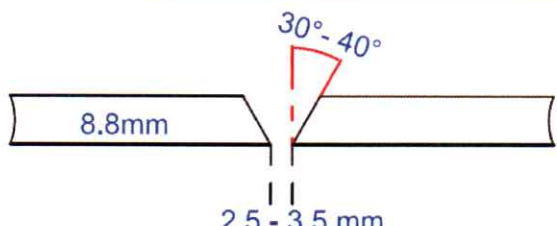



pWPS

WELDING PROCEDURE SPECIFICATION

WPQR No	WPQR - 5	Parent Material Grad	Part 1 : 316-L	Part 2 : 316-L
Method of preparation and cleaning	: CNC : Brushing/grinding	Range of Material thickness	: 3mm to 17,6mm	
Joint Type	: Butt joint	Range of Outside diameter	: 30,16 ≥ D > 500mm	
Parent Material Spec.	: SS (316-L DN50 60,33mm)	Range of Welding Position	: H-L045 (All positions)	

Welding Preparation Details

Joint design	Welding sequences
	

Welding Details

Run number	1	2	3	4
Welding process	GTAW	GTAW	GTAW	GTAW
Autom. Welding .nr. of heads				
.weaving				
Filler metal: wire (W) or electrode (E)	W	W	W	W
.Designation	Kaynak Tekniği Sanayi ve Ticaret A.Ş (ASKAYNAK)			
.Grade	ER316L			
.Description	AS TIG 316-L			
.Diameter	2,4	2,4	2,4	2,4
Shielding: Flux (F) or gas (G)	G	G	G	G
.Powder flux .description				
.type and trade name	HABAS	HABAS	HABAS	HABAS
.Gas flux .description	%99,9 Ar			
.type and trade name				
.Backing .flow rate (l/mn)				
.Shielding .flow rate (l/mn)				
.Plasma				
Tungsten electrode: type/size				
Type of current	DC	DC	DC	DC
Electrode or wire polarity	-	-	-	-
Current (A)	104-105	140-141	139-140	113-114
Voltage (V)	9,5-10,2	11,5-11,9	10,7-11,2	10,5-11,2
Travel speed S (cm/min)	7,86	8,3	12,6	6,03
Wire feed speed (cm/min)				
7622	4905	7277	4480	7622
Interpass temperature in °C (min/max)	Min 80 °C / Max 150°C			
Welding equipment .trade mark / Type	ESAB TIG 4000i			

Pre heat	NO	Temperature°C.....	Holding Time.....
Post heating	NO	Temperature°C.....	Holding Time.....
Post Weld Heat treatment	NO	Temperature°C.....	Holding Time.....

Prepared by Representative

Endorsed by BV Surveyor

Name: NEJDET AKPINAR
(TR-IIW-IWIP .INT. WELDING INSPECTOR)

Signature / Stamp :

Name: HAKAN TIRYAKI

Signature :

Stamp:

WELDING PROCEDURE QUALIFICATION RECORD

Firm : GÜNAL GEMİ İNŞAAT MAKİNA NAKLİYE SAN. VE TİC. LTD. ŞTİ.

Address: GÜNAL GEMİ Aydıntepe Mah. Sahil Bulvarı Alize İş Merkezi No: 191/14 Tuzla - İSTANBUL

Reference : BV Rules on Material and Welding for the Classification of Marine Units,
NR216, Ch 5, Sec 4, Approval of Welding Procedures

Further to the welding of the standardized test pieces carried out in the shipyard at GÜNAL GEMİ
Aydıntepe Mah. Sahil Bulvarı Alize İş Merkezi No: 191/14 Tuzla - İSTANBUL

on 27.04.2018 in presence of Mr. HAKAN TİRYAKİ 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: 15.05.2018

Prepared by Representative

Name: NEJDET AKPINAR
(TR-IIW-IWIP .INT. WELDING INSPECTOR)

Signature / Stamp :



