Nash Engineering FZCO

DOCUMENT COVER SHEET

DOCUMENT TITLE

WELDING BOOK

DOC. NO : N-8356/WB/001

CLIENT	ENERPROCESS
PROJECT NAME	TBA
MANUFACTURER	NASH ENGINEERING FZCO
ADDRESS	JEBEL ALI FREE ZONE , DUBAI, U.A.E.
NASH W.O.NO	N-8356
DESCRIPTION	STRUCTURAL SUPPORTS
P.O.NO.	ENER-NASH-2025-PO-200

REV	COMMENTS	DATE	NASH	ENERPROCESS
			QC Dept. NASH ENGINEERING FZCO P.O.BOX 261430 - JEBEL ALI FREE ZONE - U.A.E.	
00	FOR APPROVAL	15.03.2025		

WELD BOOK (Structural)

CLIENT:	**ENERPROCESS**	Work Order:	**N-8356**
PROJECT:	**TBA**	Rev No	**Rev 00**
DESCRIPTION:	**STRUCTURAL SUPPORTS**	Drawing No.:	**TBA**
DESIGN CODE:	**AWS D1.1 Edd 2020**	Date:	**15-Mar-2025**

SL No.	WPS	Supporting PQR	Thickness Range(mm)	Material	Welding Process	Type of Joint	Impact Test	PWHT	Remark
STRUCTURALS									
1	8356-FC-144 REV 00	NASH144	3 mm to 40 mm.	S275 JR to S275 JR	FCAW	**Butt & Fillet Welds**	NO	NO	
2	8356-SM-112 REV 00	NASH 112+Add-1&2	3 mm to unlimited	S275 JR to S275 JR	SMAW		NO	NO	

	PREPARED BY	APPROVED BY
NAME :	**Syed Ather**	**P.Natarajan**
SIGN :		
DATE :	**15-Mar-2025**	**15-Mar-2025**

NASH ENGINEERING FZCO

WELDING PROCEDURE SPECIFICATION	WPS # 8356-FC-144
	REV. # 00
	DATE:15-Mar-2025

Welding Process(es) : **FCAW** Type(s) : **Semi automatic**	**Supporting PQR # NASH 144**

CODES	AWS D1.1 M:2020	

BASE METALS

	TO	
	OR	
Specification Type & Grade :	**S275 JR /Equivalent**	
	TO	
Specification Type & Grade :	**S275 JR /Equivalent**	

Thickness ranges qualified for :

Base Metal :	Groove: **3 mm to 40 mm.**	Fillet : **All**
Diameter Range Qualified: **NA**		

This WPS shall be used for weld joints of Tertiary lines, platform,platform supports,Handrails,ladder, grating etc

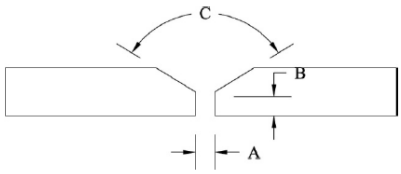
JOINTS

Included Angle **C = 60°**

Root Gap **A = 3.0-4.0mm**.

Root Face **B = 1.0-1.5mm.**

Backing : With Backing



THE OTHER APPLICABLE WELD DETAILS SHALL BE AS PER CLAUSE 3.12 & 3.13 OF AWS D1.1 EXCEPT 'TKY' JOINTS.

FILLER METALS

Process(es)	**FCAW**
Spec. No. (SFA)	**5.36**
AWS No. (Class)	**E71T-1C (H5)**
F. NO.	**6**
A- NO.	**1**
Size of Filler Metals ∅	**1.2 mm**
Flux-Wire Class	**NA**
Flux Type	**NA**
Supplemental Filler Metal	**None**
Flux Trade Name	**NA**
Electrode / Filler Wire Trade Name	**Kiswel / Equivalent**
Recrushed Slag	**NA**
Filler wire Product form	**Flux cored**
Consumable Insert	**None**
Closed Out Chamber (P51 thr. P53)	**NA**
Electrode Spacing	**NA**

Prepared & Reviwed :Syed Ather

For Nash Engg Fzco

N8356

WPS #8356-FC-144 Rev 00

POSITIONS	**POSTWELD HEAT TREATMENT : NONE**
Position(s) of Groove: V	Temperature Range: ---
Welding Progression: **Uphill**	Time Range: ---
Position(s) of Fillet: All	Heating Rate/Hr. --- :
PREHEAT	Cooling Rate/Hr. --- :
Method : **Propane gas with Rose bud torch/ Electrical resistance**	**GAS: For FCAW only**
Preheat Temp.(Min.): 100**°C**	
Interpass Temp.(Max.) : **250°C**	
(Continuous or Special heating where applicable should be recorded)	**Purging duration :**

	Gas(es)	(Mixture)	Flow Rate
Shielding	CO2	Single gas	20 – 30 cfh
Trailing	---	---	---
Purging	---	---	---

TECHNIQUE	
String or Weave bead: **String & Weave**	Oscillation: **None**
Max. Weave Width: **NA**	Contact tube to work distance: **FCAW – 10-20mm**
Orifice/Gas cup size: **---**	Multiple/Single pass (per side): **Multipass**
Initial Cleaning: **Grinding & or Wire brushing**	Multiple/Single Electrode(s): **NA**
Interpass Cleaning: **Grinding & or Wire brushing**	Travel Speed (Range) : **Please see table below**
Method of back gouging: **Air arc gouging or Grinding**	Peening: **None**
Maximum weld deposit thickness per pass : <13 mm	Maximum Time between R&H Passes: NA

ELECTRICAL CHARACTERISTICS	
Current (A.C./D.C.) : **DC**	Polarity: **Please see table below**
Amps (Range): **Please see table below**	Volts (Range): **Please see table below**
Tungsten Electrode Size & Type: **NA**	Mode of metal Transfer: **FCAW-Spray transfer**
Pulsing Current : **Not Used**	(Spray arc, short circuiting arc, etc. for GMAW / FCAW)
Electrode/Wire Feed Speed Range: NA	

Weld Passes	Process	Filler Metal		Current		Volts (Range)	Travel Speed (Range) mm /min	Max Heat I/P KJ/mm
		Class	Dia. mm.	Type & Polarity	Amp. Range			
As required	**FCAW**	**E71T-1C (H5)**	**1.2**	**DC EP**	**150-180**	**23-24**	**220 - 280**	**1.1**

N-8356

WPS # 8356-FC-144 Rev 00
NOTES :
1. When backwelding is required back gouging & or grinding shall be done to sound metal prior to back welding
backchip side weld shall be carried as per the back weld parameters.
2. Tack welding parameters & preheat temperature shall be same as specified in this WPS.
3. Fillet weld sizes shall be followed as specified in approved fabrication / construction drawings.
4. Weld area base metal surfaces shall be cleaned from any rust, discontinuity, gouging marks, painting etc. before start of welding.
5. FCAW Process can't use on root welding of the butt joint unless the root is backgouged.
6. Flux core arc welding (FCAW) shall not be used for the following:
a. welding structural items to a pressure/containment boundary;
b. ifting lugs or similar lifting devices;
c. tank floor plates.
d. Production welding using FCAW consumables shall be limited to the same Manufacturer/Supplier brand or trade name as used in the Welding Procedure Qualification Record (WPQR).

N-8356

NASH ENGINEERING FZCO

WELDING PROCEDURE SPECIFICATION	WPS # 8356-SM-112
	REV. # 00
	DATE: 15-Mar-2025

Welding Process(es) : **SMAW** Type(s) : **Manual**	**Supporting PQR # NASH 112 / NASH 112 ADD-1 &ADD-2**

CODES	AWS D1.1 M:2020	

BASE METALS

	TO	
OR		
Specification Type & Grade :	**S275 JR /Equivalent**	
TO		
Specification Type & Grade :	**S275 JR /Equivalent**	
Thickness ranges qualified for :		
Base Metal :	**Groove: 3 mm to unlimited**	Fillet : **All**
Diameter Range Qualified: **NA**		

This WPS shall be used for weld joints of Tertiary lines, platform,platform supports,Handrails,ladder, grating etc

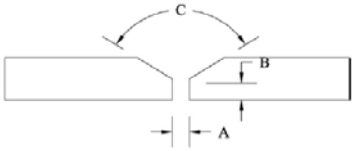
JOINTS

Included Angle **C = 60°**

Root Gap **A = 3.0-4.0mm**.

Root Face **B = 1.0-1.5mm.**

Backing : Without Backing



THE OTHER APPLICABLE WELD DETAILS SHALL BE AS PER CLAUSE 3.12 & 3.13 OF AWS D1.1 EXCEPT 'TKY' JOINTS.

FILLER METALS

Process(es)	SMAW
Spec. No. (SFA)	5.1
AWS No. (Class)	E7018-1
F. NO.	4
A- NO.	1
Size of Filler Metals ∅	Ø2.5mm, 3.2mm & 4.0mm
Flux-Wire Class	NA
Flux Type	NA
Supplemental Filler Metal	None
Flux Trade Name	NA
Electrode / Filler Wire Trade Name	Bohler / Esab / Equivalent
Recrushed Slag	NA
Filler wire Product form	NA
Consumable Insert	None
Closed Out Chamber (P51 thr. P53)	NA
Electrode Spacing	NA

Prepared & Reviewed by: Syed Ather.

QC Dept.

For Nash Engg Fzco

WPS # 8356-SM-112 REV 00

POSITIONS	**POSTWELD HEAT TREATMENT : NONE**
Position(s) of Groove: F,H	Temperature Range: ---
Welding Progression: Uphill	Time Range: ---
Position(s) of Fillet: All	Heating Rate/Hr. --- :
PREHEAT	Cooling Rate/Hr. --- :
Method : **Propane gas with Rose bud torch/ Electrical resistance**	**GAS: Not used**
Preheat Temp.(Min.): **25°C**	
Interpass Temp.(Max.) : **250°C**	
(Continuous or Special heating where applicable should be recorded)	**Purging duration :**

	Gas(es)	(Mixture)	Flow Rate
Shielding	---	---	---
Trailing	---	---	---
Purging	---	---	---

TECHNIQUE	
String or Weave bead: **String & Weave**	Oscillation: **None**
Max. Weave Width: **NA**	Contact tube to work distance: **NA**
Orifice/Gas cup size: **---**	Multiple/Single pass (per side): **Multipass**
Initial Cleaning: **Grinding & or Wire brushing**	Multiple/Single Electrode(s): **NA**
Interpass Cleaning: **Grinding & or Wire brushing**	Travel Speed (Range) : **Please see table below**
Method of back gouging: **Air arc gouging or Grinding**	Peening: **None**
Maximum weld deposit thickness per pass : <6 mm	Maximum Time between R&H Passes: NA

ELECTRICAL CHARACTERISTICS	
Current (A.C./D.C.) : **DC**	Polarity: **Please see table below**
Amps (Range): **Please see table below**	Volts (Range): **Please see table below**
Tungsten Electrode Size & Type: **NA**	Mode of metal Transfer: **N**
Pulsing Current : **Not Used**	(Spray arc, short circuiting arc, etc. for GMAW / FCAW)
Electrode/Wire Feed Speed Range: NA	

Weld Passes	Process	Filler Metal		Current		Volts (Range)	Travel Speed (Range) mm /min	Max Heat I/P KJ/mm
		Class	Dia. mm.	Type & Polarity	Amp. Range			
As required	**SMAW**	**E7018-1**	**2.5**	**DC EP**	**65 - 90**	**20 – 25**	**Min.80**	**1.68**
	SMAW	**E7018-1**	**3.2**	**DC EP**	**90 - 120**	**22 – 26**	**Min. 115**	**1.62**
	SMAW	**E7018-1**	**4.0**	**DC EP**	**130 - 170**	**22 – 26**	**Min. 160**	**1.65**

WPS # 8356-SM-112 Rev.00
NOTES :
1. When backwelding is required back gouging & or grinding shall be done to sound metal prior to back welding
Backchip side weld shall be carried as per the back weld parameters.
2. Hot pass shall be applied immediately after root- pass weld cleaned.
3. Tack welding parameters & preheat temperature shall be same as specified in this WPS.
4. Fillet weld sizes shall be followed as specified in approved fabrication / construction drawings.
5. Weld area base metal surfaces shall be cleaned from any rust, discontinuity, gouging marks, painting etc. before start of welding.
6. Max Hardness value 185 HV and Impact tested + 20 Min 85 J Refer attached Report In PQR Nash 112 Addendum-2

N-8356

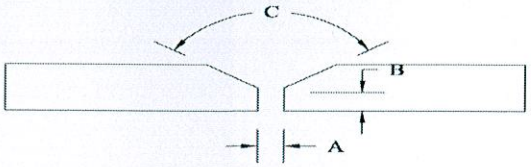
NASH ENGINEERING FZCO

WELDING PROCEDURE QUALIFICATION RECORD

PQR No: **NASH 144 Rev. 0**	Cognisant Code(s): **AWS D1.1 M:2010**
Welding Process (es) : **FCAW**	Welder(s) Name(s): **D.ROBERT**
Type/Mode: **Manual**	Welder(s) Ident(s) : **W124**

JOINT DESIGN:

Test Coupon Thickness **thk = 20.00 mm.**
Included Angle **C = 60°**
Root Gap **A = 3.0-4.0mm.**
Root Face **B = 1.0-1.5mm.**



BASE METAL			
Material Specs.	S275JR	to	S275JR
Heat/plate No.:	G0910		
Test Thickness	20 mm.	to	20 mm.

