LEETSTEEL

LEETSTEEL LTD
www.leetsteel.co.uk
sales@leetsteel.co.uk
07865002656

Material Investigation Report

Client:
Peter Cook
Taziker Industrial
Tamar Bridge Office,
Pemros Road,
St Budeaux,
Plymouth,
PL5 1LP

Dear Peter,

Please find enclosed Chemical and Mechanical results for the Newport Transporter Bridge. SGS MIS Testing conducted Charpy Impact, Chemical Analysis, Tensile Strength and Hardness tests from the same sample.

Due to the Tensile and Charpy results being adequate for S235JR I've used the properties required for new S235JR steel for a basic comparison with the exception of hardness which has not been compared to any standard. Please see comparisons below:

- The test sample was approximately 8mm thick and they needed machine it to 2.5mm thick in order for full removal of corrosion and inclusions. The significance of the inclusions and corrosion is not known from this sample.

- Charpy impact analysis results recorded an average of 19KJ for the 10MM X 2.5MM sample tested. If this test was possible from the same material batch in 10MMX10MM samples it would be expected to withstand 76KJ. (10MMX2.5MM = 25% of 10MMX10MM thus 19KJ times by a factor of 4 is 76KJ). For this reason it has comfortably passed a 27J at 20 Degrees Celsius test / JR.

- The tensile strength tests has given acceptable results in order to pass the required yield properties of structural grade S235 but it would not suffice for S275 steel.

- The hardness tests are low for the parent material tested.

- The chemical composition contains higher Phosphorus levels than is usually permitted on newer comparable steels which is 0.053% (Usually permitted 0.035%). There are lots of other chemical traces and in particular Boron which has been highlighted in recent years due to causing weld hardening and thus cracking - however this is a very small trace element. Due to the age of the material the chemical analysis results were to be expected. Overall the CEV calculation in accordance with 7.2.3 of the BSEN10025-2 2004 is 0.147%. Typically you would expect new S235 steel to have a maximum CEV of around 0.35% for a comparable thickness.
  Report Date: 14/04/2020 (Delivered by email)
  Inspection Sample Location: Newport Transporter Bridge
  Inspection Authority: SGS MIS Testing
  Attached Documents: SGS MIS Test Report
  Page 1 - Leetsteel Comparison
  Page 2 - Sample Pre-Testing Photograph
  Page 3 - SGS Report Page One
  Page 4 - SGS Report Page Two

With Regards,
Ellis Farrelly Techweldi EngTech AMinstNDT
Senior Welding Inspector and RWC

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Sample Pre-Testing Photograph

Code: C/IWH
Tested: 09/04/2020
Reported: 09/04/2020

UKAS TESTING 4444

TEST CERTIFICATE: CON246448

Leetsteel Ltd
25 Coed-Y-Gric Road
Griffthstown
Pontypool
NP4 5HE
Attn: Ellis Farrelly

Order Number: Verbal Ellis

Item/Product: Bracket

Additional Information:

Test Specification: Client Requirements

TENSILE TO BS EN ISO 6892-1:2019 "A224"

Identity	Location / Direction	Size (mm)	XS Area (mm^2)	Yield Strength (N/mm^2)	Tensile Strength (N/mm^2)	Gauge Length (mm)	% Elong	% R.A.
1	Longitudinal	20.06 x 6.90	138.4	330	379	50	20.0	

IMPACT TO BS EN ISO 148-1: 2016 (KV2)

Identity	Location / Direction	Size (mm)	Type	Temp (°C)	Result (Joules)	Ave (Joules)
	Longitudinal	10 x 2.5	CVN	20	21 - 20 - 17	19

CHEMICAL ANALYSIS (Analytical Method Used - OES)

%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%Nb	%V	%Cu	%Al
0.046	0.008	0.54	0.053	0.072	0.018	0.003	0.044	<0.001	0.001	0.057	<0.0005
%Ti	%Co	%Sn	%B	%N							
<0.0002	0.017	0.011	<0.0002	0.009							

HARDNESS CHECK (TO BS EN ISO 6507-1 :2018 (HV))

Ident/Location	Result	Load
N/A	121, 116, 126	Hv 10

Tested By: SGS Consett

This document has been electronically authorised by:

Bob Hannant
Operations Manager
For and on authority of
SGS United Kingdom Limited

Code: C/IWH
Tested: 09/04/2020
Reported: 09/04/2020

UKAS TESTING
4444

TEST CERTIFICATE: CON246448

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