

## DET NORSKE VERITAS

Ref.: 11913038-1

## WELDING PROCEDURE QUALIFICATION TEST

According to (code, standard)

<b>DNV Rules</b>	for Ships	& DNV	-OS-C401
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Manufacturer's welding procedure No.

						the Thursday		P	QR-EzyFit-(	048	IDEOGIA .
	38	9 juges	aulics Pty Ltd	ot actual V	vici .	Place and	d date	Adelaide	, 2011-09-1	3 191 910	
	314 111.00	, tratreter;	aulics Fty Ltu	rigorosacon		Project	N.A.	X.160-111	delalde, ad	A steb bri	6 906P
	10 MARCH 1984 1986 • 1996 1	. No. N.A.				Fioject				Store tele XIO	ota Nas
		yond code/sta			e prire 10	DASE MAT	ΓΕΡΙΔΙ	SPECIFIC	CATION AND	GROUPING	uhoalis
State r Bevel	olling direct	ction, if applica	equence (Sketch). ible <b>Gap: 0mm</b>	ė bė	o TU I	JNS S32750 (		Speci			ing)
Root	Landing		10 8	795 795	G	rade C, %	C	eq %	Grade	C, %	C eq %
		7 5 3 2/1/	6 4	850 545 - Former t	If app	olicable, the folic			on ladle anal		alculated:
	29.5	ed	enoier E	nemib bas ar		210	1000			earrante or	ng say T-
Weldir	ng process	(es) GTAW	/ We	elding position	on 1G		Si	ngle-/doul	ble sided wel	ding Single	2 y 2
WELD	ING CON	SUMABLES:									
i	ndex	Consumab	le(s), trade name						esignation		
	Α	Sandvik 2	5.10.4L					AWS E	R2594		
L	B umu	ring dosn	Requires	816	101 × 01		- 1/G	2-10	egyT	stast japon i	
	С	iateliani	Sparsva	ε	E CONTRACT		§ 0.008	1	anine		<u> </u>
WELD	ING PAR	METERS	1000	100	X40	801		USA	Travel	Wire feed	Heat inpu
Pass No.	Index	Diam. mm	Gas composition	Gas L/min	Current	I Amns		/olts	speed mm/min	mm/min	kJ/mm
1-3 4-12 		1.6 2.4 	Argon/2% N2 (as above)	15 15 	DC- DC- 	226-250 250 	13-14 14 	05- -50 -50	117-140 132-212 	FSS HAZES FSS HAZES C parent m	1.58max 1.59max
			64	10	2.1	60	2 - F8 N		neizenh	Mauro oxal	.1
				. OFVH	Vicker	lyne if tests	pilos		\$0.	Hardness to	
solnel	(nio <sup>©</sup>	i azantnsi	trion learn	nuHJo	55 Po	enhald pres	e i		enodniA	en prisyorie	Skist 7
Other Back	information purge: /	n (weaving, ba Argon/2% N	acking, groove prep 2 +/-15lpm	paration, gou	ging, grind	ding, etc.):	AH MA				
SPEC	IAL REQU	JIREMENTS: I	Preheat min. 40°0	C 283 33	Interpass	max 127°C	PW	HT°C	Tịn	ne Hr(s)	
		rate				ctrodes					
WELD	ING CAR	RIED OUT BY	Dane Kelly			TEST PIECE	MARKI	D DK		4.,4	
EXTE	NT OF AF	PROVAL: Bas	se material(s)	32750 /A18	32 F53	Positions:		1G			
Plate	/wall thick	ness 6.5 - 2	6 mm	D	iam. (12	5 and above)	mm	Other lim	itations Cas	tings exclu	ided
(All N	IDT, med	hanical and	l metallurgical te	esting carr	ried out	by Adelaide I	nspect	ions Ser	vices - Job	No. M1102	<u>!1)</u>
specif	ed/Code/ facturers	Ståndard årld/ CHEVIOT I signature and i	Statific Manage	correct and the		DNIVPo outrou				POK	e with the SKE
14	80-ST-P	1: 08 - 8281	0900	10-10	1819				Maria	0	S. C.