FILLER METAL	FCAW	
SFA Specification	5.20	
AWS Classification	E71T-1C/9CJ	
Filler F-No.	6	
Analysis A-No.	1	
Electrode/F.Metal Size ∅	Ø 1.2 mm	
Filler Metal Product Form	Flux Cored Wire (Tubular)	
Flux–Wire Class	---	

POSITIONS	
Groove position	3G
Weld Progression	UPHILL
Backing	None

TECHNIQUE	
Travel Speed Range(cm/min)	Refer attached actual variable sheet.
Stringe/ Weave	Stringe & Weave
Single/ Multipass	Multipass
No of Electrodes	1
Contact tube to work distance:	10mm
Mode of transfer	Spray type(FCAW)

PRE-HEAT	
Method : **None**	
Preheat Temp.: **100° C-minimum**	
Interpass Temp. : **188°C –maximum**	
Measurement : **Thermostick/DigitalThermometer**	

PWHT	
Heating Method	---
Temperature Rise Rate	---
Soak Temperature	---
Holding Time	---
Temperature Fall Rate	---

GAS	--
Shielding	CO2
Mixture	100%
Flow Rate (LPM)	26
Purging	NA
Flow Rate (cfh)	NA
Purging Duration.	NA

ELECTRICAL	
	FCAW
Current & Polarity	Refer attached actual variable sheet.
Amps range	
Voltage range	

RECORD OF ACTUAL TEST PARAMETERS : Pl. see attached variable sheet

ENVIRONMENTAL CONDITIONS: Welding conducted in day light ; *Ambient temp.: about 32°C (90°F)

ATTACHMENTS:

Mill Certificates	**YES**	**NDT Reports**	**YES**
Mechanical Test Reports	**YES**	**PWHT chart & report**	**NA**
Hardness Test Reports	**YES**	**Macro Photo**	**YES**

QC Dept.
NASH ENGINEERING FZCO

Nash	PQR NO. NASH-150144 Page 2 of 2

NON- DESTRUCTIVE INSPECTION

VISUAL INSPECTION : SATISFACTORY	MPI: ACCEPTABLE Report # 16436	UT: ACCEPTABLE Report # 08328	RT: ACCEPTABLE Report # 41666 Dtd-05.10.2013

TENSILE TEST

Specimen No.	Size mm	Area mm^2	Ultimate load KN	Tensile Strength psi (Mpa)	Failure Location	% Elongation or Reduction in area
TT-1	20.22X19.40	392.27	188.35	69,600(480)	On PM(Ductile)	---
TT-2	20.21X19.22	388.44	188.75	70,500(486)	On PM(Ductile)	---

GUIDED BEND TEST

Specimen No.	Type	Former Diameter (mm)	Bend Angle	Results
SB 1	Side Bend	Ø38.1	180°	Satisfactory
SB 2	Side Bend	Ø38.1	180°	Satisfactory
SB3	Side Bend	Ø38.1	180°	Satisfactory
SB4	Side Bend	Ø38.1	180°	Satisfactory

CHARPY IMPACT TEST ("V" Notch) Joules Test Temp.: **NA** Size: --

Position	WCL	FL	FL+1 mm.	FL+2 mm.	FL+5 mm.					

MACROSECTION 1 : SATISFACTORY

HARDNESS TEST : CAP(PM-158:HAZ-175:Weld-185) : ROOT(PM-161:HAZ-177:Weld-183)

Mechanical tests done at IGTS Lab, Dubai – IGTS Report # M 3764 P:M 3764 H:M 3764 M.

OTHER TESTS: ---

We certify that the statements of this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of the code(s) above.

For NASH	For BV
Name : Mubhash.PK(Welding Engineer)	Name :
Sign:	Sign:
Date : 06.11.2013	Date :

NASH ENGINEERING FZC QC Dept. P.O. BOX 261430 - JEBEL ALI FREE ZONE U.A.E.

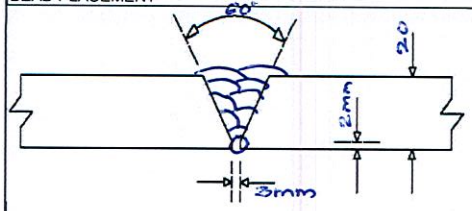
BUREAU VERITAS DUBAI, U.A.E. WITNESSED REVIEWED SURVEYOR DATE 14.11.13 SIGN

PROCEDURE QUALIFICATION RECORD OF ACTUAL VARIABLES

PASS	PROCESS	ELECTRODE		ELECTRICAL DATA			HEAT INPUT				SHIELDING			PURGING		O2 Content %	Weld Deposit / Layer	TEMPERATURE (°C)		PROGR
		CLASS	DIA.	TYPE	AMPS	VOLTS	ARC (Sec)	WELD (cm)	CM P M	KJ/CM	FLUX	GAS	FLOW RATE (cfh)	GAS	FLOW RATE (cfh)			PREHEAT	INTERPASS	Uphill
Root	FCAW	E71T-1C/9CJ	1.2	DCEP	155	19	287	60	12.5	14.1	NA	CO_2	26.0	--	--	--	<13mm	100	--	Uphill
Hot	FCAW	E71T-1C/9CJ	1.2	DCEP	209	19	279	60	12.9	18.5	NA	CO_2	26.0	--	--	--	<13mm	--	149	Uphill
Fill	FCAW	E71T-1C/9CJ	1.2	DCEP	195	18	330	60	10.9	19.3	NA	CO_2	26.0	--	--	--	<13mm	--	188	Uphill
Fill	FCAW	E71T-1C/9CJ	1.2	DCEP	193	18	278	60	12.9	16.1	NA	CO_2	26.0	--	--	--	<13mm	--	159	Uphill
Fill	FCAW	E71T-1C/9CJ	1.2	DCEP	191	18	332	60	10.8	19.0	NA	CO_2	26.0	--	--	--	<13mm	--	158	Uphill
Fill	FCAW	E71T-1C/9CJ	1.2	DCEP	191	19	315	60	11.4	19.1	NA	CO_2	26.0	--	--	--	<13mm	--	166	Uphill
Fill	FCAW	E71T-1C/9CJ	1.2	DCEP	192	19	330	60	10.9	20.1	NA	CO_2	26.0	--	--	--	<13mm	--	186	Uphill
Fill	FCAW	E71T-1C/9CJ	1.2	DCEP	166	18	190	60	18.9	9.5	NA	CO_2	26.0	--	--	--	<13mm	--	129	Uphill
Cap	FCAW	E71T-1C/9CJ	1.2	DCEP	169	18	198	60	18.2	10.0	NA	CO_2	26.0	--	--	--	<13mm	--	160	Uphill
Cap	FCAW	E71T-1C/9CJ	1.2	DCEP	165	18	189	60	19.0	9.4	NA	CO_2	26.0	--	--	--	<13mm	--	163	Uphill

NOTES. Wire feed speed - 250 to 375 inch/minute.

BEAD PLACEMENT



PQR :NASH:144	WEATHER :SUNNYDAY	WELDER'S NAME :
MATERIAL S275 JR	START TIME :9:00AM	
POSITION :3G	FINISH TIME :2:00PM	D.ROBERT
PROCESS FCAW	PWHT :NA	WELDER ID #:
PIPE DIA :NA	CODE :AWS D1.1	W124
PROCESS 20 mm	DATE :5.10.2013	

QC Dept
5/10/13
NASH ENGINEERING FZCO
P.O. BOX 261430 - JEBEL ALI FREE ZONE - U.A.E.

BUREAU VERITAS
DUBAI, U.A.E.
WITNESSED | REVIEWED
SURVEYOR
DATE
SIGN
14.11.13

NASH WELDING ENGG
Mubhash.P.K

BV

WELD PROCEDURE QUALIFICATION TEST REPORT

Client:	Nash Eng FZC, Jabel Ali, Dubai,U.A.E		
Attention:	Mr .Seralathan	Req Date:	03.11.13

IGTS Job#	NE-003-M13	IGTS Job Card No:	1547	Test Date:	06.11.13
IGTS Report#	M 3764 P			Equipment ID:	UTM,IGTS-EQ-009

Job Description (As per Client Request)

Sample Dimension:	20 mm Thick Welded Plate	Material Grade:	BS EN 10025-2 S275 JR
Process/Position:	FCAW / 3G	PQR No:	NASH-144
Heat No:	G0910	Welder ID:	W-124
Test Code:	AWS D1.1:2010		

Tensile Test

	Dimension	Area	Yield Load	Ultimate Load	Yield Strength		Tensile Strength		Fracture Location
	mm	mm^2	kN	kN	N/mm^2	Psi	N/mm^2	Psi	
TT-1	20.22x19.40	392.27	--	188.35	--	--	480	69,600	On PM
TT-2	20.21x19.22	388.44	--	188.75	--	--	486	70,500	On PM

Bend Test

Angle Of Bend: 180°		Mandrel Ø :38.1 mm	
Side Bend-1	Side Bend-2	Side Bend-3	Side Bend-4
Satisfactory	Satisfactory	Satisfactory	Satisfactory

Macro Examination

Macro -1	Satisfactory

P.O.Box : 390061 Dubai - U.A.E. Indogulfexpert Inspection And Testing Services

QC Dept. NASH ENGINEERING FZCO P.O. BOX 261439 - JEBEL ALI FREE ZONE - U.A.E.

Supervisor Metallurgist Test Witnessed By: Mr.Maanjumaah(BV)

Report Issued On:06.11.13 Form-53Rev0

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IndoGulf-StenaTech
INSP NDT AUT MET CHEM
PROFICIENT SOLUTION PROVIDER

اندوجلف انسفيكشن اند تيستيج سير فيسز

INDOGULF INSPECTION & TESTING SERVICES

WELD MACRO HARDNESS TEST REPORT

Client:	Nash Eng FZC, Jabel Ali, Dubai, U.A.E		
Attention:	Mr .Seralathan	Req Date:	3.11.13

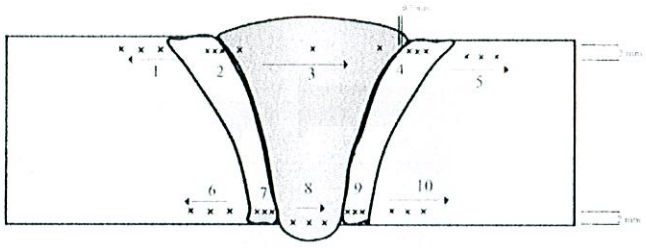
IGTS Job#	NE-003-M13	IGTS Job Card No:	1547	Test Date:	06.11.13
IGTS Report#	M 3764 H			Equipment ID:	VHM-IGTS-EQ-013

Job Description (As per Client Request)

Sample Dimension:	20 mm Thick Welded Plate	Material Grade:	BS EN 10025-2 S275 JR
Process/Position:	FCAW / 3G	PQR No:	NASH-144
Heat No:	G0910	Welder ID:	W-124
Test Code:	AWS D1.1:2010		

Hardness Values as per ASTM E92

Macro ID	M 3764 H	Maximum Hardness Value	185(WELD)



Illustrative Sketch

VICKERS HARDNESS

Cap					Root				
1	2	3	4	5	6	7	8	9	10
PM	HAZ	Weld	HAZ	PM	PM	HAZ	Weld	HAZ	PM
151	173	181	175	154	156	174	183	175	161
158	174	183	173	153	155	176	182	176	156
156	169	185	168	158	154	173	181	177	155

WCL-Weld Center Line ; HAZ- Heat Affected Zone ; PM-Parent Metal

P.O.Box : 390061
Dubai - U.A.E.
Indogulfexpert Inspection And Testing Services

Supervisor Metallurgist

QC Dept.
P.O.BOX 261420 - JEBEL ALI FREE ZONE - U.A.E.
NASH ENGINEERING FZCO

Report Issued On: 06.11.13 Form-53Rev0

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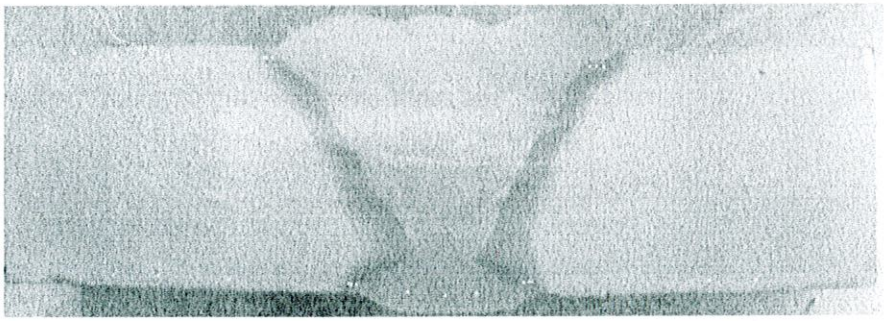
Fax: +971 9 2281372

