



The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein

Learning Resources for the course:

Steel Structure Inspector Course for EN 1090

This document covers only:

Competence unit no. CU-4 DOCUMENTATION AND PRODUCTION PLAN

Table of Contents

Structure of this document:.....	2
Introduction.....	2
Objective.....	3
A. Teacher Guideline.....	3
B. Students Guideline.....	4
C. Learning resources.....	4
D. Students tasks.....	5
E. Evaluation.....	6
F. Appendix.....	6

Structure of this document:

Introduction.

Objective.

A. Teacher Guideline.

B. Students Guideline

C. Learning resources

D. Students tasks

E. Appendix.

Introduction

Note. It is assumed that the teacher has in depth knowledge of the industry requirements for the topics discussed in this CU.

**Reference document covering the course structure, see document D2.2
The content of this document covers deliverables for D4.1 and D4.2**

This CU, Documentation and Production Plan, is general in its structure and the learning resources that has been selected from the Internet should be sufficient for the teacher and students as background information. However the material listed in Learning Resources developed for the project contains a number of industry examples that can easily be implemented in the industrial companies of the students if they do not have such documents already.

Note however that the CPD and the 1090 standard has special requirements for welding of reinforcing steel which is easy to forget. WE strongly recommend that these requirements are highlighted and discussed. In the Learning resources two specific documents have been added; a welding procedure for welding of reinforced steel and a production log for tensile test of reinforced steel.

It may very well happen that the local industry is not aware of these requirements.

If the product you are referring to during CU 2 and CU3 do not include welding of reinforced steel then the documents can be used for information only.

Please also note that the learning resources summarized and added in chapter C, is the deliverables harvested from 3 different pilot courses in Hungary and Slovenia

Objective.

The objective of this CU is analyze the clients documents submitted in CU2 and create both a detailed production plan for that product and a detailed documentation plan for the product as well. Based on the reference documents and the Industries that are represented one important discussion will be the topic of traceability. The learning resources developed for the CU contains real examples for how this can be done. The students should also bring their own examples for discussion. The competence targets should be met and additional tasks for the students can be developed for this purpose.

A. Teacher Guideline.

Content of the Teacher Guideline:

The topic for CU 4 is Documentation.

This CU shall focus on documentation and traceability. The understanding of why traceability is important and why documentation is necessary should be stressed.

It is recommended that you take the life span of the product into consideration here. Example, if it turns out after 5 years that a certain weld where the ex. TIG (141) first run in a welded joint starts to crack, then this will occur in similar welds throughout the product. The important question from a maintenance and security point of view is; where are these welds. We assume that the experienced students have similar examples from their own companies.

Try to get these examples on the table and discuss consequences of failures.

That will motivate the students to see the importance of this CU.

As an example a procedure for Identification and Traceability has been uploaded as a resource.

The students may also have such examples which can be used for discussion

Discussions for student group work or for individual work if groups are not created:

*Verify the need for documentation related to inspection of welding seams and welding procedures.

*Specify which documents you will use through the inspection process and what content the documents shall have.

*Write a procedure for inspection activities before, during and after welding that ensures traceability of the activities.

*Give examples of other relevant documents.

*Create Template for Procedure/checklist for the tasks

B. Students Guideline

CU 4 covers the topic documentation.

The topics will cover how to create a system for identification and traceability and documentation of the work and inspection that has been done, or will be done, on the product.

The importance of the thematic will be seen in a lifelong perspective for the product.

You should reflect over for example: The consequences of a defect in a welded joint and see what happens if the same conditions are available in other joints and where these are situated in the product.

If you have examples from your own company, this could be used as a background for discussion in the class.

Time schedule for CU 4: 4 hours (2 hours studying and 2 hours zoom meeting)

Under folder with “Resources and activities”. The material is available as pdf-files, word- and excel files, and video material (online at YouTube and as mp4 files stored in the learning management system). Please notice that the written assignments should be answered by using the word-files that are embedded into the description of the tasks. **You shall not use** the Office package installed on your own device.

If you are not using Its Learning LMS system, then the teacher have to decide where you shall find the resources for the course.

Type of work:

You have 2 weeks to complete each CU. The first week should be preparation activities, while the second week should be used to solve the tasks, exercises and hand in your results to the teacher. The learning activities include individual studies, work-based training in your company, group activities, classroom training and a digital Zoom video meeting with the teacher once per week (Saturdays) of using zoom meetings

C. Learning resources

Support resources from selected from the Internet.

