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Certificate of conformance

ACCORDING TO EN–10204-3.1

CERT. No	125/19	ORDER	0152/18
CUSTOMER ORDER	201802382	INVOICE	**TBA**
CUSTOMER	KOVIS GROUP	DATE	28/8/2019

We certify that the supplies stated below :

Drawing	Alloy	Description	Lot (Pcs)	Pieces	S/N
107RS 090300-1-02	340-550W	AXLE BOX LEFT	22325-4 22582-4 22241-1 22320-5 22322-5	19	22325 - EGN36 22582 - EGN39 22241 - EGN31 22320 - EGN34 22322 - EGN35

Which has been inspected

For Chemical Composition using mass spectrograph type SpectroMaXx LMM15 and were found the following results acc. to ISO3755:

LOT	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu %	V %	CE %
SPEC	Max 0.25	Max 0.6	Max 1.5	Max 0.035	Max 0.035	Max 0.35	Max 0.4	Max 0.15	Max 0.4	Max 0.05	0
22325	0.23	0.412	1.12	0.0211	0.0209	0.186	0.354	0.0285	0.128	0.0451	
22582	0.224	0.398	1.17	0.0202	0.0161	0.151	0.350	0.0124	0.0938	0.0146	
22241	0.221	0.418	1.21	0.0219	0.0144	0.165	0.323	0.020	0.121	0.0107	
22320	0.23	0.417	1.10	0.0203	0.0123	0.154	0.339	0.008	0.118	0.0042	
22322	0.242	0.401	1.13	0.021	0.0194	0.219	0.394	0.033	0.143	0.031	

Mechanical Properties acc. to ISO3755, ISO6892, ISO148

LOT	Code	R (N/mm^2)	Rm (N/mm^2)	A (%)	Impact (J)@-20°C	Z (%)	R.E. %
SPEC	0493-011	Min 340	550-700	Min 18	Min 15 @-20oC	Min 21	
22325	0493-011	367	573	27.9	31-33-31	32	
22582	0493-011	368	574	38	42-41-43	33.4	
22241	0493-011	407	668	20	23-25-24	28	
22320	0493-011	368	580	31	41-40-40	34	
22322	0493-011	352	574	30.2	40-39-42	38	

NDT

LOT		MT 100%	VT 100%
SPEC	NDT	ISO 4986 , SM2-LM2-AM2(MS) + SM4-LM3-AM3(RS)	EN 1370 3S1, A3, B5, C3, D4, E4
22325		√	A2,B2,C1,D1,E1,F1,G1,H1,J1
22582		√	A2,B2,C1,D1,E1,F1,G1,H1,J1
22241		√	A2,B2,C1,D1,E1,F1,G1,H1,J1
22320		√	A2,B2,C1,D1,E1,F1,G1,H1,J1
22322		√	A2,B2,C1,D1,E1,F1,G1,H1,J1

Are according to all the above specifications

Marinos Pyxaras
Quality Control Manager

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SURFACE QUALITY TEST REPORT

Report No:	EGN001-125/19	**Contract No:**	0152/18
Customer:	KOVIS GROUP	**Material:**	340-550W
Drawing No:	107RS 090300-1-02	**Diagnostic Area:**	Cast Area
Surface:	Satisfactory		
Test According:	ASTM A802 SCRATA	**Acceptance Stand.:**	EN 1370 3S1, A3, B5, C3, D4, E4

Lot	Number of Castings	Item	Defects	Conclusion	Remarks
22325	4	AXLE BOX LEFT	-	Accepted	-
22582	4	AXLE BOX LEFT	-	Accepted	-
22241	1	AXLE BOX LEFT	-	Accepted	-
22320	5	AXLE BOX LEFT	-	Accepted	-
22322	5	AXLE BOX LEFT	-	Accepted	-

Defects

A: Surface Roughness	**B:** Surface Inclusion	**C:** Gas Porosity
D: Laps and Cold Shuts	**E:** Scabs	**F:** Chaplets
G: Surface Finish-Thermal	**H:** Surface Finish-Mechanical	**J:** Welds

Issue Date:
29/8/2019

Test Date:
26/8/2019

Quality Control Dpt:
Marinos Pyxaras
ASNT NDT Level II VT,PT,MT,UT

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MAGNETIC PARTICLE TEST REPORT - MT

Report No:	EGN001-125/19	**Contract No:**	0152/18
Customer:	KOVIS GROUP	**Material:**	340-550W
Drawing No:	107RS 090300-1-02	**Diagnostic Area:**	Cast Area
Surface:	Satisfactory		
Test According:	ISO 4986 , SM2-LM2-AM2(MS) + SM4-LM3-AM3(RS)	**Acceptance Stand.:**	SM2-LM2-AM2(MS) SM4-LM3-AM3(RS)
Cleaner:	NDT Materials, MR 71 REMOVER	**Inc Application:**	Spraying-Wet Method
Magnetic Inc:	SREM TECH. FLUXO 6-Fluorescent	**Magnetization Type:**	Yoke+Cables
Contrast Paint:	-	**Test Temperature:**	Up to 52^{o}C
Ultra Violet Lamp:	MR 98 WAN BRILLIANT LED		