FAX: 08 - 8281 1698
FAX: 08 - 8281 1698
M.Henriques/G.Kittel

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Del Norske Veritas, then Del Norske Veritas stall pay compensation to such person for his Nitrat Bellinity.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Del Norske Veritas stall pay compensation shall not exceed us a mount equal to ten limes the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million.

In this provision "Del Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Ref.: 11913038-1

rocedure ref. CSP 415		Accent	ance criteri	а Г	ONV R	ules for Sh	ips	Result	Pass	14 met 441		
ilm type (not stated)	CATTA		Acceptance criteria DNV Rules for Ships Result Pass  Screens Pb 0.125mm IQI ASTM 1A									
V mAmin.		Sensitivity 1.3% Density 2.9-3.9										
2. Ultrasonic examination		المحتشار							10/4	ALVECT!		
Procedure ref		Accept	ance criteria	a -	](r) 29	DNAKU		Result		CHARLE STATE		
3. Other examination Type:	Dy		ant Test									
Procedure ref. CSP 413		Accept	ance criteri	a [	ONV R	ules for Sh	ips	Result	Pass			
Place and date Adelaide, 2011 aboratory signature ind stamp		LW tota	joiq V Dules f			ed by Adela	aide Ins	sp Services		11021		
	According		V Rules f	01 3111	ha		ecified F					
1. Tensile tests	Specified	d load	ReH	ПТ	. load	Rm	_		Eotraenio gr	Milga State		
Test Dim Area No. (mm) (mm²)		kN)	(N/mm <sup>2</sup> )		. 10au (N)	(N/mm²)	A, %	. 13	Remark	Roof! as		
74309 (Transverse) 74310 (Transverse) 74234 (All Weld) 74235 (All Weld)	ransverse) ransverse) II Weld)					795 795 850 845	81 78		at forging side at forging side			
2. Bend tests Specified	O nti.	180	degr.	V.	F	ormer diamet	ter 40	mm 🛒 😏				
ype and dimensions	. 8	Results				nd dimension	s		Results			
x Side Bends x Root Bends		Pass Pass		2		e Bends	e c obox	GTAW - BEES, nsurrable(a), t	Pass	WELDING to build		
3. Impact tests Type:	Charpy		Size:	10 x 1	l0mm		Re	equirement:	Minimum	27J		
Notch Location/Direction	Ten	ıp. ℃	1	/alues, 2	J   3	Ave	rage J	Re	marks			
632750 HAZ+5mm 632750 HAZ+2mm Weld Metal A182 F53 HAZ+2mm A182 F53 HAZ+5mm 632750 parent metal	-50 -50 -50 -50 -50	El St	105 103 224 67 115 176	147 98 214 70 120 104	158 107 220 38 120 224 81	102 219 58 118	Gas unpeald non12% shove	Pass Pass Pass Pass Pass Pass Pass Pass	ympal	Pass Pass No. 1-3 4-12		
4. Macro examination	-50  -50	Pass	00	1 4	101	1,0		1 400				
			if toet:	Vicke	rs HV	10						
5. Hardness test	Spec	ified type		2000	Marco agree y consecu	Hardness	Poin	t Hardnes	s Point	Hardness		
Sketch showing indentations		Point T1	Hardnes		Point 2	riaiuiless	T3	i Halulles	I Ollit	1 ididileas		
		PM1	277 ma		- PM1	270 max	PM1	314 max	(1			
		HAZ1	271 ma		IAZ1	278 max	HAZ		aro, nyusini	u in iuniu		
	(6)	Weld	276 ma		Veld _	283 max	Weld					
	THIN	HAZ2	273 ma		IAZ2	285 max	HAZ			340176		
	<u> </u>	PM2	265 ma	x F	PM2	277 max	PM2	254 max	51 () 000000	D EMIZAH		
T1 T2	IM #1/#					10 12 00	44 Ya 700	UEI BERAD E	DINOUNIV			
T3 \\	ten/O	2 =	S32750	2013 2013	nois:	1001326	(L)lairs	AL 8248 mai 8.5 - 25 min	OF APR CO	May (4)		
1,20,3137.51	l mention	ant eb	istahA vrt	mist of	>h!==!	do Ditting T	OC# / A S	STM G-48 Me	athed A)	Page		
	-	INDA TACIL	แร: rer			ed by DNV	COL (M	TIVI G-40 IVI	striou Aj -	deren eW		
6. Other tests	Type		10-23	3 10								
6. Other tests Place Adelaide		2011-0	9-23	30,300	Reveiw	ed by Div			ant talus	U. T. Carlo		
Place Adelaide	Date				Keveiw	ed by Div	DO LE	MONTHUR TO MONTHUR TO MONTHUR TO	2011-12	A CONTRACTOR SI		