1 - 11280

ISO 9001 OHSAS 18001 BUREAU VERITAS Certification

MACRO PHOTOGRAPH



Job Description (As per Client Request)

Sample Dimension:	20 mm Thick Welded Plate	Material Grade:	BS EN 10025-2 S275 JR
Process/Position:	FCAW / 3G	PQR No:	NASH-144
Heat No:	G0910	Welder ID:	W-124
Report No:	M3764 M		

P.O.Box : 390061
Dubai - U.A.E.
Indogulfexpert Inspection And Testing Services

NASH ENGINEERING FZCO

BUREAU VERITAS
DUBAI, U.A.E.
WITNESSED / REVIEWED
SURVEYOR
DATE 14.11.13
SIGN

CHARPY IMPACT TEST REPORT

Client:	Nash Engineering FZCO	**BCTS Report #**	M 6067 CT
		BCTS Job #	19A1581
		Tested Date:	06.11.2013
Attention:	Mr. Syed Ather	**Equipment Serial #:**	CIT-221379
Req Date:	06.11.2013	**Location:**	BCTS LAB

Sample Description (As provided by client)

Sample Description:	20mm Thick Welded Plate	**Material Grade :**	BS EN 10025-2 S275JR
Process / Position :	FCAW /3G	**PQR No :**	NASH-144
Heat No :	G0910	**Welder No:**	W-124
Test Code:	AWS D1.1 /D1.1M :2010		

Charpy "V" Notch Impact Test Results

Specimen Size	**10 x 10 x 55 mm**	**Temperature:**	**Plus 20°C**	**Unit**
Sample Location	**WCL**	**FL+1**	**FL+5**	
Specimen 1	45	36	44	J
Specimen 2	52	48	39	J
Specimen 3	50	52	42	J
Average	**49**	**45**	**42**	**J**

Form # BCTS/FR/37F R1

Supervisor

Metallurgy Dept.

Test Witnessed by:

Warehouse No. 31, P. O. Box 91785, Al Quoz Industrial Area Dubai, U.A.E
Office Tel: +971 4 3395515 / Fax : +971 4 3395516 Email : info@bctslab.com
Branch Office: P.O. BOX : 33097, Mussafah M 38 No. 43 Abu Dhabi, U.A.E

RADIOGRAPHIC TESTING REPORT

Examination Date	05-10-13	Job No.		Report No.	41666
Client	NASH ENG'G				
Project	WQT				
Job Location	JABAL ALI				
Job Description	RT ON BUTT WELD				
Procedure No.	NDT-SOP-037-R-00		Rev. 0		

Drg / Iso Number	—	Technique	S.W.I.S.I
Material Type	C/S	IQI Used	ASTM 15
Material Thickness	20mm	IQI Placement	S/S
Welding Process	FCAW	IQI Wire Required	9S
Weld Reinforcement	3mm	IQI Wire Achieved	9S
Diameter / Length	600mm	Density	2-3.5
Source Type	IR192	Screens thick(Front & Back)	0.125mm
Source Size/Strength	2x3mm	Film Type & Manufacturer	AA400
Exposure Time	8min	No. of Radiographs	02
SOD	16	No. of Film in each cassette	1
Film Viewing ☐ Single ☐ Double		Acceptance Criteria	~~ASME SEC IX~~ AWS. D1.1

Item No.	Weld ID	Welder ID	Location	Observations	Disposition Accept	Disposition Reject
WQ-N-139		PQR	NASH-144	P#34		
		W-124	0 - 30	NSD	✓	
			30 - 58		✓	

Remarks:

Technician Level - II	Client's Representative	ASME / Authorized Inspector
Signature	Signature	Signature

ABBREVIATIONS:	BT Burn through	CP Cluster porosity	LF Lack of fusion
NSD No significant defect	EP Excessive penetration	ELP Elongated porosity	I Inclusion
UC Cap undercut	LP Lack of penetration	IGP Isolated gas pore	TI Tungsten inclusion
SD Surface depression	RC Root concavity	P Porosity	C Crack

From Ref: NDT-FRM-038-02-Radiographic Testing Report

Abu Dhabi	Tel: +971 2 550 0767	Fax: +971 2 550 0838	Email: ltis@eim.ae
Dubai	Tel: +971 4 324 3888	Fax: +971 4 324 3682	Email: ndt@lonestar-lab.com

Distribution: White: Client, Pink: Client, Blue: Job File, Green: Records ***(Do not tear)***

Lonestar Technical Services

P.O. Box 8817
Dubai Ship Docking Yard (Al Jadaf)
Building DY-34
Dubai - United Arab Emirates

Tel : +971-4-324-3888
Fax : +971-4-324-3682
e-mail : testing@lonestar-lab.com
website : www.lonestar-lab.com

MAGNETIC PARTICLE INSPECTION REPORT

Date	5-10-13	Job #		Report #	16436/MT

Client	NASH ENGG		
Project			
Job Location	NASH ENGG, JEBEL ALI		
Job Description	MPI		
Material	C/S	Heat Treatment	–
Surface Condition	As - CLEANED	Test Temperature	AMBIENT
Weld ID	–	Welder ID	–
Weld Type	BUTT	Dwg / ISO Number	–
Procedure	NDT-SOP-038.00	Acceptance Criteria	AWS D1.1
Method	WET CONTINUOUS	Equipment	AC YOKE
Illumination	DAY LIGHT	Sensitivity	BU STRIP

Degreaser	S-72	Back Ground	WCP-712	Detecting Media	54

* MPI was Carried out on following item.

PQR - NASH 144
thk - 20 mm

BUREAU VERITAS DUBAI, U.A.E. WITNESSED REVIEWED SURVEYOR DATE SIGN 14.11.13

* No Relevent Indication was Observed during Testing.
* Found Acceptable as per specification.

Technician:	Badarinath	Client's Rep./Supervisor:	
Level:	ASNT Level II		
Signature:		Signature :	

LONESTAR Technical Services L.L.C

NASH ENGINEERING P.O. BOX 18100 · JEBEL ALI FREE ZONE · U.A.E. QC Dept.

Distribution: White: Client, Green: Job File, Blue: Records (Do not Tear)

LONESTAR

Lonestar Technical Services

P.O. Box 8817
Dubai Ship Docking Yard (Al Jadaf)
Building DY-34
Dubai - United Arab Emirates

Tel : +971-4-324-3888
Fax : +971-4-324-3682
e-mail : testing@lonestar-lab.com
website : www.lonestar-lab.com

ULTRASONIC INSPECTION REPORT

Date	05-10-13	Job #		Report #	08328 /UT
Client	NASH ENGG.				
Project					
Item	PQR PLATE				
Job Location	NASH ENGG, JEBEL ALI				

Weld Id	–	Welder ID	–
Weld Type	BUTT	Welding Process	FCAW
Material	C/S	Drg/ Iso Number	–
Weld Thickness	20MM	Diameter	–
Heat Treatment Status	–	Surface Condition	As CLEANED
Procedure Code	NDT-SOP-036-00	Acceptance Criteria	AWS D1.1
Technique	PULSE ECHO	Couplant	CELLULOSE PASTE
Equipment	USN 52L	Equipment Necdb No.	00K1HY

Probe Angle	Frequency Mhz	Size mm	Type of Crystal	Sensitivity Setting	Sensitivity dB	Scanning dB	Transfer Loss dB
0°	4	Ø10	Single	1st Base set to 80% of FSH	46	52	–
70°	4	8x9	Single	DAC	50	56	+2
60°	4	8x9	Single	DAC	52	58	+2

* UT was carried out on following items.

PQR :- NASH 144
thk :- 20 mm

* No Recordable Indications Was Observed during Testing.
* Found Acceptable as per specification.

Technician:	Badr...	Client's Rep./Supervisor	[signature]
Level:			
Signature:	[signature]	Signature :	[signature]

Stamp: Lonestar Technical Services L.L.C.
Stamp: QC Dept. NASH ENGINEERING FZCO, P.O. Box 261430 - JEBEL ALI FREE ZONE - U.A.E.

File Ref: NIDT-TMP-37-02-RT

Distribution: White: Client, Blue:Job File, Green: Records, Do not tear)

A

注文者 SHIPPER : HANWA CO., LTD.
注文者照合番号 REFERENCE No. : 228-67421031
契約番号 CONTRACT No. : 2-831-HI-5-7-CI09
商品名 COMMODITY : HOT ROLLED STEEL PLATE
規格 SPECIFICATION : EN10025-2 (2004) S275JR
文書番号 DOCUMENT No. :

新日本製鐵株式會社
Nippon Steel Corporation
鋼材検査証明書
INSPECTION CERTIFICATE

ACCORDING TO EN 10204 3.2

本社 HEAD OFFICE : 〒100-8071 東京都千代田区丸の内二丁目6番1号 2-6-1, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8071, JAPAN
君津製鐵所 KIMITSU WORKS : 〒299-1141 千葉県君津市君津1番地 1, KIMITSU, KIMITSU-CITY, CHIBA-PREF. 299-1141 JAPAN

証明書番号 CERTIFICATE No. : A-52110 頁 PAGE : 10
発行年月日 DATE OF ISSUE : 2012-08-15
A731

需要家 CUSTOMER : AGE STEEL LTD.
需要家管理番号 CUSTOMER'S CONTROL No. :
E05

寸法 DIMENSION mm, ″:inch, ′:feet	員数 QUANTITY	質量 MASS KG	製鋼番号 CAST No.	試験番号 TEST No.	製品番号 PLATE No.	※1	※2	引張試験 TENSILE TEST 耐力降伏点 YS- YP MPA	引張強さ TS MPA	伸び EL %	※3	※1	衝撃試験 IMPACT TEST 平均値 AVG	個々値 EACH	化学成分 CHEMICAL COMPOSITION % C ×1000	Si ×100	Mn ×100	P ×1000	S ×1000	Cu ×100	Ni ×100	Cr ×100	Mo ×100	Nb ×100	V ×100	TAl ×1000	Ceq. 1 ×100	供給状態 CONDITION OF SUPPLY
															N ×10000										Pcm ×100	Sol. Al ×100	Ceq. 2 ×100	※7
18X2000X12000	10	2 6782	G0910 41488	FROM 579521011 TO 579521012		TCJ		324	473	31					12	22 21	92	16	4	1	2	2	0	0		32	
18X2000X12000	10	3 10173	G1100 42712	FROM 579521013 TO 579521015		TCJ		307	470	33					17	23 21	93	13	5	2	2	2	0	0		33	
20X2000X12000	11	2 7536	G0910 41490	FROM 579521101 TO 579521102		TCJ		299	460	35					16	22 21	92	16	4	1	2	2	0	0		32	
20X2000X12000	11	4 15072	G0910 41490	FROM 579521109 TO 579521112		TCJ		299	460	35					16	22 21	92	16	4	1	2	2	0	0		32	
20X2000X12000	11	6 22608	G0910 41491	FROM 579521103 TO 579521108		TCJ		299	463	33					16	22 21	92	16	4	1	2	2	0	0		32	
20X2000X12000	11	1 3768	G1100 42713	579521113		TCJ		297	464						17	23 21	93	13	5	2	2	2	0	0		33	

AGE STEEL LIMITED
P.O. Box 5762
JEBEL ALI
DUBAI, U.A.E.

AGE STEEL VERIFY THIS CERTIFICATE TO BE A TRUE AND ACCURATE REPRODUCTION OF THE ORIGINAL HELD IN OUR POSSESSION.

注記 NOTES ※1 Location Orientation 位置・方向, T:頂部 Top, B:底部 Bottom, L:圧延方向 Longitudinal, C:直角方向 Transverse, Z:板厚方向 Through Thickness, R:45° 方向 45Deg. to the Longitudinal Axis
※2 GL 標点距離 Gage Length, A:50mm 平形試験片 Rectangular, B:50mm 丸形試験片 Round, C:70mm 平形試験片 Rectangular, D:70mm 丸形試験片 Round, E:80mm 平形試験片 Rectangular, F:80mm 丸形試験片 Round, G:200mm, H:2″, I:8″, J:5.65$\sqrt{So}$, K:4$\sqrt{So}$
※3 RA:絞り Reduction of Area, YR:降伏比 Yield Ratio, ※4 A:合格 Acceptable, ※5 F:標準寸法 FULL SIZE, 2:2.5mm, 3:3.3mm, 4:3.33mm, 5:5.0mm, 6:6.67mm, 7:7.5mm, 8:6.7mm, 9:製品板厚 PlateThickness, ※6 P:製品分析 Product Analysis,
※7 N:焼準 Normalized, Q:焼入れ Quenched, T:焼戻し Tempered, CR:Controlled Rolled, NIC:NIC Process/TMC Process, CLC:CLC Process/TMC Process, AR:As Rolled, TMR:TMR Process/TMC Process, NR:Normalizing Rolled
SH:延性破面率 Shear Fracture, CF:結晶粒度番号 Crystallinity Fracture, LE:横膨出 Lateral Expansion, AGS:オーステナイト粒度 Austenite Grain Size, FGS:フェライト粒度 Ferrite Grain Size, SR:Stress Relieved/Post Weld Heat Treatment
温度 Temperature C: °C F: °F

TO BE CONTINUED

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE TO THE APPLICABLE SPECIFICATION BY THE BASIC OXYGEN PROCESS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EUROPEAN STANDARDS WITH SATISFACTORY RESULTS.