GÜNAL GEMİ İNŞAAT MAKİNA NAKLİYE SAN. VE TİC. LTD. ŞTİ.
Aydıntepe Mah. Sahil Bulvarı Alize İş Merkezi No: 191/14 Tuzla / İST
Tel: 0216 447 37 40 Tic. Sicil No: 665 133
Tuzla V.D. 426 053 9954 Mersis No: 0426 053 9954 00018
www.gunalgemi.com e-mail: gunalgemi@gmail.com

Endorsed by BV Surveyor

Name: HAKAN TİRYAKİ

Signature / Stamp :

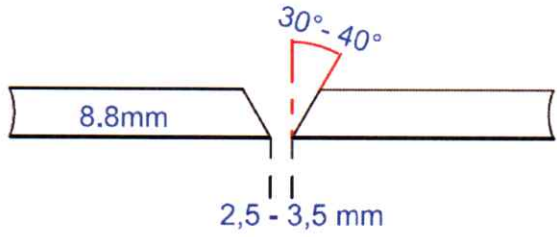



BUREAU VERITAS MARINE & OFFSHORE
BUREAU
VERITAS
INTERNATIONAL REGISTER

1 DETAILS OF WELD TEST

Method of preparation: CNC	Parent material spec	Part 1 : 316-L	Part 2 : 316-L
Cleaning : Brushing/grinding	Heat Nr	: A161089	A161089
Joint type : Butt joint	Material thickness	: 8,8mm	8,8mm
	Outside diameter	: 60,33 (DN50)	60,33 (DN50)

Weld Preparation Details


Joint design	Welding sequences
	

Welding Details

Run number	1	2	3	4		
Welding process	GTAW	GTAW	GTAW	GTAW		
Welding position	HL-045	HL-045	HL-045	HL-045		
Autom. Welding .nr. of heads						
.weaving						
Filler metal: wire (W) or electrode (E)	W	W	W	W		
.Designation	Kaynak Tekniği Sanayi ve Ticaret A.Ş (ASKAYNAK)					
.Grade	ER316L					
.Description	AS TIG 316-L					
.Diameter	2,4	2,4	2,4	2,4		
Shielding: Flux (F) or gas (G)	G	G	G	G		
.Power flux .description						
.type and trade name						
.Gas flux .description	HABAS (%99,9 Ar)					
.type and trade name						
.Backing .flow rate (l/mn)						
.Shielding .flow rate (l/mn)						
.Plasma						
Tungsten electrode: type/size						
Type of current	DC	DC	DC	DC		
Electrode or wire polarity	-	-	-	-		
Current (A)	104-105	140-141	139-140	113-114		
Voltage (V)	9,5-10,2	11,5-11,9	10,7-11,2	10,5-11,2		
Travel speed S (cm/min)	7,86	8,3	12,6	6,03		
Wire feed speed (cm/min)						
Heat input (J/cm) = [k x V x A x 60] / S	4905	7277	4480	7622		
Interpass temperature in °C (min/max)	Min 80 °C / Max 150°C					
Welding equipment .trade mark / Type	ESAB TIG 4000i					

Pre heat	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	Temperature°C	N.A	Holding Time.....
Post heating	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	Temperature°C.....	N.A	Holding Time.....
Post Weld Heat treatment	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	Temperature°C.....	N.A	Holding Time.....



 GÜNAL GEMİ <small>GÜNAL GEMİ İNŞAAT MAKİNA NAKLİYE SAN. VE TİC. LTD. ŞTİ.</small>	WELDING PROCEDURE QUALIFICATION RECORD WPQR	WPQR No: 5 432ITB18 Page 3 of 4
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2 TEST RESULTS

2.1

NON-DESTRUCTIVE TESTS	PERFORMED BY	REPORT Nr. / DATE	RESULT
Visual examination	İMKOSAN	04058/18/VT – 28.04.2018	OK
Dye penetrant	İMKOSAN	04056/18/PT – 28.04.2018	OK
Radiographic examination	İMKOSAN	04144/18/SE – 30.04.2018	OK
Ultrasonic examination	N/A		

