

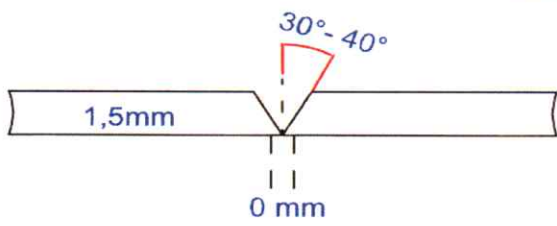
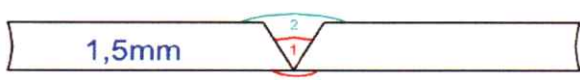
# pWPS

Page 1/1

## WELDING PROCEDURE SPECIFICATION

|                       |                      |                             |                          |                 |
|-----------------------|----------------------|-----------------------------|--------------------------|-----------------|
| WPQR No               | WPQR - 4             | Parent Material Grad        | Part 1 : CuNiFe          | Part 2 : CuNiFe |
| Method of preparation | : CNC                | Range of Material thickness | : 0,5mm to 3mm           |                 |
| and cleaning          | : Brushing/grinding  | Range of Outside diameter   | : 28,5 ≥ D > 500mm       |                 |
| Joint Type            | : Butt joint         | Range of Welding Position   | : H-L045 (All positions) |                 |
| Parent Material Spec. | : CuNiFe (DN50 57mm) |                             |                          |                 |

### Welding Preparation Details

| Joint design                                                                      | Welding sequences                                                                  |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |

### Welding Details

|                                          |                       |                    |                   |  |  |
|------------------------------------------|-----------------------|--------------------|-------------------|--|--|
| Run number                               | 1                     | 2                  |                   |  |  |
| Welding process                          | GTAW                  | GTAW               |                   |  |  |
| Autom. Welding .nr. of heads             |                       |                    |                   |  |  |
| .weaving                                 |                       |                    |                   |  |  |
| Filler metal: wire (W) or electrode (E)  | W                     | W                  |                   |  |  |
| .Designation                             | Böhler Welding        |                    |                   |  |  |
| .Grade                                   | CuNi 30 Fe            |                    |                   |  |  |
| .Description                             | CuNi 30 Fe            |                    |                   |  |  |
| .Diameter                                | 3,2                   | 3,2                |                   |  |  |
| Shielding: Flux (F) or gas (G)           | G                     | G                  |                   |  |  |
| .Powder flux .description                |                       |                    |                   |  |  |
| .type and trade name                     | 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                 |                   |  |  |
| Electrode or wire polarity               | -                     | -                  |                   |  |  |
| Current (A)                              | 72-73                 | 65-67              |                   |  |  |
| Voltage (V)                              | 9,1-9,2               | 9,2-9,3            |                   |  |  |
| Travel speed S (cm/min)                  | 8,6                   | 7,5                |                   |  |  |
| Wire feed speed (cm/min)                 |                       |                    |                   |  |  |
| Heat input (J/cm) = [k x V x A x 60] / S | 2811                  | 2990               |                   |  |  |
| 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..... |  |  |
| Welder: Ahmet DEMİR                      |                       |                    |                   |  |  |

### Prepared by Representative

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

### Endorsed by BV Surveyor

Name: HAKAN TIRYAKI  
Signature : .....



|                                                                                                                                              |               |                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------|
| <br>GÜNAL GEMİ İNŞAAT MAKİNA NAKLİYE SAN. VE TİC. LTD. ŞTİ. | <h1>WPQR</h1> | WPQR No: 4<br>432ITB18<br><br>Page 1 of 4 |
|----------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------|

## 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 : 0716 447 37 40 Tic. Sicil No : 255 133  
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 : .....