SURVEYOR TO AMERICAN BUREAU OF SHIPPING
YOKOHAMA
RYOJI HASHIMOTO

K. Yoshii
君津製鐵所厚板管理グループリーダー
Head of Department
PLATE QUALITY CONTROL DEPT.
KIMITSU WORKS

Mill Test Certificate LPO:-35977

KISWEL
KISWEL SDN BHD
PLO 63, Jalan Keluli 2, P.O.Box 63,
81750 Pasir Gudang, Johor, Malaysia
TEL : +60-7-2515933, FAX : +60-7-2515934
http://www.kiswel.com

Certificate No. : C-14-07-002
Issued Date : 2014 07 25

Brand Name : K-71UT

This Material conforms to specification :
AWS Specification A5.20/A5.20M:2005
Class T1, Schedule F
BS EN ISO 17632-B:2008
Type : E 71T-1C/-9CJ H4
T49 4 T1-1CA-U H5

Customer Name : MANAF TRADING
Invoice No : E2014060038

Size : 1.2mm X 15kg SPOOL
Weight : 20,160kg
Lot Number : 406148
Shielding Gas : CO_2 100%

	Chemical Composition		Specification Requirements AWS	Specification Requirements EN ISO
C	0.040	Max.	0.12	0.18
Si	0.597	Max.	0.90	0.90
Mn	1.743	Max.	1.75	2.00
P	0.011	Max.	0.03	0.03
S	0.007	Max.	0.03	0.03
Cr	0.036	Max.	0.20	0.20
Ni	0.414	Max.	0.50	0.50
Mo	0.011	Max.	0.30	0.30
V	0.025	Max.	0.08	0.08
Cu	0.020	Max.	0.35	N/A

	Mechanical Properties As-welded	Specification Requirements As-welded AWS	Specification Requirements As-welded EN ISO
Tensile Test			
Y.S.(0.2%) N/mm^2	578	MIN. 400	MIN. 390
T.S. N/mm^2	645	483 ~ 655	490 ~ 670
Elongation (2")-%	24	Min. 22	MIN. 18
Reduction of Area -%	72	N/A	N/A
Impact Test, Joule (Charpy V-Notch)			
-40°C			
Absorbed Energy (J)	106 / 144 / 133	Min. 47	
Lateral Expansion (mm)			
Shear Fracture (%)			
Fillet Weld Test	Satisfactory		
Radiographic Test	Satisfactory		

Additional Test	Hydrogen Content As-Welded	Specification Requirement As Welded
Disfussible Hydrogen Test		
Hydrogen Content (mℓ/100g)	3.85	Max 4.00

REVIEWED FOR CONFORMANCE TO ... C 2013
20/12/2014

TÜV Rheinland Industrie Services

The under signed certifies that the products supplied will meet the applicable AWS or JIS (if applicable) filler metal specification when tested in accordance with those specifications.
All the values are made from actual determinations with this lot of electrodes. By

HEAD OF QA SECTION / MR PARK WOOK SOON

NASH-144.

PROCEDURE QUALIFICATION RECORD OF ACTUAL VARIABLES

		ELECTRODE		ELECTRICAL DATA			HEAT INPUT				SHIELDING		Weld Deposit	TEMPERATURE		PROGR
PASS	PROCESS	CLASS	DIA.	TYPE	AMPS	VOLTS	ARC (Min)	WELD (mm)	CM P M	KJ/CM	FLUX	GAS	/ Layer	PREHEAT	INTERPASS	
1	FCAW	E71T.	1.2	DCEP	150-155	18-19	4:27	600	12.5	14.1		CO2		100.		
2	"	"	"	"	205-209	18-19	4:29	600	12.9	18.5		"		—	149	
3	"	"	"	"	192-195	17-18	5:30	600	10.9	19.3		"		—	188.	
4	"	"	"	"	190-192	17-18	4:38	600	12.9	16.1		"		—	159	
5	"	"	"	"	189-191	17-18	4:92	600	10.8	19.0		"		—	158.	
6	"	"	"	"	190-191	18-19	5:15	600	11.4	19.1		"		—	166.	
7.	"	"	"	"	189-192	18-19	4:90	600	10.9	20.1		"		—	186	
8	"	"	"	"	164-166	17-18	3:10	600	18.9	9.5		"		—	129	
9	"	"	"	"	168-169	17-18	3:18	600	18.2	10.0		"		—	160.	
10	"	"	"	"	163:165	17-18	3:09	600	19.0	9.4				—	163.	

BUREAU VERITAS DUBAI, U.A.E. WITNESSED REVIEWED SURVEYOR DATE 5.10.13 SIGN

BEAD PLACEMENT

PQR: NASH-144

MATERIAL: S 275 JR

POSITION: 3G

PROCESS: FCAW

PIPE DIAMETE NA H/A

THICKNESS: 20 mm

WEATHER: SUNNY DAY

START TIME: 9:30 Am.

FINISH TIME: 01:30 Pm

PWHT:

CODE: AWS D1.1 ~~2010 Edition Add 2011a~~

DATE: 05/10/2013

WELDER'S NAME : Robert

WELDER ID #: # 182 W-124

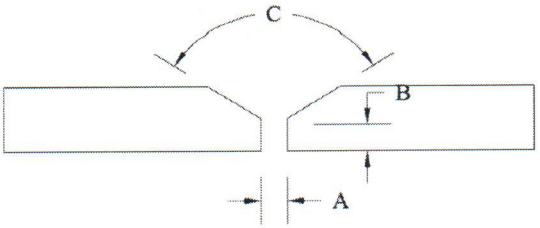
NASH ENGINEERING FZCO

WELDING PROCEDURE QUALIFICATION RECORD

PQR No: **NASH 112 Rev. 0**	Cognisant Code(s): **AWS D1.1 M:2010**
Welding Process (es) : **SMAW**	Welder(s) Name(s): **Pola Reddy**
Type/Mode: **Manual**	Welder(s) Ident(s) : **W099**

JOINT DESIGN:

Test Coupon Thickness **thk = 25.00 mm.**
Included Angle **C = 60°**
Root Gap **A = 3.0-4.0mm.**
Root Face **B = 1.0-1.5mm.**



BASE METAL				PRE-HEAT
Material Specs.	S275 JR/ASTM A36/EN 10025	to	S275 JR/ASTM A36/EN 10025	Method : **None**
				Preheat Temp.: **100° C-minimum**
Heat/plate No.:	856682			Interpass Temp. : **250°C –maximum**
Test Thickness	25 mm.	to	25 mm.	Measurement : **Thermostick/DigitalThermometer**

FILLER METAL	SMAW	PWHT	
SFA Specification	5.1	Heating Method	---
AWS Classification	E7018-1H4R	Temperature Rise Rate	---
Filler F-No.	4	Soak Temperature	---
Analysis A-No.	1	Holding Time	---
Electrode/F.Metal Size ∅	Ø2.5mm, 3.2mm & 4.0mm	Temperature Fall Rate	---
Filler Metal Product Form	NA	**GAS**	--
Flux–Wire Class	---	Shielding	--
POSITIONS		Mixture	--
Groove position	2G	Flow Rate (LPM)	--
Weld Progression	NA	Purging	NA
Backing	None	Flow Rate (cfh)	NA
		Purging Duration.	NA

TECHNIQUE		ELECTRICAL		
Travel Speed Range(cm/min)	Refer attached actual variable sheet.		SMAW	FCAW
Stringe/ Weave	Stringe & Weave	Current & Polarity	Refer attached actual variable sheet.	
Single/ Multipass	Multipass	Amps range		
Single/Multiple Electrode	Single	Voltage range		

RECORD OF ACTUAL TEST PARAMETERS : Pl. see attached variable sheet

ENVIRONMENTAL CONDITIONS: Welding conducted in day light ; *Ambient temp.: about 32°C (90°F)

ATTACHMENTS:

Mill Certificates	**YES**	**NDT Reports**	**YES**
Mechanical Test Reports	**YES**	**PWHT chart & report**	**NA**
Hardness Test Reports	**YES**	**Macro Photo**	**YES**

QC Dept. FZCO

NON- DESTRUCTIVE INSPECTION

VISUAL INSPECTION :	MPI:	UT:	RT:
SATISFACTORY	ACCEPTABLE Report # 16463 dt. 2/07/13	ACCEPTABLE Report # 07984dt. 2/07/13	ACCEPTABLE Report # 38912 dt.01-07-13

TENSILE TEST

Specimen No.	Size mm	Area mm^2	Ultimate load KN	Tensile Strength psi (Mpa)	Failure Location	% Elongation or Reduction in area
TT-1	20.19X24.50	490.25	255.00	75,400 (520)	On PM(Ductile)	---
TT-2	20.19x24.54	495.46	250.05	73,200 (505)	On PM(Ductile)	---

GUIDED BEND TEST

Specimen No.	Type	Former Diameter (mm)	Bend Angle	Results
SB 1	Side Bend	Ø38.1	180°	Satisfactory
SB 2	Side Bend	Ø38.1	180°	Satisfactory
FB 1	Face Bend	Ø38.1	180°	Satisfactory
FB 2	Face Bend	Ø38.1	180°	Satisfactory
RB1	Root Bend	Ø38.1	180°	Satisfactory
RB2	Root Bend	Ø38.1	180°	Satisfactory

CHARPY IMPACT TEST ("V" Notch) Joules Test Temp.: -- Size: --

Position	WCL	FL	FL+1 mm.	FL+2 mm.	FL+5 mm.					

MACROSECTION 1 : SATISFACTORY

HARDNESS TEST : --

Mechanical tests done at IGTS Lab, Dubai – IGTS Report # M 2105 P,M 2105 M

OTHER TESTS: ---

We certify that the statements of this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of the code(s) above.

For NASH	For BV
Name : Mubhash.PK(Welding Engineer)	Name :
Sign:	Sign:
Date : 09-07-2013	Date : 09-07-2013

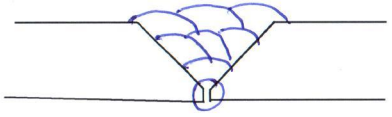
QC Dept. P.O.BOX 261430 - JEBEL ALI FREEZON DUBAI - FZCO

BUREAU VERITAS DUBAI, U.A.E. WITNESSED REVIEWED SURVEYOR DATE SIGN 9.7.13

PROCEDURE QUALIFICATION RECORD OF ACTUAL VARIABLES

	ELECTRODE		ELECTRICAL DATA			HEAT INPUT				SHIELDING		Weld Deposit	TEMPERATURE		PROGR
PASS	CLASS	DIA. (mm)	TYPE	AMPS	VOLTS	ARC (Min)	WELD (mm)	CM P M	KJ/CM	FLUX	GAS	/ Layer	PREHEAT	INTERPASS	
Root	E-7018-1	2.5	DCEN	75-80	21-24	2:40	80	3.6	30	NA	NA	<13MM	100	232	NA
Hot	E-7018-1	2.5	DCEP	85-96	23-24	3:05	400	11.7	11.8	NA	NA	<13MM	-	231	NA
Fill	E-7018-1	3.2	DCEP	125-130	24-26	2:54	400	13.7	14.8	NA	NA	<13MM	-	231	NA
Fill	E-7018-1	4	DCEP	128-130	24-25	3:00	400	13.3	14.6	NA	NA	<13MM	-	231	NA
Fill	E-7018-1	4	DCEP	165-170	25-26	3:01	400	13.3	19.9	NA	NA	<13MM	-	231	NA
Fill	E-7018-1	4	DCEP	165-168	25-26	3:02	400	13.3	19.7	NA	NA	<13MM	-	235	NA
Fill	E-7018-1	4	DCEP	165-168	25-26	3:01	400	13.3	19.7	NA	NA	<13MM	-	235	NA
Fill	E-7018-1	4	DCEP	160-165	26-27	3:02	400	13.3	19.6	NA	NA	<13MM	-	235	NA
Fill	E-7018-1	4	DCEP	160-164	26-28	3:01	400	13.3	20.7	NA	NA	<13MM	-	235	NA
Fill	E-7018-1	4	DCEP	160-164	26-28	3:03	400	13.3	20.7	NA	NA	<13MM	-	235	NA

BEAD PLACEMENT



PQR: NASH-112

MATERIAL: S275 JR/ASTM A36/EN 10025

POSITION: 2G

PROCESS: SMAW

PIPE DIAMETE NA

THICKNESS: 25 mm

WEATHER: SUNNY DAY

START TIME: 11:00 AM

FINISH TIME: 5:00 PM

PWHT: NO

CODE: AWS D1.1 M:2010

DATE: 1/7/2013

WELDER'S NAME :

Pola Reddy

WELDER ID #:

W-99

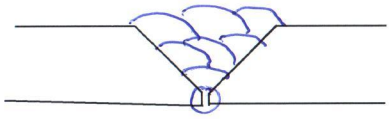
QC Dept.