Title	Producer	Language	No of pages	Copy-right
General 1090 -voluntary	OCAB-OCBS	English	29	no

certification				
Checklist 1101-Structural steelwork		English	2	No
Guideline BFS-RL 07-1010	Bauforum stahl	English	13	No
Manual of contract documents	Specification for Highway works	English	54	No
BS EN ISO B17660-1-2006	BS	English	50	No
BS EN ISO B17660-1-2006 part 2	BS	English	30	No

Learning resources developed in the project.

Title	Producer	Language	No of pages	Copyright
Control Summary	QMS	English	2	No
Weld Summary	QMS	English	2	No
QA-4.2-1 Identification and traceability	QMS	English	1	No
Visual Inspection Report	ISIM	English	1	No
List of approved WPS-WPQR	ISIM	English	1	No
List of approved Welders	ISIM	English	1	No
EX Dimensional Control	QMS	English	1	No
QA-7-2 Work Instruction NDT operator	QMS	English	1	No
QA -17-2 Checklist for final documentation	QMS	English	1	No
QA-17 Procedure for final documentation	QMS	English	1	No
Log from tensile test of reinforced steel	QMS	English	1	No
WPS for 1090-2	QMS	English	1	No

Video resources created for this CU

No special resources have been created for this CU

D. Students tasks

Delivery from the students :

*Verify the need for documentation related to inspection of welding seams and welding procedures.

*Specify which documents you will use through the inspection process and what content the documents shall have.

*Write a procedure for inspection activities before, during and after welding that ensures traceability of the activities.

Which personnel shall be responsible for signing the documents?

*Give examples of other relevant documents.

*Create Template for Procedure/checklist for the tasks

Discussions for student groups or to be submitted as individual tasks for the students:

*Shall control reports be written?

- * Shall control reports be written for all control items whatever the result is?
- * Shall control reports be written only when there are something to be reported?
- * What is a trigger level for report ?

E. Evaluation

1. Did you find this module relevant ?

- * Yes
- * No
- * I don't know

2. Was it time enough for going through the material ?

- * Yes
- * No
- * I do not know

3. Was the resources relevant for this module ?

- * Yes
- * No
- * I do not know

F. Appendix.

Learning resources developed for this CU.

The list is according the table: Learning resources developed in the project. Se paragraph C-Learning Resources.

The learning resources for this CU have been scanned and merged together as one document.

Insp plan: 147-235-41

Object: Oresundslink_HB

WPY

Order no: 55401820E

Det: 3500:Lower Cord North

Activity: Prefabrication


Prep by: JF

Page: 1 of 2

Rev:

Rev date:

Insp code
 V= Visual insp
 B= Presence
 S%= Random insp
 A= Insp all items
M1-g= Receiv insp
MA= Dim insp
F= Shape insp
Off= Non destruction test (U,R,M,P)
Ultrasonic, Radiogr
Magnetic part, Dye penetr
U= Alignment, positioning
TÄ= Leak test
TP= Pressure test
VÄ= Heat treat insp
R= Cleanliness insp
Y= Surf treat, coat insp
K= Component insp
MO= Assembly insp
Mi= Environmental test
P= Process insp
Fu= Insp of function
MA= Insp of marking
HP= Holdpoint
EL= Insp electrical inst
E= Insp electronics inst
1= Insp of cablerunnings
2= Insp of terminators
3= Insp of marking
4= Continuity test
5= Insp of connect.

REVIEW OF INSP DOCUMENTS
 KKR
 CUSTOMER
 /


PBS	Insp code	Insp no	Perf by	Req code	Specification	Drawing, valid document(s)	Description, method and scope of insp	Date/Sign	Report
41.0	MÄ V A	23541001	Ts	3A	P32 P1 P11	09-F.702A-423541 09-F.702A-4P3541	Lower Chord North Before fabr. Inspection of identification for all components (drawing no., position no. etc) Visual inspection with respect to finish of edges, grooves and surfaces. (ev.damages)	980320 JF	
41.1	V F A	23541002	Ts	2A	P32 P11	09-F.702A-423541	Lower Chord North General Inspection with respect to fitness of components (alignment, weld bevels etc)	980320 JF	
41.2	P S% 10	23541003	Ts	2B	P11 P4/5	09-F.702A-423541 WPS	Lower Chord North Production Inspection of welding parameters, ref. applicable WPS and drawings.	980320 JF	
41.2	F MÄ A	23541004	Ts	1A	KVS0567.11 P11	09-F.702A-423541	Lower Chord North Production Dimensional inspection during/after assembly/tack welding of chord. (P11). Fixtures to be used.	980320 JF	

Eks 1.

