

Verchéenne Welding old steels

In order to refurbish a metallic bridge built in 1912, Verchéenne wished to previously characterise the old steels so as to determine whether they could support the welding operations. The answer is...yes, under certain conditions.



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OUR CLIENT

Corporate name
SAS Verchéenne

Activity
Set-up in Verchers sur Layon (49), the Verchéenne company is an SME with around 100 employees that designs and builds engineering structures concerning hydraulic, maritime and fluvial works.

C.A
M€ 10.3 in 2012

To weld or not to weld? That is the question that the Verchéenne company asked the Cetim, after it was entrusted the refurbishment of the Grand Pas bridge over the Vilaine river in Sainte Marie (35). This operation notably provides for the refurbishment and the reinforcement of the metallic structure of the bridge built in 1912.

“Our problem consisted in previously determining whether this “old” irons could support welding without any risks”, tells Christophe Morisseau, technical manager of the SMI.

Thoroughly tested

Three samples of flat bars 8 mm thick are withdrawn from the bridge and sent to the Cetim laboratory of the Nantes facilities. There, they will be thoroughly examined. At the Cetim, complete chemical analyses of the irons follow metallographic examinations. The latter tests are carried out before and after chemical etching so as to check the inclusion density that conditions a certain ability to welding. An assessment of the toughness in the main section (that is to say away from any possible

weld joint or cold worked area) is then performed from Charpy V-notch tests. The objective: to assess the base metal ductility, a condition for the success of the planned welding operations. Tests at ambient temperature (+20 °C) and lower temperature (0 °C) are also carried out.

Three conditions

Upon completion of the tests, the Cetim diagnostic is clear: yes, welding is possible, under certain conditions:

1. necessity to use a non-overmatching filler metal that deposits a highly ductile steel, yet rich in manganese (Mn);
2. to choose guarantied filler products with low or medium diffusible hydrogen content, with a system of basic slag, as required;
3. to weld with low heat input and by limiting dilution.

That is what was done. And the brand new bridge is still operational.

Cetim's asset

Based on a strong documentary base and collective study



results, the Cetim experts provide wise practical advice.

For that purpose, they also rely on the responsiveness of the metallography laboratory.