

Inspection of old bridges



OBJECTIVES

- | Inspect and verify materials used in old bridges.
- | Identify carbon content for welding with portable spectrometer.

RESULTS

- | Fast.
- | Significant savings.
- | Reduction of destructive testing.

Identification of metals with portable spark spectrometer helps to restore bridges in the Netherlands

Nebest, an engineering consultancy based in the Netherlands, was appointed to inspect and verify materials used in old bridges all over the Netherlands. One of the bridges was “De Hef”, an 1877 steel railroad bridge that connects Noordereiland Island in the river Maas with Rotterdam. By using the portable PMI-MASTER Smart spectrometer, the team were able to quickly determine the weldability of material for maintenance works.

The Dutch authorities were keen to start maintenance work on “De Hef”. However, due to the age of the bridge, the materials used to construct the bridge had not been fully documented down the years. This meant that before restoration could start Nebest had to first identify the materials used and understand their carbon content. It is a well-known fact that steels containing carbon above 0.22% are difficult or even impossible to weld. But other elements also influence weldability, the new material used in the weld also had to be inspected for carbon content.

The team from Nebest, who specialise in solutions for inspection and research in infrastructure, industrial, offshore, mechanical and electrical installations, were not allowed to take away any material from the historic listed bridge, so needed to be able to conduct the analysis at the bridge site.

“ **The PMI-MASTER Smart’s real value is its ability to quickly and accurately determine the precise carbon content and the carbon equivalent of material.** ”



MEASURING CARBON WITH AN OES ANALYSER

Carbon is measured with optical emission spectrometers (OES), which are usually too big and heavy to be used at hard to reach places like a bridge construction.

Nebest decided to go with Hitachi High-Tech's PMI-MASTER Smart, a truly portable OES analyser. It is small, 15 kg in weight, has an analytical performance that is comparable to laboratory quality and provides results fast. Ideal when measurements had to be taken in difficult to reach places.



National monument "De Hef" bridge in Rotterdam, NL



On-site analysis with optical emission spectroscopy

RESULTS THAT DELIVER VALUE

When analysing the materials used on the "De Hef" bridge, Nebest found the PMI-MASTER Smart easy to use. Its real value however, was its ability to quickly and accurately determine the precise carbon content of materials. This allowed the team to decide the weldability of the original material directly on-site, providing significant savings.

The PMI-MASTER Smart was set-up with a library of the most common formulas to be able to calculate the important material properties on the basis of the chemical results, in this case, the carbon equivalent. If you would like to see the PMI-MASTER Smart analyser in action, visit www.hitachi-hightech.com/hha or book a demo.

Hitachi High-Tech Analytical Science

This publication is the copyright of Hitachi High-Tech Analytical Science and provides outline information only, which (unless agreed by the company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or regarded as the representation relating to the products or services concerned. Hitachi High-Tech Analytical Science's policy is one of continued improvement. The company reserves the right to alter, without notice the specification, design or conditions of supply of any product or service.

Hitachi High-Tech Analytical Science acknowledges all trademarks and registrations.

© Hitachi High-Tech Analytical Science, 2017. All rights reserved.

ABOUT NEBEST CONSULTANCY GROUP

Nebest is a holding with engineering / consulting offices in the Netherlands, provides solutions for inspection and research matters for infrastructure, industrial, offshore, mechanical and electrical installations, coatings, non-destructive test inspections.