**1 DETAILS OF WELD TEST**

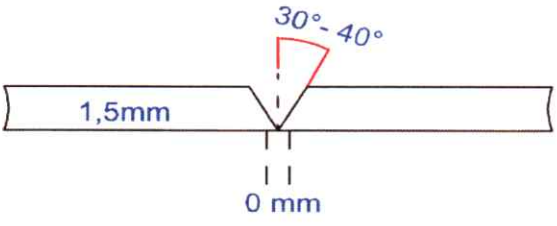
Method of preparation: CNC

Cleaning : Brushing/grinding

Joint type : Butt joint

Parent material spec : CuNiFe(Copper – Nickel 90/10)  
Heat Nr : NR0727 NR0727  
Material thickness : 1,5mm  
Outside diameter : 57 (DN50)

**Weld Preparation Details**

| Joint design                                                                      | Welding sequences                                                                  |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |

**Welding Details**

|                                            |                       |         |  |  |  |  |
|--------------------------------------------|-----------------------|---------|--|--|--|--|
| Run number                                 | 1                     | 2       |  |  |  |  |
| Welding process                            | GTAW                  | GTAW    |  |  |  |  |
| Welding position                           | HL-045                | HL-045  |  |  |  |  |
| Autom. Welding .nr. of heads               |                       |         |  |  |  |  |
| .weaving                                   |                       |         |  |  |  |  |
| Filler metal: wire (W) or electrode (E)    | W                     | W       |  |  |  |  |
| .Designation                               | Böhler Welding        |         |  |  |  |  |
| .Grade                                     | CuNi 30 Fe            |         |  |  |  |  |
| .Description                               | CuNi 30 Fe            |         |  |  |  |  |
| .Diameter                                  | 3,2                   | 3,2     |  |  |  |  |
| Shielding: Flux (F) or gas (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      |  |  |  |  |
| Electrode or wire polarity                 | -                     | -       |  |  |  |  |
| Current (A)                                | 72-73                 | 65-67   |  |  |  |  |
| Voltage (V)                                | 9,1-9,2               | 9,2-9,3 |  |  |  |  |
| Travel speed S (cm/min)                    | 86,04                 | 75,201  |  |  |  |  |
| Wire feed speed (cm/min)                   |                       |         |  |  |  |  |
| Heat input (J/cm) = [ k x V x A x 60 ] / S | 2811                  | 2990    |  |  |  |  |
| Interpass temperature in °C (min/max)      | Min 80 °C / Max 150°C |         |  |  |  |  |
| Welding equipment .trade mark / Type       | ESAB TIG 4000i        |         |  |  |  |  |

Pre heat ☒ No ☐ Yes

Temperature°C N.A

Holding Time.....

Post heating ☒ No ☐ Yes

Temperature°C.....N.A

Holding Time.....

Post Weld Heat treatment ☒ No ☐ Yes

Temperature°C...N.A

Holding Time.....



|                                                                                                                                                                        |                                                                                                           |                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|  <p><b>GÜNAL GEMİ</b><br/>GÜNAL GEMİ İNŞAAT MAKİNA NAKLİYE SAN. VE TİC. LTD. ŞTİ.</p> | <p align="center"><b>WELDING PROCEDURE<br/>QUALIFICATION RECORD</b></p> <p align="center"><b>WPQR</b></p> | <p align="center"><b>WPQR No: 4<br/>432ITB18</b></p> <p align="center">Page 3 of 4</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|

## 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: 1743/18 - 11.05.2018

| Test Numune No<br><i>Test Piece No</i> | Boyutlar<br><i>Size of Specimen<br/>mm<sup>2</sup></i> | Akma Dayanımı %0,2<br><i>(Yield Strength)<br/>N/mm<sup>2</sup></i> | Çekme Dayanımı<br><i>(Tensile Strength)<br/>N/mm<sup>2</sup></i> | Maks. Yük<br><i>(Max. Load)<br/>kN</i> | Kırılma Bölgesi<br><i>(Location of<br/>fracture)</i> | Notlar; Çatlak<br>Kırılma Görünüşü<br><i>(Remarks<br/>e.g. fracture appearance)</i> |
|----------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1                                      | 17,07                                                  | 155                                                                | 335,5                                                            | 5,73                                   | AM                                                   | ---                                                                                 |
| 2                                      | 17,07                                                  | 165                                                                | 344,5                                                            | 5,88                                   | AM                                                   | ---                                                                                 |
| --                                     | --                                                     | --                                                                 | --                                                               | --                                     | --                                                   | --                                                                                  |

