



Page 1 of 2
Certificate No. OSL2400120
First Date of Inspection 14 February 2024
Final Date of Inspection 14 February 2024
Office Oslo

Certificate for Machinery Equipment

Valves others

This is to certify that the undersigned Surveyor to LLOYD'S REGISTER did at the request of the below customer, attend the testing and examination of the product(s) described below in accordance with the relevant Rules and Regulations for the Classification of Ships and found it/them satisfactory.

General information

Customer	Jotron Skipper AS
Purchase Order No	PWO-130978
Manufacturer	Jotron Skipper AS
Intended for	Warehouse
Customer Work Order No	131341, 130978, 128626 and 128652
Date of issue	18 February 2024
Quantity	4 pcs

Particulars

Description	3 X Sea valves with flanges and 7 tanks for visual inspection
Size	1xDB60mm + 2xSB100mm
Valve body material	EN10213/1.4408
Test pressure body	24 bar
Test pressure seat	5 bar
Design pressure	5 bar
Set pressure if applicable	-
Quantity	3

Identification Marks On Product

I.D number	LR OSL2400120
Surveyors initials	-
Date of inspection	14.02.2024

Remarks

No remarks raised

Johannes Nordtveit
Lloyd's Register EMEA
A subsidiary of Lloyd's Register Group Limited



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Certificate No. OSL2400120
First Date of Inspection 14 February 2024
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Office Oslo

Description	Manufacturer Designation	Serial Number	IMO Number
DB-60-SA		24107	0
SB-100-SB		24105 and 24106	0
ETNST		N142T9CW	0
ETNSTCLF		N142U9MZ	0

PICKING LIST

SKIPPER

SKI-NO: PWO/130978



Printed: 07.02.2024 - 16:28

Operation number	Operation	Manufacturing area	Remaining quantity
		PRODUCTION	2 stk

Note
SB-100-SB-LR

Stockloc / Details	Assignment	Quantity	Product
For operation number 200			
1-PALL-00	SSA/132176-1	✓ 2 stk	DB-2051 <i>2304 x 2</i> Intermediate element for xB-100-xB casted
1-PALL-00	22 stk		
L10	1 stk Picking blocked		
For operation number 100			
1-PALL-00	SSA/132468-1	2 stk	ZCC-01015 Main element, Ball Valve DN100 PN16/3.1.B
1-PALL-00	22 stk		
For operation number 200			
1-PALL-03	SSA/131171-1	16 stk	ZOA-01075 Screw M16x55 mm DIN933 A4-80
1-PALL-03	160 stk		
1-PALL-06	SSA/132440-1	✓ 2 stk	DB-2031 Top Flange for XB-100/200-XX
1-PALL-06	17 stk		
L10	1 stk Picking blocked		
1-PALL-07	SSA/132517-1	✓ 2 stk	SB-2019 <i>567560 x 2 2404</i> Bottom flange for SB-100-xx
1-PALL-07	30 stk		
1-S-74	SSA/129962-1	2 stk	DB-2040 Washer Ø46x2,5 Ø32,5 for XB-60/100/200-XX
1-S-74	98 stk		
1-T-01	SSA/132213-1	4 stk	DB-2035 Gasket Ø47/32,5 X 20mm for XB-60/100/200-XX
1-T-01	193 stk		
1-T-02	SSA/131169-1	8 stk	ZOA-01035 Spring washer M16 DIN127B A4
1-T-02	210 stk		
1-T-02	SSA/132137-1	16 stk	ZOA-01035 Spring washer M16 DIN127B A4
1-T-02	1404 stk		
1-T-02	SSA/132138-1	24 stk	ZOA-01036 Nut M16 DIN934 A4
1-T-02	1021 stk		
1-T-02	SSA/132424-1	2 stk	DB-2036 Nut M50 Brass for XB-60/100/200-XX
1-T-02	39 stk		
Varmerom	SSA/131679-1	4 stk	ZZA-01127 Metallised polyester label on roll
Varmerom	4678 stk		

Additional parts

Product	Stockloc	Quantity
GVA-LR Sea Valve approval from Lloyds Register		2 stk

B / C
S.no. 24105 : TD9A / TE9A
24106 : TD9A / TE9A

SKIPPER Electronics A/S
 Enebakkveien 150
 P.O.Box 151 Manglerud
 N-0612 OSLO

Telephone: +47 23 30 22 70
 Telefax: +47 23 30 22 71
 E-mail: support@skipper.no
 Web page: www.skipper.no

SKIPPER
 C.O. reg no: NO-965378847-MVA

INSPECTION & TEST PROTOCOL FOR SEA VALVE

Document No: Q12-TI-0108-02 2023

SKIPPER sea valve Serial No.:	24106
Class certificate no.:	

Class stamp and certificate no. shall be stamped on main element and bottom flange (welding part)

Class: DNV ABS BV LR RINA NK

Sea valve Type:

		-SA	-SB	-LA	-LB	-F1	SLB	SJB
SB-60		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
DB-60		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
SB-100		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
DB-100		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
ETN- 100mm							<input type="checkbox"/>	<input type="checkbox"/>
SB-200-Echo	<input type="checkbox"/>							

Assembly, Items Serial No. / Batch No. / Charge No.:

	<u>Heat no</u> <u>Body</u>	<u>Heat no</u> <u>Cap</u>	<u>Skipper Part</u> <u>No.</u>
Valve Element:	TD9A	TE9A	ZCC-01015
Intermediate Element:		2304	DB-2051
Bottom Flange:		567560	SB-2019
Intermediate flange (for DB valves)			

Visual Inspection:

Performed without remarks:

Pressure Test:

Working pressure 2 bar

Tested for 5 minutes with 5 bar pressure,

According to procedure no. 02-Q12_Pressure testing Gate_ball Valve

Performed without remarks:

Date: 12/2-24

Sign.: 

SKIPPER Electronics A/S
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 N-0612 OSLO

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 Web page: www.skipper.no



C.O. reg no: NO-965378847-MVA

INSPECTION & TEST PROTOCOL FOR SEA VALVE

Document No: Q12-TI-0108-02 2023

SKIPPER sea valve Serial No.:	24105
Class certificate no.:	

Class stamp and certificate no. shall be stamped on main element and bottom flange (welding part)

Class: DNV ABS BV LR RINA NK

Sea valve Type:

		<u>-SA</u>	<u>-SB</u>	<u>-LA</u>	<u>-LB</u>	<u>-F1</u>	<u>SLB</u>	<u>SJB</u>
SB-60		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
DB-60		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
SB-100		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
DB-100		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
ETN- 100mm							<input type="checkbox"/>	<input type="checkbox"/>
SB-200-Echo	<input type="checkbox"/>							

Assembly, Items Serial No. / Batch No. / Charge No.:

	<u>Heat no</u> <u>Body</u>	<u>Heat no</u> <u>Cap</u>	<u>Skipper Part</u> <u>No.</u>
Valve Element:	TD9A	TE9A	ZCC-01015
Intermediate Element:		2304	DB-2051
Bottom Flange:		567560	SB-2019
Intermediate flange (for DB valves)			

Visual Inspection:

Performed without remarks:

Pressure Test:

Working pressure 2 bar

Tested for 5 minutes with 5 bar pressure,

According to procedure no. 02-Q12_Pressure testing Gate_ball Valve

Performed without remarks:

Date: 12/2-24

Sign.: S.T.

PICKING LIST

SKIPPER

SKI-NO: PWO/131708

CASE. 131341

Printed: 07.02.2024 - 16:48

Operation number Operation Manufacturing area Remaining quantity
PRODUCTION **1 stk**

Note
DB-60-SA-LR

Stockloc / Details	Assignment	Quantity	Product
For operation number 200			
1-L-08-02 1-L-08-02 1 stk	SSA/123037-1	✓ 1 stk	DB-1030 <i>562966</i> Sea Valve 60 mm, Intermediate Flange, for DB-60-XA <i>#22</i>
1-PALL-03-B6 1-PALL-03-B6 6 stk	SSA/131822-1	✓ 1 stk	DB-1022 <i>566504</i> Bottom Flange for DB-60-XA <i>2350</i>
1-PALL-06 1-PALL-06 1 stk	SSA/127873-1	✓ 1 stk	DB-1021 <i>6238</i> Intermediate Element 60 mm
For operation number 100			
1-PALL-06 1-PALL-06 3 stk	SSA/131223-1	✓ 1 stk	ZCC-02001 <i>CNCN4</i> Main element DN65 for XB-60-XA
For operation number 200			
1-PALL-06 1-PALL-06 1 stk	SSA/131269-1	✓ 1 stk	DB-1031 Top Flange for XB-60-XA
1-S-74 1-S-74 98 stk	SSA/129962-1	1 stk	DB-2040 Washer Ø46x2,5 Ø32,5 for XB-60/100/200-XX
1-T-01 1-T-01 112 stk	SSA/129637-1	4 stk	ZOA-01034 Screw M16x40 DIN933 A4-80
1-T-01 1-T-01 193 stk	SSA/132213-1	2 stk	DB-2035 Gasket Ø47/32,5 X 20mm for XB-60/100/200-XX
1-T-02 1-T-02 69 stk	SSA/127824-1	2 stk	ZOA-01065 Screw M12x40 mm DIN933 A4-80
1-T-02 1-T-02 990 stk	SSA/130000-1	6 stk	ZOA-01066 Spring Washer M12,2 DIN 127B A4
1-T-02 1-T-02 202 stk	SSA/130207-1	4 stk	ZOA-01035 Spring washer M16 DIN127B A4
1-T-02 1-T-02 520 stk	SSA/132277-1	4 stk	ZOA-01023 Nut M12 DIN934 A4
1-T-02 1-T-02 39 stk	SSA/132424-1	1 stk	DB-2036 Nut M50 Brass for XB-60/100/200-XX
1-T-03 1-T-03 140 stk	SSA/129656-1	4 stk	ZOA-01048 Washer M12 DIN125 A4
Varmerom Varmerom 4678 stk	SSA/131679-1	2 stk	ZZA-01127 Metallised polyester label on roll

Additional parts

Product	Stockloc	Quantity
GVA-LR Sea Valve approval from Lloyds Register		1 stk

S.no 24107 : CNCN4

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C.O. reg no: NO-965378847-MVA

INSPECTION & TEST PROTOCOL FOR SEA VALVE

Document No: Q12-TI-0108-02 2023

SKIPPER sea valve Serial No.:	24107
Class certificate no.:	

Class stamp and certificate no. shall be stamped on main element and bottom flange (welding part)

Class: DNV ABS BV LR RINA NK

Sea valve Type:

		<u>-SA</u>	<u>-SB</u>	<u>-LA</u>	<u>-LB</u>	<u>-F1</u>	<u>SLB</u>	<u>SJB</u>
<u>SB-60</u>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
<u>DB-60</u>		<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
<u>SB-100</u>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<u>DB-100</u>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<u>ETN- 100mm</u>							<input type="checkbox"/>	<input type="checkbox"/>
<u>SB-200-Echo</u>	<input type="checkbox"/>							

Assembly, Items Serial No. / Batch No. / Charge No.:

	<u>Heat no</u> <u>Body</u>	<u>Heat no</u> <u>Cap</u>	<u>Skipper Part</u> <u>No.</u>
Valve Element:	CNCN4		ZCC-02001
Intermediate Element:		6238	DB-1021
Bottom Flange:		566504	DB-1022
Intermediate flange (for DB valves)		562966	DB-1030

Visual Inspection:

Performed without remarks:

Pressure Test:

Working pressure 2 bar

Tested for 5 minutes with 5 bar pressure,

According to procedure no. 02-Q12_Pressure testing Gate_ball Valve

Performed without remarks:

Date: 12/2-24

Sign.:



SAMSVARSERKLÆRING

Leverandør / produsent:

Strømmen Dreieverksted AS

Sendt dato:

30/1 - 2024

SKIPPER bestillings nr:

107327

SKIPPER varenummer:

SB-2019

Revisjon:

04

Antall levert:

30

Stål produsentens Heat / Charge nr:

1. S67560

2.

