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EDXRF1834 - Titanium on Steel



Scope

This application note demonstrates the measurement of titanium (Ti) conversion coating on galvanized steel using [NEX Q C+](#).

Background

Aluminum and steel are often coated with a protective conversion coating, also called passivate or passivation coating, to prevent oxidation and corrosion of the base metal. Conversion coatings include chromium (Cr), titanium (Ti), vanadium (V), manganese (Mn), nickel (Ni), phosphorus (P), or zirconium (Zr). A phosphate coating may also be applied to minimize wear on cutting tools and stamping machines.

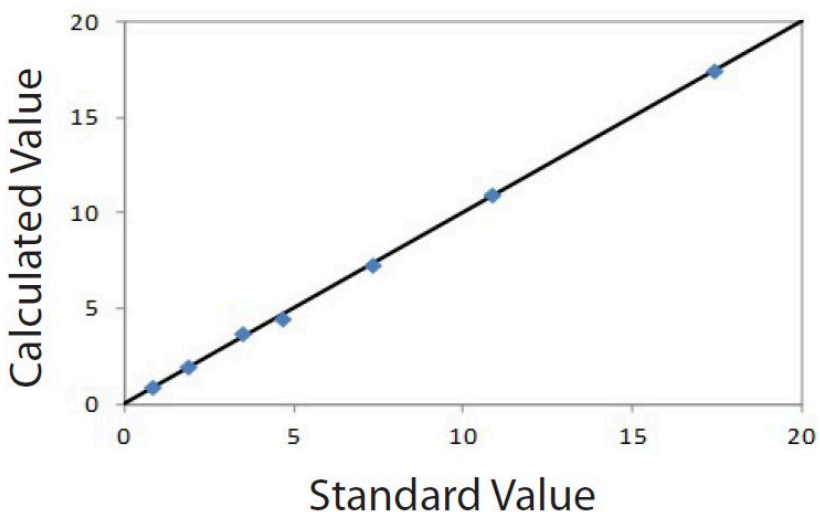
Aluminum is often coated for use in aircraft parts, aluminum window frames, and other similar industries where the aluminum is exposed to weathering. Steel for the automotive industry is typically first galvanized with a zinc coating before the conversion coating is applied. Protected steel is also used for outdoor sheds and other similar uses where steel is exposed to weathering. Conversion coating also helps in the retention of paint for the final finished product.

Calibration

An empirical calibration was built using a set of standards assayed by careful weigh-strip-weigh.

Element: Ti
Units: mg/ft²

Sample I.D.	Standard value	Calculated value
STD 1	0.83	0.835
STD 2	1.90	1.905
STD 3	3.50	3.643
STD 4	4.64	4.472
STD 5	7.29	7.254
STD 6	10.82	10.883
STD 7	17.43	17.418



Correlation plot Ti on galvanized steel

Recovery and repeatability

To demonstrate repeatability (precision), the low and high calibration standards were chosen. Each sample was measured in a static position for ten repeat analyses with typical results shown below.

Element: Ti				
Units: mg/ft²				
Sample I.D.	Standard value	Average value	Std. dev	% Relative
STD 1	0.83	0.845	0.024	2.9
STD 7	17.43	17.440	0.069	0.4

Conclusion

The performance shown here demonstrates NEX QC+ provides excellent sensitivity and performance for the measurement of titanium conversion coatings on galvanized steel.

Related products



NEX QC Series

Combines quality, affordability, and performance for a wide range of applications