## 2.3 BEND TESTS

Performed by: İMKOSAN

Report Nr. / DATE: 1744/18 – 11.05.2018

| Test Numune No<br><i>Test Piece No</i> | Deney Türü<br><i>(Type of test)</i> | Boyutlar<br><i>(Dimensions) w<br/>x t x l (mm)</i> | Mandrel çapı<br><i>(Former diameter)<br/>mm</i> | Mesnetler arası<br>mesafe<br><i>(Distance<br/>between rollers)<br/>mm</i> | Eğme açısı<br><i>(Bend angle<br/>degrees)</i> | Notlar; Çatlak<br>Kırılma Görünüşü<br><i>(Remarks<br/>e.g. fracture appearance)</i> |
|----------------------------------------|-------------------------------------|----------------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------------------|
| 1                                      | ROOT                                | 1,5x30x300                                         | 3                                               | 8                                                                         | 180                                           | ACCEPTABLE                                                                          |
| 2                                      | ROOT                                | 1,5x30x300                                         | 3                                               | 8                                                                         | 180                                           | ACCEPTABLE                                                                          |
| 3                                      | FACE                                | 1,5x30x300                                         | 3                                               | 8                                                                         | 180                                           | ACCEPTABLE                                                                          |
| 4                                      | FACE                                | 1,5x30x300                                         | 3                                               | 8                                                                         | 180                                           | ACCEPTABLE                                                                          |

