

Accelerated Corrosion Testing

Technical Data Sheet



Accelerated corrosion testing is used to obtain data about the relative performance of different coatings. They are also used as a “quick” test for quality control purposes. Note, however that some very resistant coatings withstand test periods of 1000 or 1500 hours in accelerated testing facilities so the use of the word “quick” is subjective,

The most widely used test for surface coatings is the 5% Neutral Salt Spray (NSS) Test (ISO 9227 or ASTM B117). This test is used by most of the world for assessing the performance of many coatings (though not nickel chromium). See performance figures in the table below.

Other tests used include:

A.S.S.	Acetic Acid Salt Spray
C.A.S.S.	Copper Accelerated Acetic Acid Salt Spray. A fairly aggressive test used mostly for nickel chromium coatings
C.O.R.R.	Corrode Cote
Kesternich	A test using specified sulphur dioxide concentrations in a test cabinet atmosphere to evaluate resistance to acid rain

Cyclic Tests (Climatic Tests)

To try to make accelerated testing give results more comparable with corrosion caused in the normal environment in which items are to be used, many Original Equipment Manufacturers and other users have produced testing sequences which use a combination of salt spray, humidity, drying periods, high (and sometimes low) temperatures. Parts are often subjected to a number of cycles. No standard test has yet been adopted, but if this can be achieved it would considerably reduce the costs involved and the time taken to carry out evaluations.

The usual failure point under accelerated testing is considered to be the first appearance of base metal corrosion (for zinc coatings, the appearance of white corrosion also has to be considered).

There is no correlation between the different accelerated tests and it is difficult to compare tests with actual performance in use, as the exposure in the environment varies considerably from place to place and year to year.

COATING	THICKNESS (microns)	5% N S S TEST		TIME TO FIRST APPEARANCE OF RUST				
		White corrosion	Rust	Under car	Under bonnet	Environment		
						Urban	Rural	Coastal
Zinc heavy weight passivate and seal	8	96 hrs	384 hrs	18 mths	3yrs	18 mths	2 - 6 yrs	1 yr
Zinc nickel and heavy weight passivate	8	360 hrs	720 hrs	2 yrs	5 yrs	2 yrs	3 - 8 yrs	1 - 2 yrs
Zinc flake (dip-spin)	8	-	500 hrs	2 yrs	5 yrs	18 mths	2 - 4 yrs	18 mths
Zinc flake (spray)	10	-	1000 hrs	5 yrs	5 - 10 yrs	5 yrs	5 - 10 yrs	3 yrs
Galvanising	67	12 hrs				5 - 10 yrs	10 - 20 yrs	

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