Salt Fog Testing

It is over seventy years since the specifications of the neutral salt fog test were first defined by ASTM B117 in 1939. American Society of Testing and Materials method B117 is the standard salt fog environmental test used for accelerated corrosion testing of materials. ASTM B117 is the universal international salt fog test method and the conditions of the test have been widely written into many national standards and industry codes. The conditions of the B117 test method produce an environment containing a salt fog that reacts with exposed specimens. The salt fog method is commonly called salt spray or salt mist testing, however these names are a misnomer as the environment exists in the test chamber is a strictly controlled salt fog. ASTM B117 formalised the details of the salt fog test in a reproducible format. Salt fog testing had existed in various forms from 1914, however the parameters of the ad hoc test methods and procedures varied significantly and it was difficult to compare the results of salt fog testing from the variety of methods used by laboratories.

The salt fog chamber is a device to expose samples to an environment of droplets of warm saline solution for a continuous test period. The samples are exposed to specific conditions of temperature in the chamber and the environmental conditions may be specific to the component or generic specifications. The product specifications defining the test exposure time and sample assessment are often original equipment manufacturing (OEM) protocols based on extensive testing, in particular testing of components and materials under a range of external environmental conditions. Exposure times can range from as little as 8 hours up to in some cases 10,000 hours.

The ASTM B117 salt fog test method is suitable for metallic samples, with and without metallic and/or non-metallic surface coatings, films and treatments. The test method does not define the exposure times for specimens. The test method does not define the process of assessing the exposed samples for corrosion and coating damage. Exposure times and sample assessment are set out in applicable product specifications.

Salt fog testing is used extensively for automotive, building, structural and externally exposed components. The method is primarily used to evaluate the relative corrosion resistance of coated or treated surfaces. Product specification exposure and assessment conditions may be specific to the component or generic specifications. The product specifications defining the test exposure time and sample assessment are often original equipment manufacturing (OEM) protocols based on extensive testing, in particular testing of components and materials under a range of external environmental conditions. Exposure times can range from as little as 8 hours up to in some cases 10,000 hours.

Salt fog testing to ASTM B117 is a common corrosion test method because it is cheap, quick, well standardized and repeatable. Salt fog test is widely used in industry for the evaluation of corrosion resistance of coated and treated surfaces on components. The qualification is that there is a poor correlation between the exposure in salt fog chamber and the external operation of a coating. As you are all aware surface corrosion reactions are a complicated process and are influenced by many external factors. Monty Luke, Principal Metallurgist Bureau Veritas Asset Integrity and Reliability Services Pty Ltd