Insp code
 V= Visual insp
 B= Presence
 M1-g= Receiv insp
 S%= Random insp
 F= Shape insp
 A= Insp all items

OF= Non destruction test
 (U,R,M,P)Ultrasonic,Radiogr
 Magnetic part,Dye penetr
 U= Alignment, positioning

TÅ= Leak test
 TP= Preassure test
 VÅ= Heat treat insp
 R= Cleanliness insp

Y= Surf treat,coat insp
 K= Component insp
 MO= Assembly insp
 MI= Environmental test

P= Process insp
 Fu= Insp of function
 MA= Insp of marking
 HP= Holdpoint

EL= Insp electrical inst
 E= Insp electronics inst
 MA= Insp of cablerunnings
 2= Insp of terminators

3= Insp of marking
 4= Continuity test
 5= Insp of connect

PBS Insp code

41.3 MÅ F

A

Insp no

23541005

Perf by

Ts

Req code

1B

Specification

KVS0567.11
P11

Drawing, valid document(s)

09-F.702A-423541

Description, method and scope of insp

Lower Chord North After fabr.
 Dimensional inspection.
 All reports to be stored at Qc dept.-KkrV.

Date/Sign

980324

JF

Report

351

41.3 OFPMV
OFPR OFPU

23541006

Ts

Qio

1A P11
prENV1090
P29
P30
P31
P32

09-F.702A-4W3541

Lower Chord North After fabr.
 None Destructive Examination of welds.
 NB! Holdtime before NDE.
 All reports to be stored at Qc dept.-KkrV.

Date/Sign

980324

JF

Report

351

Insp plan: 147-235-41

Object: Oresundslink_HB

WPY

Order no: 55401820E

Det: 3500:Lower Cord North

Activity: Prefabrication

Prep by: JF

Page: 2 of 2

Rev:

Rev date:

REVIEW OF INSP DOCUMENTS
 KKR
 CUSTOMER
 /

NOTES

In the weld Summary list, there are two columns named " Extra Report Available" 1, and " Extra Report Available" 2.

" Extra Report Available" 1 shows the Visual inspection, which is performed 100%.

" Extra Report Available" 2. Shows Lamination inspection, this is performed 100% when this is signed.

Explanation to abbreviation in the weldlogg

Column : NDE gr.

Abbreviation

BMO	Weldclass B, Member zones, Other Welds. In accordance with prENv 1090-1: 1994
MF	Member zones, Fillet Welds
CF	Connection zones, Fillet Welds
MX	Member zones, Full penetrated welds. With requirements on Lamination inspection
CX	Connection zones, Full penetrated welds, With requirements on Lamination inspection
MOF	Member zones, Full penetrated welds
COF	Connection zones, Full penetrated welds
MOP	Member zones, Partly penetrated welds
COP	Connection zones, Partly penetrated welds.
MI	Member Zones, Inline welds
CI	Connection Zones, Inlide welds

Other Columns

Abbreviation

BW	Butt weld
FW	Fillet weld
MT	Magnetical particle testing
PT	Penetrant testing (Not used on project Öresundslink_HB)
UT	Ultra sonic testing
RT	Radiographic testing
VIS	Visual inspection
LAM	Lamination testing
OK	Accepted without remarks
OKE	Accepted with remarks
NOK	Not accepted
NC	Not Controlled (the % is taken on another weld)

WELD SUMMARY LIST

Rep. no.:

Date 980325

Page 1 of 2

Project: Oresundslink_HB Section: 3500

Drawing: 09-F.702A-4W3541

Rev.: 00

Sign.: 

Search status:

Client: Sundlink_Contractors

Line: -

Spool: -

S. no.: WPY

ENGINEERING

Date:

