Gesellschaft für Schweißtechnik International mbH
Schweißtechnische Lehr- und Versuchsanstalt SLV Duisburg

GSI SLV
Duisburg

No. 20156600027

1. copy

producer: Dr. Demuth Derisol Lackfarben GmbH & Co KG
Hillerser Str.
37154 Northeim

Trace gas measurement during flame cutting of plates coated with shopprimer
Hydro Eco Weld

laboratory: GSI mbH - NL SLV Duisburg
Bismarckstraße 85
47057 Duisburg

The report comprises:
3 pages of text
-- pages with pictures/figures
-- enclosure(s)

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Duisburg, 07.05.2015
Contact: Lohs
Phone: 0203 / 3781-177

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Schweißtechnische Lehr- und Versuchsanstalt SLV Duisburg

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Duisburg

Test report No.: 20156600027

Reference: **Trace gas measurement during flame cutting of plates coated with shopprimer Hydro Eco Weld**

Client:

Dr. Demuth Derisol
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Date: 07.05.2015

pages: 3

Trace gas measurement during flame cutting of plates coated with shopprimer Hydro Eco Weld,

1. Application of coating/Measurement of coating thickness

Three sand-blasted plates of mild steel (Surface finish: SA3 in accordance with DIN EN ISO 12944) of dimension 100 x 500 x 12 mm were coated on one side.

The coating application and the measurement of its thickness was performed in accordance with DVS guideline 0501, edition March 1976, paragraph 2.2. Coating thickness of 20 µm acc. to DVS guideline 0501.

2. Dry-Film thickness

The following coating thicknesses were measured:

	Data in µm	
Measurement	First sheet (1)	Last sheet (10)
1	18,0	18,0
2	18,0	18,0
3	19,0	19,0
4	18,0	17,0
5	20,0	18,0
6	19,0	19,0
7	19,0	20,0
8	18,0	19,0
9	17,0	20,0
10	18,0	19,0
Average value	18,4	18,7
Total average value	**18,6**	

Coating thickness determination was carrired out by means of an instrument using the magnetic inductive principle. (paint thickness gauge: Fischers Scope MMS)

After a drying time of ten days at room temperature and 70 % max. relative humidity (R.H.), the coated plates were flame cutted with the fuel gas acetylene.

3. Gas Detecting

During welding gas samples were taken with a Dräger gas detector. Samples were taken from within the breathing zone of the welder. The following gas pipettes were used:

		Gas Pipette No.	Stroke	Measurement Range [ml/m³]
Carbon monoxide	CO	CH 25601	10	5-150
Carbon dioxide	CO2	CH 23501	5	100-12000
Nitrous fumes	NO, NO2	CH 29401	5	0,5-10
Formaldehyde	HCHO	6733081	10	0,5-5
Cyanide	HCN	CH 25701	5	2-30

4. Results of Trace Gas Test

The concentration found for each gas is given in the table below:

		Values in ml/m³ (ppm)			
	Carbon monoxide CO	Carbon dioxide CO2	Nitrous fumes NO, NO2	Formalde-hyde HCHO	Cyanide HCN
TL-Values*	30	5000	3	0,5	10
measured concentration	10	1000	1	0	0

* Threshold limit values in BRD, 2009
n.d. = concentration lies under detection limit

The fumes which were measured with Dräger gas detectors during flame cutting with the fuel gas acetylene are

HEALTH HAZARD FREE

In case of conflict, the original German Text of this report shall govern.

Duisburg, 07.05.2015

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Head of the testing lab: Dipl.-Ing. Thomas Wilhelm

Gesellschaft für Schweißtechnik International mbH
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Determination of the porosity level in accordance with DIN EN ISO 17652-2 once
DVS-guideline 0501 edition March 1976 Shopprimer
Hydro Eco Weld

laboratory: GSI mbH - NL SLV Duisburg
Bismarckstraße 85
47057 Duisburg

accredited acc.to ISO 17025, DAP-P-01.025-00-90-01

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Test report No.: 20156600027

Reference: **Determination of the porosity level in accordance with DIN EN ISO 17652-2 once DVS-guideline 0501 edition March 1976 Shopprimer Hydro Eco Weld**

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Trade name of the shopprimer: Hydro Eco Weld

Characteristic pigment-base: ironoxide

Characteristic Resign: Alkydacryl

1. Chemical composition of base material and welding wire

	Data in % by mass				
	C	Si	Mn	P	S
Filler: G3Si1 DIN EN ISO 14341	0,08	0,80	1,41	0,012	0,009
Base material: C10 DIN EN 10278					
12 x 50 x 200 mm	0,10	0,16	0,44	0,025	0,021
20 x 80 x 200 mm	0,09	0,22	0,52	0,029	0,034

2. Applied coating (dry-film) thickness

The following coating thicknesses were measured:

	Data in µm	
Measurement	First sheet (1)	Last sheet (10)
1	18,0	18,0
2	18,0	18,0
3	19,0	19,0
4	18,0	17,0
5	20,0	18,0
6	19,0	19,0
7	19,0	20,0
8	18,0	19,0
9	17,0	20,0
10	18,0	19,0
Average value	18,4	18,7
Total average value	**18,6**	

Coating thickness determination was by means of an instrument using the magnetic inductive principle. (paint thickness gauge: Fischers Scope MMS)

3. Result of testing

Specimen-No.	Number of pores N	Total area of pores F [mm²]	Mean area of a single pore F/n [mm²]
1	36	74,59	2,07
2	38	80,79	2,13
3	46	105,10	2,29
4	38	71,14	1,87
5	39	87,54	2,24
6	43	92,94	2,16
7	42	80,85	1,93
8	40	81,65	2,04
Average value	40,25	84,33	2,09
C.L.*	2,71	9,03	0,12

*C.L. = Confidence limit of the average value on the 95%- level related to the average value in %.

At the present state of knowledge the total area of pores "F" is the best determinator / indicator.

The mean total area of pores is: **84,33 mm²**

The acceptance requirements according to the Deutscher Ausschuss für Stahlbau (DASt-Guideline 006) **are met** (i.e. pore area ≤ 125 mm²).

The testing laboratory maintains a bar chart which is continuously updated with new test results (mean value of total area of the pores).

4. Declaration

The above testing was carried out in accordance with DIN EN ISO 17652-2 once the DVS-Guideline 0501, edition 1976. Attention: All requirements of this standard and the welding procedure were observed.

The application of this guideline leads to excessive, not typical for practice, pore generation. This excessive pore generation is necessary to provide reproducibility and differentiation.
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Duisburg, 07.05.2015

Head of the testing lab: Dipl.-Ing. Thomas Wilhelm