WELDING PROCEDURE QUALIFICATION RECORD

Firm : Ser Hidrolik Mak. Müh Elektirik Elekt. San. ve Tic. LTD. ŞTİ.

Address : İmes San. Sitesi E Blok 504 Sokak No:13 Y.Dudullu/ISTANBUL

Reference : BV Rules on Material and Welding for the Classification of Marine Units, NR216, Ch 12, Sec 3, Approval of Welding Procedures

Further to the welding of the standardized test pieces carried out in the shipyard at Ser Hidrolik Mak. Müh Elektirik Elekt. San. ve Tic. LTD. ŞTİ. on 02/09/2024 in presence of Mr. Tarık KAMÇI Bureau Veritas Surveyor,

We certify that shipyard welding procedure detailed in page 2/5 of this record has given satisfactory results in accordance with the requirements of above reference.

Date of Issue: 20.01.2025

Prepared by Firm Representative

Name: Mr. Orhan YİĞİT

Signature:
Stamp

SER HİDROLİK MAKİNA MÜHENDİSLİK ELEKTRİK ELEKTRONİK SAN. VE TİC. LTD. ŞTİ. İmes San.Sit. E Blok 504 Sk. No:13 Y.Dudullu-İST. Sarıgazi V.D. 048 7689 Tel:0216 527 52 77 Fax:0216 527 52 97 Ticaret Sicil No: 425591

Endorsed by BV Surveyor

Name: Mr. Tarık KAMÇI

Signature:
BV Stamp

BUREAU VERITAS MARINE & OFFSHORE INTERNATIONAL REGISTER

Tarık KAMÇI
SURVEYOR
Bureau Veritas İstanbul

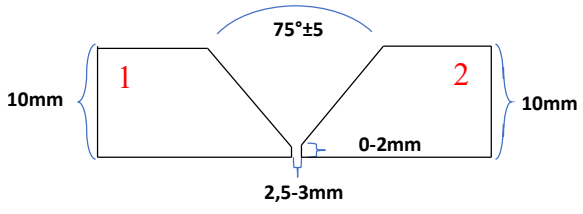
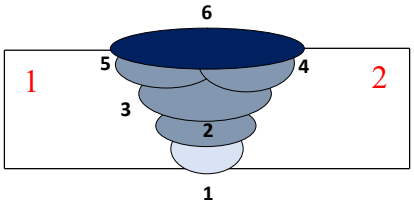
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1 DETAILS OF WELD TEST

			Part 1	Part 2
Method of preparation: Grinding		Parent material spec	: 316L	316L
Cleaning	: Brushing	Heat Nr	: NY230705AT04	
Joint type	: Butt Joint	Material thickness	: 10mm	10mm
WPS No	: SER-WPS005	Outside diameter	: 80mm	80mm
Parent material spec	: S. Steel & S. Steel	Welding Position	: PA	
		BV Job Number	: 1173.ITB.24	

Weld Preparation Details

Joint design	Welding sequences
	

Welding Details

Run number	1	2	3	4	5	6
Welding process	141 (TIG)					
Welding position	PA					
Autom. Welding .nr. of heads	-					
.weaving	-					
Filler metal:wire (W) or electrode (E)	W					
.Designation	Geka – ELOX SG 316 L					
.Grade	-					
.Description	-					
.Diameter	2,4	3,2	3,2	3,2	3,2	3,2
Shielding:Flux (F) or gas (G)	G					
.Power flux .description	-					
.type and trade name	-					
.Gas flux .descriprition	I1					
.type and trade name	KOYUNCU GAZ – **Backing:** I1 , **Shielding:** I1					
.Backing .flow rate (l/mn)	3 - 4					
.Shielding .flow rate (l/mn)	12 - 13					
.Plasma	-					
Tungsten electrode: type/size	-					
Type of current	DC					
Electrode or wire polarity	-					
Current (A)	100	140	145	145	145	145
Voltage (V)	16	14	15	15	15	15
Travel speed S (cm/min)	33,49	75,36	47,10	54,81	56,88	59,11
Wire feed speed (m/min)	-	-	-	-	-	-
Heat input (kJ/cm) = [k x V x A x 60] / S	1,72	0,94	1,66	1,43	1,38	1,32
Interpass temperature in °C (min/max)	20°C - 250°C					
Welding equipment .trade mark	MAGMA MEKATRONİK – ID 300T DC					
.type						

Pre heat	☑ No ☐ Yes	Temperature°C.....	Holding Time.....
Post heating	☑ No ☐ Yes	Temperature°C.....	Holding Time.....
Post Weld Heat treatment	☑ No ☐ Yes	Temperature°C.....	Holding Time.....

