



Project: **Laboratory Testing of Galvanic Anode
Materials for Quality Control**

Client: **ENVIRONMENTAL PROTECTION
ENGINEERING S.A.**

Office: **Piraeus**

Clients Order Number: -

Date: **05 July 2007**

Order Status: **Incomplete**

Inspection Dates

First: **25 June 2007**

Final: **29 June 2007**

This certificate is issued to **ENVIRONMENTAL PROTECTION ENGINEERING S.A.** to certify that the undersigned Surveyor did, at their request, attend their works at Schistos Industrial Area, between 25th and 29th of June 2007 for the purpose of monitoring the electrochemical testing of Zinc Based Anodes according to Annex B of DNV-RP-B401 Recommended Practice "Cathodic Protection Design", January 2005 + Amendment April 2006.

The following tests and examinations were performed:-

1. Verification of sample's heat number F20071 and review of manufacturer's declared chemical analysis report. Chemical analysis was carried out by means of a metal analyser ARL 3460 (emission spectrometer) calibrated according to manufacturer's procedure.
2. Dimensional examination of cylindrical test specimen, which found to be in accordance with clause 11.2.2 of subject recommended practice.
3. Witnessing the preparation of testing solution and of testing arrangement.
4. Witnessing of test specimen and of copper coulometer (current integrator) weight verification at the beginning of test that found to be 48.159 gr and 66.413 gr, respectively.
5. Monitoring of anodic current densities (i.e. Day 1: 1.5 mA/cm², Day 2: 0.4 mA/cm², Day 3: 4.0 mA/cm² & Day 4: 1.5 mA/cm²).
6. Witnessing of test specimen and of copper coulometer (current integrator) weight verification on completion of test that found to be 45.637 gr and 68.754 gr, respectively.
7. Spot monitoring of close circuit potential that found to be -1,000 mV at the end of 4th day.
8. The electrochemical efficiency found to be 783 Ah/kg that is greater than the minimum specified value of 780 Ah/kg for zinc based anodes.
9. Review of measuring devices calibration records.

P. Mintzaridis
Surveyor to Lloyd's Register of Shipping & Industrial Services S.A.

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