

ENTREGA DE DOCUMENTACIÓN / DOCUMENTATION DELIVERY

Tipo de Requisito Documental: <i>Type of Document Requirement:</i>	MC
Proveedor: <i>Supplier:</i>	MICROLAN AEROSPACE, S.L.
Nº Pedido: <i>Order Number:</i>	C-PE23/02567
Fecha: <i>Date:</i>	05/07/2024
Nº Pieza: <i>Part Number:</i>	T000982574-11701P01
Cantidad: <i>Quantity:</i>	14

A02/Z03

INSPECTION CERTIFICATE acc to
EN 10204 3.1

A06

NITINOX SOLUTIONS S.L
B° MURTATZA, S/N
48390 BEDIA, VIZCAYA
SPAIN

INSPECTION STAMP

SVQ

Customer References A07 8/1720 <div style="text-align: right;">Customer order 2022-11-28</div> 320-00991 NITIBEDI-W	Alleima References A08 <table style="width:100%;"> <tr> <td>Order No.</td> <td>Subs No.</td> <td>Dispatch note</td> </tr> <tr> <td>592733</td> <td>716114</td> <td>39842/53</td> </tr> <tr> <td>Suppl. No</td> <td>C.Code</td> <td></td> </tr> <tr> <td>284-66637</td> <td>42</td> <td></td> </tr> </table>	Order No.	Subs No.	Dispatch note	592733	716114	39842/53	Suppl. No	C.Code		284-66637	42																					
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Material description B01/B04 HOT WORKED BAR STEEL ROLLED ANNEALED & STRAIGHTENED PEEL TURNED AND POLISHED <table style="width:100%;"> <tr> <td>Metallurgical process</td> <td>Origin</td> <td style="text-align: right;">C70</td> </tr> <tr> <td>E+AOD+LRF</td> <td>Sweden</td> <td></td> </tr> </table>	Metallurgical process	Origin	C70	E+AOD+LRF	Sweden		Steel/material Designations B02 <table style="width:100%;"> <tr> <td>UNS</td> <td>EN no</td> </tr> <tr> <td>S31803/S32205</td> <td>1.4462</td> </tr> </table>	UNS	EN no	S31803/S32205	1.4462																						
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Technical requirements B03 ISO 17781:2017:QL1, IOGP S-563:2018, EN10222-5:-2017*, PED 2014/68/EU, EN 10060:2003, EN 10221:1996 NACE MR0175/ISO 15156-3:-2015, NACE MR0103/ISO 17945-1:-2015, ASTM A-276-17, ASME SA-276-ED-21 SECT II PART A, EN 10272:2016*, ASTM A-479-21, ASME SA-479-ED-21 SECT II PART A, ASTM A-484-22, ASTM A-182-22A*, ASTM A-1049-18*, ASTM A-314-19*, NORSOK M-630:2020, NORSOK MDS D47 REV. 6, EN 10088-3:-2014, *For detailed information, please see the appendix																																	
EXTENT OF DELIVERY B07-B13 <table style="width:100%;"> <tr> <th>It</th> <th>Product designation</th> <th>Heat</th> <th>Lot</th> <th>Pieces</th> <th>Kg</th> </tr> <tr> <td>05</td> <td>MBR-SANMAC2205+-170 MI-5000-</td> <td>566342</td> <td>86041</td> <td>2</td> <td>2189.0</td> </tr> <tr> <td colspan="4" style="text-align: right;">Total</td> <td>2</td> <td>2189.0</td> </tr> </table> <table style="width:100%;"> <tr> <td>Heat</td> <td></td> <td>Recycled material(%)</td> </tr> <tr> <td>566342</td> <td>Ingot casting</td> <td>83.4</td> </tr> </table> TEST RESULTS Reduction ratio (times) <table style="width:100%;"> <tr> <td>Lot</td> <td></td> </tr> <tr> <td>86041</td> <td>11.4</td> </tr> </table> Chemical composition (weight%) acc. to ASTM A-751 <table style="width:100%;"> <tr> <td>Heat</td> <td>PRE</td> </tr> <tr> <td>566342</td> <td>35.8</td> </tr> </table>		It	Product designation	Heat	Lot	Pieces	Kg	05	MBR-SANMAC2205+-170 MI-5000-	566342	86041	2	2189.0	Total				2	2189.0	Heat		Recycled material(%)	566342	Ingot casting	83.4	Lot		86041	11.4	Heat	PRE	566342	35.8
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Nickel Titanio Inoxidable
Barrio Murtatza, s/n
48390 BEDIA (Bizkaia) SPAIN
Tfno: +34 94 651 03 00
Fax: +34 94 651 02 22

Quality assurance - Erik Jansson/QA-manager Primary Products
MTC Service / Certificates