3.

4.

5.

Batch nr (år-uke-løpenummer):

Eks på batch nr: 13441

2404

Hvis samme varenummer blir levert mer enn en gang i løpet av uken, skal løpenummer endres fra 1 til 2 o.s.v.

Produsenten/leverandøren erklærer herved at produktet er laget i henhold til SKIPPERs seneste godkjente tegning, og i samsvar med SKIPPERs bestilling.

(Batch nummer skal stemples i materialet)

Dette skjemaet skal følge med varene som blir levert til SKIPPER, og evt. skannes og sendes til SKIPPER sammen med materialsertifikat.

Produktet er målt, kontrollert og godkjent av:

Stempel / Sign:

Strømmen Dreieverksted AS

E-post: firmapost@dreie.no

www.dreie.no

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	%	%
23551	Rp0.2	Rp1.0	Rm	A	2"
	241	328	529	48	48
	Red.of Area				
	%				
	Z				
	67				

Transversal, 90° from each other.

Location half radius

Lot	Yield strength		Tensile strength	Elongation	
	MPa	MPa	MPa	%	%
23551	Rp0.2	Rp1.0	Rm	A	2"
	222	326	534	51	51
	234	324	534	50	50
	Red.of Area				
	%				
	Z				
	69				
	70				

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

Location half radius

Lot	Min	Max
23551	145	145
Lot	Min	Max
Lot	HRB	HRB
23551	78	78

Grain size acc to ASTM E-112.

Location half radius

Lot		
23551	3.0	3.0

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

Location half radius

Lot	Single values			Avg.	Temperature
	Joule			Joule	°C
23551	148	148	140	145	20
	138	142	150	143	20

Following controls/tests have been satisfactorily performed:

- Intergranular corrosion test acc to ASTM A-262 PR.E and EN ISO 3651-2A
- Positive Material Identification (PMI)
- Ultrasonic testing (*)
- Visual inspection and dimensional control.

Heat Treatment:

Solution annealed and quenched.

Melt Source

Heat 567560 ALLEIMA AB

SWEDEN



HEAT TREATMENT:

Up to 35mm: Material soaking 1050°C, min. 20 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

>35-150mm: In process annealed according to ASTM A484 above the minimum hot rolling temperature of 1010°C and cooled in air.

>150-350mm: Material soaking 1065°C, min. 30 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

>350-375mm: Material soaking 1050°C, min. 60 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

>375mm: Material soaking 1050°C, min. 120 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

The raw material is free from radioactive contamination.

Material free from mercury contamination.

No welding or weld repair.

This is to certify that the contents of this certified material test report are correct and accurate and that all test results and operations are in compliance with the material specification.

Approved acc. AD 2000-Merkblatt W0 and certified acc. to Pressure Equipment Directive (2014/68/EU) by TÜV NORD; notified body, reg.no. 0045.

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

Lab accreditation

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

Applicable only to specific dimensions

20mm - 250mm: EN 10088-5 EN (Only valid for CE marked products together with Alleima Declaration of Performance certificate).

20mm - 400mm: PED 2014/68/EU EN 10272 (Stainless steel bars for pressure purposes)

20mm - 375mm: AD-2000-W2/W10

20mm - 450mm: NORSOK M-630 - NORSOK MDS S17

180mm- 450mm: PED 2014/68/EU EN 10222-5 (Chemical composition only)

70mm - 450mm: AMS 5648 Rev. L, AMS 5653 Rev. H

Suitable for manufacturing of components in acc. with *ASTM A-182, (F316/F316L), ASTM A-965, ASTM A-314.

Test location

Mechanical, ferrite, corrosion testing:

Bar dim <=50mm - Longitudinal test pieces in center of the bar.

Bar dim > 50mm - 160 mm - Longitudinal test pieces, 1/4 T and minimum 100 mm from any second surface.

Bar dim > 160mm- 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.

Furnace calibration every third month according to API 6A 21th Edition Annex M, 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.

Alleima, formerly Sandvik Materials Technology. During a brand transition period, both Sandvik and Alleima marking on products may exist.



