



Documentation

Transformer

BOMAFA-Com.-No.: 29.500/04-2012


Item 4


Order No.: DECLI-DH1-352


Flowtec Armaturen Limited


Dongfang, Duyen Power Plant

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1. Description of the pressure device

1.1 Intended purpose

The intended use of the device is the through-flow of the medium in compliance with the specified operating conditions.

The pressure device is designed, built and tested in accordance with the pressure-equipment directive 97/23/EG, according to the AD-2000 system of rules.

1.2 Information on the pressure device

See valve data sheet.

1.3 Labelling of the valves

All relevant data concerning the valve is located on the valve's rating plate.

1.4 Scope of delivery

This is in accordance with the order.

2. Classification of the defined use

Please consult section 7 onwards.

3. Transport and storage

Valves are supplied ready to be installed. Any spindles or openings which require welding are protected with plastic caps.

If these protective covers are found damaged on receipt of a valve, it is absolutely necessary that the interior of the housing be examined for dirt. Any dirt found should be removed carefully – without damaging the movable interior parts.

In order to rule out damage during loading, off-loading or transport, valves must only be moved by hand or with suitable cranes or elevators. Do NOT use handwheels or (the actuator`s) eyebolts as lifting points. Protective covers used in transport should be left in place until the valve is installed.

Please consult the dimensional drawing for information regarding the correct positioning of the lifting accessories.

All BOMAFA-valves are protected by paint complying with the operating conditions` requirements. Please ensure that this protective paint is not damaged during transport.

The transport eyebolts on the actuator must only be used for transporting the actuator.

All valves have to be stored in a dry and sheltered place. In particular the area around the gland and stuffing box and the spindle should be kept free of dirt.

4. Assembly

4.1 General information

The operating and maintenance instructions are divided into two parts. The 1st part (section 1-6) concerns general information, and the 2nd part (section 7-11) concerns information particular to specific valves. Should any difficulties arise which you cannot solve with this manual, please consult BOMAFA directly for further information.

This operating manual conforms to the relevant EN safety standards as well as to the German national rules and regulations.

Should the valve be used outside Germany, the operator must ensure that the valve conforms to the relevant national regulations..

BOMAFA reserves the right to make technical alterations and improvements at any time.

The service personnel should be trained in accordance with this operating manual.

4.2 Operational parameters

The valves may be used only in accordance with the instructions stipulated in this manual and within the parameters and ranges of application agreed upon in the sales contract. The deployment of the valves should comply to the media included in the data sheet.

4.3 Hazard notes

Any kind of work on the valves may only be undertaken upon issuance of a special work order.

Any kind of dismantling work may only be undertaken when the valve is depressurized.

Before beginning works on the valve ensure it has cooled to room temperature.



Appropriate safety measures must first be met if the valve is to be worked on while still hot.

Be careful when opening and dismantling the valve as medium remains may still escape, even after the system has been depressurized.

Adjustments to the valve may only be effected when pressure has been lowered in order to prevent the valve from deploying unexpectedly

After any works or adjustments always check to ensure that the valve and all its seals operate correctly.

4.4 Terms relevant to safety

In this manual, the signal terms **DANGER**, **WARNING**, **ATTENTION** and **NOTICE** are used to designate particular dangers or exceptional information to which particular attention should be paid.

DANGER means that – in case of non-observance – there may be danger to life, and / or risks of considerable damage to property.

WARNING means that – in case of non-observance – persons may be seriously injured, and / or risks of damage to property.

ATTENTION means that – in case of non-observance – persons may be injured, and / or risks of damage to property.

NOTICE means that special attention is drawn to technical issues.

In order to avoid any kind of failure which in turn may – directly or indirectly – cause personal injury or damage to property, it is also imperative that all other instructions and technical data relating to transport, operation and maintenance instructions (found in operating manuals, product information as well as on the valve itself) are observed, including those that are not especially marked or emphasized.

4.5 Qualified personnel

Qualified personnel are those persons familiar with the array, arrangement, commissioning and operation of the product who are suitably qualified in terms of their technical expertise and their job description. The guidelines of the plant's health and safety regulations should be upheld.

4.6 Installation and assembly

BOMAF A-valves are supplied with pre-adjusted actuators. The valve spindle is closed. Protective covers must only be removed shortly before the valve is welded or flanged into the pipe system.

In addition to the general installation manual, the following instructions should be observed:

- Remove covers, present.
- Ensure sufficient space for operation, maintenance and disassembly of the valve.
- Valves (except those supplied with a supporting bracket) should not be treated as fix point, but rather supported by the pipe system.
- Protect the valve from dirt – especially during building activities.

The fitting position has to be in accordance with the valve data sheet. Mind the direction of flow, as marked on the valve.

Any necessary technical support should be arranged for by the operator or the assembling company.

ATTENTION!

All pipes have to be cleaned before initiating the valve. Otherwise the tightness of seat cannot be guaranteed.

ATTENTION!!

We emphasize that a fine-meshed dirt trap should be installed in front of the inlet nozzle of injection control valves or nozzle-injection control valves, in order to avoid damages to, or blocking of, the perforations in the control elements.

ATTENTION!!

We wish to point out that down-time of longer than 3 weeks can lead to malfunctions in the valve.

4.7 Tightening torque

Please consult the parts list and parts list drawing for information on the tightening torques for screws. A min and max tightening torque is indicated on valves with Belleville springs at the screw joint of the gland plate. After commissioning (and once the system has reached operating temperature) the max tightening torque will need to be re-adjusted. During operation, the tightening torque should not under-run the min tightening torque.

4.8 Welding

Considering sets of rules:

DIN EN ISO 3834-2 and Teil 5; DIN EN ISO 9692-1; DIN EN 1011-1 und DIN EN ISO 287-1;
DIN EN ISO 970; DIN EN ISO 15641-1

Non-destructive examination:

DIN EN 473

PT-Procedure:

DIN EN ISO 1389 and 571-1

MT- Procedure:

DIN EN ISO 17638

UT- Procedure:

DIN EN 1714

RT- Procedure:

DIN EN ISO 1435

Instructions for welding the valve into the piping system, its heat treatment, cleaning and testing must be observed. Do not affix welding cables (antipole) to the valve!

Check valve and welding ends for damages.

The valve should be fit into the piping system, adjusted and supported in such a way that it can be welded on without any stress between valve and piping. Protect the valve's interior from damage and dirt.

