RUST PREVENTION

CORROSION MANAGEMENT SOLUTIONS



WHY ARMOR?

Armor Protective Packaging® offers rust prevention and rust removal products that are clean, safe, easy, and that protect metals while in-process, in transport, or in storage. ARMOR combines its VCI (vapor corrosion inhibitor) Nanotechnology® with packaging materials such as paper and poly film to create products that displace moisture on metal and guard against rust. ARMOR also offers desiccants, emitters, foam pads and its Metal Rescue® Rust Remover Bath and Dry Coat™ Rust Preventative. For more than 35 years, ARMOR has worked with customers from around the globe to provide rust prevention and rust removal solutions and to Take the Work Out of Your Workday!



ARMOR SHIELD®

CF33 Emitter

FEATURES AND BENEFITS

ARMOR SHIELD® CF33 Corrosion Inhibiting Emitter is the most advanced VCI emitting system available. The Shield CF33 Emitter is shield shaped, light weight, low odor, and mildew resistant. It is made of reticulated foam impregnated with ARMOR's proprietary VCI Nanotechnology® offering unsurpassed corrosion inhibition with ease of application.

The **ARMOR SHIELD CF33 Emitter** provides exceptional corrosion protection for up to 33.5 cubic feet and has an effective reach radius, in all directions, of two feet. The **CF33 Emitter** is 4 1/16" tall by 3 1/2" wide by 3/8" thick. It is ideal for enclosed, non-ventilated areas such as electrical boxes, gun cabinets, or export containers.

- **Easy-to-Use:** no preparation needed
- **Simple Installation:** self-stick adhesive back and date card or cable tie/string through hole to hang
- **Continuous Protection:** up to 24 months depending on environment
- **Safe:** non-toxic, environmentally friendly
- **Complements:** other ARMOR VCI products and liquid rust inhibitors
- **Compatible:** with mechanical and electrical components

The proprietary ARMOR VCI Nanotechnology® comes with more than 35 years of industry experience. With service on four continents and in more than 25 countries, ARMOR is positioned to provide corrosion management solutions wherever and whenever you need them.



Approved By/Conforms:

- FDA for use in equipment packaging
- Global OEM companies
- RoHS – REACH Compliant
- NACE Std TM0208-2008

TECHNICAL DATA

ARMOR PROTECTIVE PACKAGING CORROSION MANAGEMENT SOLUTIONS

ARMOR SHIELD® CF33 Emitter

Product Overview

All Armor Protective Packaging® products utilize our proprietary and time-proven ARMOR vapor corrosion inhibitor (VCI) Nanotechnology®. Oxidation occurs when an electrolyte (water, oxygen, etc.) is present on the surface of a metal. The corrosion process begins when electrons flow through the electrolyte from high energy areas (anode) to low energy areas (cathode) of the metal. ARMOR VCI blocks this reaction by passivating the surface and inhibiting the electrochemical current flow from anode to cathode. ARMOR VCI's protective vapors adhere to a metal surface to form an invisible film only a few molecules thick to protect metal from attack.

ARMOR SHIELD® CF33 Emitter is a light weight, low odor, mildew resistant, open-cell polyurethane VCI foam. The CF33 Emitter is reticulated foam that is compressed in a process known as felting. Compression through felting provides increased effective density, uniform porosity, non-directional characteristics, and affects fluid-to-foam interactions making it ideal for use as a fluid conduit. The CF33 Emitter is designed for the long-term storage of ferrous and non-ferrous metals and is both non-toxic and nitrite-free.

