



Page 1 of 2
Certificate No. OSL2400292
First Date of Inspection 10 April 2024
Final Date of Inspection 10 April 2024
Office Oslo

Certificate for Machinery Equipment

Valves

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 129523
Manufacturer	Jotron Skipper AS
Intended for	Warehouse
Customer Work Order No	PWO 130979
Date of issue	11 April 2024
Quantity	13 pcs

Particulars

Description	8 off valves SB100SB with bottom flange. 5 off SB60SA with bottom flange
Size	100 and 60 mm
Valve body material	Stainless steel
Test pressure body	5 BAR
Test pressure seat	5 BAR
Design pressure	-
Set pressure if applicable	-
Quantity	8 off valves SB100SB, 5 off SB60SA

Identification Marks On Product

I.D number	LR OSL2400292
Surveyors initials	-
Date of inspection	-

Remarks

No remarks raised

Stein Vangen
Lloyd's Register EMEA
A subsidiary of Lloyd's Register Group Limited



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Description	Manufacturer Designation	Serial Number	IMO Number
SB-100-SB		24218	0
SB-100-SB		24219	0
SB-100-SB		24220	0
SB-100-SB		24221	0
SB-100-SB		24222	0
SB-100-SB		24223	0
SB-100-SB		24224	0
SB-100-SB		24225	0
SB-60-SA		24226	0
SB-60-SA		24227	0
SB-60-SA		24228	0
SB-60-SA		24229	0
SB-60-SA		24230	0

Operation number

Operation

Manufacturing area

Remaining quantity

PRODUCTION

5 stk

Note

SB-60-SA-LR

Stockloc / Details	Assignment	Quantity	Product
For operation number 100			
1-PALL-00	SSA/132782-1	5 stk	ZCC-02001
1-PALL-00	16 stk		Main element DN65 for XB-60-XA
For operation number 200			
1-PALL-06	SSA/132518-1	5 stk	SB-1022
1-PALL-06	15 stk		Bottom flange for SB-60-XA
1-PALL-06	SSA/133315-1	5 stk	DB-1021
1-PALL-06	24 stk		Intermediate Element 60 mm
1-PALL-07	SSA/133483-1	5 stk	DB-1031
1-PALL-07	30 stk		Top Flange for XB-60-XA
1-S-24	SSA/131168-1	20 stk	ZOA-01023
1-S-24	163 stk		Nut M12 DIN934 A4
1-S-74	SSA/132430-1	5 stk	DB-2040
1-S-74	209 stk		Washer Ø46x2,5 Ø32,5 for XB-60/100/200-XX
1-T-01	SSA/133605-1	10 stk	DB-2035
1-T-01	500 stk		Gasket Ø47/32,5 X 20mm for XB-60/100/200-XX
1-T-02	SSA/132139-1	20 stk	ZOA-01048
1-T-02	332 stk		Washer M12 DIN125 A4
1-T-02	SSA/132719-1	2 stk	DB-2036
1-T-02	4 stk		Nut M50 Brass for XB-60/100/200-XX
1-T-02	SSA/132838-1	10 stk	ZOA-01065
1-T-02	180 stk		Screw M12x40 mm DIN933 A4-80
1-T-02	SSA/132836-1	20 stk	ZOA-01034
1-T-02	160 stk		Screw M16x40 DIN933 A4-80
1-T-02	SSA/132835-1	20 stk	ZOA-01035
1-T-02	952 stk		Spring washer M16 DIN127B A4
1-T-02	SSA/133213-1	3 stk	DB-2036
1-T-02	15 stk		Nut M50 Brass for XB-60/100/200-XX
1-T-02	SSA/133576-1	30 stk	ZOA-01066
1-T-02	952 stk		Spring Washer M12,2 DIN 127B A4
Varmerom	SSA/131679-1	10 stk	ZZA-01127
Varmerom	3695 stk		Metallised polyester label on roll

Additional parts

Product	Stockloc	Quantity
GVA-LR		5 stk
Sea Valve approval from Lloyds Register		

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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.:	24226
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 checked="" 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 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.:

	Heat no Body	Heat no Cap	Skipper Part No.
Valve Element:	CP3K9		ZCC-02001
Intermediate Element:		2308	DB-1021
Bottom Flange:		568933	SB-1022
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:

8/4

Sign:

AS

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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.:	24227
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 checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
<u>DB-60</u>		<input 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:	CP2C1		ZCC-02001
Intermediate Element:		2308	DB-1021
Bottom Flange:		568933	SB-1022
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:

8/4

Sign:

LS

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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.:	24228
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 checked="" 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 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.:

	Heat no Body	Heat no Cap	Skipper Part No.
Valve Element:	CP2C1		ZCC-02001
Intermediate Element:		2308	DB-1021
Bottom Flange:		568933	SB-1022
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: 8/4

Sign: AS

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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.:	24229
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 checked="" 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 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.:

	Heat no Body	Heat no Cap	Skipper Part No.
Valve Element:	CP16M		ZCC-02001
Intermediate Element:		2308	DB-1021
Bottom Flange:		568933	SB-1022
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: 8/4

Sign: AS

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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.:	24230
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 checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
<u>DB-60</u>		<input 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:	CP2F2		ZCC-02001
Intermediate Element:		2308	DB-1021
Bottom Flange:		568933	SB-1022
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: 8/4

Sign: AS

Operation number Operation

Manufacturing area Remaining quantity

PRODUCTION 8 stk

Note

SB-100-SB-LR

Stockloc / Details	Assignment	Quantity	Product
For operation number 100			
1-PALL-00	SSA/133188-1	8 stk	ZCC-01015
1-PALL-00	31 stk		Main element, Ball Valve DN100 PN16/3.1.B
For operation number 200			
1-PALL-00	SSA/133317-1	8 stk	DB-2051
1-PALL-00	25 stk		Intermediate element for xB-100-xB casted
1-PALL-03	SSA/132281-1	64 stk	ZOA-01075
1-PALL-03	688 stk		Screw M16x55 mm DIN933 A4-80
1-PALL-06	SSA/133307-1	8 stk	SB-2019
1-PALL-06	13 stk		Bottom flange for SB-100-xx
1-PALL-06	SSA/133370-1	8 stk	DB-2031
1-PALL-06	16 stk		Top Flange for XB-100/200-XX
1-S-74	SSA/129962-1	8 stk	DB-2040
1-S-74	32 stk		Washer Ø46x2,5 Ø32,5 for XB-60/100/200-XX
1-T-01	SSA/131319-1	72 stk	ZOA-01036
1-T-01	114 stk		Nut M16 DIN934 A4
1-T-01	SSA/132853-1	10 stk	DB-2035
1-T-01	79 stk		Gasket Ø47/32,5 X 20mm for XB-60/100/200-XX
1-T-01	SSA/133056-1	24 stk	ZOA-01036
1-T-01	1787 stk		Nut M16 DIN934 A4
1-T-01	SSA/133510-1	6 stk	DB-2035
1-T-01	476 stk		Gasket Ø47/32,5 X 20mm for XB-60/100/200-XX
1-T-02	SSA/130207-1	12 stk	ZOA-01035
1-T-02	56 stk		Spring washer M16 DIN127B A4
1-T-02	SSA/132835-1	84 stk	ZOA-01035
1-T-02	952 stk		Spring washer M16 DIN127B A4
1-T-02	SSA/133213-1	8 stk	DB-2036
1-T-02	15 stk		Nut M50 Brass for XB-60/100/200-XX
Varmerom	SSA/131679-1	16 stk	ZZA-01127
Varmerom	3695 stk		Metallised polyester label on roll

Additional parts

Product	Stockloc	Quantity
GVA-LR		8 stk
Sea Valve approval from Lloyds Register		

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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.:	24225
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 type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
<u>SB-100</u>		<input type="checkbox"/>	<input checked="" 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:	TE9A	TC9A	ZCC-01015
Intermediate Element:		2301	DB-2051
Bottom Flange:		569485	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: 8/4

Sign: AS

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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.:	24224
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.:

	Heat no Body	Heat no Cap	Skipper Part No.
Valve Element:	TD9A	TC9A	ZCC-01015
Intermediate Element:		2306	DB-2051
Bottom Flange:		569485	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:

8/4

Sign:

JS

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INSPECTION & TEST PROTOCOL FOR SEA VALVE

Document No: Q12-TI-0108-02 2023

SKIPPER sea valve Serial No.:	24223
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.:

	Heat no Body	Heat no Cap	Skipper Part No.
Valve Element:	TE9A	TE9A	ZCC-01015
Intermediate Element:		2302	DB-2051
Bottom Flange:		569485	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:

8/4

Sign.:

AS

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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.:	24222
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 type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
<u>SB-100</u>		<input type="checkbox"/>	<input checked="" 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:	TE9A	TE9A	ZCC-01015
Intermediate Element:		2301	DB-2051
Bottom Flange:		569485	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:

8/4

Sign:

fs

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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.:	24221
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.:

	Heat no Body	Heat no Cap	Skipper Part No.
Valve Element:	TD94	TD94	ZCC-01015
Intermediate Element:		2304	DB-2051
Bottom Flange:		569485	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:

8/4

Sign:

JS

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.:	24220
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:	TC9A	TC9A	ZCC-01015
Intermediate Element:		2305	DB-2051
Bottom Flange:		569485	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:

8/4

Sign.:

AS

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.:	24219
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.:

	Heat no Body	Heat no Cap	Skipper Part No.
Valve Element:	TC9A	TE9A	ZCC-01015
Intermediate Element:		2304	DB-2051
Bottom Flange:		569485	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: 8/1

Sign: 

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.:	24218
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.:

	Heat no Body	Heat no Cap	Skipper Part No.
Valve Element:	TC94	TE94	ZCC-01015
Intermediate Element:		2301	DB-2051
Bottom Flange:		569485	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: 8/4

Sign: AS



SAMSVARSERKLÆRING

Leverandør / produsent:

Strømmen Dreieverksted AS

Sendt dato:

30/1-2024

SKIPPER bestillings nr:

107178.

SKIPPER varenummer:

SB-1022

Revisjon:

04

Antall levert:

30

Stål produsentens Heat / Charge nr:

1. 568933

2.

3.

4.

5.

Batch nr (år-uke-løpenummer):

Eks på batch nr: 13441

0424

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

A02/Z03

INSPECTION CERTIFICATE acc to
EN 10204 3.1

A06

SVERDRUP STEEL AS
STRANDSVINGEN 2
4032 STAVANGER
NORWAY

SVQ

<p>Customer References A07</p> <p>PO-NO01750</p> <p style="text-align: right;">Customer order 2023-12-04</p> <p>125-06911 SVERDRUP S</p>	<p>Alleima References A08</p> <table style="width: 100%;"> <tr> <th>Order No.</th> <th>Subs No.</th> <th>Dispatch note</th> </tr> <tr> <td>604403</td> <td>723880</td> <td>49355/53</td> </tr> <tr> <th>Suppl. No</th> <th>C.Code</th> <th></th> </tr> <tr> <td>284-81756</td> <td>87</td> <td></td> </tr> </table>	Order No.	Subs No.	Dispatch note	604403	723880	49355/53	Suppl. No	C.Code		284-81756	87																																											
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<p>Material description B01/B04</p> <p>HOT WORKED BAR STEEL FORGED ANNEALED & STRAIGHTENED PEEL TURNED AND POLISHED</p> <p>Melt Source ALLEIMA AB SWEDEN</p> <p>Metallurgical process Origin C70 EAF+AOD+LRF Sweden</p>	<p>Steel/material Designations B02</p> <p>Alleima SANMAC 316/SANMAC 316L</p> <table style="width: 100%;"> <tr> <th>AISI</th> <th>UNS</th> </tr> <tr> <td>316/316L</td> <td>S31600/S31603</td> </tr> <tr> <th>W.nr</th> <th>EN no</th> </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																																														
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<p>Technical requirements B03</p> <p>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:-2020, NACE MR0103/ISO 17945-1:-2015, ASTM A-276-23, ASME SA-276-ED-21 SECT II PART A, ASTM A-479-23A, ASME SA-479-ED-21 SECT II PART A, ASTM A-484-23A, ASTM A-182-23*, ASTM A-965-21A*, ASTM A-314-19*, NORSOK M-630:2020, NORSOK MDS S17 REV. 1 *For detailed information, please see the appendix</p>																																																							
<p>EXTENT OF DELIVERY B07-B13</p> <table style="width: 100%;"> <thead> <tr> <th>It</th> <th>Product designation</th> <th>Heat</th> <th>Lot</th> <th>Pieces</th> <th>Kg</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>MBR-SANMAC316L-190 BW-1-4400-6000-</td> <td>568933</td> <td>77021</td> <td>1</td> <td>1085.0</td> </tr> <tr> <td colspan="4" style="text-align: right;">Total</td> <td>1</td> <td>1085.0</td> </tr> </tbody> </table> <p>Heat Recycled material(%) 568933 Continuous casting 95.1</p> <p>TEST RESULTS Reduction ratio (times) Lot 77021 3.1</p> <p>Chemical composition (weight%) acc. to ASTM A-751</p> <table style="width: 100%;"> <thead> <tr> <th>Heat</th> <th>C</th> <th>Si</th> <th>Mn</th> <th>P</th> <th>S</th> <th>Cr</th> <th>Ni</th> <th>Mo</th> </tr> </thead> <tbody> <tr> <td>568933</td> <td>0.016</td> <td>0.31</td> <td>1.76</td> <td>0.030</td> <td>0.024</td> <td>16.82</td> <td>10.12</td> <td>2.04</td> </tr> <tr> <td></td> <td>N</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>568933</td> <td>0.049</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		It	Product designation	Heat	Lot	Pieces	Kg	01	MBR-SANMAC316L-190 BW-1-4400-6000-	568933	77021	1	1085.0	Total				1	1085.0	Heat	C	Si	Mn	P	S	Cr	Ni	Mo	568933	0.016	0.31	1.76	0.030	0.024	16.82	10.12	2.04		N								568933	0.049							
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<p>Quality assurance - Erik Jansson/QA-manager Primary Products A05/Z02 MTC Service / Certificates</p>																																																							