2.2 TENSILE TESTS

Performed by: İMKOSAN

Report Nr. / DATE: 1746/18 - 11.05.2018

Test Numune No <i>Test Piece No</i>	Boyutlar <i>Size of Specimen mm²</i>	Akma Dayanımı %0,2 <i>(Yield Strength) N/mm²</i>	Çekme Dayanımı <i>(Tensile Strength) N/mm²</i>	Maks. Yük <i>(Max. Load) kN</i>	Kırılma Bölgesi <i>(Location of fracture)</i>	Notlar; Çatlak Kırılma Görünüşü <i>(Remarks e.g. fracture appearance)</i>
1	106,26	316	551	59	AM	...
2	106,26	331	551	59	AM	...
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2.3 BEND TESTS

Performed by: İMKOSAN

Report Nr. / DATE: 1747/18 – 11.05.2018

Test Numune No <i>Test Piece No</i>	Deney Türü <i>(Type of test)</i>	Boyutlar <i>(Dimensions) w x t x l (mm)</i>	Mandrel çapı <i>(Former diameter) mm</i>	Mesnetler arası mesafe <i>(Distance between rollers) mm</i>	Eğme açısı <i>(Bend angle degrees)</i>	Notlar; Çatlak Kırılma Görünüşü <i>(Remarks e.g. fracture appearance)</i>
1	ROOT	8,8x30x300	35	55	180	ACCEPTABLE
2	ROOT	8,8x30x300	35	55	180	ACCEPTABLE
3	FACE	8,8x30x300	35	55	180	ACCEPTABLE
4	FACE	8,8x30x300	35	55	180	ACCEPTABLE



 <p>GÜNAL GEMİ İNŞAAT MAKİNA NAKLİYE SAN. VE TİC. LTD. ŞTİ.</p>	<p>WELDING PROCEDURE QUALIFICATION RECORD</p> <p>WPQR</p>	<p>WPQR No: 5 432ITB18</p> <p>Page 4 of 4</p>
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2.4 IMPACT TESTS-NA

2.5 HARDNESS TEST-NA

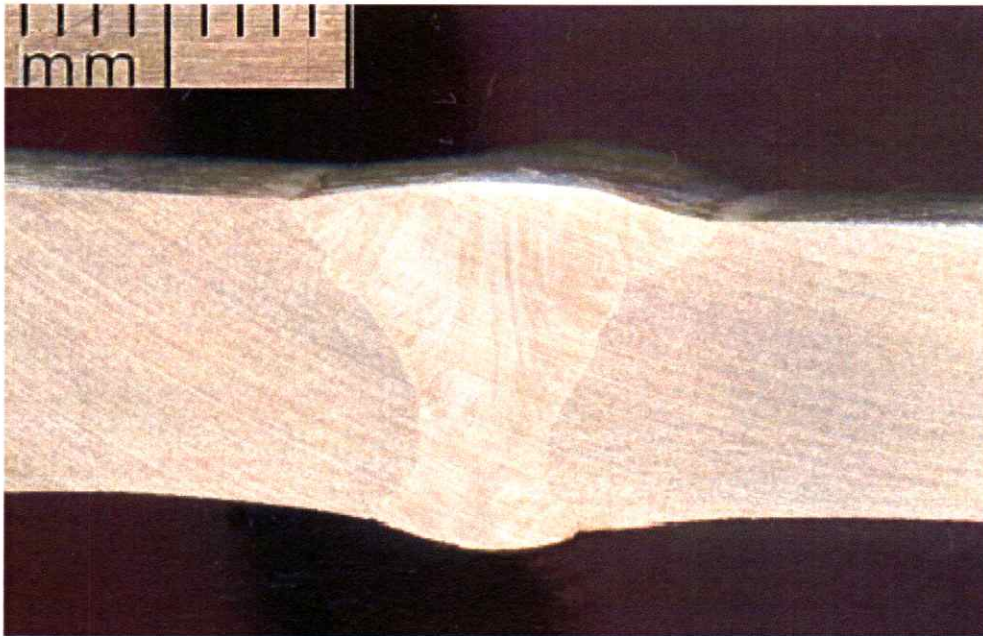
2.6 MACROGRAPHIC EXAMINATION

Performed by /IMKOSAN

MAKRO





Observations :