During welding, take special care that no debris enters the pipe system – the steam or water flow might wash them into the valve where they might damage the sealing faces of seat and cone. The weld seam has to be laid carefully in order to prevent the seating's hard-facing from annealing.

Should a heat treatment be necessary, please ensure that the operating temperature is not exceeded.

Before welding, the welding ends of valve and pipe have to be cleaned carefully.

Welding is to be done by qualified welders only, using suitable welding equipment and state-of-the-art techniques.

ATTENTION

In the event that the valve's interior parts have to be dismantled, for example as a consequence of welding debris having entered the interior, then the dismantling and assembly, as well as all necessary adjustments, must only be undertaken by - or under the supervision of - a member of BOMAF A's personnel. Otherwise, the warranty claim becomes obsolete.

4.9 Flanges

Before fitting the valve, ensure the connecting pipe system is clean. When all necessary gaskets have been put in place, seal the connections by progressively tightening the screws (heeding the correct tightening moments) on opposite sides of the flange.

The gaskets between the flanges must be centred.

5. Commissioning

ATTENTION!

During commissioning, the performance test must be effected under normal operating conditions in order to ensure safe operations.

When undertaking the first functional test, please ensure that the nozzle-injection control valve contains water in order to avoid any damages to the valve.

The guarantee is only valid, if the commissioning is undertaken by qualified BOMAFA-personnel.

Before commissioning, check all information concerning medium, pressure, temperature and direction of flow against the layout plan of the pipe system.

Bear in mind that any residues inside the pipe systems and valves (dirt, welding beads, etc.) may eventually cause leakages.

The warm-up bypass should not lead to an unwanted increase of the outlet temperature!

Steam conditioning valves which are furnished with a pre-heater bypass pipe from the inlet to the outlet must be adjusted using the control valve located in the warm-up bypass. Ensure that only sufficient flow is bypassed so as to reach the specified outlet temperature. This is necessary in order to avoid automated engagement of the injection control valve responsible for cooling the hot steam.

Before commissioning, check the actuator's performance ("OPENED"-,"CLOSED") while the system is depressurized. Make sure that the actuator reaches the necessary stroke and the proper closing position.

It goes without saying that any screws and nuts that had been slackened before starting the work must be tightened again (heed the tightening moments – check the parts list drawing).

When the medium enters the valve, the stuffing box packing and cover gaskets have to be checked for tightness immediately and – if need be – tightened (heed the tightening moments).

5.1 Danger!!

Before initiating a new plant (or reopening a plant after repair or modification work), make **completely** sure that:

- all assembly and installation work has been properly finished!
- commissioning is done by *qualified personnel* (see section 4.3)!
- the valve is in the correct operating position!
- all protective guards have been re-attached or repaired!

6. Inspection and maintenance works

6.1 Functional characteristics

See point 8 (detailed for each valve type).

6.2 Maintenance

At regular intervals all screws and nuts should be examined for firm tightening (for tightening moments, check the parts list drawing).

Leakages detected at spindle, flange or cover gaskets may easily be eliminated by tightening the screw connection immediately.

See remarks under section 4.7 regarding the tightening torques of the packing.

The valves should be maintained regularly by suitably qualified personnel. The operator should determine the maintenance intervals according to the operating conditions.

6.2.1 Lubrication for electronic actuators

If need be, the lubricating points located in the upper part of the bonnet should be lubricated every 4 weeks (approx.).

All common types of roller bearing grease may be used as a lubricant.

Since we are unaware of the frequency of actuator use, we recommend using automatic lubricators.

6.2.2 Dismantling

Before pressurized valve parts can be dismantled, the valve must be in a depressurized condition and cooled down to ambient temperature.

This depressurized condition must be maintained through appropriate safety precautions until all works have been finished.

ATTENTION!

IN CASE OF NON-OBSERVANCE: DANGER OF ACCIDENT!

Upon dismantling, inspect the valve internals for marks and furrows on the spindle and on the seat bush. The results should be logged and remedial action initiated.

In order to maintain the warranty claim, it is necessary that an annual inspection of the valves be undertaken by our specialized service personnel.

This warranty claim does NOT include wearing parts.

BOMAFA does not guarantee the perfect performance of the valve, if the installation, commissioning or dismantling of a valve is undertaken without any BOMAFA specialist being present.

We recommend that any kind of valve-related works – on both BOMAFA products as well as on those of other manufacturers – is expertly and reliably undertaken by BOMAFA personnel.

6.3 Assembly

Before you start, examine the valve and its interior parts for cleanliness and intactness. When all work has been finished, check all screw connections for tightness. Ensure the proper functioning of the valve before re-commissioning.

Any self-locking nuts removed during dismantling should be replaced with new ones.

6.4 Special tools

For flawless installation and maintenance work, we recommend the use of:

- a special tool for removing the pressure ring and accessing the seat bush.
- a mounting bush and a clamping fixture to ensure the correct position of the control spindle and its packing.
- a mounting device to pre-stress the spring washer package for safety valves.

6.5 Spare parts

- The following spares should be stored and kept ready at the plant: seat bush, control spindle, base ring, pack ring, sealing and packing materials. For further details (e.g. order numbers) please consult the spare part list in the annex of this manual.
- Manufactured parts are sealed or packaged and should be stored in a dry and sheltered place.
- Sealing and packing material must be stored according to manufacturer's instructions.
- O-rings should conform to DIN 3771 parts 1 – 4 as well as DIN 7716.
- Elastomeres include wiper rings, rod gaskets and piston gaskets.

Additional storage instructions:

Temperature: Storing temperature should be between 0°C and 25°C, otherwise the material may harden, and its shelf and working life will be reduced. In heated storage rooms, the heating elements and supply pipes must be covered to protect stored parts from direct heat. The distance between the sources of heat and the stored parts must be at least 1 (one) meter.

Humidity: On account of condensation possibly developing, do not use humid storage rooms. The most favourable relative humidity is < 65%.

Lighting: The elastomere products have to be protected from direct insolation and strong artificial light with a high ultraviolet fraction. Therefore, the windows of the storage rooms have to be painted either red or orange (but never blue!).

Ozone: To avoid cracking and embrittlement, the elastomere products have to be protected from ozone. The storage room must not have any ozone-producing equipment (e.g., fluorescent light sources, mercury vapour discharge lamps, electric motors etc.).