Lot	Number of Castings	Item	Defects	Conclusion	Remarks
22325	4	AXLE BOX LEFT	-	Accepted	-
22582	4	AXLE BOX LEFT	-	Accepted	-
22241	1	AXLE BOX LEFT	-	Accepted	-
22320	5	AXLE BOX LEFT	-	Accepted	-
22322	5	AXLE BOX LEFT	-	Accepted	-

Defects

A: BLOWHOLES& PINHOLES	B: SAND & SLAG INCLUSION	C: SHRINKAGE
D: CRACKS	E: HOT TEARS	F:INSERT

Issue Date:

29/8/2019

Test Date:

20/7-7/8/2019

Quality Control Dpt:
Marinos Pyxaras

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Tensile Strength Test

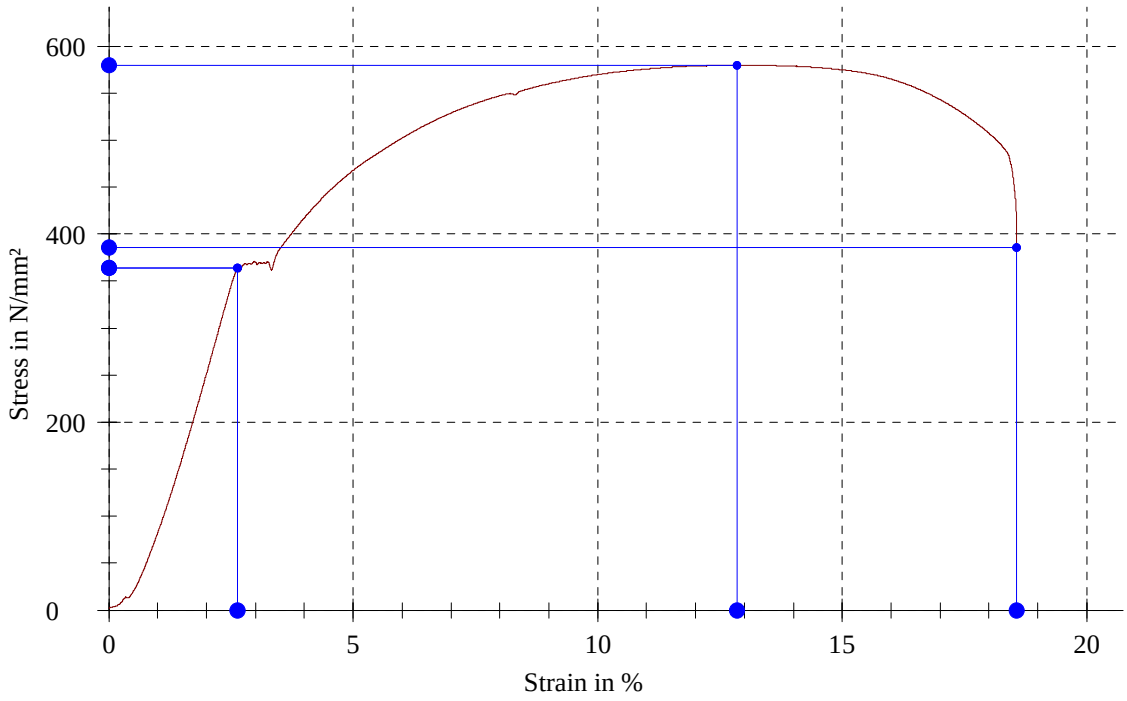
Parameter table:

Customer	: KOVIS	Product Code	: 0493-011 +0493-012
Specimen ID	:	Customer's Product Code	: AXLE BOX LEFT+RIGHT
Lot Number	: 22320	Material	: 340-550W

Results:

Nr	Rm N/mm²	Rp 0.2 N/mm²	ReH N/mm²	EMod kN/mm²	RB N/mm²	εBreak %
12	579,72	367,56	363,65	18,62	385,62	18,57

Series graph:



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Tensile Strength Test

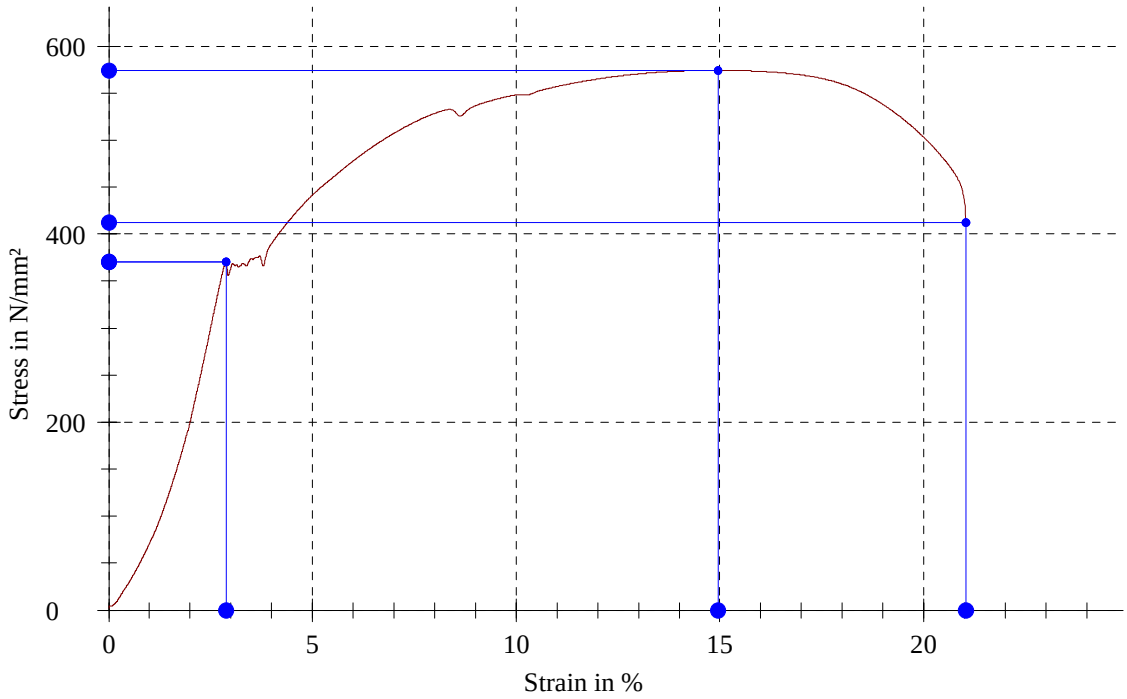
Parameter table:

Customer	: KOVIS	Product Code	: 0493-011 + 0493-012
Specimen ID	:	Customer's Product Code	: AXLE BOX LEFT + RIGHT
Lot Number	: 22582	Material	: 340-550W

Results:

Nr	Rm N/mm²	Rp 0.2 N/mm²	ReH N/mm²	EMod kN/mm²	RB N/mm²	εBreak %
4	574,30	368,55	370,33	19,75	412,64	21,03

Series graph:



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Tensile Strength Test

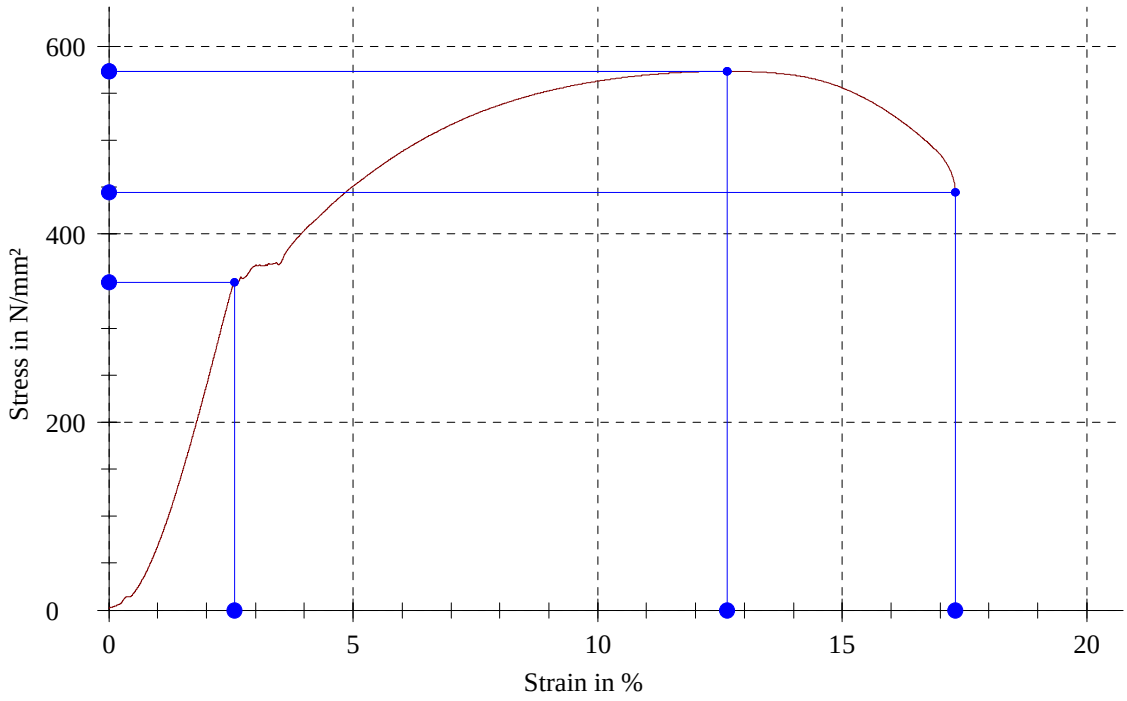
Parameter table:

Customer	: KOVIS	Product Code	: 0493-011 + 0493-012
Specimen ID	:	Customer's Product Code	: AXLE BOX LEFT + RIGHT
Lot Number	: 22325	Material	: 340-550W

Results:

Nr	Rm N/mm²	Rp 0.2 N/mm²	ReH N/mm²	EMod kN/mm²	RB N/mm²	εBreak %
6	573,31	366,82	348,42	16,69	444,08	17,31

Series graph:



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Tensile Strength Test

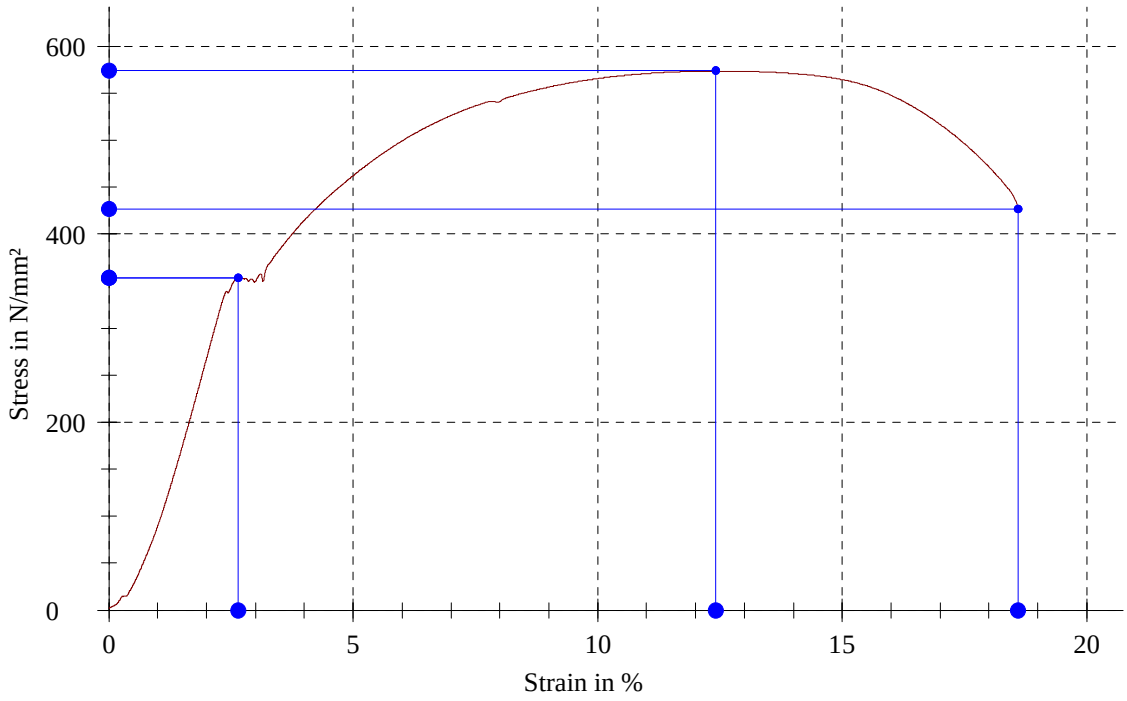
Parameter table:

Customer	: KOVIS	Product Code	: 0493-011 + 0493-012
Specimen ID	:	Customer's Product Code	: AXLE BOX LEFT+RIGHT
Lot Number	: 22322	Material	: 340-550W

Results:

Nr	Rm N/mm²	Rp 0.2 N/mm²	ReH N/mm²	EMod kN/mm²	RB N/mm²	εBreak %
1	573,58	352,31	353,55	16,82	427,06	18,60

Series graph:



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Tensile Strength Test

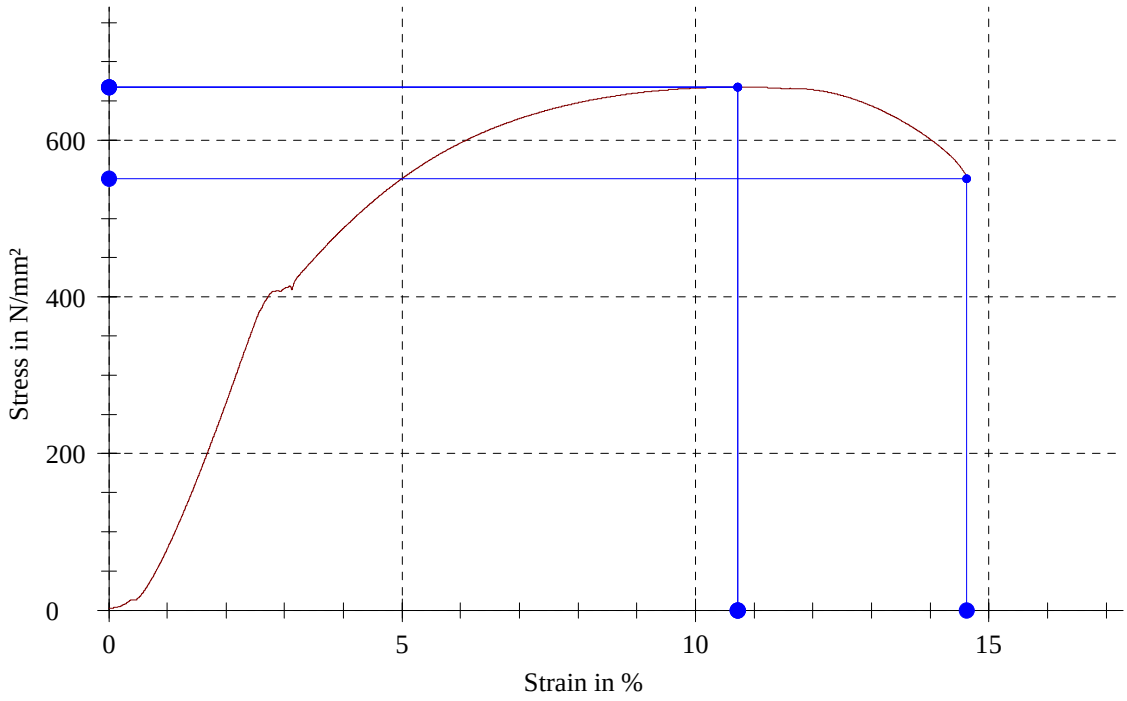
Parameter table:

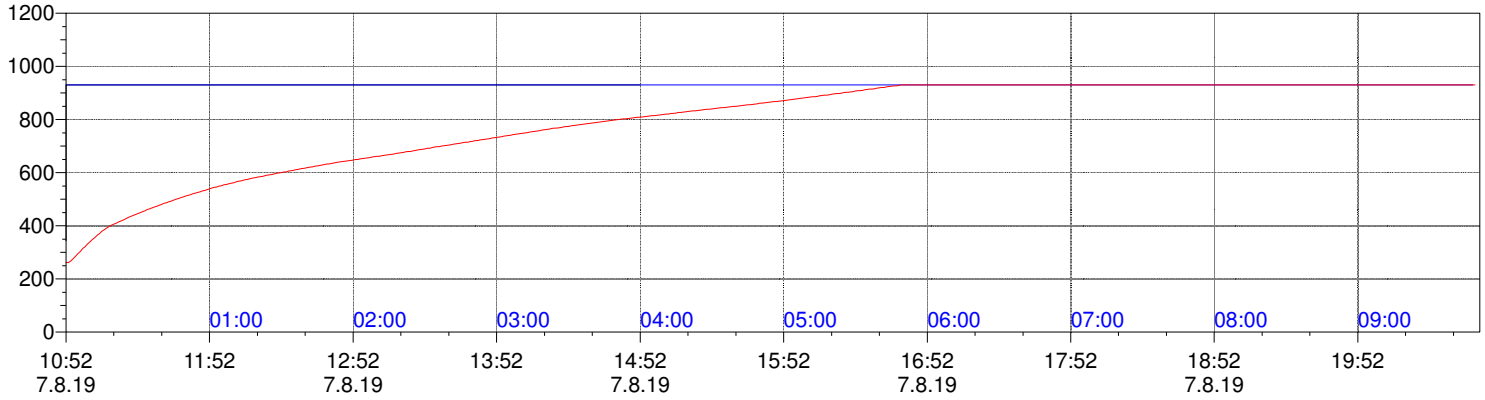
Customer	: KOVIS	Product Code	: 0493-011 + 0493-012
Specimen ID	:	Customer's Product Code	: AXLE BOX LEFT+RIGHT
Lot Number	: 22241	Material	: 340-550W

Results:

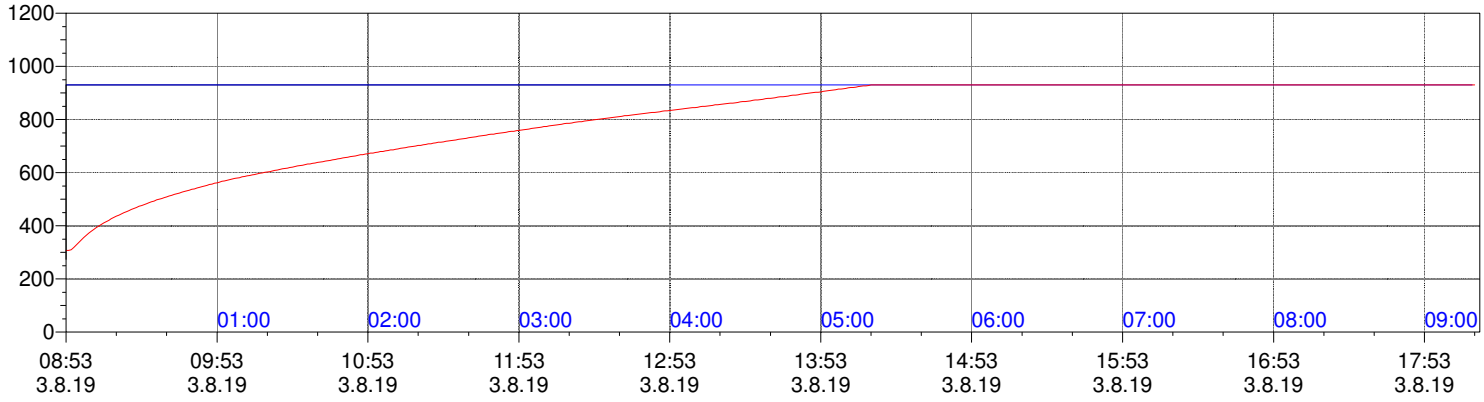
Nr	Rm N/mm²	Rp 0.2 N/mm²	ReH N/mm²	EMod kN/mm²	RB N/mm²	εBreak %
1	667,88	407,55	667,88	20,52	550,52	14,63

Series graph:

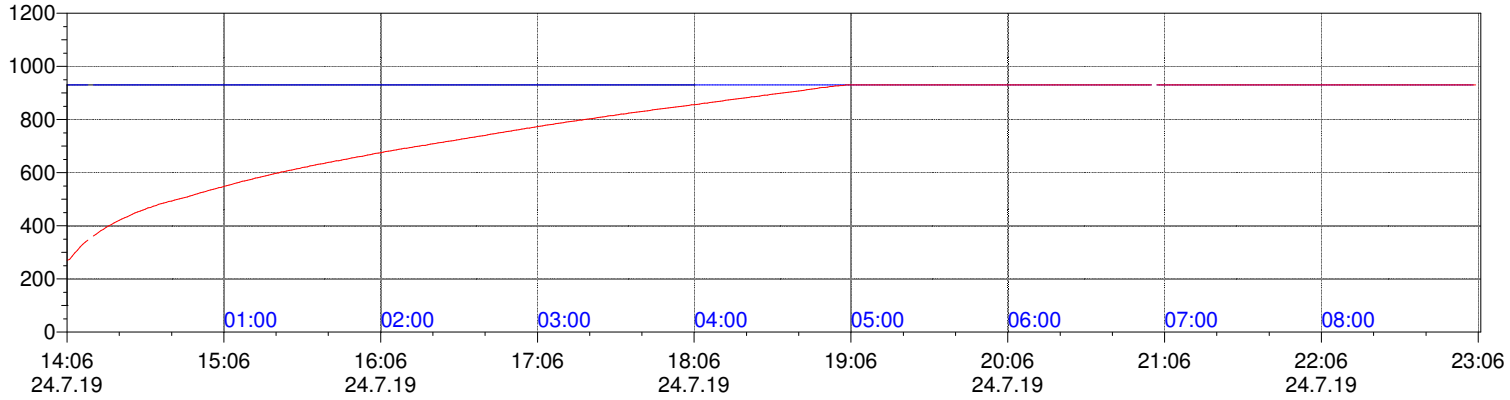




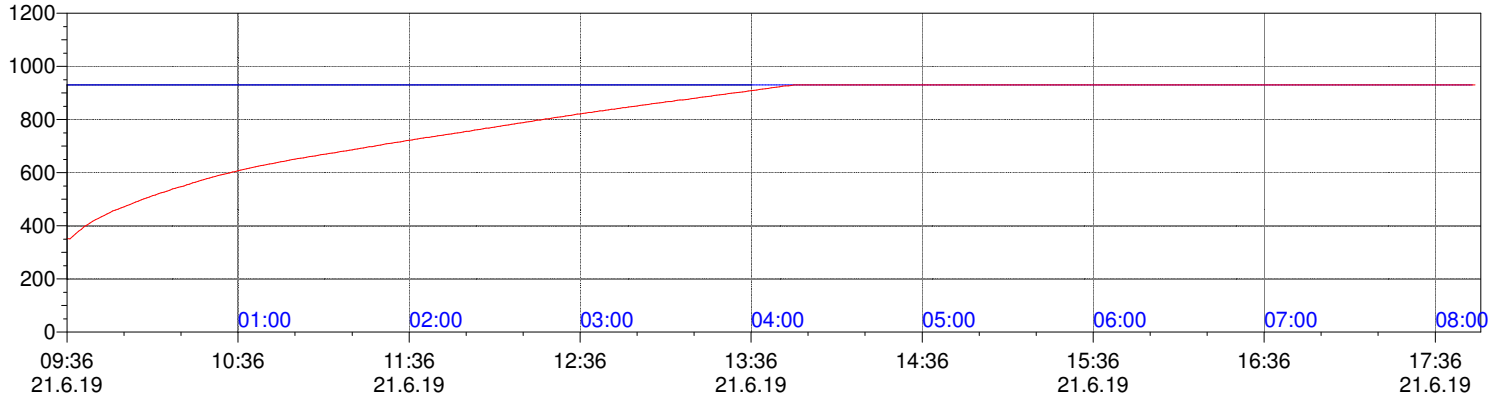
Furnace name: Furnace 2 | Charge: 90708b01
Program No.: 0 | no description
Start: 08/07/19 10:52 AM | End: 08/07/19 08:41 PM
5934 22322 0493-011-012 5+5 930/4H



Furnace name: Furnace 2 | Charge: 90308b01
Program No.: 0 | no description
Start: 08/03/19 08:53 AM | End: 08/03/19 06:13 PM
5920 0493-011-12 22320 5+5tmx22241 1+1tmx
0493-013-014 22721 10+10tmx 930 4h



Furnace name: Furnace 2 | Charge: 92407b01
Program No.: 0 | no description
Start: 07/24/19 02:06 PM | End: 07/24/19 11:05 PM
5873 22325 0493-011-4 0493-012-4



Furnace name: Furnace 2 | Charge: 92106b02
Program No.: 0 | no description
Start: 06/21/19 09:36 AM | End: 06/21/19 05:51 PM
5772 22582 0493-011-4 0493-012-4 1/1 930/4H

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ULTRASONIC TEST REPORT- UT

G4/NDTR2 (23/5/2001)

Report N°: T19.022.UT038	Page N°: 1/1	Sample Received Date (if applicable):	Contract N° :
Client - Address:	EGNATIA FOUNDRY SA (KOVIS GROUP)	Test Location:	ASPROS KILKIS – EGNATIA FAC.
Contractor :	EGNATIA FOUNDRY SA	Project:	
Item :	AXEL BOX LEFT	Drawing No:	107RS 090300-1-02
Material:	340-550W	Heat Treat:	YES
Test According To:	ISO 4992-1	Accept. Standard According To:	ISO 4992-1:LEVEL2
Surface Condition:	CAST pre-machining	Diagnostic Area:	100% of casting area
Test Equipment Mfr:	KRAUTKRAMER	Model:	USM-35X
Couplant: Cellulose glue diluted with water	Calibration Block:	Calibration block No1 (v1), AX2 plate custom made With artificial f.b.h. : 6	Amplification: D.A.C.+4dB Att.
Probes: MB4S-0°, MSEB-4-0°		Ref. flat bottom Hole : 6mm	