BUREAU VERITAS
DUBAI, U.A.E.
WITNESSED REVIEWED
SURVEYOR
DATE 1.7.13
SIGN

PROCEDURE QUALIFICATION RECORD OF ACTUAL VARIABLES

	ELECTRODE		ELECTRICAL DATA			HEAT INPUT				SHIELDING		Weld Deposit	TEMPERATURE		PROGR
PASS	CLASS	DIA. (mm)	TYPE	AMPS	VOLTS	ARC (Min)	WELD (mm)	CM P M	KJ/CM	FLUX	GAS	/ Layer	PREHEAT	INTERPASS	
Fill	E-7018-1	4	DCEP	170-176	24-26	2:20	400	17.1	16	NA	NA	<13MM	-	241	NA
Fill	E-7018-1	4	DCEP	170-176	24-26	2:21	400	17.02	16.1	NA	NA	<13MM	-	241	NA
Fill	E-7018-1	4	DCEP	170-171	24-25	2:31	400	15.8	16.7	NA	NA	<13MM	-	241	NA
Fill	E-7018-1	4	DCEP	170-171	25-26	2:31	400	15.9	16.7	NA	NA	<13MM	-	241	NA
CAP	E-7018-1	3.2	DCEP	130-132	24-25	2:15	400	17.7	11.1	NA	NA	<13MM	-	241	NA
CAP	E-7018-1	3.2	DCEP	130-131	24-25	2:52	400	13.9	14.1	NA	NA	<13MM	-	241	NA
CAP	E-7018-1	3.2	DCEP	133-134	24-25	2:53	400	13.9	14.5	NA	NA	<13MM	-	240	NA
CAP	E-7018-1	3.2	DCEP	133-134	24-25	2:49	400	14.2	14.1	NA	NA	<13MM	-	240	NA
CAP	E-7018-1	3.2	DCEP	133-134	24-25	2:49	400	14.2	14.1	NA	NA	<13MM	-	240	NA
CAP	E-7018-1	2.5	DCEP	94-96	23-24	2:20	400	17.1	8.08	NA	NA	<13MM	-	240	NA

BEAD PLACEMENT



PQR: NASH-112

MATERIAL: S275 JR/ASTM A36/EN 10025

POSITION: 2G

PROCESS: SMAW

PIPE DIAMETE NA

THICKNESS: 25 mm

WEATHER: SUNNY DAY

START TIME: 11:00 AM

FINISH TIME: 5:00 PM

PWHT: NO

CODE: AWS D1.1 M:2010

DATE: 1/7/2013

WELDER'S NAME :

Pola Reddy

WELDER ID #:

W-99

QC Dept.

BUREAU VERITAS
DUBAI, U.A.E.
WITNESSED | REVIEWED
SURVEYOR
DATE
SIGN

WELD PROCEDURE QUALIFICATION TEST REPORT

Client:	Nash Eng FZC, Jabel Ali, Dubai,U.A.E		
Attention:	Mr .Seralathan	Req Date:	03.07.13

IGTS Job#	NE-003-M13	IGTS Job Card No:	0969	Test Date:	06,July,2013
IGTS Report#	M 2105 P			Equipment ID:	UTM,IGTS-EQ-009

Job Description (As per Client Request)

Sample Dimension:	25mm Thick Welded Plate	Material Grade:	BS EN 10025-2:S 275 JR
Process/Position:	SMAW/2G	PQR No:	NASH-112
Welder ID:	W-~~112~~99	Heat No:	856682
Test Code:AWS D1.1:2010			

Tensile Test

	Dimension	Area	Yield Load	Ultimate Load	Yield Strength		Tensile Strength		Fracture Location
	mm	mm^2	kN	kN	N/mm^2	Psi	N/mm^2	Psi	
TT-1	20.01x24.50	490.25	-	255.00	-	-	520	75,400	On PM
TT-2	20.19x24.54	495.46	-	250.05	-	-	505	73,200	On PM

Bend Test

Angle Of Bend: 180°			Mandrel Ø :38.1mm		
Side Bend -1	Side Bend-2	Face Bend-1	Face Bend-2	Root Bend-1	Root Bend-2
Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory

Macro Examination

Macro -1	Satisfactory

P.O.Box : 390061 Dubai - U.A.E. Indogulfexpert Inspection And Testing Services

BUREAU VERITAS DUBAI, U.A.E. WITNESSED REVIEWED SURVEYOR DATE SIGN Yesu 3.7.13

Supervisor | Metallurgist | Test Witnessed By: Mr.T.Yesu T (BV)

Report Issued On:06.07.13 Form-53Rev0

QC Dept

Macrophotograph

Sample Dimension:	25mm Thick Welded Plate	**Material Grade:**	BS EN 10025-2:S 275 JR
Process/Position:	SMAW/2G	**PQR No:**	NASH-112
Welder ID:	W-112 99	**Heat No:**	856682
IGTS Report No:M 2105 M			

اندوجلف اكسبيرت انسفيكشن اند تيستنج سير فيسز
P.O.Box : 390061
Dubai - U.A.E.
Indogulfexpert Inspection And Testing Services

QC Dept.

BUREAU VERITAS
DUBAI, U.A.E.
WITNESSED / REVIEWED
SURVEYOR
DATE
SIGN

INDOGULF-EXPERT
INSPECTION & TESTING SERVICES
Dubai, U.A.E.
P.O.Box: 390061
Tel : +971 4 8849422
Fax: +971 4 8849424

INDOGULF INSPECTION &
TESTING SERVICES
Abu Dhabi - U.A.E.
P. O.Box: 126842
Tel : +971 2 5594238
Fax: +971 2 5594239

INDOGULF INSPECTION &
TESTING SERVICES FZC
Fujairah, U.A.E.
P.O.Box : 5367
Tel : +971 9 2281744
Fax: +971 9 2281372

LONESTAR

RADIOGRAPHIC TESTING REPORT

Examination Date	01.7.13	Job No.		Report No.	38912
Client	NASA ENGG				
Project	WQT				
Job Location	JABEL ALI				
Job Description	RT ON PLATE				
Procedure No.		Rev.			

Drg / Iso Number		Technique	SWSI
Material Type	CS	IQI Used	ASTM-1B
Material Thickness	25 mm	IQI Placement	F/S
Welding Process	GTAW + SMAW	IQI Wire Required	9 MW
Weld Reinforcement	1.6 mm	IQI Wire Achieved	9 MW
Diameter / Length		Density	2 TO 3.5
Source Type	IR-192	Screens thick(Front & Back)	0.125 mm
Source Size/Strength	2x3 mm	Film Type & Manufacturer	MX125 (10X24)
Exposure Time	8 min	No. of Radiographs	02
SOD	16"	No. of Film in each cassette	01
Film Viewing ☐ Single ☐ Double		Acceptance Criteria	

Item No.	Weld ID	Welder ID	Location	Observations	Disposition: Accept	Disposition: Reject
		2G	PQR			
	J.111		0 - 20	NSD	✓	
			20 - 38	NSD	✓	
	J-112	2G	0 - 20	NSD	✓	
			20 - 38	NSD	✓	

Remarks:

BUREAU VERITAS DUBAI, U.A.E. WITNESSED REVIEWED SURVEYOR DATE SIGN

Technician Level - II Suresh / Mahmood Signature	Client's Representative Signature 02/07	ASME / Authorized Inspector 9.7.13 Signature

ABBREVIATIONS:	BT Burn through	CP Cluster porosity	LF Lack of fusion
NSD No significant defect	EP Excessive penetration	ELP Elongated porosity	I Inclusion
UC Cap undercut	LP Lack of penetration	IGP Isolated gas pore	TI Tungsten inclusion
SD Surface depression	RC Root concavity	P Porosity	C Crack

From Ref: NDT-FRM-038-02-Radiographic Testing Report

Page__of__

Abu Dhabi	Tel: +971 2 550 0767	Fax: +971 2 550 0838	Email: ltis@eim.ae
Dubai	Tel: +971 4 324 3888	Fax: +971 4 324 3682	Email: ndt@lonestar-lab.com

Distribution: White: Client, Pink: Client, Blue: Job File, Green: Records ***(Do not tear)***

Locations: • Dubai • Abu Dhabi • Oman • Kuwait

Lonestar Technical Services

P.O. Box 8817
Dubai Ship Docking Yard (Al Jadaf)
Building DY-34
Dubai - United Arab Emirates

Tel : +971-4-324-3888
Fax : +971-4-324-3682
e-mail : testing@lonestar-lab.com
website : www.lonestar-lab.com

MAGNETIC PARTICLE INSPECTION REPORT

Date	2/7/13	Job #	N-112	Report #	16463/MT

Client	NASH
Project	
Job Location	JEBEL ALI
Job Description	PQR PLATE

Material	CS / S275 JR	Heat Treatment	
Surface Condition	AS CLEANED	Test Temperature	AMBIENT
Weld ID	-	Welder ID	W-099
Weld Type	BUTT	Dwg / ISO Number	-
Procedure	NDT-SOP-036-00	Acceptance Criteria	AWS CYCLIC CONDITION
Method	WET CONTINUOUS	Equipment	A.C. YOKE
Illumination	DAY LIGHT	Sensitivity	B.C. STRIP

Degreaser SKC	Back Ground ZR	Detecting Media SKC

→ MPI WAS CARRIED OUT ON PQR PLATE.

PQR PLATE = N 112.

BUREAU VERITAS
DUBAI, U.A.E.
WITNESSED | REVIEWED
SURVEYOR
DATE 9/7/13
SIGN

→ NO RELEVANT INDICATION WAS OBSERVED DURING TESTING.

→ FOUND ACCEPTABLE AS PER SPECIFICATION.

Technician: A. VIJAYAKUMAR	Client's Rep./Supervisor:
Level:	
Signature:	Signature :

Lonestar Technical Services L.L.C

QC Dept.

NDT-Rpt-MPI-1

Distribution: White: Client, Green: Job File, Blue: Records (Do not Tear)

Lonestar Technical Services

P.O. Box 8817
Dubai Ship Docking Yard (Al Jadaf)
Building DY-34
Dubai - United Arab Emirates

Tel : +971-4-324-3888
Fax : +971-4-324-3682
e-mail : testing@lonestar-lab.com
website : www.lonestar-lab.com

ULTRASONIC INSPECTION REPORT

Date	2/7/13	Job #	N-112	Report #	07984 /UT
Client	NASH				
Project	-				
Item	DOOR PLATE				
Job Location	JEBEL ALI				

Weld Id	-	Welder ID	W-099
Weld Type	BAT	Welding Process	SMAW
Material	S 275 JR	Drg/ Iso Number	-
Weld Thickness	-	Diameter	-
Heat Treatment Status	-	Surface Condition	AS CLEANED
Procedure Code	NDT-SOP-036-00	Acceptance Criteria	AWS CYCLIC CONDITION
Technique	PULSE ECHO	Couplant	POLYCELL
Equipment	USN 52L	Equipment Necdb No.	00K1148.

Probe Angle	Frequency Mhz	Size mm	Type of Crystal	Sensitivity Setting	Sensitivity dB	Scanning dB	Transfer Loss dB
0°	4	10	TC	1st BWE SET TO 80% OF FSH	38	38+6	
60°	4	8X9	SC	DAC	42	42+6	+2
70°	4	8X9	SC	DAC	48	48+6	+2

→ UT WAS CARRIED OUT ON DOOR PLATE :-

DOOR PLATE - N 112.

BUREAU VERITAS
DUBAI, U.A.E.
WITNESSED / REVIEWED
SURVEYOR
DATE
SIGN

→ NO RECORDABLE INDICATION WAS OBSERVED DURING TESTING.

→ FOUND ACCEPTABLE AS PER SPECIFICATION

Technician: A. VISHWANATH
Level: II
Signature:

Client's Rep./Supervisor:
Signature :

QC Dept.