Oxygen: In order to protect them from drafts, store the elastomere products in airtight receptacles. Oxygen causes cracks and embrittlement!

Limited storage life: If these prerequisites are guaranteed, the storage time is 2 (two) years.

7. Relevant documents for scope of delivery

See section 8 onwards.


8. Functional characteristics


for


Transformer


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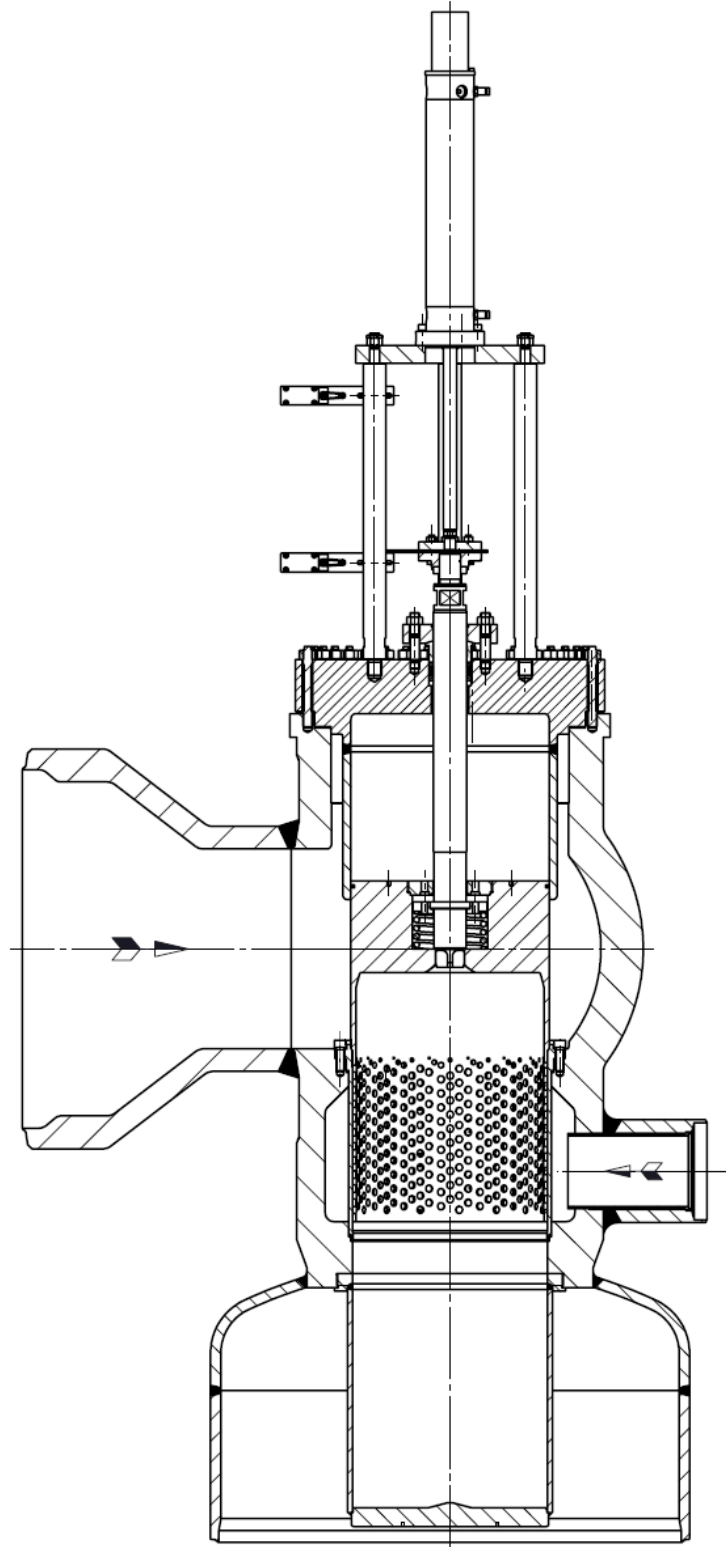
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8.1 General drawing

Item: 01





8.2 Introduction

Transformers are steam-converting valves, that are used for pressure reduction with mass flow control and, simultaneously, for steam condensation.

These three tasks are performed by one and the same valve.

The valve type, the design of its interior fittings, as well as the type of actuator, each is chosen according to the intended application.

Even with these valves, proportioning is done according to their constructional conception – i.e. either by installing a hole spindle, a hole bush, or a flat topped control spindle with hole bush.

The steam is cooled by the injection control valve measured coolants about the ring gap.



8.3 Description of the system and its components

Transformer

The valve shown here principally consists of the valve body, the insert, the seat bush (hole bush), the control spindle, the bonnet and the actuator.

The design of the valve body is angular. The body, the inlet and the outlet connection piece are made of forged steel. The fitting dimensions are in accordance with the pipe work to be connected.

The sealing to the atmosphere occurs from the gasket, which is pressed-in by the clamped insert and the valve body.

The packing area consists of the following components: The bottom ring (at the same time being the guidance for the control spindle), the packing rings (the upper and the lower packing rings serving as chamber rings, thus preventing the graphite rings from extracting through the existing annular passage), the pack ring as well as the stuffing box gland. The supporting surface of both – pack ring and stuffing box gland – is reciprocally crowned.

Closeness inside the packing area is reached by tightening the hexagon nuts at the packing box gland (See of starting torque parts list drawing and remarks under point 4.7)

The seal to the case occurs by means of gaskets in the strength shunt. The interchangeable seat bush is held from 12 hexagon socket head cap screws safeguarded against twisting.

The control spindle has a 30° bevel as seating face. The sealing face is adequately ground to match the seat bush.

The control spindle is so trained, that it contains the control characteristic of the valve.

The pressure is diminished first about the slits in the seat bush. The other pressure reduction and additional noise reduction occurs through the three connected hole bushes at the outlet side.

Through the regulated relaxation steps it is reached, that the wear of the valve is held so slightly as possible. It is counterworked by the subdivision of the pressure gradient of the noise development. The superheated steam cooling is arranged in the low pressure part directly after the first step of pressure reduction. The coolant supply carbine flows in the injection chamber ring.

The valve bonnet is screwed together by means of studs and hexagon nuts with the flange in the body neck. Arranged above the bonnet is the actuator, which is firmly connected to the bonnet adapter flange likewise by studs and hexagon nuts.