Welder or welding operatör: Murat YILDIZ

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2 TEST RESULTS

2.1 VISUAL INSPECTION

Performed by: İmkosan Kalite Kontrol Ticaret A.Ş. Report Nr. / DATE: 00014-25-VT / 13.09.2024

Requirements : NR216 & NR669

EXAMINATION INFORMATIONS / *MUAYENE BİLGİLERİ*								
NO	MARKING NUMBER *MARKALAMA NUMARASI*	WELDER NO *KAYNAKÇI NO*	THICKNESS *KALINLIK (mm)*	DEFECT TYPE *HATA TİPİ*	DEFECT DIMENSION *HATA BOYUTU*	DEFECT SIZE *HATA ÖLÇÜSÜ*	RESULT *SONUÇ*	REMARK *AÇIKLAMA*
1.	WPS-05 141 PA	Murat Yıldız	2"x4 mm	-	-		ACC	
2.	WPS-04 141 PA	Murat Yıldız	2"x4 mm	-	-		ACC	
3.	WPQR-04/2 141 PA	Turan Seren	2"x4 mm	-	-		ACC	
4.	WPS-01 141 PB	Murat Yıldız	10 mm	-	-		ACC	
5.	WPS-03 141 PB	Murat Yıldız	10 mm	-	-		ACC	
6.	WPS-03/2 141 PB	Turan Seren	10 mm	-	-		ACC	

2.2 LIQUID PENETRANT EXAMINATION REPORT

Performed by: İmkosan Kalite Kontrol Ticaret A.Ş. Report Nr. / DATE: 00958-24-PT / 13.09.2024

Requirements : NR216 & NR669

EXAMINATION INFORMATIONS / *MUAYENE BİLGİLERİ*							
NO	MARKING NUMBER *MARKALAMA NUMARASI*	THICKNESS *KALINLIK (mm)*	DEFECT TYPE *HATA TİPİ*	DEFECT DIMENSION *HATA BOYUTU*	NO of REPAIRS *TAMİR SAYISI*	RESULT *SONUÇ*	REMARK *AÇIKLAMA*
1.	WPS-05 141 PA	2"x4 mm	-	-		ACC	
2.	WPS-04 141 PA	2"x4 mm	-	-		ACC	
3.	WPS-04/2 141 PA	2"x4 mm	-	-		ACC	
4.	WPS-01 141 PB	10 mm	-	-		ACC	
5.	WPS-03 141 PB	10 mm	-	-		ACC	
6.	WPS-03/2 141 PB	10 mm	-	-		ACC	

2.3 RADIOGRAPHIC EXAMINATION REPORT

Performed by: İmkosan Kalite Kontrol Ticaret A.Ş. Report Nr. / DATE: 012334-24-XR / 13.09.2024

Requirements : NR216 & NR669

EXAMINATION INFORMATIONS / *MUAYENE BİLGİLERİ*												
NO	MARKING NUMBER *MARKALAMA NUMARASI*	EXAM. AREA *İNC. BÖLG.*	WELDER *KAYNAKÇI*	REQ. IQI *İSTEN. IQI*	VIS. IQI *GÖRÜ. IQI*	DEN. *YOĞ.*	DIA *ÇAP*	BASE. THICK. *KAL. (mm)*	REIN TH. *KAL (mm)*	NO OF REI *TAMİR S.*	TYPE OF DEFECT *HATA TİPİ*	RESULT *SONUÇ*	HATA ARALIĞI *DEFFECT AREA*
1.	WPS-05 141 PA (316L)	A&B	Murat Yıldız	15	15	2.8	Ø 2"	4 mm	--	--		ACC	
2.	WPS-04 141 PA (316L)	A&B	Murat Yıldız	15	15	2.6	Ø 2"	4 mm	--	--		ACC	
3.	WPS-04/2 141 PA (ST52-3)	A&B	Turan Seren	15	15	2.6	Ø 2"	4 mm	--	--		ACC	

