Project name: Steel type of plates, resistive coatings for bolts, strength of welded joints

BEAM-TIME APPLICATION (Project) REPORT

29.11.2013

General information

Name of the rapporteur	Name of the rapporteur's organisation
Jyrki Korkiakoski	Ykkösmetalli Oy
Type of research (nanotechnology/health care/chemistry etc.)	**Name of the research facility**
Engineering	HZG
Date of the measurement, duration	**Location of the event**
18/02/13 - 20/02/13	Hamburg
National Industrial Liaison Officer from rapporteur's country participating in the measurement	
Edwin Kukk	

Description of the project

Research description (short summary as written in the application)
Strength of welded joints between two plates. Two steel plates with hard surfacing can be welded from backside of plates. Structure of welded seam will be studied. Special interest is in the influence of welding on the hard surfacing.
Summary of activities (experiments performed, beam-time used, preliminary overview of results, next steps and other relevant information)
In different samples of welded, surface hardened steel plates, phase composition and where possible, residual stresses have been determined. For the determination of the lattice parameters, high energy X-rays (100 keV) provided by a synchrotron source have been used. (HZG-Beamline HEMS at PETRAIII, DESY). X-ray photoelectron spectroscopy was carried out at the University of Turku, Laboratory of Materials Science, Department of Physics and Astronomy. The results show that the base materials "A" and "S" consist of ferritic and austenitic steels in an average ratio of ca. 70/30, containing iron,

oxygen and carbon. The composition of the coating material is much more complex. It contains, in addition, a large molar fraction of chromium and smaller amounts of boron, silicon and chlorine. A detailed phase composition of the coating material was therefore not determined for this report. Hardness measurements of the surface coating changes after welding the samples together will be studied.
How would you describe cooperation and assistance from national contact points while preparing and carrying out the research at large scale facilities?
I am very satisfied, the experience was interesting.
Other personal remarks

Annexes

Annexes (list of annexes; meeting minutes, graphical illustrations, tables and other supplementary data)

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