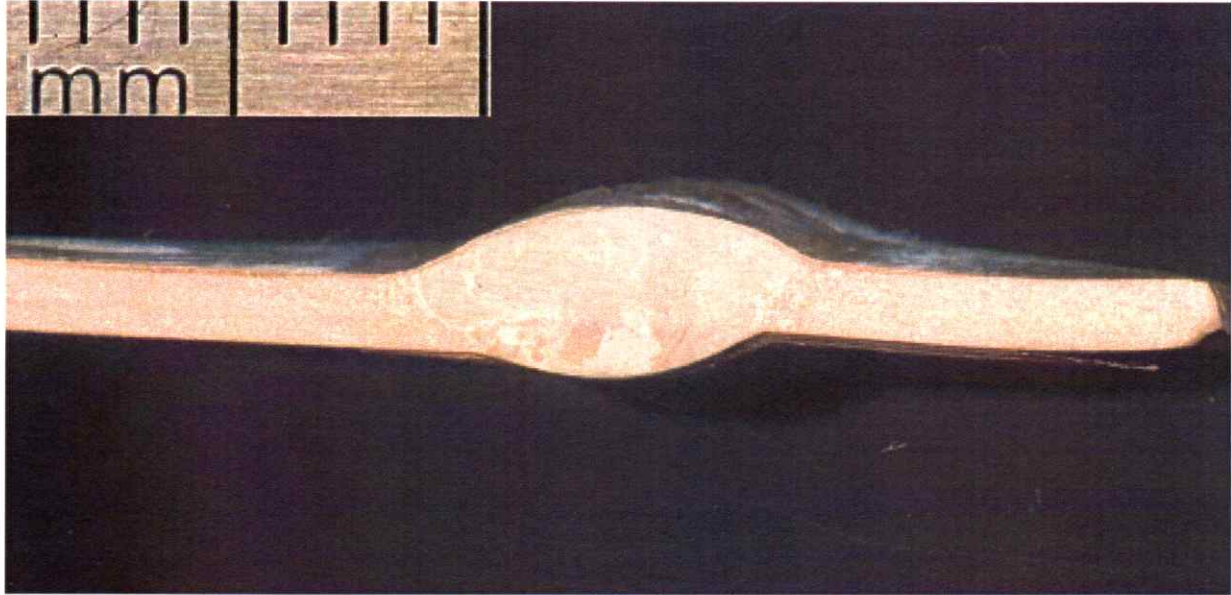


|                                                                                                                                                  |                                                                                                           |                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|  <p>GÜNAL GEMİ İNŞAAT MAKİNA NAKLIYE SAN. VE TİC. LTD. ŞTİ.</p> | <p align="center"><b>WELDING PROCEDURE<br/>QUALIFICATION RECORD</b></p> <p align="center"><b>WPQR</b></p> | <p align="center"><b>WPQR No: 4<br/>432ITB18</b></p> <p align="center">Page 4 of 4</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|

- 2.4 IMPACT TESTS-NA
- 2.5 HARDNESS TEST-NA
- 2.6 MACROGRAPHIC EXAMINATION

Performed by: İMKOSAN  
MAKRO  
Observations :

Report Nr. / DATE: 1745/18 – 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 /İMKOSAN/04144/18/SE – 30.04.2018  | <br> | <p align="center"><b>NEJDET AKPINAR</b><br/>(TR-İİW-İWIP-INT. WELDING INSPECTOR)</p> <br> <p><small>GÜNAL GEMİ İNŞAAT MAKİNA NAKLIYE SAN. VE TİC. LTD. Ş<br/>Aydıntepe Mh. Sahil Bulvarı Altın İş Merkezi No: 19 / 14 Tuzla / İ<br/>Tel: 0216 447 37 40 Tic. Sicil No: 145 133<br/>Tuzla V.D. 428 053 9954 Mersis No: 0428 053 9954 00018<br/>www.gunalgemi.com e-mail: gungalgemi@gmail.com</small></p> |
| Dye Penetrant Test Report /İMKOSAN/04056/18/PT – 28.04.2018 |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Visual Test Report /İMKOSAN/04058/18/VT – 28.04.2018        |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Tensile Test Report/ İMKOSAN/1743/18 - 11.05.2018           |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Bend Test Report /İMKOSAN/1744/18 – 11.05.2018              |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Impact test report/ İMKOSAN/ N/A                            |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Hardness test report / N/A                                  |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Macrographic Test Rep. /İMKOSAN/1745/18 – 11.05.2018        |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## WELDING PROCEDURE SPECIFICATION

WPQR No : WPQR - 4  
Method of preparation : CNC  
and cleaning : Brushing/grinding  
Joint Type : Butt joint  
Parent Material Spec. : CuNiFe (DN50 57mm)

Part 1 : CuNiFe  
Part 2 : CuNiFe  
Range of Material thickness : 0,5mm to 3mm  
Range of Outside diameter :  $28,5 \geq D > 500\text{mm}$   
Range of Welding Position : H-L045 (All positions)

### Welding Preparation Details

| Joint design | Welding sequences |
|--------------|-------------------|
|              |                   |

### Welding Details

|                                                           |                       |                    |                   |  |  |
|-----------------------------------------------------------|-----------------------|--------------------|-------------------|--|--|
| Run number                                                | 1                     | 2                  |                   |  |  |
| Welding process                                           | GTAW                  | GTAW               |                   |  |  |
| Autom. Welding .nr. of heads                              |                       |                    |                   |  |  |
| .weaving                                                  |                       |                    |                   |  |  |
| Filler metal: wire (W) or electrode (E)                   | W                     | W                  |                   |  |  |
| .Designation                                              | Böhler Welding        |                    |                   |  |  |
| .Grade                                                    | CuNi 30 Fe            |                    |                   |  |  |
| .Description                                              | CuNi 30 Fe            |                    |                   |  |  |
| .Diameter                                                 | 3,2                   | 3,2                |                   |  |  |
| Shielding: Flux (F) or gas (G)                            | G                     | G                  |                   |  |  |
| .Powder flux .description                                 |                       |                    |                   |  |  |
| .type and trade name                                      | 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                 |                   |  |  |
| Electrode or wire polarity                                | -                     | -                  |                   |  |  |
| Current (A)                                               | 72-73                 | 65-67              |                   |  |  |
| Voltage (V)                                               | 9,1-9,2               | 9,2-9,3            |                   |  |  |
| Travel speed S (cm/min)                                   | 8,6                   | 7,5                |                   |  |  |
| Wire feed speed (cm/min)                                  |                       |                    |                   |  |  |
| Heat input (J/cm) = $[k \times V \times A \times 60] / S$ | 2811                  | 2990               |                   |  |  |
| 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..... |  |  |
| Welder: Ahmet DEMİR                                       |                       |                    |                   |  |  |