Certificate EN 10204-3.1

Klant/customer:		Certificaat number/certificat number:VT-230517001									
MESON AB											
ORDER NO: IK20439			INVOICE NO: IK20439			DATE: 2023-05-17					
Item	Q'ty	Description	Dn	Rating	Conn.			Material body&cap			
1	300	V2F-BODY	100	PN16	FLANGED NED			EN10213/1.4408			
1	300	V2F-CAP	100	PN16	FLANGED NED			EN10213/1.4408			
Item	Part	Charge Nr.	Q'ty	Pressure Test /Media water	Mechanische eigenschappen /mechanical properties			Kerbschlagarbeit ISO V Probe			
					Tensile strength (N/mm2)	Yieldpoint (N/mm2)	Elongation (%)	Energy Charpy Impact (J)			
					RM	Rp 1.0	A	1	2	3	Σ/3
					PSI	440-640	≥210	≥30%			
1	V2F-BODY	TD9A	102	348	569	256	42,6	162	165	174	167,0
1	V2F-BODY	TC9A	100	348	558	262	41,5	165	169	177	170,3
1	V2F-BODY	TE9A	98	348	562	265	41,8	170	172	175	172,3
1	V2F-CAP	TD9A	101	348	569	256	42,6	162	165	174	167,0
1	V2F-CAP	TC9A	102	348	558	262	41,5	165	169	177	170,3
1	V2F-CAP	TE9A	97	348	562	265	41,8	170	172	175	172,3
CHEMISCHE SAMENSTELLING/CHEMICAL COMPOSITION											
Charge Nr.	C %	Si %	S %	P %	Mn%	Ni %	Cr %	Mo %	Cu %		
	≤0.07	≤1.50	≤0.030	≤0.040	≤1.50	9.0-12.0	18.0-20.0	2.0-2.5	≤0.50		
TD9A	0,041	0,925	0,003	0,025	0,963	9,216	18,244	2,216	0,214		
TC9A	0,052	0,936	0,005	0,028	0,954	9,302	18,412	2,163	0,185		
TE9A	0,048	0,633	0,006	0,024	0,947	9,325	18,336	2,108	0,168		
We hereby certify that material described above has been successfully tested and complies with the terms of the order.						VALVE-TEK CO., LTD.					
						LEE/SALES					

HAITIMA CORPORATION

MATERIAL TEST CERTIFICATE

8F, No. 201, Tiding Blvd. Sec. 2,

Neihu Area Taipei 114 Taiwan

Page: 3

Date: Jun. 19, 2023

Messrs. MESON AB

Contract No.		P.O. IK20378								Invoice No.		HIV063023					
Description		VALVES & FITTINGS								Specification		ACC. TO EN 10204 3.1		Type		EN 1.4408	
Item No.		Size						Quantity			Heat No.		Pressure Test		Finish		
													Shell	Seat			
11		#2052A DN50						40 PC			NBA2		60 BAR	7 BAR	GOOD		
12											N944		60 BAR	7 BAR	GOOD		
13		DN65						140 PC			CP2F2		24 BAR	7 BAR	GOOD		
14											CNCN4		24 BAR	7 BAR	GOOD		
15											CP16M		24 BAR	7 BAR	GOOD		
16											CP3PF		24 BAR	7 BAR	GOOD		
17											CP3K9		24 BAR	7 BAR	GOOD		
18											CP2C1		24 BAR	7 BAR	GOOD		
19											CP3PC		24 BAR	7 BAR	GOOD		
20											CNCSB		24 BAR	7 BAR	GOOD		
Item No.		Chemical Composition (%)									Mechanical Properties				Solution Heat Treatment		
Spec.		C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Y.S. Mpa	T.S. Mpa	Elongation %	Impact Test			
Max.		0.070	1.500	1.500	0.040	0.030	20.00	2.50	12.00	0.50	-	640	-	-	1150 C		
Min.		-	-	-	-	-	18.00	2.00	9.00	-	210	440	L: 30	60 J	1080 C		
11		0.047	1.082	0.979	0.030	0.005	18.192	2.123	9.190	0.223	299	526	53	194	1080		
12		0.055	1.088	1.064	0.023	0.008	18.077	2.133	9.231	0.210	297	582	53	199	1080		
13		0.049	1.079	0.994	0.031	0.004	18.414	2.251	9.213	0.217	328	567	51	195	1080		
14		0.047	0.934	0.977	0.029	0.006	18.106	2.258	9.054	0.228	306	524	53	195	1080		
15		0.050	0.842	0.949	0.024	0.006	18.184	2.226	9.167	0.220	315	558	47	195	1080		
16		0.060	0.969	0.838	0.031	0.009	18.474	2.043	9.265	0.198	294	513	58	195	1080		
17		0.056	1.035	0.893	0.025	0.005	18.183	2.127	9.094	0.240	297	560	51	204	1080		
18		0.061	0.957	1.054	0.031	0.007	18.084	2.202	9.098	0.219	321	595	52	204	1080		
19		0.055	0.854	0.986	0.022	0.006	18.182	2.225	9.095	0.187	317	562	48	200	1080		
20		0.059	0.891	0.877	0.025	0.005	18.140	2.244	9.198	0.237	326	568	47	196	1080		
Remarks: WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS.												Inspector		Q C Manager			
												<i>Louis Liu</i>		<i>Hanson Chen</i>			

Sertifika No / Number of Cert.: :2022/092

Tarih/Date

21.11.2022

Firma Adı / Customer Name : :LANGTHON AS/ SKIPPER

Malzeme Kalitesi / Material Standard : CF8M

Sıra Pos	Döküm No/Heat Number	Malzeme Adı / Material Name	Parça Adeti / Material Quantity	Kimyasal Kompozisyon / Chemical Composition							
				% C	% Si	% Mn	% P	% S	% Cr	%Mo	%Ni
				0.08 Max	1.5 Max.	1.5 Max.	0.040 Max	0.030 Max.	17.0-21.0	2.0-3.0	9.0-12.0
1	6208	DN65 INTERMEDIATE PART	50	0.05	1.37	1.070	0.030	0.025	17.6	2.17	9.11
2	6218	DN65 INTERMEDIATE PART	50	0.042	1.15	1.090	0.032	0.024	17.5	2.13	9.16
3	6228	DN65 INTERMEDIATE PART	50	0.049	1.22	1.120	0.026	0.022	17.4	2.12	9.05
4	6238	DN65 INTERMEDIATE PART	50	0.046	1.26	1.090	0.028	0.019	17.5	2.05	9.14
5											