Report Nr. / DATE.1748/18 – 11.05.2018



2.7 MICROGRAPHIC EXAMINATION-NA

2.8 OTHER EXAMINATIONS OR TESTS

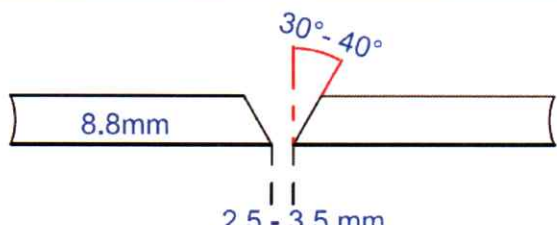

Annexed Documents Identification	Name and Signature of Bureau Veritas Surveyor	Name and Signature of Representative
Radiographic Test Report /IMKOSAN/04144/18/SE – 30.04.2018	<p>HAKAN TIRYAKI</p>  	<p>NEJDET AKPINAR</p> <p>(TR-IIW-IWIP .INT. WELDING INSPECTOR)</p>   <p>GÜNAL GEMİ İNŞAAT MAKİNA NAKLİYE SAN. VE TİC. LTD. Aydıntepe Mh. Sağıt Bulvarı Alize İş Merkezi No: 191/14 Tuzla / Tel: 8216 447 37 40 Tic. Sicil No: 665 133 Tuzla V.D. 426 053 9954 Mersis No: 0426 053 9954 00010 www.gunalgemi.com e-mail: gunalgemi@gmail.com</p>
Dye Penetrant Test Report /IMKOSAN/04056/18/PT – 28.04.2018		
Visual Test Report /IMKOSAN/04058/18/VT – 28.04.2018		
Tensile Test Report/ IMKOSAN/1746/18 - 11.05.2018		
Bend Test Report /IMKOSAN/1747/18 – 11.05.2018		
Impact test report/ IMKOSAN/ N/A		
Hardness test report / N/A		
Macrographic Test Rep. /IMKOSAN/1748/18 – 11.05.2018		

WPS

WELDING PROCEDURE SPECIFICATION

WPQR No	WPQR - 5	Parent Material Grad	Part 1 : 316-L	Part 2 : 316-L
Method of preparation and cleaning	: CNC : Brushing/grinding	Range of Material thickness	: 3mm to 17,6mm	
Joint Type	: Butt joint	Range of Outside diameter	: 30,16 ≥ D > 500mm	
Parent Material Spec.	: SS (316-L DN50 60,33mm)	Range of Welding Position	: H-L045 (All positions)	

Welding Preparation Details

Joint design	Welding sequences
	

Welding Details

Run number	1	2	3	4
Welding process	GTAW	GTAW	GTAW	GTAW
Autom. Welding .nr. of heads				
.weaving				
Filler metal: wire (W) or electrode (E)	W	W	W	W
.Designation	Kaynak Tekniği Sanayi ve Ticaret A.Ş (ASKAYNAK)			
.Grade	ER316L			
.Description	AS TIG 316-L			
.Diameter	2,4	2,4	2,4	2,4
Shielding: Flux (F) or gas (G)	G	G	G	G
.Powder flux .description				
.type and trade name	HABAS	HABAS	HABAS	HABAS
.Gas flux .description	%99,9 Ar			
.type and trade name				
.Backing .flow rate (l/mn)				
.Shielding .flow rate (l/mn)				
.Plasma				
Tungsten electrode: type/size				
Type of current	DC	DC	DC	DC
Electrode or wire polarity	-	-	-	-
Current (A)	104-105	140-141	139-140	113-114
Voltage (V)	9,5-10,2	11,5-11,9	10,7-11,2	10,5-11,2
Travel speed S (cm/min)	7,86	8,3	12,6	6,03
Wire feed speed (cm/min)				
7622	4905	7277	4480	7622
Interpass temperature in °C (min/max)	Min 80 °C / Max 150°C			
Welding equipment .trade mark / Type	ESAB TIG 4000i			

Pre heat	NO	Temperature°C.....	Holding Time.....
Post heating	NO	Temperature°C.....	Holding Time.....
Post Weld Heat treatment	NO	Temperature°C.....	Holding Time.....