As a connecting element between control spindle and actuator a coupling is planned.



8.4 Function

The steam flows in direction of the arrow into the valve body through the inlet connection piece. The control spindle is – as shown in the sectional drawing – closed. Thus the steam is shut off to the low pressure side.

When the hydraulic actuator moves in opening direction, medium flows from the high pressure side to the low pressure side.

When the stroke is small, first of all, medium streams through the clearance between control spindle and seat bush, passing the profile section cleared by the control spindle.

With increasing stroke of the control spindle, steam flows also through the free thrush sectional views of the seat bush (hole bush).

The stepwise pressure reduction occurs through the free thrush sectional views of the seat bush and the hole bushes.

In the hole bushes the steam is divided up into many individual stream, so that an additional noise reducing effect is achieved by that.

The superheated steam cooling occurs through a cooling water supply pipe connection, it flows in the injection chamber ring - arranged in the low pressure part. The highly atomised water for the cooling is injected through the ring gap of the injection chamber ring against the steam flow.


9. Engineering data


for


Transformer

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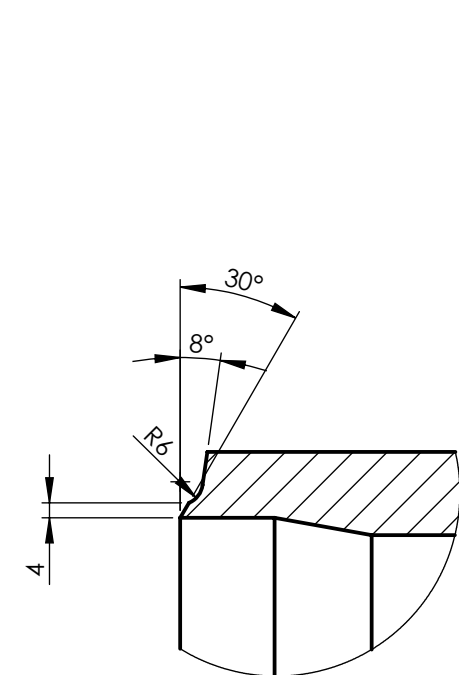
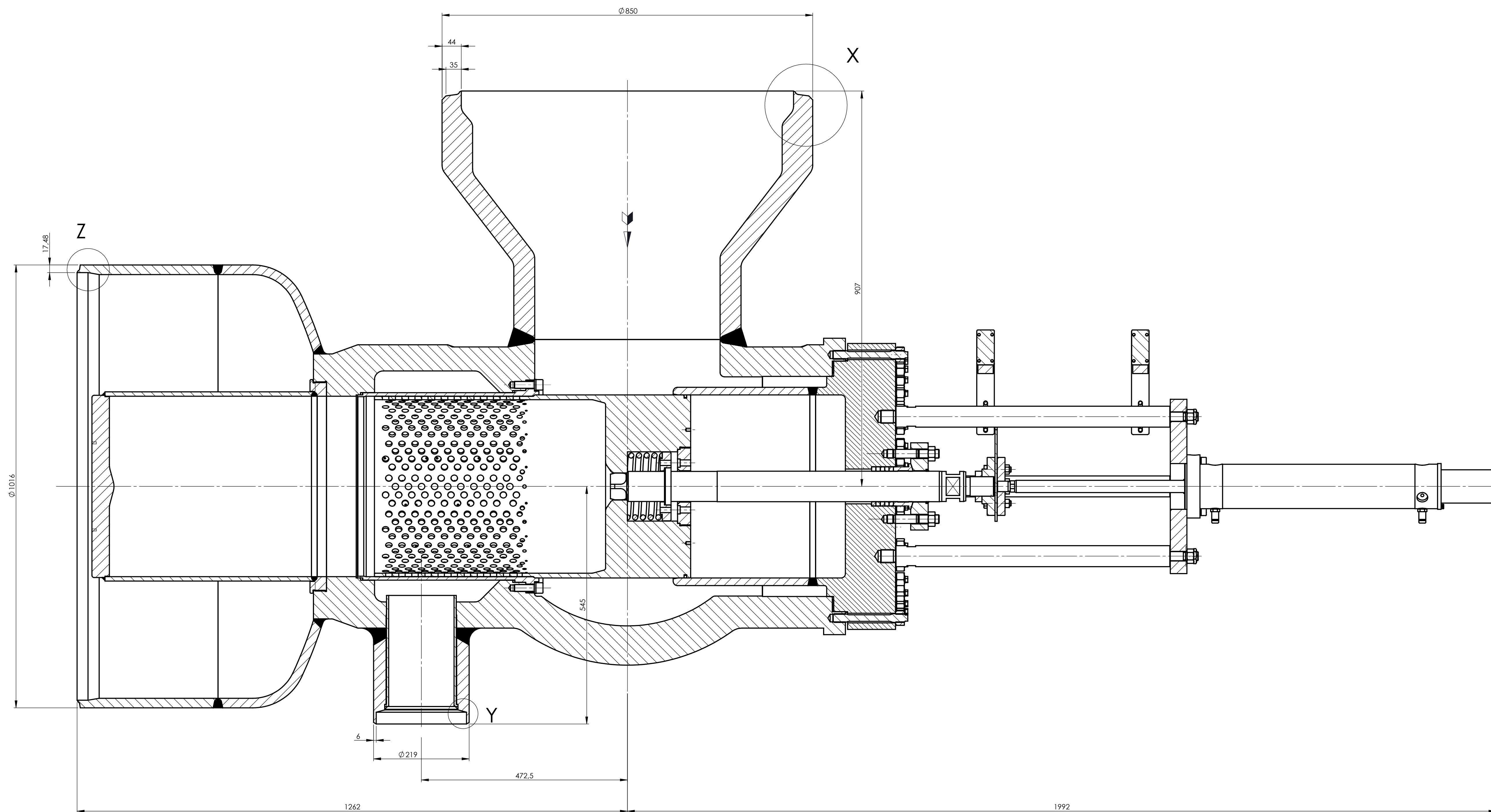
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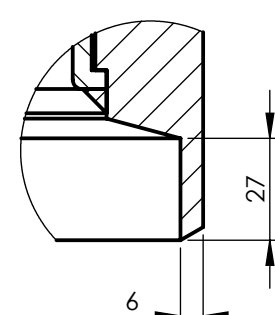
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BOMAFAG		Data Sheet Valves										Com. No.: 29.500			
Type of Valves		Transformer										pieces	4	Item	04
Installation Series		Dongfang Vietnam										BMF-4		Customer Flowtec	
Customer order n.:		DECLI-DH1-352										Entries		English	
No.		Dimension	C	Valve		Piping		Inlet		Outlet		x			
1.01	Design Data			Inlet	Outlet										
1.02	Diameter Nominal	DN	C/M	700	1000										
1.03	Pressure Nominal	PN	C/M	160	25										
1.04	Dimension of pipe connection	mm	C	ID 762 x 35	1016 x 17,48										
1.05	Welding groove / Flange design		C	BW	BW										
1.06	Seal design for flange		C												
1.07	Material: Welding end / Piping		C/M	1.7383	1.7383										
1.08	Design data : Pressure / Temp.	bar/g / °C	C	47,5 / 546	16 / 200										
1.09	Test pressure (T = Ambient temp.)	bar	M	70	24,0										
1.10															
1.11	Ambience condition	°C	C												
1.12	Δ p actuator design	bar/a	C/M	open								closed 47,0			
2.01	Operating Data	Case No.		1	2	3	4	5	6						
2.02	Medium		C	Steam	Steam	Steam	Steam	Steam	Steam						
2.03	Capacity	t/h	C	701,469	126,72225	126,409	164,923	169,286	711,6015						
2.04	Inlet	Pressure p1	bar/a	C	37,2	11	11	11	23,2						
2.05		Temp. t1	°C	C	538	320	380	420	538						
2.06		Speed w1	m/s	C/M	42	18,8	20,8	28,8	68,9						
2.07	Outlet	Pressure p2	bar/a	C	8	8	8	8	8						
2.08		Temp. t2	°C	C	175	175	175	175	175						
2.09		Speed w2	m/s	C/M	81	12,7	13,2	17,7	82,6						
2.10		Wet steam ts	°C	M	170,41	170,41	170,41	170,41	170,41						
2.11	Flow Coefficient	m³/h	M	Kv - Value	3742,4			Kvs - Value	3929,5						
2.12	Type of characteristic line		C/M	equal %		linear	X	Special design							
2.13	Floating time for full stroke	sec.	C	Adjustment		Quick-opening		Quick-closing							
3.01	Valve Data			Control Valve											