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"
77021	251	291	542	63	63
	Red.of Area				
	%				
	Z				
	76				

Transversal, 90° from each other.

Location half radius

Lot	Yield strength		Tensile strength	Elongation	
	MPa	MPa	MPa	%	%
	Rp0.2	Rp1.0	Rm	A	2"
77021	241	279	539	58	58
	240	280	542	60	60
	Red.of Area				
	%				
	Z				
	61				
	62				

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

Location half radius

Lot	Min	Max
	HB	HB
77021	134	142
Lot	Min	Max
	HRB	HRB
77021	74	77

Grain size acc to ASTM E-112.

Location half radius

Lot		
77021	5.0	5.0

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

Location half radius

Lot	Single values			Avg.	Temperature
	Joule			Joule	°C
77021	123	162	137	141	20
	141	144	145	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 568933 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.





SAMSVARSERKLÆRING

Leverandør / produsent:

Strømmen Dreieverksted AS

Sendt dato:

13-3-2024

SKIPPER bestillings nr:

107177

SKIPPER varenummer:

SB-2017

Revisjon:

04

Antall levert:

30

Stål produsentens Heat / Charge nr:

1.

567485

2.

3.

4.

5.

Batch nr (år-uke-løpenummer):

Eks på batch nr: 13441

2410

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

A02/Z03

INSPECTION CERTIFICATE acc to
EN 10204 3.1

A06

SVERDRUP STEEL AS
STRANDSVINGEN 2
4032 STAVANGER
NORWAY

SVQ

Customer References		A07	Alleima References		A08
PO-NO02358		Customer order	Order No.	Subs No.	Dispatch note
		2024-01-11	605467	724624	49476/53
125-06911 SVERDRUP S			Suppl. No	C.Code	
			284-83616	87	

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

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:-2020, NACE MR0103/ISO 17945-1:-2015,		
ASTM A-276-23, ASME SA-276-ED-23 SECT II PART A,		
ASTM A-479-23A, ASME SA-479-ED-23 SECT II PART A,		
ASTM A-484-23A, ASTM A-182-23*, ASTM A-965-23*, 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
01	MBR-SANMAC316L-225	568409	53122	1	965.0
		569485	89643	1	1579.0
			Total	2	2544.0
Heat		Recycled material(%)			
568409	Continuous casting	95.1			
569485	Continuous casting	95.3			
TEST RESULTS					
Reduction ratio (times)					
Lot					
53122	2.2				
89643	2.3				

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



Chemical composition (weight%) acc. to ASTM A-751

Heat	C	Si	Mn	P	S	Cr	Ni	Mo
568409	0.010	0.26	1.74	0.030	0.025	16.82	10.12	2.01
569485	0.011	0.27	1.70	0.029	0.023	16.90	10.10	2.01
N								
568409	0.049							
569485	0.049							

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"
53122	250	283	524	62	62
89643	248	285	529	63	63
Red.of Area					
	%				
	Z				
	75				
	74				

Transversal, 90° from each other.

Location half radius

Lot	Yield strength		Tensile strength	Elongation	
	MPa	MPa	MPa	%	%
	Rp0.2	Rp1.0	Rm	A	2"
53122	236	271	523	63	63
	236	271	526	61	61
89643	236	271	531	62	62
	241	280	534	62	62
Red.of Area					
	%				
	Z				
	69				
	69				
	69				
	66				

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

Location half radius

Lot	Min	Max
	HB	HB
53122	148	150
89643	132	139
Lot	Min	Max
	HRB	HRB
53122	74	76
89643	74	74

Grain size acc to ASTM E-112.

Location half radius

Lot		
53122	4.0	4.0
89643	4.5	4.5



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

Location half radius

Lot	Single values			Avg.	Temperature
	Joule			Joule	°C
53122	180	146	181	169	20
	159	182	172	171	20
89643	177	170	183	177	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 569485 ALLEIMA AB SWEDEN

Heat 568409 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.