2.4 TENSILE TESTS

Performed by: İmkosan Mühendislik LTD. ŞTİ. . Report Nr. / DATE: 4524-24-TENSILE TEST / 02.10.2024

Requirements : Tensile test results were found to be sufficient
Min Tensile Strenght 490 (N / mm²)

TYPE / Nr.	Re (N / mm²)	Rm(N / mm²)	A %	Z %	FRACTURE LOCATION	REMARKS
01	390	559	--	-	MATERIAL	NO REMARK
02	393	564	--	-	MATERIAL	NO REMARK

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2.5 BEND TESTS

Performed by: İmkosan Mühendislik LTD. ŞTİ. Report Nr. / DATE: 4525-24-BEND TEST / 02.10. 2024
Requirements : NR216 & NR476 – min 180°

TYPE / Nr.	PUNCH DIA./BEND. ANGLE	SPECIMEN SECTION	RESULT
01	180°	ROOT BEND 1	OK
02	180°	ROOT BEND 2	OK
03	180°	FACE BEND 3	OK
04	180°	FACE BEND 4	OK

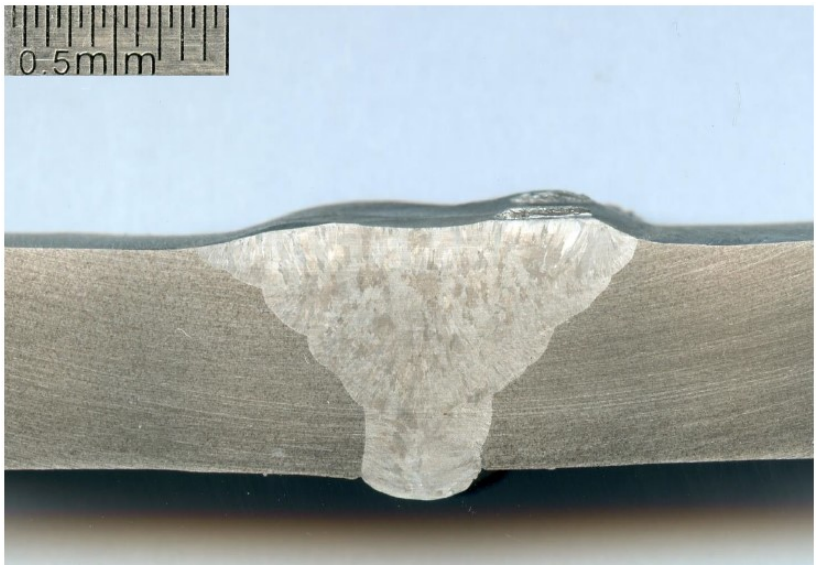
2.6 IMPACT TESTS

Performed by: İmkosan Mühendislik LTD. ŞTİ. Report Nr. / DATE: 4527-24-IMPACT TEST / 02.10.2024
Type : ISO V Size : 7,5 x 10 x 55 mm Requirements : NR216 / at -20°C Min. 27J

SPECIMEN POSITION / NOTCH LOCATION	TEMPERATURE	INDIVIDUAL VALUES 1	2	3	AVARAGE	REMARKS
Weld	-20°C	73,55	155,1	114,32	114,32	NO REMARK
Fusion	-20°C	146,63	141,72	137,83	142,06	NO REMARK
Fusion + 2	-20°C	111,3	24,23	104,24	79,92	NO REMARK

2.7 MACROGRAPHIC EXAMINATION

Performed by: İmkosan Mühendislik LTD. ŞTİ. Report Nr. / DATE: 4526-24-MACRO TEST / 02.10.2024
Observations : Lack of fusion have not been observed in weld zone, weld zone is homogeneous
Requerments : NR216



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2.8 OTHER EXAMINATIONS OR TESTS

2.8.1 WIRE TEST (GEKA Elox SG 316 L – 3,20 mm)

2.8.1.1 TENSILE TEST

Performed by: QVV Mühendislik San. Ve Tic. Ltd. Şti. Report Nr. / DATE: 0093.25.0498 / 16.01.2025
Requirements : NR216