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 5173'e göre Eğme Deneyi Raporu***Bend Test Report According to EN 5173*

Rapor No/Report Nr. : 1744-18-EĞME-  
Müşteri/Customer : GÜNAL GEMİ  
Proje adı/Project name : ...  
Test Parçası Tanımı / Test Piece Designation : WPS-4 HEAT NR NR0727 HL045 141  
Ürün Formu/Form of product : PIPE Ø2"X1,5 mm  
Ortam sıcaklığı/ Ambient temp. : 23 °C  
DolguMetalı/Filler metal : ...  
Ana Metal /Parent metal : CuNi10Fe1,6Mn  
Deneyin amacı/Purpose of examination : WPQR  
Cihaz Bilgisi /Device Information : INSTRON 5989-600kN

| Test Numune No | Deney Türü     | Boyutlar                    | Mandrel çapı         | Mesnetler arası mesafe        | Eğme açısı           | Notlar; Çatlak Kırılma Görünüşü   |
|----------------|----------------|-----------------------------|----------------------|-------------------------------|----------------------|-----------------------------------|
| Test Pice No   | (Type of test) | (Dimensions) w x t x l (mm) | (Former diameter) mm | (Distance between rollers) mm | (Bend angle degrees) | (Remarks e.g. fracture apperance) |
| 1              | ROOT           | 1,5x30x300                  | 3                    | 8                             | 180                  | ACCEPTABLE                        |
| 2              | ROOT           | 1,5x30x300                  | 3                    | 8                             | 180                  | ACCEPTABLE                        |
| 3              | FACE           | 1,5x30x300                  | 3                    | 8                             | 180                  | ACCEPTABLE                        |
| 4              | FACE           | 1,5x30x300                  | 3                    | 8                             | 180                  | ACCEPTABLE                        |
| 5              |                |                             |                      |                               |                      |                                   |
| 6              |                |                             |                      |                               |                      |                                   |

**NOTLAR** Malzeme bilgisi müşteri beyanıdır. (Material information was given by Customer)  
**NOTES** Kopyalanamaz, tüm hakları gizlidir. (Can not be copied, all rights reserved.)  
Numune ölçülerinde BV kuralları baz alınmıştır.

**TARİH**

Date

**SURVEYOR****OPERATÖR**

(Performed by)

**MEK. TEST LAB. YÖNETİCİSİ**

(Mech. Testing Lab. Manager)