Prepared by Representative

Endorsed by BV Surveyor

Name: NEJDET AKPINAR
(TR-IIW-IWIP .INT. WELDING INSPECTOR)

Signature / Stamp

Name: HAKAN TIRYAKI

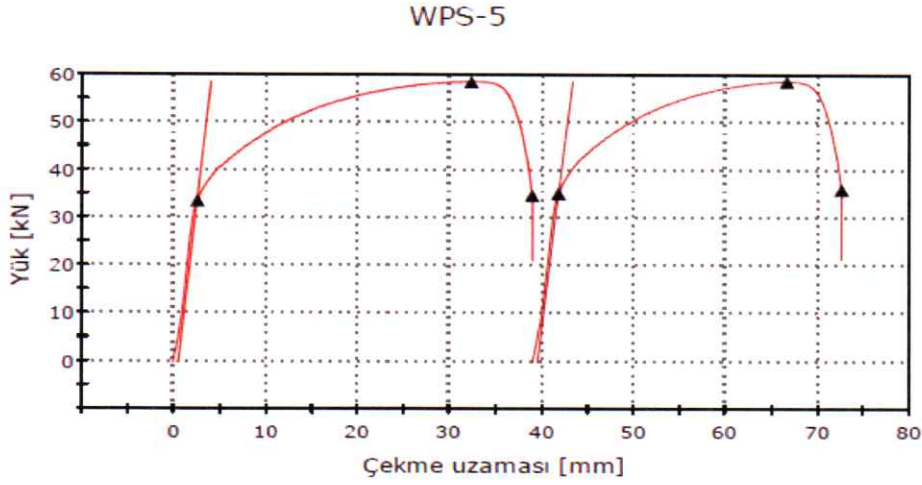
Signature

Stamp

TS EN ISO 4136 'ya göre Çekme Deneyi Raporu
Transverse Tensile Test Report According to TS EN ISO 4136

Rapor No/Report Nr. : 1746-18-ÇEKME-
Müşteri/Customer : GÜNAL GEMİ
Proje adı/Project name : ...
Test Parçası Tanımı / Test Piece Designation : WPS-5 HEAT NR A161089 HL045 141
Ürün Formu/Form of product : PIPE Ø2"X8,8 mm
Ortam sıcaklığı/ Ambient temp. : 23°C
Dolgu Metali/Filler metal : ...
Ana Metal /Parent metal : 316L
Cihaz Bilgisi /Device Information : INSTRON 5989-600kN

Deneyin Amacı: Kaynaklı malzemenin mekanik değerlerini ölçmek.
Purpose of the examination: Welded material's mechanical values of the measure.

ÇEKME DENEY GRAFİKLERİ
Tensile Test Charts

Test Numune No Test Piece No	Boyutlar Size of Specimen mm ²	Akma Dayanımı %0,2 (Yield Strength) N/mm ²	Çekme Dayanımı (Tensile Strength) N/mm ²	Maks. Yük (Max. Load) kN	Kırılma Bölgesi (Location of fracture)	Notlar; Çatlak Kırılma Görünüşü (Remarks e.g. fracture appearance)
1	106,26	316	551	59	AM	...
2	106,26	331	551	59	AM	...
..

NOTLAR Malzeme bilgisi müşteri beyanıdır.. (Material information was given by Customer)
NOTES Kopyalanamaz, tüm hakları gizlidir. (Can not be copied, all rights reserved.)