3.02	Nominal width of body connection	mm	M	Inlet	Dim. Sheet R4720					Outlet					
3.03	Valve type		M												
3.04	Construction		C	Angle design	X	Straight-way design					Z-design				
3.05	Direction fo flow	B	C/M												
3.06	Leakage / Rangeability		C/M	Leakage		Leakrate		Rangeability							
3.07	Actuator design		M	Body size	10										
3.08	Body construction		C/M	Cast steel		Forged steel	X	Weldment							
3.09	Welding stud at the body	Pieces.	M	Inlet	1	Outlet	2	Dished boiler end							
3.10	Design	mm	M	Seat diameter	414	Stroke	340	Plug stem diameter	70						
3.11	Drain-/ Warm up-/ Swelling steam - stud/pipe.	Pieces.	M	ø168x22		DN 40		Piping							
3.12	Fixed point (Valve)		M	Bracket at body		Rubber-bounded Base									
3.13	Valve insert		M	cramped		self-sealing	X	with swelling steam con.							
3.14	Seat bush		M	removable	X	removable/self-sealing		welded							
3.15	Valve seat		M	armoured		nitride	X	dynamic double seat							
3.16	Valve plug		M	fully relieved		partly relieved	X	pre stroke plug							
3.17	Sealing of the stem relief space		M	piston rings		packing of pure graphite	X								
3.18	Plug type		M	Flatplug		Parabolic plug		Perforated plug	X						
3.19	Pressure relief inserts		M	Seat bush as throttle bush	X	Number of throttle bush	1	Red.- steps total	2						
3.20	Silencer at valve outlet	Pieces	M	Number of orifice		Number of perf. Plate		Throttle labyrinth							
3.21	Steam filter		M	single		double									
3.22	Water injection		M	Center nozzle		Seat bu./Ann. Cap/Lance	X	Cooler body for nozzles							
3.23	Swelling steam delivery		M	over Seat bush		to cooler body		to center nozzle							
3.24	Additional		M	Bellow		Preheater conn. stud		Cooler body/Pro.Plates							
3.25			M	Bonnet / Protective grating		Dome for nozzle		Nominal width Dome							
3.26	Actuator		M	Multi-turn actuator		Flap actuator		Thrust actuator							
3.27			M	Hydraulic actuator	X	Pneumatic actuator		Handwheel							
3.28			C/M	Inlet	1.7383	Body	1.7383	Outlet	1.7383						
3.29	Materials		C/M	Cool. water stud	1.7335	Warm up stud		Draining con. Stud							
3.30			M	Insert	1.7383	Seat bush	1.4923	Plug	1.4923						
3.31			M	Perforated bush	1.7383	Orifice		Plug nut							
3.32	Packing material for:		M	Stem	Graphit	Seat bush	Grafit	Cover lock	Graphit						
3.33	Coating		M	BOMAFAG standard: Thermodur 600 STAN silver-gray											
3.34	Connecting coefficient		M	V = 1 Evaluation group (in accordance with DIN EN ISO 5817 a.2517)											
3.35	Noise level 1m distance (Insulated)	dB(A)	C/M	Wall thickness of the outlet piping must be total at least 15 mm											
3.36	weight of the Valve		M	without Actuator		kg	with actuator		kg						
3.37	injection water	X	M	Quantity	15-203	t/h	Waterpr.	40	bar(a)	Water temp.	50	°C			
3.38	Water stud		M	DN	200	PN	40	Number	1	Design data: Press./Temp. bar/°C	40 / 50				
3.39	Connection		M	Design											
3.40	Acceptance acc. to	PED 97/23/EC	L	Module	H	Category	III	others							
4.01	Remarks														
4.02															
4.03															
4.04															
4.05															
4.06															
4.07	Modifications		Firm	Revision	Row	Name	Phone	Date							
4.08			BOMAFAG	1											
4.09				2	2.11	Skuplik	254	2014-04-10							
4.10				3	1.09	Skuplik	254	2014-05-27							
4.11			M	to be filled in by BOMAFAG			Geprüft	Telefon-DW	Datum						
4.12			C	to be filled in by customer											
4.13	License of Customer	Signature:										Date			