A/A	Egn Code	LOT	Lot No	Echo height (db)	Distance from Refer. Point (mm)	Depth of Flaw (mm)	Recording Length (mm)	Flaw Direction		Concl.		Testing		Remarks
								Longit.	Transev.	A.	N.A.	One Side	Both Sides	
1	**0493-011**	22241	1	-	-	-	-			√			√	

According to EN 583-5

Discontinuities definition	Zone definition	
P.D: Point Discontinuity	S.R.Z.: Special Rim Zone	A. : Accepted
C.D: Complex Discontinuity	R.Z. : Rim Zone	N.A. : Non Accepted
PL.D: Planar Discontinuity	C.Z. :Core Zone	
V.D : Volumetric Discontinuity		

Report Approved By:	Issue Date: 06-08-2019	Report Made By: VLAHOS G	Test Made By: BONOS S EN ISO 9712 LEVEL II UT
			Test Date: 06-08-2019

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E-mail: info_the@gatsndt.gr

ULTRASONIC TEST REPORT- UT

G4/NDTR2 (23/5/2001)

Report N°: T19.022.UT036	Page N°: 1/1	Sample Received Date (if applicable):	Contract N° :
Client - Address:	EGNATIA FOUNDRY SA (KOVIS GROUP)	Test Location:	ASPROS KILKIS – EGNATIA FAC.
Contractor :	EGNATIA FOUNDRY SA	Project:	
Item :	AXEL BOX LEFT	Drawing No:	107RS 090300-1-02
Material:	340-550W	Heat Treat:	YES
Test According To:	ISO 4992-1	Accept. Standard According To:	ISO 4992-1:LEVEL2
Surface Condition:	CAST pre-machining	Diagnostic Area:	100% of casting area
Test Equipment Mfr:	KRAUTKRAMER	Model:	USM-35X
Couplant: Cellulose glue diluted with water	Calibration Block: Calibration block No1 (v1), AX2 plate custom made With artificial f.b.h. : 6	Amplification:	D.A.C.+4dB Att.
Probes: MB4S-0°, MSEB-4-0°		Ref. flat bottom Hole : 6mm	

A/A	Egn Code	LOT	Lot No	Echo height (db)	Distance from Refer. Point (mm)	Depth of Flaw (mm)	Recording Length (mm)	Flaw Direction		Concl.		Testing		Remarks
								Longit.	Transev.	A.	N.A.	One Side	Both Sides	
1	**0493-011**	22320	1	-	-	-	-			√			√	
2	-	-	2	-	-	-	-			√			√	
3	-	-	3	-	-	-	-			√			√	
4	-	-	4	-	-	-	-			√			√	
5	-	-	5	-	-	-	-			√			√	

According to EN 583-5

Discontinuities definition	Zone definition	
P.D: Point Discontinuity	S.R.Z.: Special Rim Zone	A. : Accepted
C.D: Complex Discontinuity	R.Z. : Rim Zone	N.A. : Non Accepted
PL.D: Planar Discontinuity	C.Z. :Core Zone	
V.D : Volumetric Discontinuity		

Report Approved By:	Issue Date: 06-08-2019	Report Made By: VLAHOS G.	Test Made By: BONOS S EN ISO 9712 LEVEL II UT
			Test Date: 06-08-2019

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ULTRASONIC TEST REPORT- UT

G4/NDTR2 (23/5/2001)

Report N°: T19.022.UT031	Page N°: 1/1	Sample Received Date (if applicable):	Contract N° :
Client - Address:	EGNATIA FOUNDRY SA (KOVIS GROUP)	Test Location:	ASPROS KILKIS – EGNATIA FAC.
Contractor :	EGNATIA FOUNDRY SA	Project:	
Item :	AXEL BOX LEFT	Drawing No:	107RS 090300-1-02
Material:	340-550W	Heat Treat:	YES
Test According To:	ISO 4992-1	Accept. Standard According To:	ISO 4992-1:LEVEL2
Surface Condition:	CAST pre-machining	Diagnostic Area:	100% of casting area
Test Equipment Mfr:	KRAUTKRAMER	Model:	USM-35X
Couplant: Cellulose glue diluted with water	Calibration Block: Calibration block No1 (v1), AX2 plate custom made With artificial f.b.h. : 6	Amplification:	D.A.C.+4dB Att.
Probes: MB4S-0°, MSEB-4-0°		Ref. flat bottom Hole : 6mm	

A/A	Egn Code	LOT	Lot No	Echo height (db)	Distance from Refer. Point (mm)	Depth of Flaw (mm)	Recording Length (mm)	Flaw Direction		Concl.		Testing		Remarks
								Longit.	Transev.	A.	N.A.	One Side	Both Sides	
1	**0493-011**	22325	1	-	-	-	-			√			√	
2	-	-	2	-	-	-	-			√			√	
3	-	-	3	-	-	-	-			√			√	
4	-	-	4	-	-	-	-			√			√	