A05/Z02


Chemical composition (weight%)

Heat	C	Si	Mn	P	S	Cr	Ni	Mo
566342	0.015	0.12	1.10	0.017	0.0012	22.51	5.55	3.13
	Cu	N						
566342	0.12	0.187						

Tensile test at room temperature acc. to ASTM A370/ISO 6892-1

Longitudinal

Location half radius

Lot	Yield strength		Tensile strength	Elongation	
	Mpa	MPa	Mpa	%	%
	Rp0.2	Rp1.0	Rm	A	2"
86041	491	567	713	43	43
	Red.of Area				
	%				
	Z				
	78				

Transversal

Location half radius

Lot	Yield strength		Tensile strength	Elongation	
	MPa	MPa	MPa	%	%
	Rp0.2	Rp1.0	Rm	A	2"
86041	490	571	724	42	42
	Red.of Area				
	%				
	Z				
	70				

Hardness test acc.to ASTM A-370/ISO 6506-1

Location half radius

Lot	HRC	HRC	HRC
86041	18	19	18


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Hardness test acc. to ASTM E-10

Near Surface

Lot	HBW	HBW	HBW
86041	244	242	245

Impact test, J, Longitudinal acc. to ASTM A-370/ISO 148-1

Location half radius

Lot	Single values			Avg. Temperature
	Joule			°C
86041	332	331	328	-50
	379	381	383	20

Lateral expansion

Lot				Temperature
	mm			°C
86041	2.26	2.25	2.24	-50
	2.35	2.37	2.35	20

Impact test, J, Transversal acc. to ASTM A-370

Location half radius

Lot	Single values			Avg. Temperature
	Joule			°C
86041	149	151	157	-50



Lateral expansion

Lot	mm	Temperature °C
86041	1.30 1.31 1.35	-50

Corrosion test according to ASTM G-48A, 25°C +/-1°C for 24 hours.

In delivery condition. No pitting corrosion found at 20x enlargement.

Test location acc to ISO 17781

Specimen weight loss

Lot	g/m2
86041	0.05

Ferrite acc to ASTM E-562, 20 fields and 25 points per field.

Tested at surface, half radius and center.

Lot	%
86041	41.7
	46.2
	44.9



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Austenite Spacing

acc. to DNV-RP-F112 Section 7

Lot	mym
86041	17.3

Following controls/tests have been satisfactorily performed:

- Intergranular corrosion test acc. to EN ISO 3651-2 C
- Positive Material Identification (PMI)
- Ultrasonic testing (*)
- Visual inspection and dimensional control.

HEAT TREATMENT:

Up to 74.9 mm: Batch furnace. Material soaking 1060°C,
min. 30 minutes. Quenched in water. Water temp pre-quench max 38°C,
after quench max 49°C
Transfer time furnace to quenching <150sek

75 - 260mm: Continuous heat treatment furnace. Material soaking at
1060°C, 30 minutes minimum. Alleima is using a continuous water spray
quenching process. Water temp pre-quench 38°C max, after quench 49°C
max. Transfer time furnace to quenching <60sek.

The raw material is free from radioactive contamination.

All testing has been done acc to ISO 17781

Microscopic Examination X 500 acc. to ASTM A 923 Method A/NORSOK M630
Free from grain boundary carbides and intermetallic phases.

Samples etched using etching agent NaOH listed in ASTM E407

Material free from mercury contamination.

No welding or weld repair.

NORSOK M-650 ED-4 QTR NO: 22 Cr Duplex SS



Certified acc. Pressure Equipment Directive (2014/68/EU Annex 1 para 4.3) TUEV CERT-Certification body for pressure equipment of the TUEV NORD GRUPPE; notified body, reg.-no. 0045.

The delivered products comply with the specifications and requirements of the order.

The material is manufactured according to a Quality system, approved and registered to ISO 9001:2015.

No unauthorized alterations. The contents of this Inspection Certificate may not be modified or revised in any way without the prior written approval of Alleima.
Unauthorized alterations to the Inspection Certificate, including introduction of false, fictitious or fraudulent statements or entries, may be punishable by fines, imprisonment, or both. This Inspection Certificate may be copied only in the manner and for the purposes specified in Section 6 of EN 10204:2004. Contravention of this notice will be prosecuted to the fullest extent of applicable law.

The certificate is produced with EDP and valid without signature

APPENDIX



NITINOX SOLUTIONS S.L.
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Lab accreditation

Our lab is accredited under SWEDAC Accreditation number 1636 for testing as per ISO/IEC 17025.

Applicable only to specific dimensions

20mm - 160mm: EN 10088-5 EN (Only valid for CE marked products together with Alleima Declaration of Performance certificate).