PRODUCTION

QUALITY INSPECTION

Weld no.	NDE gr.	Weld length/thickn.	Joint type	Material id. A/B	Batch no filler	Welders' id	WPS	Date/ Hour	Form. acc./ sign.	MT/PT		UT		RT		Extra rep. available				Weld rep. Report Date	
										Length Report Date	Acc Sign.	Length Report Date	Acc Sign.	Length Report Date	Acc Sign.	1	2	3	4		
1	MOF	11819 18.0	BW		3061	89 97	3032-1	980204 13:00	OK MAL	600 980216	OK PB	11819 305 980216	NOK PB								
1R1	MOF	11819 18.0	BW		3061	89 97	3032-1	980217 15:23	OK MAL		NC PB	11819 308 980209	NOK PB								
1R2	MOF	960 18.0	BW		3061	89 97	3032-1	980225 10:14	OK MAL	600 980225	OK PB	960 980225	OK PB								
2	MOP	11819 18.0	BW		3063	89 97	3032-1	980204 10:00	OK MAL	600 980216	OK PB	1200 980216	OK PB								
3	MF	11819 18.0	FW		3063	89 97	3032-1	980204 13:00	OK MAL	600 980216	OK PB										
4	MF	11819 18.0	FW		3063	89 97	3032-1	980204 13:00	OK MAL	600 980216	OK PB										
5	MF	11619 16.0	FW			86	3032-1	980202 15:30	OK MAL	600 980216	OK PB										
6	MF	11619 18.0	FW			86	3032-1	980202 15:30	OK MAL	600 980216	OK PB										
7	MF	11619 16.0	FW			86	3032-1	980130 09:00	OK MAL	600 980216	OK PB										
8	MF	11619 18.0	FW			86	3032-1	980202 10:00	OK MAL	600 980216	OK PB										
10	MF	920 18.0	FW			100	3032-1	980205 00:45	OK MAL	100 980216	OK PB										
11	MF	920 18.0	FW			100	3032-1	980205 15:30	OK MAL	100 980216	OK PB										
12	MF	5380 18.0	FW			100 101	3032-1	980205 21:30	OK MAL	1264 980216	OK PB										
13	MF	5380 18.0	FW			100 101	3032-1	980205 20:15	OK MAL	980216	NC PB										
14	MF	5380 18.0	FW			100 101	3032-1	980205 18:30	OK MAL	980216	NC PB										

© QM Software	IDENTIFICATION AND TRACEABILITY	Procedure No.: 4.2-1 Rev. no.:
---------------	--	--

Project:	Order:	Section:	Page: 9 of: 13
----------	--------	----------	----------------

Target: Purpose: Scope: Responsibility: Reference:	Ensure that the system for identification and traceability is according the specified requirements. Welding Coordinator
---	--

	OK/ NOK	Not rel.	Date sign.
1. Verify if the requirements for identification and traceability can be met.			
2. Is it requirements for a system for personnel identification ?			
3. Is it required a system for material traceability, ie a code which follows each item of plate/profile/pipe and which leads back to the material certificate ?			
4. Is it required a system for identification of the welds, ie requirements for production status with documentation of: - Welding Procedure used - Identification of the welder(s) - Visual inspection - NDE operator(s)			
5. Is it required a system for documentation of status ? - Approved -Not approved - Documentation for repair - No of repairs per weld - Control reports			
6. If none of the requirements can be fulfilled, a system must be established or a non-conformance request for deviation from the contract requirements must be approved by the client.			

Created by:	Approved by:	Date:	Manual no.:
-------------	--------------	-------	-------------

List of approved Welders

Project Name/Nr: NATURAL GAS PIPELINE. Project Nr. 2021

Contractor: [REDACTED]

Documet No. [REDACTED]

Third party Inspection: ISIM Supervision Company: [REDACTED]

Status Date: [REDACTED]