TYPE / Nr.	Re (N / mm²)	Rm(N / mm²)	A %	Z %	FRACTURE LOCATION	REMARKS
01	453	602	52	-	-	NO REMARK

2.8.1.2 IMPACT TESTS

Performed by: QVV Mühendislik San. Ve Tic. Ltd. Şti. Report Nr. / DATE: 0093.25.0499 / 16.01.2025
Type: ISO V Size : 10 x 10 x 55 mm Requirements : NR216 / at 20°C Min. 63J

SPECIMEN POSITION / NOTCH LOCATION	TEMPERATURE	INDIVIDUAL VALUES 1	2	3	AVARAGE	REMARKS
Material	-20°C	123	110	102	112	NO REMARK

2.8.1.3 CHEMICAL ANALYSIS REPORT

Performed by: QVV Mühendislik San. Ve Tic. Ltd. Şti. Report Nr. / DATE: 0093.25.0500 / 16.01.2025
Requirements : NR216

Test Sonuçları *(Test Results)*

Elementler *Elements*	KALAN *Rem.*	C	Si	Mn	P	S	Cr	Mo	Ni	Nb	Al	Cu
Test Ortalaması *Test Average*	66,448	0,005	0,510	1,951	0,025	0,012	17,518	2,072	10,967	0,124	0,003	0,177
Standart Değeri *Standard Value*	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

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2.8.2 WIRE TEST (GEKA Elox SG 316 L – 2,40 mm)

2.8.2.1 TENSILE TEST

Performed by: QVV Mühendislik San. Ve Tic. Ltd. Şti. Report Nr. / DATE: 0094.25.0501 / 16.01.2025
Requirements : NR216

TYPE / Nr.	Re (N / mm²)	Rm(N / mm²)	A %	Z %	FRACTURE LOCATION	REMARKS
01	482	616	50	-	-	NO REMARK

2.8.2.2 IMPACT TESTS

Performed by: QVV Mühendislik San. Ve Tic. Ltd. Şti. Report Nr. / DATE: 0093.25.0502 / 16.01.2025
Type: ISO V Size : 10 x 10 x 55 mm Requirements : NR216 / at 20°C Min. 63J

SPECIMEN POSITION / NOTCH LOCATION	TEMPERATURE	INDIVIDUAL VALUES 1	2	3	AVARAGE	REMARKS
Material	-20°C	125	115	116	119	NO REMARK

2.8.2.3 CHEMICAL ANALYSIS REPORT

Performed by: QVV Mühendislik San. Ve Tic. Ltd. Şti. Report Nr. / DATE: 0093.25.0503 / 16.01.2025
Requirements : NR216

Test Sonuçları *(Test Results)*

Elementler *Elements*	KALAN *Rem.*	C	Si	Mn	P	S	Cr	Mo	Ni	Nb	Al	Cu
Test Ortalaması *Test Average*	66,802	0,012	0,523	1,961	0,026	0,016	17,365	2,254	10,567	0,120	0,003	0,170
Standart Değeri *Standard Value*	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Annexed Documents Identification		Name and Signature of Bureau Veritas Surveyor	Name and Signature of Firm Representative
Visual Test Report	00014-25-VT / 13.09.2024	Mr. Tarık KAMÇI	Mr. Orhan YİĞİT
Liquid Penetrant Test Report	00958-24-PT / 13.09.2024	Tarık KAMÇI SURVEYOR Bureau Veritas İstanbul	SER HİDROLİK MAKİNA MÜHENDİSLİK ELEKTRİK ELEKTRONİK SAN. VE TİC. LTD. ŞTİ. İmes San.Sit. E Blok 504 Sk. No:13 Y.Dudullu-İST. Şangazi V.D. 048 7689 Tel:0216 527 52 77 Fax:0216 527 52 97 Ticaret Sicil No:425591
Radiographic Test Report	012334-24-XR / 13.09.2024		
Tensile Test Report	4524-24-TENSILE TEST / 02.10.2024		
Bend Test Report	4525-24-BEND TEST / 02.10. 2024		
Impact test report	4527-24-IMPACT TEST / 02.10.2024		
Macrographic Test Rep.	4526-24-MACRO TEST / 02.10.2024		
Other Tests	Wire Test		

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