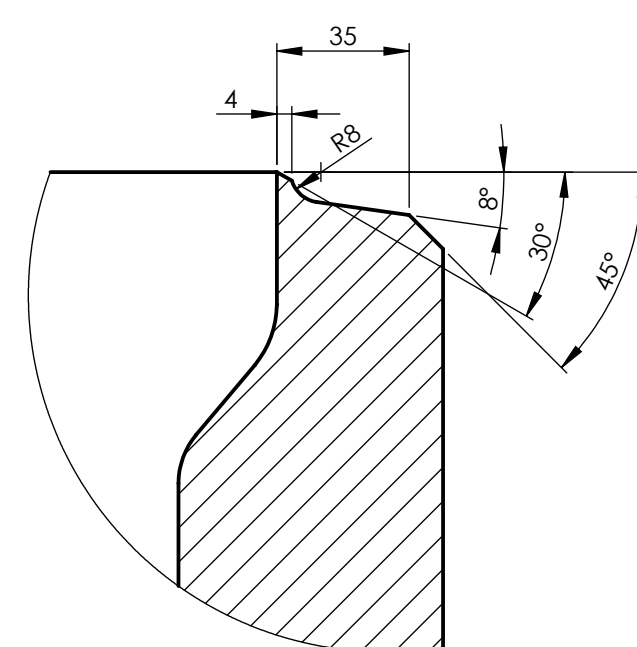
 BOMAFA® Special Valve Solutions		Data Sheet Actuation Specification for LP Bypass Steam Valve		Com No.: 29.500/13	
Type of Actuation: Hydraulic (Drawing No. 2L 10430/b)					Item: 04
01	Manufacturer: asfa		Supplier: BOMAFA		
02	Type of Actuator: CD 250 C 63/28 x 360 DBUW		Actuating Power: 30000 N		Stroke: 360 mm
03	With Flange Mounting		<input checked="" type="checkbox"/> Compact Construction		
04	Operating Characteristics	Oil Opens <input checked="" type="checkbox"/>	Oil Closes <input checked="" type="checkbox"/>	Spring Closes <input checked="" type="checkbox"/>	Spring Opens <input type="checkbox"/>
05	Stroke Time:	Normal control: ~ 10 sec.	Quick-Closing: ≤ 2 sec.	Quick-Opening: ≤ 2 sec.	
Position Transmitter (principle of magnetostriction; system of protection: IP 65; mounted in the actuator)					
06	Manufacturer: Hydac		Type No.: HLT 2100-R1		
07	Signal Transmission:	4 to 20 mA	Volt	Valve Open 20 mA	Valve Closed 4 mA
Limit Switch (system of protection: IP 66)					
08	Manufacturer: Telemecanique		Type No.: XCK-J10513		Quantity: 2
09	Type	Pneum. <input type="checkbox"/>	Electr.-mech. <input checked="" type="checkbox"/>	Inductive <input type="checkbox"/>	Contact Output
				Valve Open <input checked="" type="checkbox"/>	Valve Closed <input checked="" type="checkbox"/>
10	Mechanical Position Indication		<input checked="" type="checkbox"/>		
Other					
11					
12	other components (mounted at the actuator):				
13	- 1 piece terminal box (system of protection: IP 55)				
14					
15					
16					
17					
18					
19					
20					
21					
22					
Processing					
		Name:		Phone	Date:
		H. Propp		+49 2327/992-282	2013-07-18
Modification:		No.	Line	Date:	Name:
		1	06	2013-10-31	H. Cordruwisch
		2			
Bomafa Armaturen GmbH D-44866 Bochum Hohensteinstr. 52 Phone: +49 2327/992-0 Fax: +49 2327/31443		3			
		4			
		5			
License of Customer					



Z (1 : 2)



Y (1 : 2)



X (1 : 2)

mounting situation:
valve vertical
inlet from side

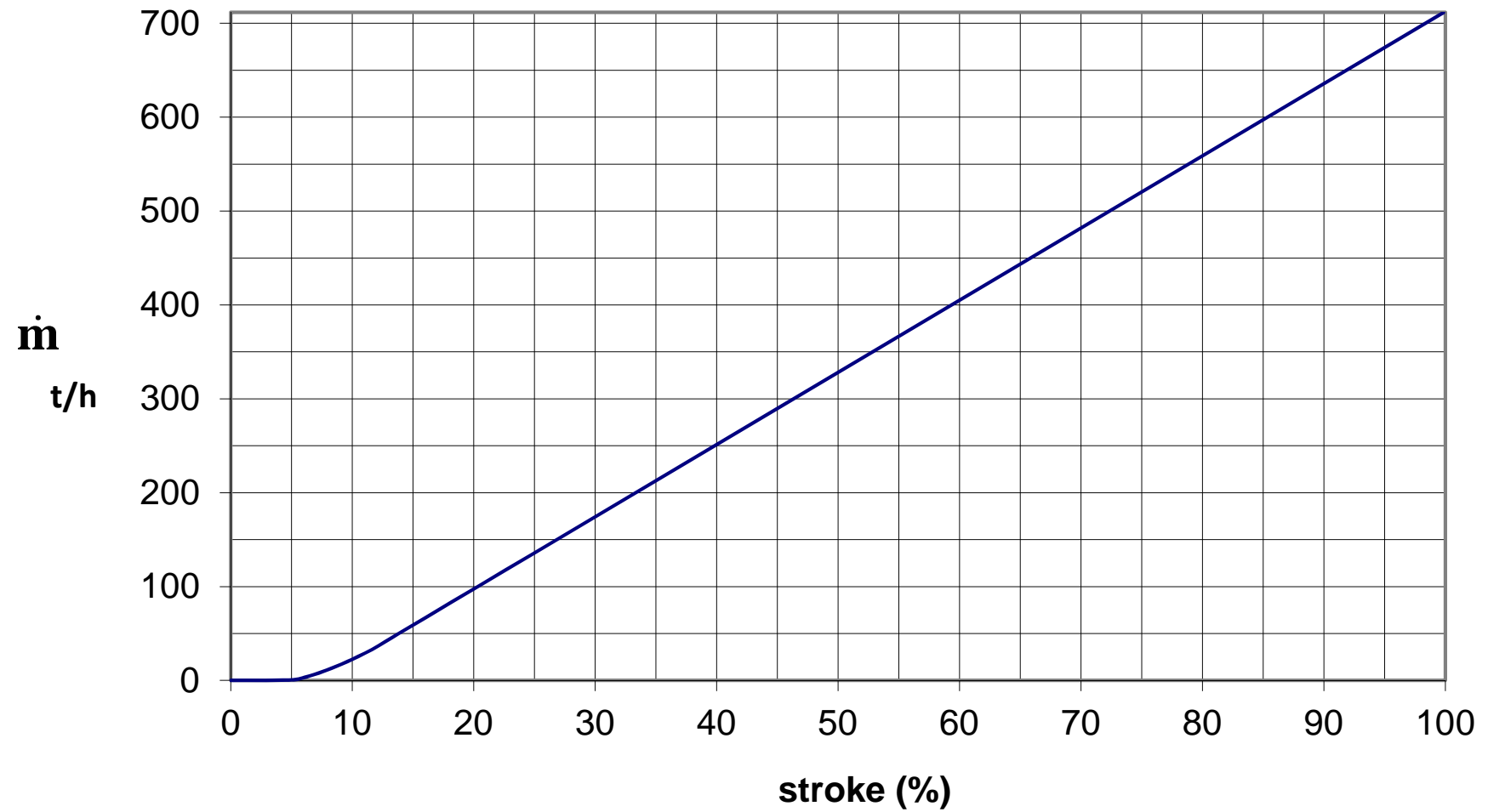
Allgemeintoleranzen (falls nicht angegeben) Maße und Toleranzen nach DIN ISO 2768-1		
Nennmaßbereich		Toleranzen
> 0,50 - 3,00		± 0,10
> 3,00 - 6,00		± 0,10
> 6,00 - 30		± 0,20
> 30 - 120		± 0,30
> 120 - 400		± 0,50
> 400 - 1000		± 0,80
> 1000 - 2000		± 1,20
> 2000 - 4000		± 2,00