DET NORSKE VERITAS AS, Veritasveien 1, NO-1322 Hovik, Norway, Telephone: +47 67 57 99 00, Telefax: +47 67 57 99 11, Org.No. NO 945 748 931 MVA

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## **DET NORSKE VERITAS**

Ref.: 11913038-2

## WELDING PROCEDURE QUALIFICATION TEST

According to (code, standard)

<b>DNV Rules f</b>	or Ships &	& DNV-	OS-C401
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		- Hereit	D	NV Rules	for Ships	s & DNV-OS-(	C401		lanufacturer's QR-EzyFit-	welding proc 049	edure No.
Manuf	facturer	EzyFit Hvdra	aulics Pty Ltd	Y Rules Fo		Place an	d date A	delaid	e, 2011-09-	13	Piccell
		c. No. N.A.	ie ijani gomico/	t variations	100.	Project	N.A.	-Fo-Lu	nelards, 20	A elsp bn	e ereis
	*		ndard None							elmental Alo	ie locatul
Joint p	preparation rolling dire	ction, if applica	equence (Sketch). ble		or Shi s	BASE MA	TERIAL S	SPECIFIC	CATION AND	GROUPING	MEDIA 1
	I Angle:		Gap: 0mm		ST.U L	UNS S32750	(pipe) to	S3180	3 (ASTM A	276)	
Koot	Landing	The second second	10			Grade C, %	(MX)	q %	Grade	C, %	C eq %
Title B		The second secon	8_/	739		0, 70		9 70	1 (91	('masvey	TABAT
	7	5	<u>€</u> 4	850 3	If app	olicable, the follo	owing C e	eq based	on ladle ana	lysis is to be	calculated:
		3.1	X	i remno-i		apela (Je	_ N	in Cr+l	Mo+V Cu+	Ni a	
<u> 1888</u>	all the same		isions!	e and ulme	re I. I	C PRU	eq=C+-	3+	$\frac{\text{Mo} + \text{V}}{5} + \frac{\text{Cu} + \text{Cu}}{15}$	— %	
Weldi	ng process	(es) GTAW	' W	elding position	n 1G		Sir	gle-/dou	ble sided we	lding Single	e
		SUMABLES:					1				
	Index	Consumable	e(s), trade name			51		Code d	esignation		
	Α	Sandvik 2			71.	,		AWS E	R2594		
1	TB munti	o II. Inem	atione4	. 516	10 s 198	a-i2	L Mai	-10	tanyT	atest toward	
	С	1	L estate/A		L. philips		"Logist	-	arifon Ch	general Lebe	
WELD	DING PAR	AMETERS			1.2		4		1 -		nless of
Pass No.	Index	Diam. mm	Gas composition	Gas L/min	Current polarity	Amps		olts	Travel speed mm/min	Wire feed mm/min	Heat inpu kJ/mm
1 2-3 4-12		1.6 1.6 2.4	Argon/2% N2 (as above) (as above)	15 15 15	DC- DC- DC-	230 250 250	14		99 124-137 133-195	3 HAZ+2and 3 HAZ+2and 0 HAZ+5.3nd 0 percent made	1.81 1.69max 1.58max
							8 - 9 - Si		neiterd	naza omeli	
				DEVEL	nsvioliv	the Mast	f emosqs		ls ls	i eearibati	
	Inio	Handness	ness Point	nsH   la	FS . 22	oint Hardn			enstions	Por privode	nitara
Other	1.6	- Consider he	cking, groove prep	eration acu	aina arina	ding oto \:				4,,	
Back	purge:	Argon/2% N2	+/-15lpm			amig, etc.). am 883 m2/ and 880 ma					
SPEC	IAL REQU	JIREMENTS: P	er An			max 122°C	PWF	IT°C	Tir	ne Hr(s)	
Heati	ng/cooling	rate	nax, Pm2	Bak	ing of elec	ctrodes			ers		
WELD	DING CAR	RIED OUT BY	Dane Kelly			TEST PIECE	MARKE	D DK			
EXTE	NT OF AP	PROVAL: Base	e material(s) S3			Positions:		1G			
Plate	/wall thick	ness 6.5 - 26	mm	Di	am. (125	and above)	mm (	Other lim	itations Cas	tings exclu	ded
(All N	NDT, med	hanical and	metallurgical te	esting carr	ied out b	oy Adelaide l	nspecti	ons Ser	vices - Job	No. M1102	(1)
We c	ertify that t	He statements	This record are c	orrect and th		t weld was prep	ared, we	lded and	heat treated	in accordance	
Mล๊กป๋		Y SOUTH SA gignature and s 8 - 8281 169		3/h	ules!	DNV's survey	station a	nd surve	yor's signatu	ile G	1864*
3	ABN 7	1 060 465 3	85			M.Henrique	s/G.Kitt	el /	mi	M	ELBOURNE

