

A number of different types of Volatile Corrosion Inhibitor protective are classified in BS 1133:1991 Section 6.2, Protection of Metal against Corrosion during Transport and Shipment, Temporary Protectives and their Application; these designations are also used below. The classifications and designations in BS 1133 are:

A) Solvent based fluids: Coatings deposited on surfaces by the evaporation of solvents.

Solvent-based fluids, which deposit a coating after the carrier solvent has evaporated, have been a traditional form of protection for some years. Usually they have a low viscosity, which together with appropriate additive treatment enables wet surfaces to be dewatered as part of the protective process. The periods of protection may range from a few days indoors, to over a year outdoors. These types of fluids are widely used as automotive “damp start” sprays, for removing moisture from plug leads, and traditionally as dewatering fluids providing interstage protection for components directly after machining with water miscible cutting fluids.

Solvent based fluids are usually applied either from a dip tank, by spray system, or by brushing.

B) Soft Film, Grease-like, Non-solvent

The grease like protectives tend to be specified where consumers are seeking a soft heavy build film. They are particularly used for core protection of wire ropes, cables, and chains, where flexing will not result in breakage of the protective film; for these applications the protective also serves as a lubricant.

C) Protective oils, Soft film type, Non-solvent

Protective oils are available in a wide variety of viscosity ranges, but all are designed to leave an oily soft film on surfaces without the use of a solvent, so avoiding some of the disadvantages of solvent-based materials. They range from very low viscosity, approx 4 mm²/s at 40°C, to highly viscous fluids.

D) Volatile Corrosion Inhibitors:

Usually abbreviated to Vapor Phase Inhibitors or Volatile Corrosion Inhibitor, this type of protection showed considerable increase in use during the 1990's. whilst originally mainly used for protecting steel surfaces, products are now available for protecting other metals, and for multi-metal situations. Volatile Corrosion Inhibitor products work by continuously releasing a vapour with powerful anticorrosion properties; on contact with metal the vapour is adsorbed onto the surface creating a film that will protect the metal from corrosion.

E) Contact Inhibitors:

These inhibitors, consists of chemicals to inhibit corrosion when in DIRECT contact with metal surfaces. Papers may be impregnated with solutions of conventional non-volatile inhibitors. When parts, which are wrapped in papers with, contact inhibitors, they are activated when condensed or contaminating moisture leaches out the inhibitors.

F) Water Based and Emusifiable Protectives

These are usually mixed with water prior to use, applied by dip, spray or brush, and depositing an oily or waxy film after drying. Use of temporary protectives which are mixed with water prior to use have been preferred in some areas over solvent based fluids, particularly to eliminate the safety related problems of use. They are successful in some but not all areas of use.

G) Desiccators and Dehumidifiers.

Corrosion of ferrous materials usually only takes place in the presence of water, and susceptible parts should always be protected from aqueous contamination. Storage indoors, under cover or in areas where condensation cannot occur are therefore recommended.

H) Inert Atmosphere.

Oxygen from the atmosphere is invariably required for corrosion to occur.

Replacement of air by a dry inert gas such as nitrogen or carbon dioxide either in a sealed environment, or one where a small positive pressure can be maintained may be suitable for temporary corrosion control of some components or equipment.

I) Barrier Foil.

The performance of temporary corrosion inhibitors can be enhanced or replaced by the use of a barrier foil. These are usually laminates consisting of three layers. An aluminium layer, which has very low moisture transmission rate, is sandwiched between a polyester layer, which gives the foil strength, and a polyethylene layer, which facilitates a good seal.