20mm - 160mm: PED 2014/68/EU, EN 10272 (Stainless steel bars for pressure purposes).

20mm - 260mm: NORSOK M-630 - NORSOK MDS D47* (For lengths max 7500 mm)

161mm - 450mm: PED 2014/68/EU, EN 10222-5 (Chemical composition only)

Suitable for manufacturing of components in acc. with *ASTM A-182 (F51/F60), ASTM A-1049, ASTM A-314.

Test location

Mechanical, ferrite testing:

Bar dim ≤ 50 mm - Longitudinal test pieces in center of the bar

Bar dim > 50 mm - 450 mm - Longitudinal test pieces, 1/4 T and minimum 100 mm from any second surface.

Bar dim > 100mm - 450 mm - Transversal test pieces, 1/4 T and minimum 100 mm from any second surface.

One set of test samples per heat treatment lot.

Maximum lot size 15 ton.

Micro: To ensure a sound, and unaffected structure all through the material three samples are taken, one close to surface, half radius, and in the center of the bar.

Furnace calibration every third month according to API 6A

Thermocouples of S-type (+/- 5°C tolerance) are used to monitor the furnace temperature.



Ultrasonic test

Dim 29 - 74 mm: EN 10308 quality class 3

Dim 75 mm - : EN 10228-4, Tab 3 Scan coverage 1a 100%, Tab 5
Quality Class 3, ASTM A-388, API 6A PSL3/3G.

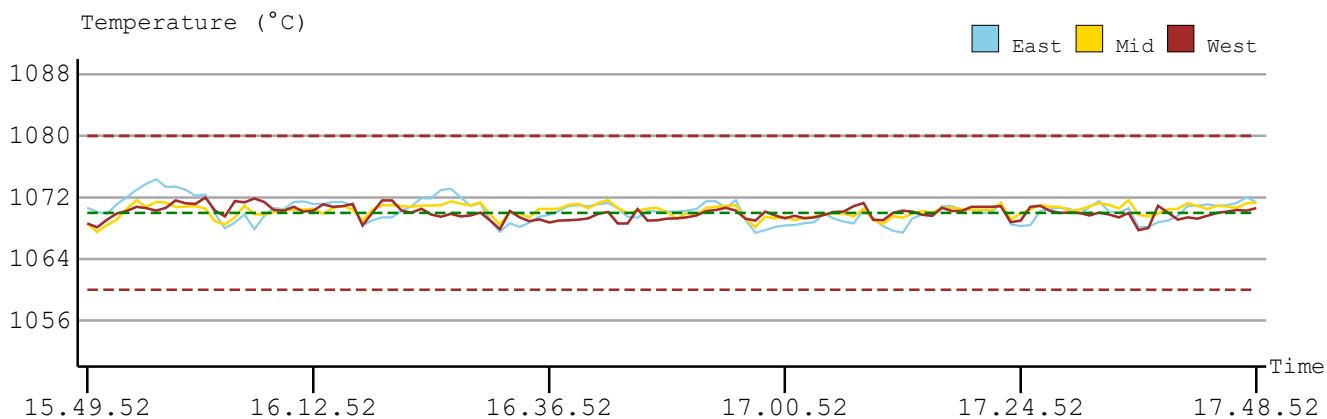
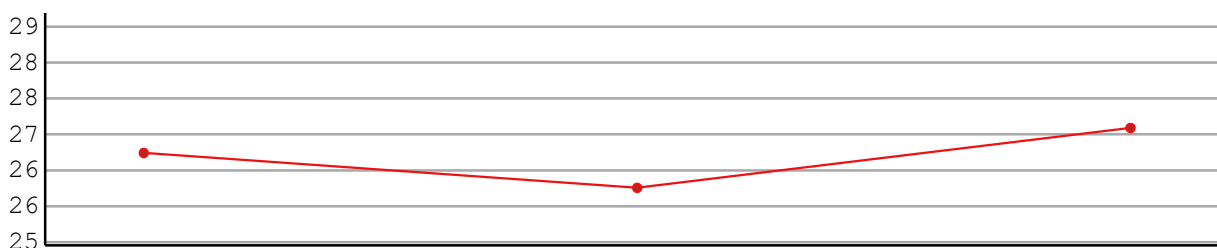


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						Setpoints					
Work order	Num. of pieces	Dim (mm)	Weight (kg)	Steel Grade	Heat Number	Strategy	Zone 3 (°C)	Mtrl. temp. out furn. (°C)	Total time (mm)	Cooling time 1 (mm:ss)	Cooling time 2 (mm:ss)
86041	3	179.1	3711	3RD69	566342	30	1070	1065	120	9:30	10:00

Heating Temperature (°C) - Zone 3 - Soaking

Temperature after cooling (°C)


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