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas, and play compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Ref.: 11913038-2

NON-DESTRUCTIVE TESTIN	NG .	2 A	TIME	N a	ap gr	O M	THE	7				. IETT	ALTO TO	
1. Radiographic testing	last											<b>版</b> :7	All al	
Procedure ref. CSP 415			Accept	ance crite	ria [	DNV R	ules fo	or Shi	ps		Result	Pass	AFF PM	
Film type (not stated)	TMU	HA.	Screen		.125mr	n 🗐 🗀	ng	9.0	uin	(50)	IQI A	STM 1A	We have	
	Amin.		(basi	Sensitivit	ty 1.3	3%			Densit	y 2	2.9-3.9	Fertile 1		
2. Ultrasonic examination	n										B2 35000	- 1414		
Procedure ref	and a filter part		Accept	ance crite	ria -		Mar YE	7	1		Result	-		
3. Other examination	Type:	Dy	e Penetr	ant Test										
Procedure ref. CSP 413	er adulas	e la N	Accept	ance crite	ria [	DNV R	ules fo	or Shi	ps		Result	Pass	************	
Place and date Adelaide Laboratory signature and stamp		A	FI 105	ord		Pavil Va	ed by A	Adelai	de Ins	sp Se	ervices J	ob No.:M1	1021	
MECHANICAL TESTING		cording		V Rules	tor Sh	ıps			21.00		n estellalismo j	tic palting	)	
1. Tensile tests		Specified	10007555		1 11-			**	cified I		Francis II J	TOTAL SECTION	OF SIBLE	
Test Dim	Area (mm²)	2000000	d load (N)	ReH (N/mm²)		. load kN)		m nm²)	A, 9	6 on	5335	Remarks	Joos	
T4311 (Transverse) T4312 (Transverse) T4234 (All Weld)	l vo heas	59 D	1 2 5	724 704		,	749 739 850 845		81 78		Break at S31803 side Break at S31803 side Pass Pass			
2. Bend tests St	pecified	An	180	deg		F	ormer d	iamete	r 40	mm	175.5	7 10 10	***	
47	Jeomeu	8 1	Results	l aeg		Type an						Results		
Type and dimensions 4 x Side Bends			Results Pass			x Fac						Pass		
2 x Root Bends		- Year - 19	Pass		91	nelileo						)esesono IUSMOO OI III		
10.1		Sharay		Size:	10 × 1	10mm	-	+	De	auiro	ment:	Minimum 2	771	
3. Impact tests Ty  Notch Location/Direction	2000 P	Charpy	p. °C	oize.	Values,			Avera	115	quire	ment.	C		
NOTE I LOCATION DIFFERIO			р. О	1	2	3	3	J	3-		Ren	narks		
