



Intercept Oil and Gas anti-corrosion preservation systems

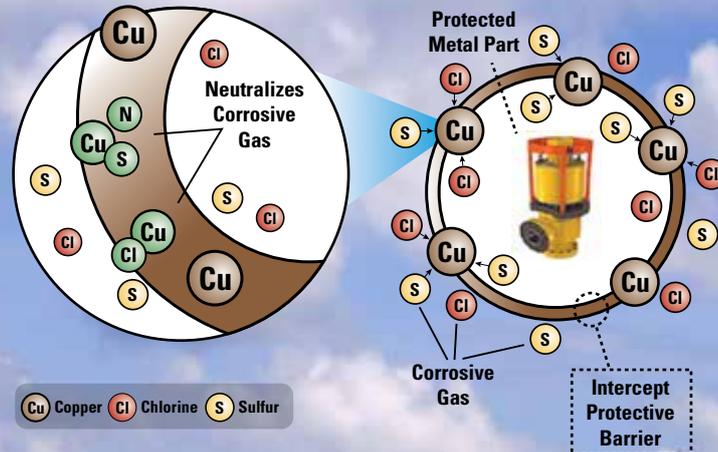
Only Intercept Technology™ utilizes high-surface area Copper particles (Cu) that are bound firmly into the plastic film uniquely that quickly and efficiently neutralize corrosive gases within the package providing protection against corrosion.

Intercept Technology™ is available in several packaging formats such as bags, canvas, stretch-film and shrink-films.

Intercept can protect:

- Drill pipe
- Wellheads, casing hangers and running tools
- Subsea trees and Manifolds
- Connectors and Chokes
- Decompression chambers
- Control rooms
- Pumps
- Life boats
- Aircraft
- Valves and Flanges

The Chemistry behind Intercept





Turbine and Rotor preservation



EGAT is Thailand's leading state-owned power utility under the Ministry of Energy and is responsible for electric power generation and transmission for the whole country. EGAT is the largest power producer in Thailand.

The utility own and operate power plants of different types and sizes which are located in 45 sites across Thailand, included are power generation facilities consisting of 3 thermal power plants, 6 combined cycle power plants, 24 hydropower plants, 9 renewable energy plants, 4 diesel power plants. EGAT own and operate a high voltage transmission network which covers all parts of Thailand.

Intercept Thailand with Intercept Australasia are leading the way for large turbine preservation in Asia offering full service and ongoing inspections during the preservation period. Intercept bags are reusable and all films are oil and solvent free (worker safe) and fully recyclable.



EGAT has observed in particular the environmental principles as outlined in the International Standard ISO 26000 titled 'Guidance on Social Responsibility', which include the environmental responsibility Prevention of Pollution - Sustainable Resource Use - Climate Change Mitigation - Promotion of the Environment - Biodiversity and Restoration of Natural Habitats.

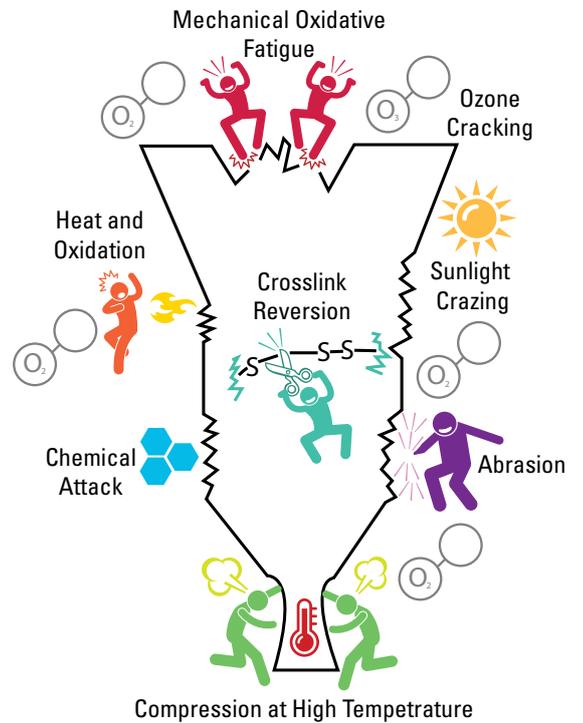


Intercept protects rubber, synthetic rubber and polycarbonates

- Test: PE, PP, PS, PVC, PA, butyl rubber, nylon, polyurethane all loss strength when exposed to SO₂ NO₂ O₃.
- Butyl rubber more susceptible to SO₂ and NO₃ but even more pronounced to O₃
- Nylon suffered chain scission;
- PP crosslinked;
- The Intercept Copper particles then are free to react with and permanently neutralize corrosive gases – such as Sulfur compounds and derivatives (COS, H₂S, SO₂ etc.), Chlorides, Ozone, Nitrous Gases, Formic Acid, etc.