Mekanik Özellikler / Mechanical Properties

Döküm No / Heat Number.	Akma Dayanımı N/mm ² Yield Strength	Çekme Dayanımı N/mm ² Tensile Strength	Uzama / Elongation %	Kesit Daralması / Reduction of Area %	Darbe Testi / Charpy Impact test J/0°C	Sertlik / Hardness HB
	180 Min.	440	30 Min.	-	-	-
6208	302	599	36.2	-	-	-
6218	295	580	34.9			
6228	287	575	36.2			
6238	287	569	35.5			

Tahribatsız Testler / Non Destructive Tests

Döküm No / Heat Number.	Parça Adeti / Material Quantity	MT	PT	UT	RT	VT	Microstructure Ranges
6208	50	-	-	-	-	OK	-
6218	50	-	-	-	-	OK	-
6228	50	-	-	-	-	OK	-
6238	50	-	-	-	-	OK	-

Uygulanan Isıl İşlemler / Heat Treatment Applied

Döküm No / Heat Number.	Parça Adeti / Material Quantity	Normalizing °C	Annealing °C	Stress Relieving °C	Quenching °C	Tempering °C
6208	50	1100°C/ 2 Hours	-	-	-	-
6218	50	1100°C/ 2 Hours	-	-	-	-
6228	50	1100°C/ 2 Hours	-	-	-	-
6238	50	1100°C/ 2 Hours	-	-	-	-

We hereby certify that the material has been made by an approval process and satisfactorily tested in accordance with the rules of BV,LR and DNV-GL.

Surface quality is suitable with eye examination of MSS SP55 Standard.

KONTROL / CONTROLLED BY		ONAY / APPROVED BY		GÖZETİM / WITNESS BODY (If necessary)	
Adı /Name	M.Merih TAŞKIN	Hakan ÇALIŞKAN			
Ünvanı/ Title	Quality Control Engineer	Quality Manager			
İmza/ Signature					
Tarih/ Date	21.11.2022	21.11.2022			

CERTIFICATES:(Validities:DD/MM/..YY)

Naviga Certification ISO 9001:2015 Cert No:1840017(10.01.2022-06.01.2023)

DNV-GL : Certificate No:AMMM00002YE (05.04.2022-04.04.2025)

Bureau Veritas-Mode II Survey Scheme- Marine Division Cert No:SMS.W.II./57463/A.0 (09.11.2018-09.11.2022)

Lloyd's Register-Certificate No:LR2004266WA (03.07.2020-02.07.2023)



A02/Z03

INSPECTION CERTIFICATE acc to
EN 10204 3.1

A06

SVERDRUP STEEL AS
STRANDSVINGEN 2
4032 STAVANGER
NORWAY

INSPECTION STAMP

SVQ

Customer References A07 PO-03705 125-06911 SVERDRUP S	Alleima References A08 <table border="0" style="width: 100%;"> <tr> <td style="width: 33%;">Order No.</td> <td style="width: 33%;">Subs No.</td> <td style="width: 33%;">Dispatch note</td> </tr> <tr> <td>590387</td> <td>714251</td> <td>37697/53</td> </tr> <tr> <td>Suppl. No</td> <td>C.Code</td> <td></td> </tr> <tr> <td>284-64142</td> <td>87</td> <td></td> </tr> </table>	Order No.	Subs No.	Dispatch note	590387	714251	37697/53	Suppl. No	C.Code		284-64142	87	
Order No.	Subs No.	Dispatch note											
590387	714251	37697/53											
Suppl. No	C.Code												
284-64142	87												

Material description B01/B04 HOT WORKED BAR STEEL ROLLED ANNEALED & STRAIGHTENED PEEL TURNED AND POLISHED <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Metallurgical process</td> <td style="width: 20%;">Origin</td> <td style="width: 30%; 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 Alleima SANMAC 316/SANMAC 316L <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">AISI</td> <td style="width: 50%;">UNS</td> </tr> <tr> <td>316/316L</td> <td>S31600/S31603</td> </tr> <tr> <td>W.nr</td> <td>EN no</td> </tr> <tr> <td>1.4401/1.4404</td> <td>1.4401/1.4404</td> </tr> </table>	AISI	UNS	316/316L	S31600/S31603	W.nr	EN no	1.4401/1.4404	1.4401/1.4404
Metallurgical process	Origin	c70													
E+AOD+LRF	Sweden														
AISI	UNS														
316/316L	S31600/S31603														
W.nr	EN no														
1.4401/1.4404	1.4401/1.4404														

Technical requirements B03 EN 10088-3:-2014, EN10272:-2016*, EN10060:2003, EN 10221:1996 EN10222-5:-2017*, PED 2014/68/EU, QQ-S-763 F, 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, ASTM A-479-21, ASME SA-479-ED-21 SECT II PART A, ASTM A-484-22, ASTM A-182-22*, ASTM A-965-21A*, ASTM A-314-19*, NORSOK M-630:2020, NORSOK MDS S17 REV. 1 *For detailed information, please see the appendix
--

EXTENT OF DELIVERY B07-B13								
It	Product designation	Heat	Lot	Pieces	Kg			
06	MBR-SANMAC316L-140	566504	78963	1	737.0			
			Total	1	737.0			
Heat		Recycled material(%)						
566504	Continuous casting		95.3					
TEST RESULTS								
Reduction ratio (times)								
Lot								
78963	5.7							
Chemical composition (weight%) acc. to ASTM A-751								
Heat	C	Si	Mn	P	S	Cr	Ni	Mo
566504	0.012	0.28	1.71	0.031	0.027	16.91	10.19	2.04
	N							
566504	0.044							

Quality assurance - Erik Jansson/QA-manager Primary Products A05/Z02 MTC Service / Certificates
--



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	%	%
78963	Rp0.2	Rp1.0	Rm	A	2"
	218	253	544	62	62
	Red.of Area				
	%				
	Z				
	79				

Transversal, 90° from each other.