S32750 HAZ+5mm       -50         S32750 HAZ+2mm       -50         Weld Metal       -50         S31803 HAZ+2mm       -50         S31803 HAZ+5mm       -50         S32750 parent metal       -50				162 95 210 66 108 124	155 125 197 97 92 114	164 135 194 75 176 120	1° 20 79 12 1° 1° 1° 1° 1° 1° 1° 1° 1° 1° 1° 1° 1°	25 19	Pas Pas Pas Pas Pas Pas		S AN	Pass Index No. 1 1 2-3 6-12		
S31803 parent metal		-50		111 95 82 96 Pass										
4. Macro examination		x2 -	Pass											
5. Hardness test		Spec	ified type	if test::	Vicke	ers HV	10		_	,				
Sketch showing indentations			Point	Hardne		Point	Hard	ness	Poin	it	Hardness	Point	Hardness	
	17	_	T1			2					140		1	
		- '	PM1	247 m		HAZ1 257 r					242 max 273 max	uli malta meni	n and the	
T1 \\	/ /		HAZ1 Weld	263 m								DIA 1901U	S DIRECT	
T2	HAZ2							eld 321 max AZ2 321 max		712 14 4 2 2 2 2	. 100 100 100			
T3 \	1 3		PM2	286 m	-	M2		281 max			317 max			
	PHINC								PM2			State Brownia	Distributed 1	
			1 =	S3180	3	American	4427		4,30	la Li	FB TURNS	ii and d	METTERAL .	
			2 =	and the second second second		1000	UGAN	.6	Diana	intern	emil JAW	OF APP 30	HATKE	
ing Castings excluded	intellerit		ntm (byo	and a po	1 (125	Dien				min (	6.6 - 28	ละ รถปอนปี ใช้	vi etel9 i .	
es - Job No. (M1 (021)	Service	anolipa	anl ab	y Adelai	d tuo b	carrier	onite	ical te	rulls	dan	ons Ison	T. maci av	TALLAL .	
6. Other tests			and resu						st (A	STM	G-48 Me	thod A) - P	ass	
Place Adelaide		Date	2011-0	9-23	Amel O N	Reveiw	ed by C	VNC				magagagaga		
Laboratory signature and stamp	noveviu.	e bris no	nvey statt	a avero				7.5	al	ordial and	11.H730 2007 (1998)		Selffiller.	
We hereby certify that by virtue of the in	nformation o	iven on pac	ge 1 of this fo	rm and the	F	Place I	Melbo	urne		- 38	Date	2011-12-0	18 ORS	
laboratory test results given above, this purchaser's specification, and that with purchaser"s specification by our signat	s welding pro in the limitat	ocedure me ions given i	ets the Code n the Code/S	/Standard an Itandard and/	1	Surveyo		Br	n'	Mic	hael Hen	riques	PET A	

DET NORSKE VERITAS AS, Veritasveien 1, NO-1322 Hovik, Norway, Telephone, #47 67 57 99 00, Telefax: +47 67 57 99 11, Org.No. NO 945 748 931 MEABOURNE
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