No.	Welders Name	Date of Birth	Welder ID Number	Diameter Range	wall thickness [mm]	Position	Process	First Issued (Date)	To be extended latest (Date)
1			H-1	80 - 500 mm	141: (3.00- 8.00) mm 111: (3.75 - 10.30) mm	All except PJ, J-L045	141/111		
2				≤ 115 mm	141: (4.12 - 11.00) mm	All except PJ, J-L045	141		
3				≥ 22.75 mm	Branch: ≥ 5.00 mm Pipe: (3.00 - 18.30) mm	All except PJ, J-L045	141/111		
4				≥ 325 mm	141: (2.62 - 7.00) mm 111: (6.90- 18.4) mm	All except PJ, J-L045	141/111		
5			H-2	80 - 500 mm	141: (3.00- 8.00) mm 111: (3.75 - 10.30) mm	All except PJ, J-L045	141/111		
6				≤ 115 mm	141: (4.12 - 11.00) mm	All except PJ, J-L045	141		
7				≥ 22.75 mm	Branch: ≥ 5.00 mm Pipe: (3.00 - 18.30) mm	All except PJ, J-L045	141/111		
8				≥ 325 mm	141: (2.62 - 7.00) mm 111: (6.90- 18.4) mm	All except PJ, J-L045	141/111		
9			H-10	80 - 500 mm	141: (3.75 -10.00) mm 111 : (4.80 -13.00) mm	PA, PE, PF, PH	141/111		
10			H-6	≥ 325 mm	141: (2.62 - 7.00) mm 111: (6.90- 18.4) mm	All except PJ, J-L045	141/111		
11			H-3	80 - 500 mm	141: (3.75 -10.00) mm 111 : (4.80 -13.00) mm	PA, PE, PF, PH	141/111		
12			H-4	80 - 500 mm	141: (3.75 -10.00) mm 111 : (4.80 -13.00) mm	PA, PE, PF, PH	141/111		

The welders Certificates have been reviewed and are attached to this listing

Contractor:	Supervision Company:	Client/Consultant:	Third Party Inspection:
-------------	----------------------	--------------------	-------------------------

List of approved WPS's and PQR's

INGL Project Name/Nr: _____

Contractor _____

Document NO: _____

Third party Inspection: _____

Supervision Company: _____

Ludan Engineering

Status Date: _____

No.	PQR Nr.	WPS Nr.	Material Range	Diameter Range	Wall Thickness	Position	Process	Station / Pipeline	Rem
1									
2									
3									
4									
5									
6									
7									
8									
9									

The PQR's and WPS's have been reviewed and are attached to this listing

Contractor:

Supervision Company:

Client / Consultant:

Third Party Inspe

INGL Form 410 - May 2012

© QM Software	WORK-INSTRUCTION NDT Operator		Procedure No.: 7.2 Rev. no.: 0
Project:	Order:	Section:	Page: 1 of: 1
1. WORK-INSTRUCTION Title: Reports to: Responsibility: Main Function: 2. QUALIFICATION REQUIREMENTS	NDT OPERator Welding Inspector Control and verification of own work Execution of NDT control The NDT Operator shall be certified according relevant standard at level 1, 2 or 3		
	3. Responsibility. The NDT Operator shall be responsible for the activities as follows: <ol style="list-style-type: none"> 1. Receive and understand the work instructions 2. Install and set-up of the equipment according procedures 3. Calibrate the equipment *or verify that the equipment is calibrated 4. Execute the work as described in the work instruction/ standards 5. Report the test results according procedures and sign off the documentation. Non-conformance to be reported according procedures 6. Report the status, calibration and functionality of the equipment Level 1 operator can only work under supervision of personnel with level 2 or level 3 certificate. * CALIBRATION CAN ONLY BE DONE BY PERSONNEL WITH LEVEL 2 OR LEVEL 3 CERTIFICATE.		

Created by:	Approved by:	Date:	Manual no.:
-------------	--------------	-------	-------------

© QM Software		CHECKLIST FOR FINAL DOCUMENTATION		Procedure No.: 17.2	
				Rev. no.:	
Project:		Order:	Section:	Page: 1 of 1	
Purpose:	Ensure that final documentation is correct, complete and ready for delivery together with the product				
Responsibility:	Welding Coordinator				
			OK/ NOK	Not rel.	Date sign.
1. Quality Plan					
2. NDT procedures/work instructions					
3. Design-/Production review, checklists					
4. Material certificates					
5. Welding procedures and qualifications					
6. Certificates and certificate survey for welders					
7. Certificates and certificate survey for NDT personnel					
8. Welders Certificate for each welder					
9. NDT certificates for the operator					
10. Heat Treatment reports					
11. Weld Log (summary list)					
12. NDT reports					
13. Dimensional control reports					
14. Weight reports					
15. Surface treatment					
16. Checklist for FAT control					
17. Non-conformance notices					
18. Repair requests					
19. Change order					
20. Calibration reports					
21. Survey for used equipment					
22. Complete fabrication documentation					
23. Acceptance test documents					
24. Delivery certificates					
25. Delivery document with list of possible remaining items					