TARİH
Date

SURVEYOR

OPERATÖR
(Performed by)

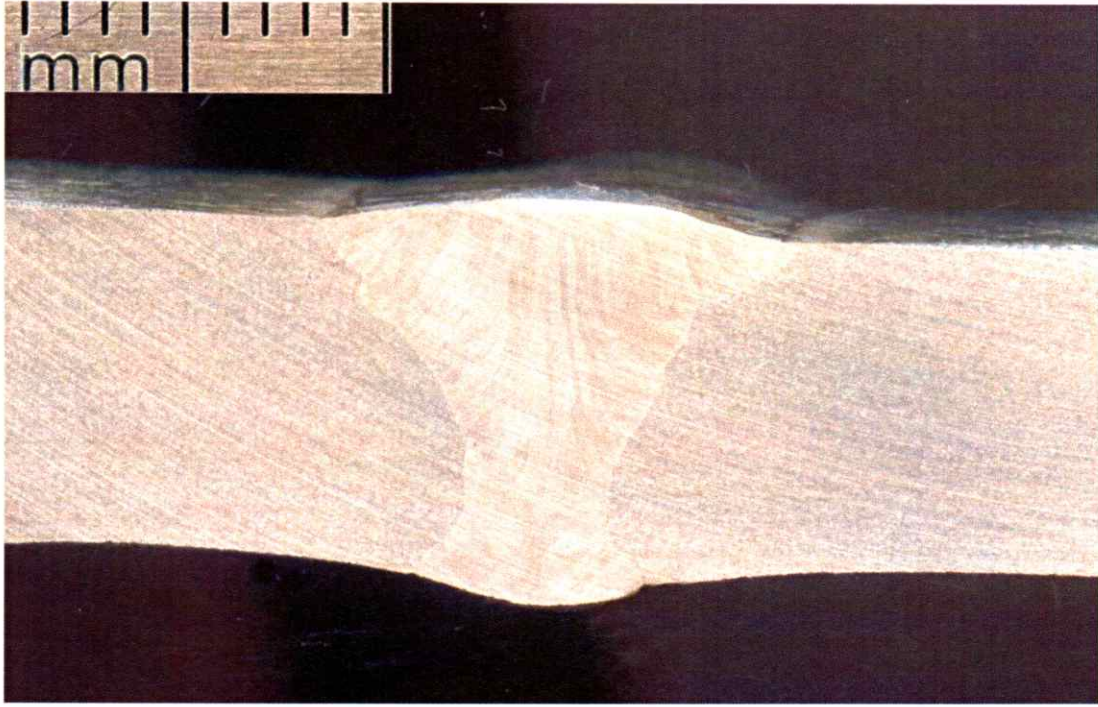
MEK. TEST LAB. YÖNETİCİSİ
(Mech. Testing Lab. Manager)

11.05.2018



TS EN ISO 17639'a göre Makro İnceleme Deney Raporu
Macro Examination Test Report According to TS EN ISO 17639

Rapor No/Report Nr. : 1748-18-MAKRO-
Müşteri/Customer : GÜNAL GEMİ
Proje adı/Project Nr. : ...
Test Parçası Tanımı / Test Piece Designation : WPS-5 HEAT NR A161089 HL045 141
Ürün Formu/Form of product : PIPE Ø2"X8,8 mm
Ortam sıcaklığı/ Ambient temp. : 20°C
Dağlama Çözeltisi/Eaching solution : H2O+HCl+FeCl3
DolguMetalı/Filler metal : ...
Ana Metal /Parent metal : 316L
Cihaz Bilgisi/Device information : EPSON V 500 PHOTO
Deneyin amacı/Purpose of examination : WPQR

MAKRO YAPI GÖRÜNTÜLERİ
Macro Structure Spectrum

NOTLAR Malzeme bilgisi müşteri beyanıdır. (Material information was given by Customer)
NOTES Kopyalanamaz, tüm hakları gizlidir. (Can not be copied, all rights reserved.)

TARİH
Date

11.05.2018

OPERATÖR
Performed by



MEK. TEST LAB. YÖNETİCİSİ
Mech. Testing Lab. Manager



İmkosan Mühendislik Ltd. Şti.

Adres: Güzelyalı mh. Alinteri sk. No:4 Pendik/Istanbul (34903)
Tel: 0216 392 82 78 (92) Faks: 0216 392 82 79

1
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LAB.F.003/04.06.2012/Rev.02-25.01.2017