Location half radius

Lot	Yield strength		Tensile strength	Elongation	
	MPa	MPa	MPa	%	%
78963	Rp0.2	Rp1.0	Rm	A	2"
	222	271	546	58	49
	Red.of Area				
	%				
	Z				
	72				

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

Location half radius

Lot	Min	Max
	78963	HB
	139	140
	Min	Max
78963	HRB	HRB
	75	76

Grain size acc to ASTM E-112.

Location half radius

Lot		
78963	7.0	7.0

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

Location half radius

Lot	Single values			Avg.	Temperature
	Joule			Joule	°C
78963	261	257	226	248	20
	266	276	269	270	20

Following controls/tests have been satisfactorily performed:

- Intergranular corrosion test acc to ASTM A-262 PR.E and EN ISO 3651-2A
- Positive Material Identification (PMI)
- Ultrasonic testing (*)
- Visual inspection and dimensional control.

Heat Treatment:

Solution annealed and quenched.



HEAT TREATMENT:

Up to 35mm: Material soaking 1050°C, min. 20 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

>35-150mm: In process annealed according to ASTM A484 above the minimum hot rolling temperature of 1010°C and cooled in air.

>150-350mm: Material soaking 1065°C, min. 30 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

>350-375mm: Material soaking 1050°C, min. 60 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

>375mm: Material soaking 1050°C, min. 120 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

The raw material is free from radioactive contamination.

Material free from mercury contamination.

No welding or weld repair.

This is to certify that the contents of this certified material test report are correct and accurate and that all test results and operations are in compliance with the material specification.

Approved acc. AD 2000-Merkblatt W0 and certified acc. to Pressure Equipment Directive (2014/68/EU) by TÜV NORD; notified body, reg.no. 0045.

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

Lab accreditation

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

Applicable only to specific dimensions

20mm - 250mm: EN 10088-5 EN (Only valid for CE marked products together with Alleima Declaration of Performance certificate).

20mm - 400mm: PED 2014/68/EU EN 10272 (Stainless steel bars for pressure purposes)

20mm - 375mm: AD-2000-W2/W10

20mm - 450mm: NORSOK M-630 - NORSOK MDS S11

180mm- 450mm: PED 2014/68/EU EN 10222-5 (Chemical composition only)

70mm - 450mm: AMS 5648 Rev. L, AMS 5653 Rev. H

Suitable for manufacturing of components in acc. with *ASTM A-182, (F316/F316L), ASTM A-965, ASTM A-314.

Test location

Mechanical, ferrite, corrosion testing:

Bar dim \leq 50mm - Longitudinal test pieces in center of the bar.

Bar dim $>$ 50mm - 160 mm - Longitudinal test pieces, 1/4 T and minimum 100 mm from any second surface.

Bar dim $>$ 160mm- 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.

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.

Alleima, formerly Sandvik Materials Technology. During a brand transition period, both Sandvik and Alleima marking on products may exist.



**CERTIFICATE**

A03/Z02

No. A/21-977521**Rev****00****Date**

2021-10-20

Page

1/4

A02/Z03

INSPECTION CERTIFICATE acc to
EN 10204 3.1

A06

SVERDRUP STEEL AS
STRANDSVINGEN 2
4032 STAVANGER
NORWAY

INSPECTION STAMP

SVQ

Customer References 851173 125-06911 SVERDRUP S	A07		Sandvik References Order No. 577064 Subs No. 703374 SMT Dispatch note 26718/53 SMT No. 284-46141 C.Code 87	A08
	Customer order			
	2021-10-19			

Material description HOT WORKED BAR STEEL FORGED ANNEALED & STRAIGHTENED PEEL TURNED AND POLISHED	B01/B04		Steel/material Designations Sandvik SANMAC 316/SANMAC 316L AISI 316/316L UNS S31600/S31603 W.nr 1.4401/1.4404 EN no 1.4401/1.4404	B02
Metallurgical process E+AOD+LRF	Origin Sweden	c70		

Technical requirements EN 10088-3:-2014, EN10272:-2016*, EN10060:2003, EN 10221:1996 EN10222-5:-2017*, PED 2014/68/EU, QQ-S-763 F, 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, ASTM A-479-20, ASME SA-479-ED-21 SECT II PART A, ASTM A-484-20B, ASTM A-182-21*, ASTM A-965-21*, ASTM A-314-19*, NORSOK M-630 ED-6, NORSOK MDS S01 REV. 5, *For detailed information, please see the appendix	B03
--	-----

EXTENT OF DELIVERY							B07-B13	
It	Product designation	Heat	Lot	Pieces	Kg			
12	MBR-SANMAC316L-190	562966	64923	1	1318.0			
	MI-1-5000-							
			Total	1	1318.0			
Heat		Recycled material(%)						
562966	Continuous casting	93.6						
TEST RESULTS								
Reduction ratio (times)								
Lot								
64923	3.1							
Chemical composition (weight%) acc. to ASTM A-751								
Heat	C	Si	Mn	P	S	Cr	Ni	Mo
562966	0.010	0.24	1.76	0.035	0.026	16.81	10.15	2.02
	N							
562966	0.052							

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

A05/Z02

A01

AB SANDVIK MATERIALS TECHNOLOGY Reg No. 556234-6832 VAT No. SE556234683201
SE-81181 SANDVIKEN SWEDEN www.materials.sandvik mtc_service.smt@sandvik.com



**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	%	%
64923	Rp0.2	Rp1.0	Rm	A	2"
	265	301	534	62	62
	Red.of Area				
	%				
	Z				
	76				

Transversal, 90° from each other.