Types of Degradation in Natural and Synthetic Rubber Vulcanisates



Intercept Anti-Corrosion Helicopter Preservation



Intercept packaging reduces the overall cost of maintaining an out-of-service helicopter or for protection during shipping and transport. Intercept Technology™ completely controls and neutralises the environment of corrosive elements such as chlorides and sulphides around and within the aircraft.

Intercept protects the windshield's from crazing and zipper windows enable entry into the aircraft for inspections, rotation of shafts and bearings... zip it up and the anti corrosion preservation goes back to work. Corrosion Intercept foam provides long term corrosion prevention to the engine and rotor bay, as well as exhausts and interiors. Intercept is optic safe and is more cost effective than expensive climate controlled environment warehouses or hangers.



Are you OK?

Intercept Australia teamed up with Westrac in Perth to raise awareness for RUOK? dedicated to reminding everyone to ask, "Are you OK?" and to remember every day of the year to support people who may be struggling with life's ups and downs.



Intercept® Preserves a Slice of History

Textile conservator Rinske Car of the Denmark River Textile Conservation Studio (WA) in conjunction with Dr Ian D MacLeod *Fellow, Western Australian Museum* - have conducted a two (2+) year Intercept preservation trial on a Papal Guard Jacket belonging to a local Australian community museum.

Dr Macleod presented a Poster on his findings at the recent Metal 2019 Conference in Switzerland that explained how many historic composite textiles are too fragile to be immersed in a chemical treatment bath. Other textiles have very fugitive colours so cannot be washed. In addition there was little curatorial appetite to support the wet treatment methods, and laser cleaning and chemical stripping were deemed inappropriate or cost prohibitive for many textile collections.

Close inspections of the object, using an electronic microscope (SEM), shows mobilisation of the silver sulphide from the surface and the thicker layers deeper inside the structure are apparently thinning out. Metallic braid removed from the treated jacket, after 2 years passively stored in an Intercept copper bag, has shown a massive reduction of silver sulphide on the gilded silver braid and circumvented the need for any wet or chemical cleaning procedure. It seems almost hard to believe that what was once considered an irreversible process is now being "magically" transformed and the sulphide ions are effectively migrating in the bag to react with the copper to form copper sulphide, which is much more stable than silver sulphide.

Method

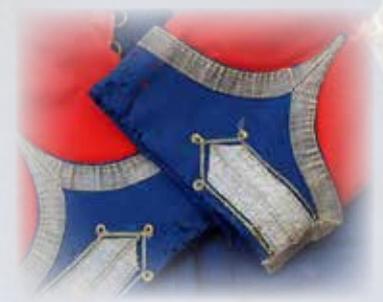
Papal guard jacket with gilded brass buttons and heavily tarnished woven silver braids, before treatment.



Conclusions & Future Directions

There was clear evidence of multiple layers of Ag_2S removal using Silvo polish. Bulk grey-white Silvo residues were removed by washing in 90% ethanol with a non-ionic museum detergent as surfactant, since they were insoluble in warm soapy water. Removal of a test section of metal braid on the right cuff showed that the un-polished hidden surfaces were gilded silver-copper wire. The removed braid was treated using the standard dithionite method3 to act as a reference for Ag_2S removal.

Copper particles embedded in the polyethylene of the Intercept bags is effective at slowly converting surface Ag_2S to Cu_2S inside the bag. The Cu_2S is twice as stable as silver sulphide and this energy is the driving force for the reaction. The mechanism appears to be driven by La Chateliere's principal of continuous displacement of a reactant from an equilibrium mixture, bringing about a metathetical decomposition of silver sulphide to copper sulphide. Being a solid-state reaction the change is naturally going to be slow.



Test sample

Gilded silver-copper alloy braid, removed from the jacket for wet treatment.



The passive treatment of composite metal, silver and textile artefacts provides two major advantages for the effective conservation management of military and ecclesiastical collections. When typical exhibition schedules involve several years between conception and fruition, the re-packing of military uniforms and vestments into Intercept bags is a sound procedure as it will remove the sulphide corroded tarnished layers and also provide an insect-proof storage microenvironment.