File Ref: NIDT-TMP-37-02-RT

Distribution: White: Client, Blue:Job File, Green: Records, Do not tear)

MILL TEST CERTIFICATE

DONGKUK STEEL
POHANG WORKS 880 SONGDONG-RI DAESONG-MYEON NAM-GU
POHANG-SI GYEONGSANGBUK-DO 790-841 KOREA

Order No.	: J095500015				
PO No.	: AMMT-DUBAI				
Commodity	: STEEL PLATE	Supplier	: DAEWOO INTERNATIONAL CORP.	Certificate No.	: PP1-2-090617-029-04
Specification	: ASTM A36/EN 10025-2 S275JR+AR:	Customer	: AMMT	Date of Issue	: Jun. 17. 2009

Dimension Unit inch: ", mm: Space	Product No	Quantity	Weight kg	Heat No	Position	Tensile Test GL	Tensile Test YP N/mm²	Tensile Test TS N/mm²	Tensile Test EL %	Impact Test Sub	Impact Test 20 °C V Notch J	Division	C 2	Si 2	Mn 2	P 3	S 3	Cr 3	Ni 2	Cu 2	Mo 3	Nb 3	V 3	N 4	Ceq 3	Remarks
20.00*2000*6000 *Specimen No :PP03273412-a, PP03273412-c	Sub Total (50) 2592126-02.03.04	3	5,652 1,884	H3113606	T	6	292	453	29		1:192 2:188 3:208 A:196	L	15	23	91	13	6	10	1	1	2	1	1	44	306	11Y
20.00*2000*6000 *Specimen No :PP03258813-a, PP03258813-c	Sub Total (50) 2592644-03.04	3	5,652 1,884	HC24308	T	6	283	448	30		1:162 2:190 3:165 A:172	L	14	24	85	17	8	50	3	2	8	1	1	45	296	11Y
20.00*2000*6000 *Specimen No :PP03278808-a, PP03278808-c	Sub Total (50) 2592097-02.04	2	3,768 1,884	HC24454	T	6	301	466	30		1:165 2:153 3:164 A:167	L	14	22	87	18	8	30	2	1	4	1	1	73	294	11Y
25.00*2000*6000 *Specimen Np :PP03217505-a, PP03217504-c	Sub Total (50) 2593787-02	2	3,768 2,354	856534	T	6	296	456	27		1:177 2:221 3:208 A:201	L	14	29	97	12	4	20	1	1	1	1	1	57	307	11Y
25.00*2000*6000 *Specimen No :PP03297402-a, PP03297403-c	Sub Total (60) 2593774-01.02.03 2593778-03	1	2,354 2,354	856682	T	6	294	454	29		1:211 2:213 3:217 A:213	L	14	28	92	20	7	30	1	1	1	2	2	51	301	11Y
25.00*2000*6000 *Specimen No :PP03217404-a, PP03217404-c	Sub Total (60) 2593760-01.02.03 2593765-01.02.03	4	9,416 2,354	866227	T	6	293	449	32		1:220 2:210 3:216 A:215	L	14	32	97	16	5	20	1	1	1	1	1	75	307	11Y
25.00*2000*6000 *Specimen No :PP03204602-a, PP03204602-c	Sub Total (60) 2593759-01.02.03 2593767-01.02.03	6	14,124 2,354	866368	T	6	288	442	34		1:180 2:204 3:203 A:195	L	14	24	88	12	8	20	1	0	1	2	2	46	292	11Y

- Tensile Test Direction–Transverse
- Impact Test Direction–Longitudinal
- Ceq = C+Mn/6+(Ni+Cu)/15+(Cr+Mo+V)/5
- Supply Condition – As Rolled
- Chemical Composition Unit(%) : 2–x100, 3–x1000, 4–x10000

We hereby certify that the material herein has been made and tested in accordance with above specification and also with the requirements called for by the above order.

When using the ordered product for other uses, rather than the above specification use, product damage and safety accidents may be caused

- Specimen No. : a–Tension, c–Impact
- Position : T–Top, M–Middle, B–Bottom
- Division : L–Ladle Analysis, P–Product Analysis
- Sub(Sub Size, Real Value, mm) . Blank–Full Size, 1–7.5*10, 2–5.0*10
- GL(Gauge Length, mm) : 1–200, 2–100, 3–80, 4–70, 5–50, 6–5.65√A, 7–5d, 8–4d, 9–8d
- T(S).Al : Total(Soluble) Al

				S.H An
Surveyor to	Surveyor to	Surveyor to	Surveyor to	Chief of Quality Assurance Team

BUREAU VERITAS
DUBAI, U.A.E.
WITNESSED | REVIEWED
SURVEYOR
DATE
SIGN
9.7.13

INSPECTION CERTIFICATE

Certificate No.: 17334
Standard: 3.1 / EN 10204

Bohler Welding GROUP
A voestalpine company

Customer :
Bohler Welding Group Middle EatsFZE
PO Box 262840
LOB-16; 4th Floor, Office#414
Jebel Ali Free Zone

PHONE/FAX :+971 4 8870 704

Your Order:	1647		Issued Date:	6-Feb-13
Our Order :	212089			
Pack:	103669			
Product	CARBON STEEL WELDING MATERIAL ELECTRODES		Article No.:	EL7018B400002
Trade Designation	BOHLER	BOHLER FOX S EV 50-1		
Standard Designation	AWS A5.1: 2004	E7018-1H4R		
	EN ISO 2560-B: 2009	E 49 18-1 A U H5		
Size	4.00 X 450 MM		Lot No.	13017
Quantity	4464 kg / 9832.6 lbs			
Special Requirements	Impact Test at -50 degree Celcius			

Chemical composition-All weld metal (wt%)

Lot No.	C	Si	Mn	P	S	Cu	Cr	Mo	Ni	V	Mn+Ni+Cr+Mo+V	Remarks
13017	0.041	0.34	1.10	0.011	0.011	0.060	0.06	0.011	0.03	0.002	1.21	As welded

Tensile test
(minimum values according to AWS)

	T Test temp. °C	R_{eH} Yield Point Mpa	$R_{p\,0.2}$ Yield Strength Mpa	R_m Tensile Strength Mpa	A_4 Elongation %	Z Reduction %	Remarks
Actual Values	+25	-	462	573	37	-	As welded

Impact test
(minimum values according to AWS)

	T Test temp. °C	KV Absorbed energy values (J)				Hardness Approx. (Brinell)				Remarks
		1	2	3	Average	1	2	3	Average	
Actual Values	-50	90	85	96	90	-	-	-		As welded

Remarks: The product BOHLER FOX S EV 50-1, meets the requirement of the filler metal specification ASME Se. II Part C, SFA 5.1 (AWS A5.1: 2004), Classification E7018-1H4R when tested in accordance with that specification.

Place: Jakarta

The requirements stipulated are satisfied.

Quality Department
PT BOHLER WELDING GROUP ASIA PACIFIC
OKTRI VIRILIS

BUREAU VERITAS
DUBAI, U.A.E.
WITNESSED | REVIEWED
SURVEYOR
DATE
SIGN
9.2.13

PT BOHLER WELDING GROUP ASIA PACIFIC
Jl. Industri Selatan 2 Blok JJ No. 7-10
Kawasan Industri Jababeka Cikarang,
Pasirsari, Cikarang Selatan
Bekasi 17530
INDONESIA

FULFILLING HIGH DEMANDS

Rev No.: 0

Lion Weld Trading Co. L.L.C. P.O.Box:283011 Jabel Ali Ind. 2 Dubai - U.A.E.

Bohler Welding Group Middle East FZE P.O.Box: 262840 Jebel Ali Free Zone U.A.E.

CERTIFIED TRUE COPY

INSPECTION CERTIFICATE

Certificate No.: 17147
Standard: 3.1 / EN 10204

Bohler Welding
GROUP
A voestalpine company

Customer:
Bohler Welding Group Middle EatsFZE
PO Box 262840
LOB-16, 4th Floor, Office#414.
Jebel Ali Free Zone

PHONE/FAX :+971 4 8870 704

Your Order:	1647	Issued Date:	7-Jan-13
Our Order :	212089		
Pack:	103603		
Product	CARBON STEEL WELDING MATERIAL ELECTRODES	Article No.:	EL7018B325102
Trade Designation	BOHLER	BOHLER FOX S EV 50-1	
Standard Designation	AWS A5.1: 2004	E7018-1H4R	
	EN ISO 2560-B: 2009	E 49 18-1 A U H5	
Size	3.25 X 450 MM	Lot No.	12573
Quantity	11424 kg / 25163.0 lbs		
Special Requirements	*Impact strength test at temperature -50 degree Celcius.		

Chemical composition-All weld metal (wt%)

Lot No.	C	Si	Mn	P	S	Cu	Cr	Mo	Ni	V	Mn+Ni+Cr+Mo+V	Remarks
12573	0.083	0.41	1.29	0.014	0.009	0.054	0.03	0.009	0.03	0.003	1.36	As welded

Tensile test
(minimum values according to AWS)

	T Test temp. °C	R_{eh} Yield Point Mpa	$R_{p0.2}$ Yield Strength Mpa	R_m Tensile Strength Mpa	A_4 Elongation %	Z Reduction %	Remarks
Actual Values	+25	-	439	568	35	-	As welded

Impact test
(minimum values according to AWS)

	T Test temp. °C	KV Absorbed energy values (J)				Hardness Approx. (Brinell)				Remarks
		1	2	3	Average	1	2	3	Average	
Actual Values	-50	81	73	70	75	-	-	-		As welded

Remarks The product BOHLER FOX S EV 50-1, meets the requirement of the filler metal specification ASME Se. II Part C, SFA 5.1 (AWS A5.1: 2004), Classification E7018-1H4R when tested in accordance with that specification.

Place PT. Bohler Welding Group Asia Pacific

The requirements stipulated are satisfied.

PT BOHLER WELDING GROUP ASIA PACIFIC
Jl. Industri Selatan 2, Blok JJ No. 7-10
Kawasan Industri Jababeka Cikarang,
Pasirsari Cikarang Selatan,
Bekasi 17530
INDONESIA

Quality Department
PT BOHLER WELDING GROUP ASIA PACIFIC
OKTRI VIRILIS

Lion Weld Trading Co. L.L.C. P.O.Box:283011 Jabel Ali Ind. 2 Dubai - U.A.E

Bohler Welding Group Middle East FZE P.O.Box: 262840 Jebel Ali Free Zone U.A.E

FULFILLING HIGH DEMANDS

CERTIFIED TRUE COPY

INSPECTION CERTIFICATE

Certificate No.: 17957
Standard: 3.1 / EN 10204

Bohler Welding GROUP
A voestalpine company

Customer :
Bohler Welding Group Middle East FZE
PO Box 262840
LOB-16; 4th Floor, Office#414
Jebel Ali Free Zone

PHONE/FAX :+971 4 8870 704

Your Order:	1647		
Our Order :	212089		Issued Date: 20-May-13
Pack:	103909		
Product :	CARBON STEEL WELDING MATERIAL ELECTRODES		Article No.: EL7018B250002
Trade Designation	BOHLER	BOHLER FOX S EV 50-1	
Standard Designation	AWS A5.1: 2004	E7018-1H4R	
	EN ISO 2560-B: 2009	E 49 18 1 A U H5	
Size	2.50 X 350 MM		
Quantity	5050 kg / 11145.4 lbs		Lot No.: 13054
Special Requirements	Impact Test at -50 degree Celcius		

Chemical composition-All weld metal (wt%)

Lot No.	C	Si	Mn	P	S	Cr	Ni	Mo	Cu	V	Mn+Cr+Ni +Mo+V	Remarks
13054	0.067	0.44	1.16	0.012	0.012	0.04	0.02	0.005	0.044	0.003	1.23	As Welded

Tensile test
(minimum values according to AWS)

	T Test temp. °C	$R_{p0.2}$ Yield Strength Mpa	R_m Tensile Strength MPa	A_4 Elongation %	Z Reduction %	Remarks
Actual Values	+25	447	551	36	-	As Welded

Impact test
(minimum values according to AWS)

	T Test temp. °C	KV Absorbed energy values (J)				Lateral Expansion (mm)				Shear Fracture %	Remarks
		1	2	3	Avg.	1	2	3	Avg.		
Actual Values	-50	93	103	86	94	-	-	-	-	-	As Welded

Remarks The product BOHLER FOX S EV 50-1, meets the requirement of the filler metal specification ASME Sec. II Part C, SFA 5.1 (AWS A5.1: 2004), Classification E7018-1H4R when tested in accordance with that specification.

Place: PT. Bohler Welding Group Asia Pacific

The requirements stipulated are satisfied.

Quality Department
PT BOHLER WELDING GROUP ASIA PACIFIC
OKTRI VIRIES

PT BOHLER-WELDING GROUP ASIA PACIFIC
Jl. Industri Selatan 2 Blok JJ No. 7-10
Kawasan Industri Jababeka Cikarang,
Pasirsari, Cikarang Selatan
Bekasi 17530
INDONESIA

Rev No.: 0

FULFILLING HIGH DEMANDS

Lion Weld Trading Co. L.L.C. P.O.Box:233011 Jabel Ali Ind. 2 Dubai - U.A.E.

Bohler Welding Group Middle East FZE P.O. Box : 262840 Jebel Ali Free Zone U.A.E.