Location half radius

Lot	Yield strength		Tensile strength	Elongation	
	MPa	MPa	MPa	%	%
64923	Rp0.2	Rp1.0	Rm	A	2"
	225	266	531	64	64
	234	271	529	63	63
	Red.of Area				
	%				
	Z				
	72				
	67				

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

Location half radius

Lot	Min	Max
	HB	HB
64923	133	134
Lot	Min	Max
	HRB	HRB
64923	73	74

Grain size acc to ASTM E-112.

Location half radius

Lot		
64923	4.0	4.0

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

Location half radius

Lot	Single values			Avg.	Temperature
	Joule			Joule	°C
64923	133	115	127	125	20
	145	127	130	134	20

Following controls/tests have been satisfactorily performed:

- Intergranular corrosion test acc to ASTM A-262 PR.E and EN ISO 3651-2A
- Positive Material Identification (PMI)
- Ultrasonic testing (*)
- Visual inspection and dimensional control.

Heat Treatment:

Solution annealed and quenched.





HEAT TREATMENT:

Up to 35mm: Material soaking 1050°C, min. 20 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

>35-150mm: In process annealed according to ASTM A484 above the minimum hot rolling temperature of 1010°C and cooled in air.

>150-350mm: Material soaking 1065°C, min. 30 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

>350-375mm: Material soaking 1050°C, min. 60 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

>375mm: Material soaking 1050°C, min. 120 minutes. Quenched in water. Water temp pre-quench max 38°C, after quench max 49°C.

The raw material is free from radioactive contamination.

Material free from mercury contamination.

No welding or weld repair.

This is to certify that the contents of this certified material test report are correct and accurate and that all test results and operations are in compliance with the material specification.

Approved acc. AD 2000-Merkblatt W0 and certified acc. to Pressure Equipment Directive (2014/68/EU) (PMA 1326W113330-1) by TUEV NORD GmbH; 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 Sandvik Materials Technology. 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.

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APPENDIX

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

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20mm - 250mm: EN 10088-5 EN (Only valid for CE marked products together with Sandvik Declaration of Performance certificate).

20mm - 400mm: PED 2014/68/EU EN 10272 (Stainless steel bars for pressure purposes)

20mm - 375mm: AD-2000-W2/W10

20mm - 450mm: NORSOK M-630 Ed. 6 - NORSOK MDS S01 Rev. 5

180mm- 450mm: PED 2014/68/EU EN 10222-5 (Chemical composition only)

70mm - 450mm: AMS 5648 Rev. L, AMS 5653 Rev. H

Suitable for manufacturing of components in acc. with *ASTM A-182, (F316/F316L), ASTM A-965, ASTM A-314.

Test location

Mechanical, ferrite, corrosion testing:

Bar dim <=50mm - Longitudinal test pieces in center of the bar.

Bar dim > 50mm - 160 mm - Longitudinal test pieces, 1/4 T and minimum 100 mm from any second surface.

Bar dim > 160mm- 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.

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.





LANGTHON MARITIME AS

Smertuveien 1
1672 KRÅKERØY, Norge
Foretaksregisteret: NO 920 323 812 MVA
Telefon: +4795832432
E-post: kristian@langthon.com
Nettside: www.langthon.com

JOTRON SKIPPER AS
Postboks 151 Manglerud
0612 OSLO
Norge

Pakkseddel

Ordrenummer:	452471	Ordredato:	2023-03-09
Kundenr.:	16	Vår kontakt:	Kristian Langthon Jakobsen
Referanse:	PO106404	Deres kontakt:	Tore Lundell Olsen
Kontaktens telefonnr.:	45398103	Vekt:	565,00 kg

452471-3

Beskrivelse

DB-2051 DB2051 Intermediate element DN100
112 Freightcost

Antall

50 stki ✓
1 stk

HJN 11.01.2024

EN 10204 - 3.1

Sertifika No / Number of Cert.: :2023/066

Tarih/Date

7.07.2023

Firma Adı / Customer Name : :LANGTHON AS/ SKIPPER - PO 452471 & PO 452472

Malzeme Kalitesi / Material Standard : CF8M / Stainless Steel Casting

Sıra Pos	Döküm No/Heat Number	Malzeme Adı / Material Name	Parça Adeti / Material Quantity	Kimyasal Kompozisyon / Chemical Composition									
				% C	% Si	% Mn	% P	% S	% Cr	% Mo	% Ni		
				0.08 Max	1.5 Max.	1.5 Max.	0.040 Max	0.030 Max.	17.0-21.0	2.0-3.0	9.0-12.0		
1	2306	DN100 PN16 INTERMEDIATE BODY	50	0.059	0.82	0.790	0.024	0.023	17.4	2.08	9.05		
2	2307	DN65 PN16 INTERMEDIATE BODY	20	0.054	0.81	0.810	0.026	0.019	17.6	2.11	9.09		
3	2308	DN65 PN16 INTERMEDIATE BODY	20	0.052	0.95	0.840	0.029	0.025	17.3	2.15	9.11		
4													
5													

Mekanik Özellikler / Mechanical Properties

Döküm No / Heat Number.	Akma Dayanımı N/mm ² Yield Strength	Çekme Dayanımı N/mm ² Tensile Strength	Uzama / Elongation %	Kesit Daralması / Reduction of Area %	Darbe Testi / Charpy Impact test 1/0°C	Sertlik / Hardness HB
	180 Min.	440	30 Min.	-	-	-
2306	281.4	486.4	41	-	-	-
2307	278.6	495.4	43	-	-	-
2308	274.6	501.4	47	-	-	-

Tahribatsız Testler / Non Destructive Tests

Döküm No / Heat Number.	Parça Adeti / Material Quantity	MT	PT	UT	RT	VT	Microstructure Ranges
2306	50	-	-	-	-	OK	-
2307	20	-	-	-	-	OK	-
2308	20	-	-	-	-	OK	-

Uygulanan Isıl İşlemler / Heat Treatment Applied

Döküm No / Heat Number.	Parça Adeti / Material Quantity	Normalizing °C	Annealing °C	Stress Relieving °C	Quenching °C	Tempering °C
2306	50	1100°C/ 2 Hours	-	-	-	-
2307	20	1100°C/ 2 Hours	-	-	-	-
2308	20	1100°C/ 2 Hours	-	-	-	-

We hereby certify that the material has been made by an approval process and satisfactorily tested in accordance with the rules of BV,LR and DNV-GL.

