

Corrosion protection of metal surfaces remains a pervasive and costly problem for long-term storage and shipment of military parts and equipment, particularly when parts must be clean, uncorroded, and ready to use directly out of the package or shipping container. Vapor corrosion inhibitor materials were created about two decades ago in various forms of polyolefin plastics that release volatile molecules over long periods of time. This fundamental invention of formulations and processes for making VCI plastic materials provided the basis for the continuing innovation in this technology, including polyethylene films, bags, foams, vapor capsules, tubes, rods and molded containers for an expanding range of applications. Their effectiveness and cost advantages in protecting parts and systems from corrosion have resulted in replacement of oil coating and desiccants in commercial applications that parallel military usage.

Many of the metallic parts, components, and finished machines produced by the manufacturing industries may have bare metal surfaces which require to be protected until brought into use, or receive interstage protection prior to further assembly or processing. They may be finished metallic parts, which need to receive some form of protection from corrosion during shipping or storage, or they may require some form of protection from corrosion whilst in use. Typical examples are automotive parts which require protection for a few days, weeks or months, fasteners, steel strip, steel sections, drawn sections of steel, aluminium alloys, or yellow metals etc, during a delay in the manufacture and supply schedule.

The material may need to provide protection when exposed to a variety of different corrosive atmospheres, indoors, outdoors either under cover or fully exposed, in a marine environment, under effects of direct sunlight, perhaps in a radiation flux, in the presence of specific chemical corrosives in an industrial environment etc.

During its protective period, it needs to give adequate freedom from corrosion of bare metal surfaces for a predetermined length of time in manufacture, assembly, storage or distribution. The term of protection will need to be determined for each application, in line with other requirements, and the type of protective selected to suit.

Since temporary protective are invariably used in inter-stage manufacturing operations, they may need to be compatible or in harmony with later stages in the production operations. Particularly compatibility with any materials such as paints, adhesives, sealants etc., which may be applied to the metal surface at a later stage is important, even though there may be prior removal/degreasing/cleaning operations.