CERTIFIED TRUE COPY

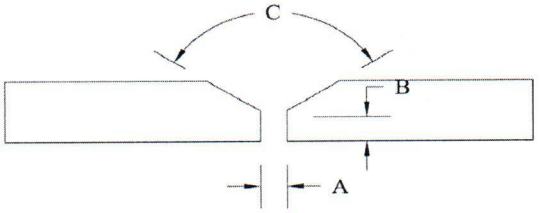
NASH ENGINEERING FZCO

WELDING PROCEDURE QUALIFICATION RECORD

Addendum-1	Date:18.8.2013
PQR No: **NASH 112 Rev. 0**	Cognisant Code(s): **AWS D1.1 M:2010**
Welding Process (es) : **SMAW**	Welder(s) Name(s): **Pola Reddy**
Type/Mode: **Manual**	Welder(s) Ident(s) : **W099**

JOINT DESIGN:

Test Coupon Thickness **thk = 25.00 mm.**
Included Angle **C = 60°**
Root Gap **A = 3.0-4.0mm.**
Root Face **B = 1.0-1.5mm.**



BASE METAL				
Material Specs.	**S275 JR/ASTM A36/EN 10025**	to	**S275 JR/ASTM A36/EN 10025**	
Heat/plate No.:	**856682**			
Test Thickness	**25 mm.**	to	**25 mm.**	

GUIDED BEND TEST

Specimen No.	Type	Former Diameter (mm)	Bend Angle	Results
SB 3	**Side Bend**	**Ø38.1**	**180°**	**Satisfactory**
SB 4	**Side Bend**	**Ø38.1**	**180°**	**Satisfactory**

REPORT NO:M2105P

NOTES:

We certify that the statements of this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of the code(s) above.

NASH Engg FZCO	
Certified by:	**Mubhash.P.K**
Signature:	
Designation:	**Welding Engineer**
Date :	**18-08-2013**

WELD PROCEDURE QUALIFICATION TEST REPORT

Client:	Nash Eng FZC, Jabel Ali, Dubai,U.A.E		
Attention:	Mr .Seralathan	Req Date:	03.07.13

IGTS Job#	NE-003-M13	IGTS Job Card No:	0969	Test Date:	18,August,2013
IGTS Report#	M 2105 P			Equipment ID:	UTM,IGTS-EQ-009

Job Description (As per Client Request)

Sample Dimension:	25mm Thick Welded Plate	Material Grade:	BS EN 10025-2:S 275 JR
Process/Position:	SMAW/2G	PQR No:	NASH-112
Welder ID:	W-~~112~~ 99	Heat No:	856682
Test Code:AWS D1.1:2010			

Bend Test

Angle Of Bend: 180°	Mandrel Ø :38.1mm
Side Bend -3	Side Bend-4
Satisfactory	Satisfactory

QC Dept. P.O.BOX 261430 - JEBEL ALI FREE ZONE - U.A.E. NASH ENGINEERING FZCO

BUREAU VERITAS DUBAI U.A.E. WITNESSED INSPECTOR

P.O.Box : 390061 Dubai - U.A.E. Indogulfexpert Inspection And Testing Services

Supervisor | Metallurgist | Test Witnessed By: Mr.Manjunatha (BV)

Report Issued On:18.08.13 Form-53Rev0

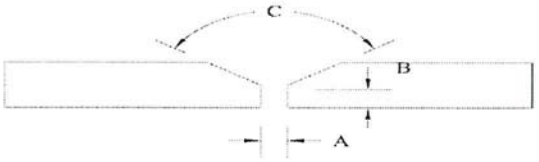
NASH ENGINEERING FZCO

WELDING PROCEDURE QUALIFICATION RECORD

Addendum-2	Date:10.01.2015
PQR No: **NASH 112**	Cognisant Code(s): **AWS D1.1 M:2010**
Welding Process (es) : **SMAW**	Welder(s) Name(s): **Amarjith Yadav.**
Type/Mode: **Manual**	Welder(s) Ident(s) : **W091.**

JOINT DESIGN:

Test Coupon Thickness **thk = 15.00 mm.**
Included Angle **C = 60°**
Root Gap **A = 3.0-4.0mm.**
Root Face **B = 1.0-1.5mm.**



BASE METAL				PRE-HEAT
Material Specs.	S275 JR	to	S275 JR	Method : **Propane gas with Rose bud torch**
Heat/plate No.:	1142614			Preheat Temp.: **100° C-minimum**
Test Thickness:	15 mm.	to	15 mm.	Interpass Temp. : **238°C –maximum**
Position:	2G			Measurement : **DigitalThermometer**

CHARPY IMPACT TEST ("V" Notch) Joules Test Temp.: Plus **20°C** Size:**10X10X55**

Sampling Location	WCL	HAZ	FL	FL+1	FL+2	FL+5	Unit
Specimen1	85	140	95	140	125	120	**Joules**
Specimen2	120	147	101	120	130	124	**Joules**
Specimen3	110	125	121	124	124	122	**Joules**
Average	**105**	**137**	**106**	**128**	**126**	**122**	

Ultrsonic Testing- SATISFACTORY Report No:09225

MACRO SECTION 1 -SATISFACTORY

HARDNESS TEST.(HV-10).
Maximum Values: PM-152,HAZ-177,WELD-185.

Mechanical tests done at INDO GULF INSPECTION AND TESTING SERVICES Lab, Dubai .

IGTS Report # M 0062 C,M 0062 H,M 0062 M.

NOTES:
Additional test weldment prepared and CVN Testing conducted for PQR#NASH-112 as per clause 4.36.3 of AWS D1.1.

We certify that the statements of this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of the code(s) above.

Certified by:		Witnessed By
Name:	Mubhash.P.K	Ahmed El Kady
Organization:	NASH Engg FZCO	TUV RHEINLAND
Signature:		
Designation:	Welding Engineer	TPI
Date :	10.1.2015	10.01.2015

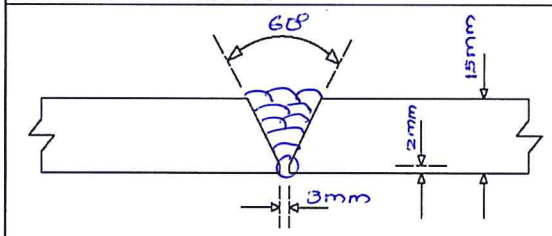
QC Dept. NASH ENGINEERING FZCO

TÜVRheinland 93460 Industrial Services

PROCEDURE QUALIFICATION RECORD OF ACTUAL VARIABLES

PASS	ELECTRODE		ELECTRICAL DATA			HEAT INPUT				SHIELDING		Weld Deposit	TEMPERATURE		PROGR
	CLASS	DIA. (mm)	TYPE	AMPS	VOLTS	ARC (Sec)	WELD (mm)	CM P M	KJ/CM	FLUX	GAS	/ Layer	PREHEAT	INTERPASS	
Root	E-7018-1	2.5	DCEP	86	24	548	50	5.5	22.6	NA	NA	<13MM	100	--	NA
Hot	E-7018-1	2.5	DCEP	82	24	255	50	11.8	10.0	NA	NA	<13MM	-	155	NA
Fill	E-7018-1	3.2	DCEP	126	27	218	50	13.8	14.8	NA	NA	<13MM	-	156	NA
Fill	E-7018-1	3.2	DCEP	124	27	218	50	13.8	14.6	NA	NA	<13MM	-	165	NA
Fill	E-7018-1	3.2	DCEP	125	27	219	50	13.7	14.8	NA	NA	<13MM	-	168	NA
Fill	E-7018-1	4	DCEP	162	28	206	50	14.6	18.7	NA	NA	<13MM	-	198	NA
Fill	E-7018-1	4	DCEP	165	28	205	50	14.6	18.9	NA	NA	<13MM	-	210	NA
Cap	E-7018-1	3.2	DCEP	128	28	220	50	13.6	15.8	NA	NA	<13MM	-	220	NA
Cap	E-7018-1	3.2	DCEP	128	28	221	50	13.6	15.8	NA	NA	<13MM	-	230	NA
Cap	E-7018-1	3.2	DCEP	128	28	220	50	13.6	15.8	NA	NA	<13MM	-	238	NA

JOINT DESIGN+BEAD PLACEMENT



PQR: NASH-112(Additional)	WEATHER: SUNNY DAY	WELDER'S NAME :
MATERIAL: S275JR(HEB 200)	START TIME: 8:00 AM	Amarjith Yadav(W-91)
POSITION: 2G	FINISH TIME: 1:00 PM	WELDING MATERIAL
PROCESS: SMAW	PWHT: NO	SMAW-E7018-1 (Lot No-SFO06012, SFO25069,MI216114)
PIPE DIAMETE NA	CODE: AWS D1.1 M:2010	
THICKNESS: 15 mm	DATE: 10.12.2014	

QC Dept. NASH ENGINEERING FZCO

10/12/14

NASH Engineering FZCO
Mubhash.P.K
Welding Engineer

TÜVRheinland® 93460 Industrial Services

TUV Rheinland
Ahmed El Kady

CHARPY IMPACT TEST REPORT

Client:	**Nash Eng FZC, Jabel Ali, Dubai, U.A.E**		
Attention:	**Mr .Mubhash .P.K**	**Req Date:**	15.12.14

IGTS Job Card No:		**Test Date:**	17.12.14
IGTS Report#	M 0062C	**Equipment ID:**	UTM,IGTS-EQ-009/CIT-011

Job Description (As per Client Request)

Sample Dimension:	15 mm thick welded plate	**Material Grade:**	S275JR to S275JR
Process/Position:	SMAW / 2G	**PQR No:**	NASH-112
Heat No:	1142614	**Welder ID:**	W-91
Test Code:	AWS D1.1:2010		

CHARPY 2mm 'V' NOTCH THROUGH 406 JOULES

Sample Size	10 x 10 x 55mm		**Test Temperature:**		Plus 20˚C		**Unit**
Sampling Location:	**WCL**	**HAZ**	**FL**	**FL+1**	**FL+2**	**FL+5**	
Specimen 1	85	140	95	140	125	120	J
Specimen 2	120	147	101	120	130	124	J
Specimen 3	110	125	121	124	124	122	J
Average	**105**	**137**	**106**	**128**	**126**	**122**	**J**

17/12/14

QC Dept. NASH ENGINEERING FZCO

P.O.Box : 390061 Dubai - U.A.E. Indogulfexpert Inspection And Testing Services

TÜVRheinland® 93460 Industrial Services

Supervisor | Metallurgist | Test Witnessed By: | (TUV)

Report Issued On: 17.12.14 | Form-53Rev0

WELD MACRO HARDNESS TEST REPORT

Client:	**Nash Eng FZC, Jabel Ali, Dubai, U.A.E**		
Attention:	**Mr .Mubhash .P.K**	**Req Date:**	15.12.14

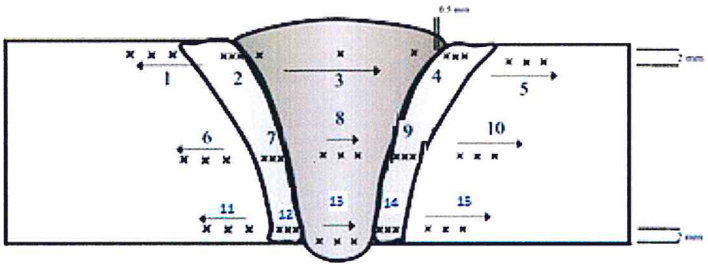
IGTS Job Card No:	--	**Test Date:**	17.12.14
IGTS Report No:	M 0062H	**Equipment ID:**	**IGTS/EQ-013,VHM**

Job Description (As per Client Request)

Sample Dimension:	15 mm thick welded plate	**Material Grade:**	S275JR to S275JR
Process/Position:	SMAW / 2G	**PQR No:**	NASH-112
Heat No:	1142614	**Welder ID:**	W-91
Test Code:	ASTM E384 / NACE MR0175 – 2		

Hardness Values as per ASTM E384 (HV-10)

Macro ID	M0062H	Maximum Hardness Value	Weld -185 (Max)



Illustrative Sketch

VICKERS HARDNESS

Top					Middle					Bottom				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	14
PM	HAZ	Weld	HAZ	PM	PM	HAZ	Weld	HAZ	PM	PM	HAZ	Weld	HAZ	PM
150	170	182	171	150	151	170	180	172	147	142	168	182	167	147
147	166	178	170	147	147	172	185	177	150	147	166	180	166	152
150	165	180	167	148	150	165	182	174	152	152	165	184	165	150