According to EN 583-5

Discontinuities definition	Zone definition	
P.D: Point Discontinuity	S.R.Z.: Special Rim Zone	A. : Accepted
C.D: Complex Discontinuity	R.Z. : Rim Zone	N.A. : Non Accepted
PL.D: Planar Discontinuity	C.Z. :Core Zone	
V.D : Volumetric Discontinuity		

Report Approved By:	Issue Date: 25-07-2019	Report Made By: VLAHOS G	Test Made By: BONOS S EN ISO 9712 LEVEL II UT
			Test Date: 25-07-2019

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ULTRASONIC TEST REPORT- UT

G4/NDTR2 (23/5/2001)

Report N°: T19.022.UT034	Page N°: 1/1	Sample Received Date (if applicable):	Contract N° :
Client - Address:	EGNATIA FOUNDRY SA (KOVIS GROUP)	Test Location:	ASPROS KILKIS – EGNATIA FAC.
Contractor :	EGNATIA FOUNDRY SA	Project:	
Item :	AXEL BOX LEFT	Drawing No:	107RS 090300-1-02
Material:	340-550W	Heat Treat:	YES
Test According To:	ISO 4992-1	Accept. Standard According To:	ISO 4992-1:LEVEL2
Surface Condition:	CAST pre-machining	Diagnostic Area:	100% of casting area
Test Equipment Mfr:	KRAUTKRAMER	Model:	USM-35X

Couplant:	Cellulose glue diluted with water	Calibration Block:	Calibration block No1 (v1), AX2 plate custom made With artificial f.b.h. : 6	Amplification:	D.A.C.+4dB Att.
Probes:	MB4S-0°, MSEB-4-0°			Ref. flat bottom Hole : 6mm	

A/A	Egn Code	LOT	Lot No	Echo height (db)	Distance from Refer. Point (mm)	Depth of Flaw (mm)	Recording Length (mm)	Flaw Direction		Concl.		Testing		Remarks
								Longit.	Transev.	A.	N.A.	One Side	Both Sides	
1	**0493-011**	22322	1	-	-	-	-			√			√	
2	-	-	2	-	-	-	-			√			√	
3	-	-	3	-	-	-	-			√			√	
4	-	-	4	-	-	-	-			√			√	
5	-	-	5	-	-	-	-			√			√	

According to EN 583-5

Discontinuities definition	Zone definition	
P.D: Point Discontinuity	S.R.Z.: Special Rim Zone	A. : Accepted
C.D: Complex Discontinuity	R.Z. : Rim Zone	N.A. : Non Accepted
PL.D: Planar Discontinuity	C.Z. :Core Zone	
V.D : Volumetric Discontinuity		

Report Approved By:	Issue Date: 09-08-2019	Report Made By: VLAHOS G	Test Made By: BONOS S EN ISO 9712 LEVEL II UT
			Test Date: 09-08-2019

The above results are only valid for the tested samples/items
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Certificate of Approval N° : 6R16.2239Q/8.V.Q.I.

General Applications of Technology and Science Testing Laboratories

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ULTRASONIC TEST REPORT- UT

G4/NDTR2 (23/5/2001)

Report N°: T19.022.UT029	Page N°: 1/1	Sample Received Date (if applicable):	Contract N° :
Client - Address:	EGNATIA FOUNDRY SA (KOVIS GROUP)	Test Location:	ASPROS KILKIS – EGNATIA FAC.
Contractor :	EGNATIA FOUNDRY SA	Project:	
Item :	AXEL BOX LEFT	Drawing No:	107RS 090300-1-02
Material:	340-550W	Heat Treat:	YES
Test According To:	ISO 4992-1	Accept. Standard According To:	ISO 4992-1:LEVEL2
Surface Condition:	CAST pre-machining	Diagnostic Area:	100% of casting area
Test Equipment Mfr:	KRAUTKRAMER	Model:	USM-35X
Couplant:	Cellulose glue diluted with water	Calibration Block:	Calibration block No1 (v1), AX2 plate custom made With artificial f.b.h. : 6
Amplification:	D.A.C.+4dB Att.		
Probes:	MB4S-0°, MSEB-4-0°	Ref. flat bottom Hole : 6mm	

A/A	Egn Code	LOT	Lot No	Echo height (db)	Distance from Refer. Point (mm)	Depth of Flaw (mm)	Recording Length (mm)	Flaw Direction		Concl.		Testing		Remarks
								Longit.	Transev.	A.	N.A.	One Side	Both Sides	
1	**0493-011**	22582	1	-	-	-	-			√			√	
2	-	-	2	-	-	-	-			√			√	
3	-	-	3	-	-	-	-			√			√	
4	-	-	4	-	-	-	-			√			√	

According to EN 583-5

Discontinuities definition	Zone definition	
P.D: Point Discontinuity	S.R.Z.: Special Rim Zone	A. : Accepted
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PL.D: Planar Discontinuity	C.Z. :Core Zone	
V.D : Volumetric Discontinuity		

Report Approved By:

Issue Date: 05-07-2019

Report Made By:
VLAHOS G

Test Made By:
BONOS S
EN ISO 9712 LEVEL II UT

Test Date: 05-07-2019

GENERAL APPLICATIONS OF TECHNOLOGY & SCIENCE FETE GATS

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