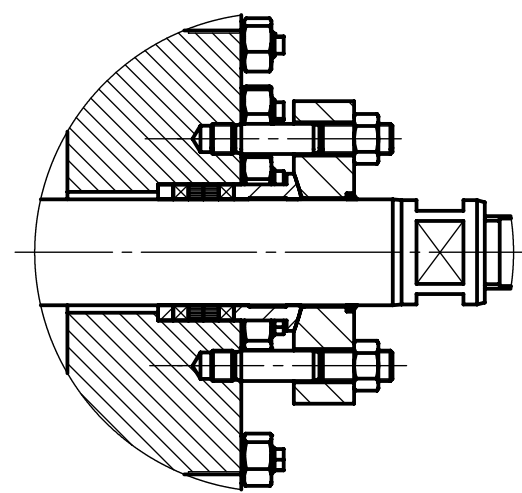
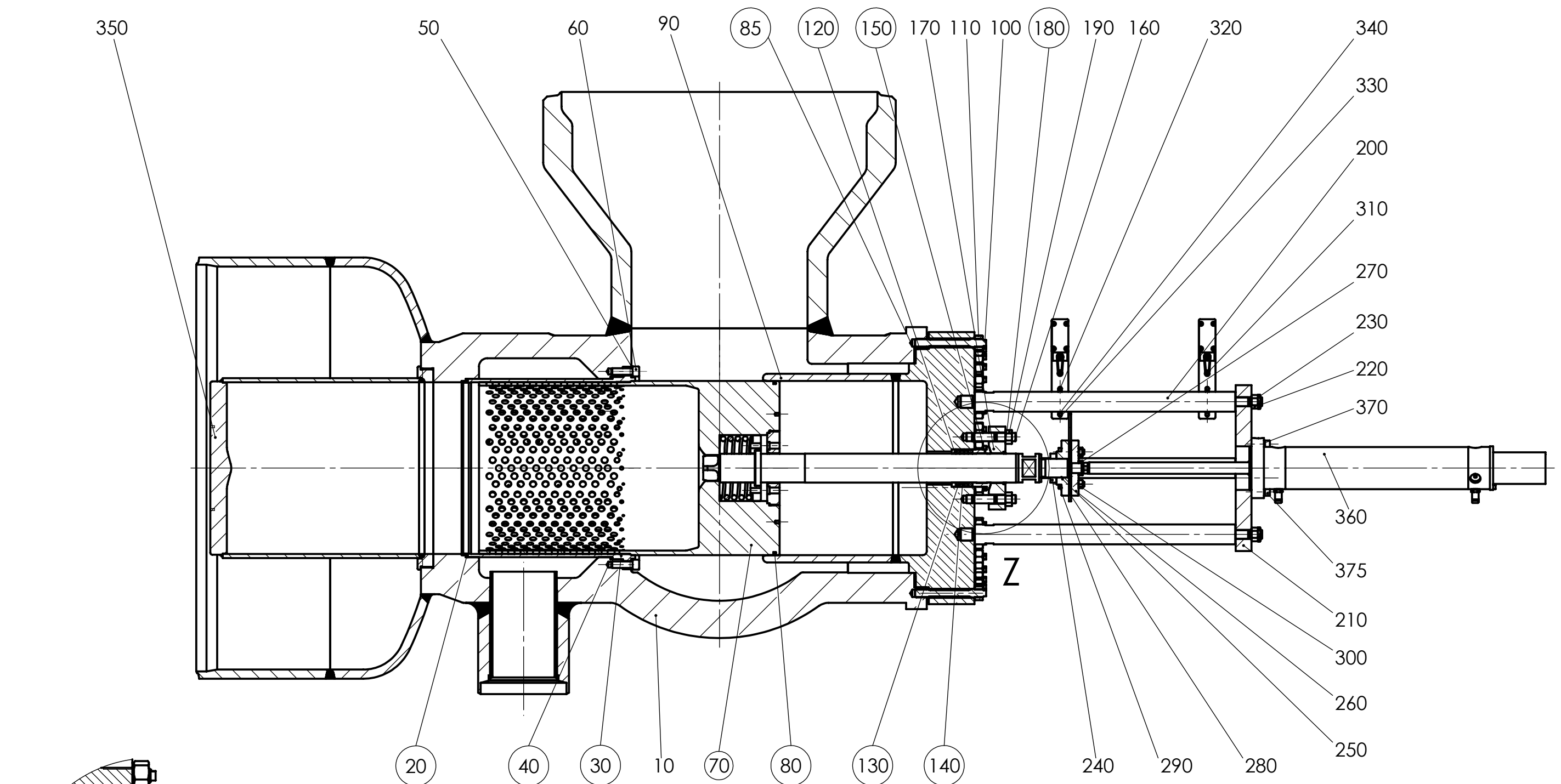


An dieser Zeichnung behalten wir uns die gesetzlichen Urheberrechte vor. Ohne unsere vorherige Zustimmung darf diese Zeichnung weder vervielfältigt noch Dritten zugänglich gemacht werden. Sie darf auch nicht durch den Empfänger oder Dritte in anderer Weise mißbräuchlich verwendet werden.