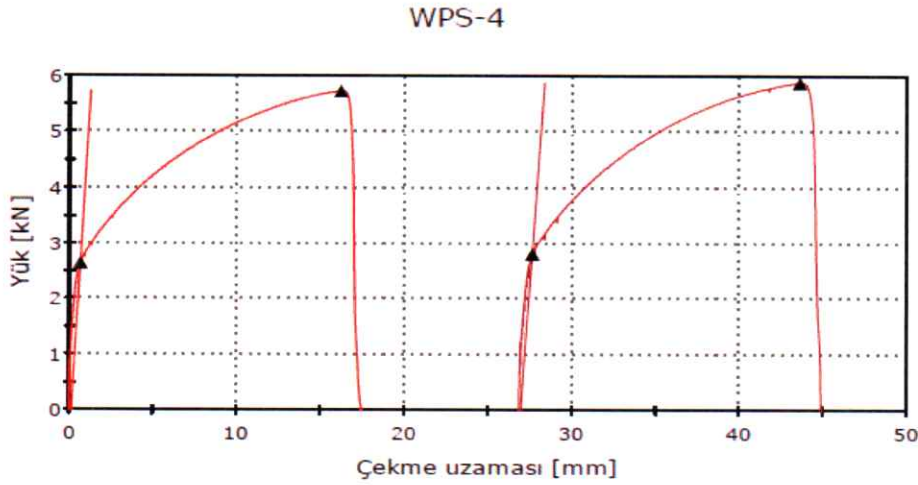


11.05.2018

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

Rapor No/Report Nr. : 1743-18-ÇEKME-  
Müşteri/Customer : GÜNAL GEMİ  
Proje adı/Project name : ...  
Test Parçası Tanımı / Test Piece Designation : WPS-4 HEAT NR NR0727 HL045 141  
Ürün Formu/Form of product : PIPE Ø2"X1,5 mm  
Ortam sıcaklığı/ Ambient temp. : 23°C  
DolguMetalı/Filler metal : ...  
Ana Metal /Parent metal : CuNi10Fe1,6Mn  
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<br>Test Piece No                                                                                                                                   | Boyutlar<br>Size of Specimen<br>mm <sup>2</sup> | Akma<br>Dayanımı %0,2<br>(Yield Strength)<br>N/mm <sup>2</sup> | Çekme Dayanımı<br>(Tensile Strength)<br>N/mm <sup>2</sup> | Maks. Yük<br>(Max. Load)<br>kN | Kırılma Bölgesi<br>(Location of<br>fracture) | Notlar; Çatlak<br>Kırılma Görünüşü<br>(Remarks<br>e.g. fracture appearance) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------|--------------------------------|----------------------------------------------|-----------------------------------------------------------------------------|
| 1                                                                                                                                                                 | 17,07                                           | 155                                                            | 335,5                                                     | 5,73                           | AM                                           | ...                                                                         |
| 2                                                                                                                                                                 | 17,07                                           | 165                                                            | 344,5                                                     | 5,88                           | AM                                           | ...                                                                         |
| ..                                                                                                                                                                | ..                                              | ..                                                             | ..                                                        | ..                             | ..                                           | ..                                                                          |
|                                                                                                                                                                   |                                                 |                                                                |                                                           |                                |                                              |                                                                             |
|                                                                                                                                                                   |                                                 |                                                                |                                                           |                                |                                              |                                                                             |
|                                                                                                                                                                   |                                                 |                                                                |                                                           |                                |                                              |                                                                             |
| NOTLAR<br>NOTES                                                                                                                                                   |                                                 |                                                                |                                                           |                                |                                              |                                                                             |
| Malzeme bilgisi müşteri beyanıdır.. (Material information was given by Customer)<br>Kopyalanamaz, tüm hakları gizlidir. (Can not be copied, all rights reserved.) |                                                 |                                                                |                                                           |                                |                                              |                                                                             |

TARİH  
Date

11.05.2018



OPERATÖR  
(Performed by)