Compatibility of ARMOR SHIELD CF33 Emitter with Metals

Metal to be Protected	ARMOR SHIELD® CF33 Emitter
Aluminum	★★
Aluminum Bronze	★★
Aluminum Magnesium alloy	○
Brass	★★★
Bronze	★★★
Cadmium	★★★
Cast Iron	★
Chromium	★★
Constantan	★★★
Copper	★★★
Galvanized	★★★
Lead	○
Molybdenum	○○
Nickel	★★★
Nickel Silver (CU, Ni, Zn)	★★★
Silver	○○
Solder (Pb, Sn)	○
Steel	★★
Tin (Pure)	★★★
Tinned Steel	★★★
Zinc	★★★

Compatibility Key

- ★★★ Complete Protection
- ★★ Good Protection
- ★ This product will protect this metal from corrosion; however a more suitable formula may be available.
- Testing is recommended
- Not Compatible

TECHNICAL DATA

ARMOR PROTECTIVE PACKAGING CORROSION MANAGEMENT SOLUTIONS

Length of Protection

The ARMOR Shield CF33 Emitter will protect metal for approximately 12-24 months depending upon airflow and conditions such as the container/space size and the frequency of opening the space. When the Shield emitter is adhered to a flat surface it protects up to 17 ft³ (Cubic Feet). When the Shield emitter is hung from the center of the space it protects up to 33 ft³ (Cubic Feet). The Shield emitter is effective immediately, but may take a few hours (from 6 to 36 hours) to fill the package space and deposit on all surfaces. It is important to note that proximity is critical -- the closer the emitter is to the metal, the faster the vapors will reach the critical areas. ARMOR recommends checking cabinets every 6 months to monitor effectiveness and upcoming expiration dates.

You will need to evaluate your needs, depending on storage environment, package integrity, condition of the parts and their location within the enclosure. Testing is always recommended in any application before use.

Proper Storage

ARMOR distributes its Shield CF33 Emitters in re-closable plastic bags so they may be easily resealed for storage after an emitter is removed. To retain the effectiveness of VCI, it is vital that emitters be stored in sealed packaging. The Shield CF33 Emitter is designed to release VCI vapors quickly when exposed to the environment to ensure metal surfaces are protected immediately and thoroughly. When stored in sealed packaging, the VCI vapors quickly come to an equilibrium that allows the emitters to retain their VCI content well into the future. It is also important to store the product in an area that is not exposed to high temperatures and/or direct exposure to sunlight to help dissuade the urethane foam from yellowing.

Discoloration of Urethane Foam

Urethane foams tend to naturally yellow over time. Oxidation, ultra violet light and temperature affect the color stability. The ultra violet wave length in light will interact with the urethane polymer causing it to oxidize. This chemical reaction produces a yellow color. ARMOR's Shield Emitter is blue, therefore the yellowing process may produce a more greenish hue over time.

Another common means of oxidizing urethanes is through exposure to oxides of nitrogen. These gases are very common in many facilities as they may be produced by gas-fired furnaces and motor emissions. Most warehouses have furnaces and many have gas-powered lift trucks. Ozone gas will also affect the oxidation and consequential yellowing of urethane foams. Ozone is commonly associated with combustion engines.

Temperature is another way that yellowing may occur. The manufacturing process itself may produce a yellowed product as it is an exothermic reaction, meaning that it produces heat and releases it during the polymerization of the material.

Certain additives, such as fire retardants may increase the chance of discoloration as well.

The discoloration of urethane foams is a natural phenomenon as they will inevitably be exposed to oxidizing gases and light at some point. The change in color is **purely cosmetic** and **will have no detrimental effect** on the ability of the VCI (including those emitted from the Shield CF33 Emitter) to protect the metal surfaces from corrosion.

Wash hands thoroughly after handling this product and before eating.

All products manufactured Armor Protective Packaging® are warranted to be first class products and free from defects in material and workmanship. Liability under this warranty is limited to the net purchase price of any of such products proven defective or at our option to the repair or replacement of said products upon their return to us transportation prepaid. All claims on defective products must be made in writing 30 days after the receipt of such products in your plant and prior to further processing or combining with other materials and products. We make no warranty, express or implied, as to the suitability of any of our product for any particular use, and we shall not be subject to liability from any damages resulting from their use in operations not under our direct control. This warranty is exclusive of all other warranties, express or implied, and no representative of ours or any other person is authorized to assume for us any other liability in connection with the sale of our products.

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