Fire Fighting Foams & Equipment

Fomtec Technical Advices
FTA No. 30

Corrosion

General

The most common use of the word corrosion means electrochemical oxidation of metal in reaction with oxidants, such as oxygen or sulphates. This type of process typically produces oxides or salts of the metal giving a surface a typical colouration. Corrosion degrades the useful properties of materials and structures including strength, appearance etc.

Fomtec has tested some commonly used metals in foam systems with a selection of products from our portfolio. This information is available on request.

Galvanic Corrosion

Most commonly for foam systems is galvanic corrosion, where different metals are combined in pumps, valves, tanks, injectors etc. Galvanic corrosion occurs when two different metals have physical or electrical contact with each other and are immersed in a common electrolyte and forms a galvanic couple. This is what can happen when different metals are combined in a system where the foam concentrate or the premix act as electrolyte. In a galvanic couple, the more active metal (the anode) corrodes at an accelerated rate and the more noble metal (the cathode) corrodes at a slower rate.

Example of this is combination of stainless steel with bronze or brass, where bronze and brass are the least noble metal and corrodes faster. Factors such as relative size of anode, types of metal, and operating conditions (temperature, humidity, salinity, etc.) affect galvanic corrosion. The surface area ratio of the anode and cathode directly affects the corrosion rates of the materials.

Corrosion Inhibition

A corrosion inhibitor is a chemical compound that, when added to a liquid, decreases the corrosion rate of a material, typically a metal or an alloy. The effectiveness of a corrosion inhibitor depends on fluid composition, quantity of water, and flow regime. A common mechanism for inhibiting corrosion involves formation of a coating, often a passivation layer, which prevents access of the corrosive substance to the metal. Corrosion inhibitors are additives to the fluids that surround the metal or related object.

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As corrosion inhibitor sodium benzo triazolide or sodium tolyl triazole types can be used. Corrosion inhibitors can be added on request to all Fomtec foam concentrates at about 0,5% based on the final solution.

Recommendation

Avoid mixing different metals in foam systems to avoid problems with corrosion when in contact with foam concentrates or premixes.

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