WCL-Weld Center Line ; HAZ- Heat Affected Zone ; PM-Parent Metal

P.O.Box : 390061 Dubai - U.A.E. Indogulfexpert Inspection And Testing Services

Supervisor

Metallurgist

QC Dept. NASH ENGINEERING FZCO

TÜVRheinland 93460 Industrial Services

Report Issued On: 26.10.14 Form-56 Rev0

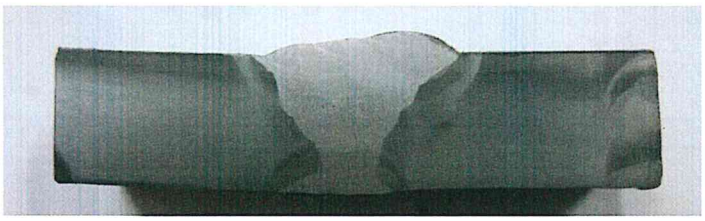
INDOGULF-EXPERT INSPECTION & TESTING SERVICES
Dubai, U.A.E.
P.O.Box: 390061
Tel : +971 4 8849422
Fax: +971 4 8849424

INDOGULF INSPECTION & TESTING SERVICES
Abu Dhabi - U.A.E.
P. O.Box: 126842
Tel : +971 2 5512396
Fax: +971 2 5512397

INDOGULF INSPECTION & TESTING SERVICES FZC
Fujairah, U.A.E.
P.O.Box : 5367
Tel : +971 9 2248386
Fax: +971 9 2248387

MACROPHOTOGRAPH

M 0062 M



Job Description (As per Client Request)

Sample Dimension:	15 mm thick welded plate	**Material Grade:**	S275JR to S275JR
Process/Position:	SMAW / 2G	**PQR No:**	NASH-112
Heat No:	1142614	**Welder ID:**	W-91
Sample No:	M0062M		

QC Dept. NASH ENGINEERING FZCO

P.O.Box : 390061 Dubai - U.A.E. Indogulfexpert Inspection And Testing Services

TÜVRheinland 93460 Industrial Services

INDOGULF-EXPERT INSPECTION & TESTING SERVICES
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INDOGULF INSPECTION & TESTING SERVICES FZC
Fujairah, U.A.E.
P.O.Box : 5367
Tel : +971 9 2248386
Fax: +971 9 2248387

Lonestar Technical Services

P.O. Box 8817
Dubai Ship Docking Yard (Al Jadaf)
Building DY-34
Dubai - United Arab Emirates

Tel : +971-4-324-3888
Fax : +971-4-324-3682
e-mail : testing@lonestar-lab.com
website : www.lonestar-lab.com

ULTRASONIC INSPECTION REPORT

Date	13/12/14	Job #		Report #	09225 /UT
Client	NASH ENGINEERING				
Project	–				
Item	As below				
Job Location	Jebel Ali F3e				
Weld Id	–		Welder ID	–	
Weld Type	Butt Weld		Welding Process	SMAW	
Material	As below		Drg/ Iso Number	–	
Weld Thickness	15mm		Diameter	–	
Heat Treatment Status	–		Surface Condition	As cleaned	
Procedure Code			Acceptance Criteria	AWS D1.1 C6	
Technique	Pulse echo		Couplant	Paste	
Equipment	Vibronics		Equipment Necdb No.	9559	

Probe Angle	Frequency Mhz	Size mm	Type of Crystal	Sensitivity Setting	Sensitivity dB	Scanning dB	Transfer Loss dB
0°	4	ϕ10	Dual	1st B.W.E Set to 80% of F.S.H	43	43+6	
70°	4	8X9	Single	1st B.W.E set to 80% from 1.5mm hole of V1 block.	48	48+6	

UT Carried out on the below mentioned Item.

PQR - 112
Thk - 15mm Beam flange
Process - SMAW
Position - 2G
Material - S275JR

* No Recordable indication was observed during testing
* Found Acceptable as Per Specification

Technician: Santhosh-tc	Client's Rep./Supervisor : Ramakrishnan
Level: II	
Signature: Santhosh-tc	Signature :

File Ref: NIDT-TMP-37-02-RT

Distribution: White: Client, Blue:Job File, Green: Records, Do not tear)

شركة صلب ش.م.ب. (مقفلة)
SULB COMPANY B.S.C. (CLOSED)
P.O. Box 30177 Hidd Industrial Area
Kingdom of Bahrain
Tel: (+973) 17 464222, Fax: (+973) 17 673364
C.R. 71012, www.sulb.com.bh

MILL TEST CERTIFICATE

Customer Name / Address
AGE INTRADE LLC
DUBAI
PO Box : 5762
Tel No : 97143338282
Fax No : 4-3339292

Shipping Address
AGE STEEL LIMITED
JEBEL ALI
PO Box :
Tel No : 97148860235
Fax No :

Certificate No.	: 8100008885 / 1
Delivery Note No./Date	: 8100008885 / 26.05.2014
Sales Contract/Order	: 3000000681
Customer P.O. No.	: BY EMAIL
Date of TC Issue	: 26.05.2014

Product Code : PHC20020075JRE4C00
Product Dimension : H200X200X12.00M
Product Name : P HEB 200 S275JR EN 12M

Process Route: EAF, FULLY KILLED STEEL, AS ROLLED
KG Per Meter: 61.30

Specification : EN 10025-2: 2004
Dimension : EN 10034: 1993

Product Cast Number	No. of Bars	No. of Bundles	Bundle Weight (MT)	Product Chemical Analysis														Mechanical Properties		
				C	Si	Mn	P	S	N	Cu	Ni	Cr	Mo	Nb	V	Al	CEV	YS	UTS	EL
				%	%	%	%	%	%	%	%	%	%	%	%	%	%	MPa	MPa	%
1142614	36	4	26.482	0.176	0.183	0.717	0.006	0.006	0.006	0.005	0.011	0.010	0.007	0.000	0.002	0.293	0.300	313.00	430.00	31.70

QC
3/Sept/14
MASH ENGINEERING FZCO

AGE STEEL LIMITED
P.O. Box 5762
JEBEL ALI
DUBAI - U.A.E.

AGE STEEL VERIFY THIS CERTIFICATE TO BE A TRUE AND ACCURATE REPRODUCTION OF THE ORIGINAL HELD IN OUR POSSESSION.

SULB COMPANY B.S.C. CLOSED

G.L. - 200mm=(e.g. ASTM. JIS); 80mm = (e.g. DIN 17100); 5.65 $\sqrt{a}$ = (e.g. BSEN 10025), Applicable as per Order Specification.
Where a= Cross Sectional Area of the Specimen.

WE CERTIFY THAT MATERIALS DESCRIBED HEREIN HAS BEEN TESTED AS PER ABOVE SPECIFICATIONS.

ABOVE VALUES ARE AVERAGES OBTAINED DURING ANALYSIS AND TESTING.

ISSUED IN ACCORDANCE TO BSEN 10204 CLAUSE 3.1

AUTHORIZED SIGNATORY
QUALITY ASSURANCE

INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Date:	2014-04-22	Certificate number:	EC23412205 rev. 0
Our order:	827870	Your order:	1001012
Our reference:	Web user - Movex CMP020 GBB	Your reference:	
Customer number:	AE000454	Your fax number:	
Customer order date:	20140420	Your e-mail:	

Invoice address
FINE TOOLS TRADING
PO BOX 30139
DUBAI U.A.E.
United Arab Emirates

Receiver of certificate

Delivery address
FINE TOOLS TRADING
AL QUOZ
P O BOX 30139
AL QUOZ
DUBAI UAE
United Arab Emirates

DELIVERY Lot number: SFO06012 Quantity: 1782 KGM

PRODUCT

Brand: ESAB
Description: OK 55.00 2.5x350mm
Item number: 5500253500

CLASSIFICATIONS

SFA/AWS A5.1 E7018-1H4 R
EN ISO 2560-A E 46 5 B 32 H5

CHEMICAL COMPOSITION

Actual results
acc to EN 10204 - 3.1

All weld metal
Auxiliary:

C	0.07%
Si	0.43%
Mn	1.59%
P	0.020%
S	0.005%
Cr	0.06%
Ni	0.03%
Mo	0.01%
Nb	0.01%
Cu	0.03%
V	0.03%

MECHANICAL PROPERTIES

Typical data
acc to EN 10204 - 2.2
Standard:
Auxiliary:
Condition:

TENSILE

ReL	Rm	A4-A5
500 MPa	590 MPa	28 %

IMPACT

Temp	KV
-50 °C	50 J

COMMENTS

Tested according to NACE TM0177 and TM0284.

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to:
Plot No. S20134, Jebel Ali Free Zone (South), PO Box 8964, Dubai, Tel +971 4 880 9493

Validation - Chemical Analysis		Validation - Others	
Pál Dranka	Quality Assurance Manager	Ester de Weijer	Product Manager

INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Date: 2014-09-15

Certificate number: EC23587095 rev. 0

Our order:	922157	Your order:	1001433
Our reference:	Web user - Movex CMP020 GBB	Your reference:	
Customer number:	AE000454	Your fax number:	
Customer order date:	20140914	Your e-mail:	

Invoice address
FINE TOOLS TRADING
PO BOX 30139
DUBAI U.A.E.
United Arab Emirates

Receiver of certificate

Delivery address
FINE TOOLS TRADING
AL QUOZ
P O BOX 30139
AL QUOZ
DUBAI UAE
United Arab Emirates

DELIVERY | Lot number: SFO25069 | Quantity: 1822.8 KGM

PRODUCT

Brand: ESAB
Description: OK 55.00 3.2x450mm
Item number: 5500324500

CLASSIFICATIONS

SFA/AWS A5.1 E7018-1H4 R
EN ISO 2560-A E 46 5 B 32 H5

CHEMICAL COMPOSITION

Actual results
acc to EN 10204 - 3.1

All weld metal

Auxiliary:

C	0.06%
Si	0.56%
Mn	1.60%
P	0.018%
S	0.006%
Cr	0.03%
Ni	0.03%
Mo	0.01%
Nb	0.01%
Cu	0.04%
V	0.02%

MECHANICAL PROPERTIES

Typical data
acc to EN 10204 - 2.2
Standard:
Auxiliary:
Condition:

TENSILE

ReL	Rm	A4-A5
500 MPa	590 MPa	28 %

IMPACT

Temp	KV
-50 °C	50 J

REVIEWED FOR CONFORMANCE TO ASME SEC II PART C ... 2013
QC REVIEWER
DATE RECEIVED 20/10/14

FINETOOLS
FINE TOOLS TRADING (L.L.C.)
Tel.: 04 - 3385240, Fax: 04 - 3385239
P.O. Box: 30139, Dubai, U.A.E.

COMMENTS

Tested according to NACE TM0177 and TM0284.

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to:

Plot No. S20134, Jebel Ali Free Zone (South), PO Box 8964, Dubai, Tel +971 4 880 9493

Validation - Chemical Analysis		Validation - Others	
Pål Dranka	Quality Assurance Manager	Ester de Weijer	Product Manager

ESAB

INSPECTION CERTIFICATE (3.1) - Chemical analysis
TEST REPORT (2.2) - Mechanical properties

Date: 2014-04-08 | Certificate number: EC23395981 rev. 0

Our order:	814656	Your order:	1000968
Our reference:	Amalia Dsouza Dubai	Your reference:	
Customer number:	AE000454	Your fax number:	
Customer order date:	20140401	Your e-mail:	

Invoice address
FINE TOOLS TRADING
PO BOX 30139
DUBAI U.A.E.
United Arab Emirates

Receiver of certificate

Delivery address
FINE TOOLS TRADING
DIP
DIP
DUBAI, UAE
United Arab Emirates

DELIVERY | Lot number: MI216114 | Quantity: 1 CT

PRODUCT

Brand: ESAB
Description: OK 55.00 4.0x450mm
Item number: 5500404L00

CLASSIFICATIONS

SFA/AWS A5.1 — E7018-1H4 R
EN ISO 2560-A — E 46 5 B 32 H5

CHEMICAL COMPOSITION

Actual results
acc to EN 10204 - 3.1

All weld metal
Auxiliary:

C	0.06%
Si	0.51%
Mn	1.57%
P	0.015%
S	0.006%
Cr	0.06%
Ni	0.03%
Mo	0.01%
Nb	0.01%
Cu	0.07%
V	0.02%

MECHANICAL PROPERTIES

Typical data
acc to EN 10204 - 2.2
Standard:
Auxiliary:
Condition:

TENSILE

ReL	Rm	A4-A5
500 MPa	590 MPa	28 %

IMPACT

Temp	KV
-50 °C	50 J

RELEASED FOR CONFORMANCE TO
QC INSPECTOR 24/4/14

FINETOOLS
FINE TOOLS TRADING (L.L.C)
Tel.: 04 - 3385240, Fax: 04 - 3385239
P.O. Box: 30139, Dubai, U.A.E.

COMMENTS

Tested according to NACE TM0177 and TM0284.

Product supplied under a QA Programme fulfilling the EN ISO 9001 standard.
This certificate is produced electronically and is valid without signature.
Please refer any queries to:
Plot No. S20134, Jebel Ali Free Zone (South), PO Box 8964, Dubai, Tel +971 4 880 9493

Validation - Chemical Analysis
Albena Vartyiska — Quality Assurance Manager

Validation - Others
Ester de Weijer — Product Manager