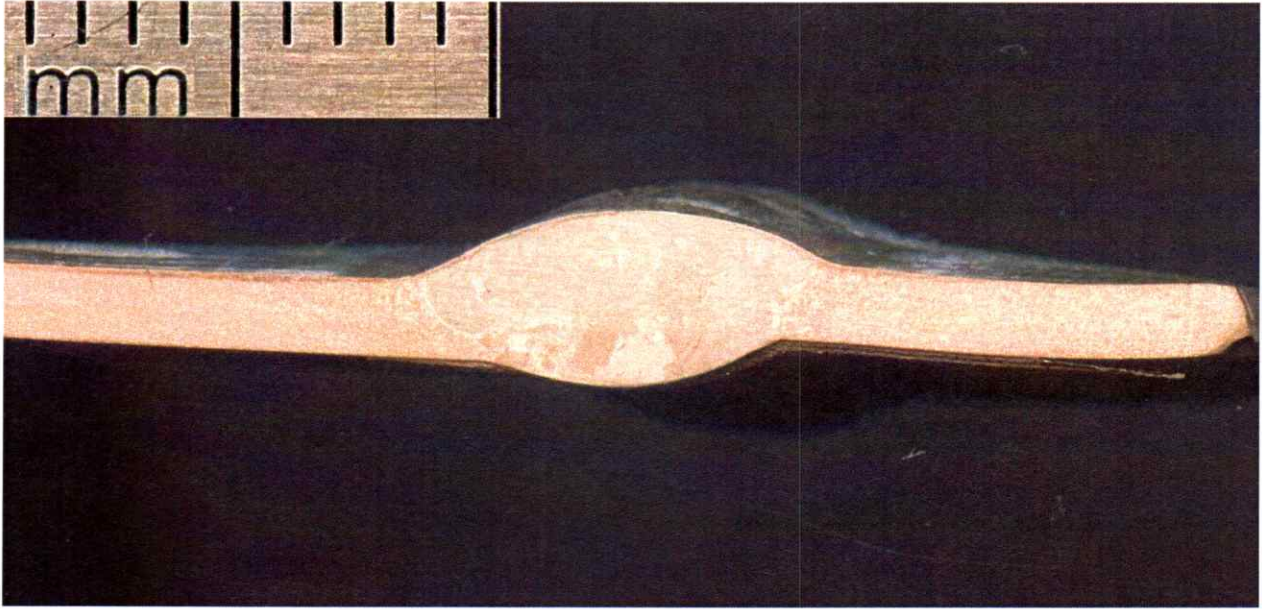


MEK. TEST LAB. YÖNETİCİSİ  
(Mech. Testing Lab. Manager)



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

Rapor No/Report Nr. : 1745-18-MAKRO-  
Müşteri/Customer : GÜNAL GEMİ  
Proje adı/Project Nr : ...  
Test Parçası Tanımı / Test Piece Designation : WPS-4 HEAT NR NR0727 HL045 141  
Ürün Formu/Form of product : PIPE Ø2"X1,5 mm  
Ortam sıcaklığı/ Ambient temp. : 20°C  
Dağlama Çözeltisi/Eaching solution : H2O+HCl+FECI3  
DolguMetalı/Filler metal : ...  
Ana Metal /Parent metal : CuNi10Fe1,6Mn  
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

OPERATÖR  
Performed by

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

11.05.2018



**İmkosan Mühendislik Ltd. Şti.**

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

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



## GEDİK KAYNAK LABORATUVARI

NUMUNE ADI : NUMUNE1

ANALİZ KODU : BAKIR BAZLI-10mm

İLGİLİ FIRMA : İMKOSAN

ONAY : TULAY OZGUL

İLGİLİ KİŞİ : FATİH ÖZTÜRK

| No.   | Result       | Unit |
|-------|--------------|------|
| 1 Sn  | 0.005 mass%  |      |
| 2 Zn  | 0.040 mass%  |      |
| 3 Ni  | 11.207 mass% |      |
| 4 Co  | 0.006 mass%  |      |
| 5 Fe  | 1.715 mass%  |      |
| 6 Al  | 0.000 mass%  |      |
| 7 Si  | 0.000 mass%  |      |
| 8 P   | 0.000 mass%  |      |
| 9 S   | 0.000 mass%  |      |
| 10 Pb | 0.000 mass%  |      |
| 11 Bi | 0.000 mass%  |      |
| 12 Sb | 0.000 mass%  |      |
| 13 As | 0.079 mass%  |      |
| 14 Ag | 0.003 mass%  |      |
| 15 Cr | 0.000 mass%  |      |
| 16 Mn | 0.656 mass%  |      |
| 17 Cu | 86.288 mass% |      |