Created by:	Approved by:	Date:	Manual no.:
-------------	--------------	-------	-------------

SVEISEPROSEDYRE- SPESIFIKASJON (WPS)

WPS No.: L-A 136-09

Ref.:

Dato: 2020-02-11

Rev: 2

Utarb. av: Vitec AS

Kunde: Alle

Ref. stand: EN-ISO 15609-1

Prosjekt: Basis

Ref. spes.: ISO 17660-01

Godkj.org.:

Sted:

Ref. WPQR: LO-A 136-112

LO-A 136-113

LO-A 136-101A

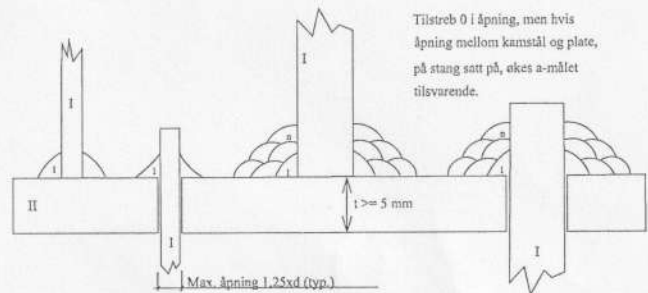
LO-A 136-103

Sveisemetode	136 G-FCAW		
Beskyttelsesgass type	1 MISON 18 (M21:14175)	2	3
Pending (Ja/Nei)	NEI maks: mm	maks: mm	maks: mm
Rotgass type	NA	l/min	
Sveisestillinger	PB		
Forbindelsestype	KILSVEIS		
Fugetildanning	SLIPING/KUTTING**		
Rengjøringsmetode	SLIPING OG STÅLBØRSTE*		
Mothold	NA		
En-/Tosidig	NA		
Oppfuring	NA		
Pulverbetegnelse	NA		
Pulverbehandling	NA		
Wolframelektrode	NA	mm	
Pistolvinkel	0		
Dyseavstand		15-20 mm	
Dysediameter	16 mm	mm	
Heftsveispros.	NA	Rev:	

STANG SATT PÅ OG STANG SATT GJENNOM, KAMSTÅL Ø10 - Ø32

d	Diameter kamstål	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø32
a	Min. a-mål = 0,4xd	4	5	6	7	8	10	13
t	Min. plate tykkelse = 0,4xd	5	5	5,6	6,4	8	10	12,8

Min. avstand ml. kamstål på endeplater = 3xd



Identifikasjon av grunnmateriale I: CE max: 0,39 C max: PCM maks: II: CE max: C max: PCM maks:

Del	Betegnelse	Standard	Gruppe	Leveringstilstand	Tykkelsesområde [mm]	Diameterområde [mm]
I	B500NC/B500B/K500C-T	NS 3576		TEMPCORE	-	10,00 - 32,00
II	S355	EN10225,10025/2/3/4	1.3	Alle	5,00 - 50,00	-

Identifikasjon av tilsett

Indeks	Handelsnavn	Standard/klassifikasjon	Gruppe	Tilsetthåndtering
1	Nittetsu SF-3AM	AWS A5.36:E81T1-M21A8-Ni1-H4		Lafopa 3.2.3.1
2				
3				

Sveiseparametere

Utstyr:

Streng nr.	Indeks	Dia. [mm]	Sveisemetode	Tråd-hastighet [m/min]	Strøm [A]	Spenning [V]	Strømart/Polaritet	Sveise-hastighet [mm/min]	Strekklengde [mm]	Gass [l/min]	Varmetilførsel [kJ/mm]
1	1	1,20	136	-	165 - 195	21,0 - 22,0	DC+	230 - 300		~Dyse Ø	0,7 - 1,1
2-n	1	1,20	136	-	170 - 200	21,0 - 23,0	DC+	150 - 350		~Dyse Ø	0,6 - 1,8

Varmebehandling

Metode: Ac/Ox MED DYSE

Forvarme min: 18 °C Mellomstr.temp. maks.: 250 °C Varmebehandling pros.:

Temp. kontroll:


PWHT min: °C maks: °C Holdetid: min/mm

Oppv.hast.: °C/t Avkj. hast.: °C/t

Merknader:

**KUTT KAMSTÅLET SLIK AT DET IKKE BLIR ÅPNING MOT ENDEPLATEN.
*SVEISEOMRÅDET SLIPES RENT FØR SVEISING.
-VED TEMPERATURER UNDER FORVARMETEMPERATUR TØRKES/FORVARMES DET TIL OPPNÅDD TEMPERATUR.
-VED TYKKELSER OVER 30 mm ER FORVARMINGSTEMPERATUREN 50 °C.
-KARBONEKVIVALENTEN FOR Ø10-12 mm KAN VÆRE 0,40.

Tilleggsinformasjon vedlagt (Ja/Nei):

Dato/signatur: 2020-02-11
PER 
VITEC AS
Godkjent: 2020-02-11 PER OLAV HELDEN POH

Produksjonslogg strekk-testing armeringsstål for sveisere



Sveiser:	ID: HUM	WPS/Sveiseprosedyre: L-A 136-09, rev.1	Produksjons-test: WPT 2020-01/2020-02/2020-03/2021-01/2021-02
Produsent:		Sv.prosedyreprøving: Produksjons-test	Dato for sveising: 23.03.20/25.06.20/29.09.20/29.01.21/15.05.21,
Lokasjon sveising:		Prøving av sveiser: Sveiser og WPS	Dato for testing: 24.03.20/26.06.20 /01.10.20/05.02.21/24.05.21,
Sveiseprosess: 136 G-FCAW		Sveise-tilsatt: Elgacore DWA 55Ni1	Heat/charge:
Lokasjon testing: Vitec as		Material plate: S355N	Heat/charge:
Ansv. Sveisekoordinator: Per Olav Helden, IWE		Material kamstål: $\phi 25 / \phi 20$	Heat/charge:

Prøve-nummer WPT / WPS	Prøve-legeme, som figur i tillegg C- ISO 17660-1	Sveise-stilling i samsvar med ISO 6947	Diameter/ tykkelse på prøve legeme (mm)	Sveise-bredde= w/a-mål/ sveiselengde (mm)	Kvalitetsnivå på uregelmessig-heter på overflaten i samsvar med ISO 5817	Største målte trykk (bar)	Største kraft, (kN)	Brudd-sted	Kvalitetsnivå på innv. uregelmessigheter i bruddstedet i samsvar med ISO 5817	Dato: / Resultat: G= Godkjent, IG= Ikke godkjent Sign.
WPT 2020-01 / L-A 136-09	Figur C.9 c)	PB	$\phi 20$	a-mål = 8	C	124 125 124	204 206 204	Kamstål	NA	24.03.2020 / G H. Fylkesnes, Vitec AS
WPT 2020-02 / L-A 136-09	Figur C.9 c)	PB	$\phi 20$	a-mål = 8	C	125	205	Kamstål	NA	26.06.2020 / G H. Fylkesnes, Vitec AS
WPT 2020-03 / L-A 136-09	Figur C.9 c)	PB	$\phi 25$	a-mål = 10	C	206	339	Kamstål	NA	01.10.2020 / G H. Fylkesnes, Vitec AS
WPT 2021-01 / L-A 136-09	Figur C.9 c)	PB	$\phi 25$	a-mål = 8	C	183 183 182	318 319 300	Kamstål	NA	5.02.2021 / G H. Fylkesnes, Vitec AS
WPT 2021-02 / L-A 136-09	Figur C.9 c)	PB	$\phi 20$	a-mål = 8	C	123 122 124	202 201 204	Kamstål	NA	24.05.2021/G H. Fylkesnes, Vitec AS

Største kraft = Målt trykk x Effektivt hydraulisk areal på sylinder

Effektivt hydraulisk areal på sylinder = $164,6 \text{ cm}^2$

Minimum godkjent kraft for $\phi 25 / \phi 20 \text{ mm} = 284 \text{ kN} / 182 \text{ kN}$ (Areal x minimum specified yield strength * R_m / R_e)

18.05.2021
Lokal sveisekoordinator og produsent

Per Olav Helden, IWE 31.05.2021
Ansvarlig sveisekoordinator