Surface quality is suitable with eye examination of MSS SP55 Standard.

KONTROL / CONTROLLED BY		ONAY / APPROVED BY		GÖZETİM / WITNESS BODY (if necessary)
Adı /Name	Tuncay SARAÇ	Adı /Name	Hakan ÇALIŞKAN	
Ünvanı/ Title	Quality Control Engineer	Ünvanı/ Title	Quality Manager	
İmza/ Signature		İmza/ Signature		
Tarih/ Date	7.07.2023	Tarih/ Date	7.07.2023	

CERTIFICATES: (Validities: DD/MM/..YY)

Navüga Certification ISO 9001:2015 Cert No:2140003(10.01.2023-06.01.2024)	DNV-GL : Certificate No:AMMM00002YE (05.04.2022-04.04.2025)
Bureau Veritas-Mode II Survey Scheme- Marine Division Cert No:SMS.W.II./57463/A.0 (09.11.2022-27.02.2026)	Lloyd's Register-Certificate No:LR2004266WA (03.07.2020-02.07.2023)



EN 10204 - 3.1

Sertifika No / Number of Cert.: :2023/065

Tarih/Date

7.07.2023

Firma Adı / Customer Name : :LANGTHON AS/ SKIPPER - PO 452471

Malzeme Kalitesi / Material Standard : CF8M / Stainless Steel Casting

Sıra Pos	Döküm No/Heat Number	Malzeme Adı / Material Name	Parça Adeti / Material Quantity	Kimyasal Kompozisyon / Chemical Composition									
				% C	% Si	% Mn	% P	% S	% Cr	% Mo	% Ni		
				0.08 Max	1.5 Max.	1.5 Max.	0.040 Max	0.030 Max.	17.0-21.0	2.0-3.0	9.0-12.0		
1	2301	DN100 PN16 INTERMEDIATE BODY	50	0.056	0.84	0.770	0.022	0.024	17.3	2.11	9.12		
2	2302	DN100 PN16 INTERMEDIATE BODY	50	0.051	0.85	0.780	0.019	0.016	17.5	2.14	9.13		
3	2303	DN100 PN16 INTERMEDIATE BODY	50	0.058	0.91	0.764	0.024	0.021	17.4	2.16	9.14		
4	2304	DN100 PN16 INTERMEDIATE BODY	50	0.058	0.93	0.794	0.023	0.023	17.2	2.09	9.22		
5	2305	DN100 PN16 INTERMEDIATE BODY	50	0.061	0.94	0.871	0.021	0.022	17.1	2.11	9.15		

Mekanik Özellikler / Mechanical Properties

Döküm No / Heat Number.	Akma Dayanımı N/mm ² Yield Strength	Çekme Dayanımı N/mm ² Tensile Strength	Uzama / Elongation %	Kesit Daralması / Reduction of Area %	Darbe Testi / Charpy Impact test J/0°C	Sertlik / Hardness HB
	180 Min.	440	30 Min.	-	-	-
2301	276.5	501.4	43	-	-	-
2302	282.2	502.6	44	-	-	-
2303	284.5	506.9	48	-	-	-
2304	271.5	498.4	44	-	-	-
2305	275.6	505.6	48	-	-	-

Tahribatsız Testler / Non Destructive Tests


Döküm No / Heat Number.	Parça Adeti / Material Quantity	MT	PT	UT	RT	VT	Microstructure Ranges
2301	50	-	-	-	-	OK	-
2302	50	-	-	-	-	OK	-
2303	50	-	-	-	-	OK	-
2304	50	-	-	-	-	OK	-
2305	50	-	-	-	-	OK	-

Uygulanan Isıl İşlemler / Heat Treatment Applied

Döküm No / Heat Number.	Parça Adeti / Material Quantity	Normalizing °C	Annealing °C	Stress Relieving °C	Quenching °C	Tempering °C
2301	50	1100°C/ 2 Hours	-	-	-	-
2302	50	1100°C/ 2 Hours	-	-	-	-
2303	50	1100°C/ 2 Hours	-	-	-	-
2304	50	1100°C/ 2 Hours	-	-	-	-
2305	50	1100°C/ 2 Hours	-	-	-	-

We hereby certify that the material has been made by an approval process and satisfactorily tested in accordance with the rules of BV, LR and DNV-GL.

Surface quality is suitable with eye examination of MSS SP55 Standard.

KONTROL / CONTROLLED BY		ONAY / APPROVED BY		GÖZETİM / WITNESS BODY (if necessary)
Adı / Name	Tuncay SARAÇ	Adı / Name	Hakan ÇALIŞKAN	
Ünvanı / Title	Quality Control Engineer	Ünvanı / Title	Quality Manager	
İmza / Signature		İmza / Signature		
Tarih / Date	7.07.2023	Tarih / Date	7.07.2023	

CERTIFICATES: (Validities: DD/MM/..YY)

Naviga Certification ISO 9001:2015 Cert No:2140003(10.01.2023-06.01.2024)	DNV-GL : Certificate No:AMMM00002YE (05.04.2022-04.04.2025)
Bureau Veritas-Mode II Survey Scheme- Marine Division Cert No:SMS.W.II./57463/A.0 (09.11.2022-27.02.2026)	Lloyd's Register-Certificate No:LR2004266WA (03.07.2020-02.07.2023)

