Evaluation of atmospheric corrosion on electroplated zinc and zinc nickel coatings by Electrical Resistance (ER) Monitoring

ER (Electrical Resistance) probes provide a measurement of metal loss, measured at any time when a metal is exposed to the real environment. The precise electrical resistance monitoring system can evaluate the corrosion to the level of nanometers, if the conductivity is compensated for temperature and magnetic fields. With this technique very important information about the durability of a new conversion coatings for aluminum, zinc and zinc alloys exposed to unknown atmospheric conditions can be gathered. This is expected to have a major impact on a number of industrial segments, such as test cars for the automotive industry, off-shore construction or component and devices used in harsh industrial environments. The ER monitoring makes it possible to study the corrosion rate on-line in remote locations as a function of temperature, relative humidity and changes in the composition of the atmosphere. Different coatings of zinc, zinc/nickel without and with different Cr+3 conversion coatings were tested in salt spray, and the corrosions rate was recorded every 5 minutes. The results will be discussed and compared. Copyright © (2013) by the National Association for Surface Finishing.

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