Rev.	Änderung	Datum	Name
Komm. Nr. 29.500/04	AKZ Nr.	Artikel Nr. 036367-M	
Werkstoff: 3303.34 kg	Ers. f.:	Ers. d.:	
Maßstab: 1:5	QS-Überprüfung nach DIN ISO 9001		A1
Bearb. 23.05.2013	Name bcarth	Benennung: Transformerttransformer	
Gepr.		Zeichng.Nr.: R4720-M	
Maße ohne Toleranzangabe nach DIN 7168 mittel			Blatt 1 von 1

Transformer DN 750/100 PN 160/25
BOMAFA-Comm.-No.: 29.500/04





Z (1 : 5)

Pos. 60 - MA = 100 NM
 Pos.110 - MA = 125 NM
 Pos.190 - MA = 135 NM (Assembly)
 Pos.190 - MA = 65 NM (Operation)

○ - vorgeschlagene Ersatzteile
 spare parts

Ursprungs-Kom.-Nr. 29.500/04			AKZ Nr. -			Artikel Nr. 036367					
 BOMAF®			Werkstoff:			Ers. f.: -			Ers. d.: -		
			Gewicht: 3303.3 kg			QS-Überprüfung nach DIN ISO 9001					
			Maßstab: 1:10								
<p>An dieser Zeichnung behalten wir uns die gesetzlichen Urheberrechte vor. Ohne unsere vorherige Zustimmung darf diese Zeichnung weder vervielfältigt noch Dritten zugänglich gemacht werden. Sie darf auch nicht durch den Empfänger oder Dritte in anderer Weise mißbräuchlich verwendet werden.</p>				Datum	Name	Benennung: <div>Transformer</div> <div>-</div>					
			Bearb.	22.05.2013	Kloss						
			Gepr.	11.06.2013	Skuplik						
			Dateiname: Transformer-036367~0			Zeichng.Nr.: <div>R4720</div>					
Maße ohne Toleranzangabe nach DIN ISO 2768-1 mittel			1 Bl.								



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M1320 5.0

CLIENT PART LIST

Date 26.05.2014 Page 1

Article
036367/R02Definition
TRANSFORMER RE 750/1000Drawing-No.
R4720
Order-No.:
29.500/04-12

Article	Pos.	Quantity	Definition	Drawing-No.
=====				
			TRANSFORMER	
			DN 750/1000 PN 160/25	
			-	
			DRAWING-NO.: R4720	
			-	
			PIECES: 4	
			-	
			STROKE: 340 MM	
			-	
			ACTUATOR: CO. ASFA	
			TYPE: CD 250 C 63/28 X 360 DBUW	
			ACCESSORIES SEE ACTUATOR DATA SHEET	
			-	
			POS. 60 - MA = 100 NM	
			POS. 110 - MA = 125 NM	
			POS. 190 - MA = 135 NM (ASSEMBLY)	
			POS. 190 - MA = 65 NM (OPERATION)	
			-	
			-	
036371	10	1,000 QUANT.	BODY - ASSEMBLY	SW1R4720-1
036372	11	1,000 QUANT.	BODY - PART 11	R4720-1-1
036375	12	1,000 QUANT.	INLET CONNECTION - PART 12	1.7383/3.1
037198	13	1,000 QUANT.	DISHED BOILER END - PART 13	SW3R4720-1-3
037870	14	1,000 QUANT.	OUTLET CONNECTION - PART 14	1.7383/3.1
037869	15	1,000 QUANT.	COOLING WATER CONNECTION - PART 15	SW2R4720-1-4
038019	16	1,000 QUANT.	BUSH - PART 16	1.7383/3.1
037966	20	1,000 QUANT.	GASKET	SW4R4720-1-6
036374	30	1,000 QUANT.	SEAT BUSH	1.7383/3.1
502209	31	1,000 QUANT.	CONTROL CHARACTERISTIC	SW3R4720-1-5
037967	40	1,000 QUANT.	GASKET	1.7335/3.1
036252	50	20,000 PAIR	WEDGE PROTECTION DISC	R4720-1-7
039310	60	20,000 QUANT.	HEXAGON SOCKET HEAD CAP SCREW	1.7335/3.1
037824	70	1,000 QUANT.	CONTROL SPINDLE - ASSEMBLY	GRAPHIT
037825	71	1,000 QUANT.	CONTROL SPINDLE - HEAD	SW2R4720-2
037827	72	1,000 QUANT.	CONTROL SPINDLE - STEM	1.4923
036359	73	1,000 QUANT.	CONTROL SPINDLE - RING	R4720-2
033877	74	1,000 QUANT.	CONTROL SPINDLE - THREADED RING	A=30,16
103597	75	1,000 QUANT.	PRESSURE SPRING	GRAPHIT
502188	76	1,000 QUANT.	CONTROL CHARACTERISTIC	2.4667
037609	80	1,000 QUANT.	PISTON RING	R4720-7
032745	85	1,000 QUANT.	GASKET	SW3R4720-7-1



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M1320 5.0

CLIENT PART LIST

Date 26.05.2014 Page 2

Article
036367/R02Definition
TRANSFORMER RE 750/1000Drawing-No.
R4720
Order-No.:
29.500/04-12

Article	Pos.	Quantity	Definition	Drawing-No.
037828	90	1,000	QUANT. INSERT - ASSEMBLY	SW3R4720-8
037829	91	1,000	QUANT. INSERT - POS. 91	R4720-8-1 1.7383/3.1
037830	92	1,000	QUANT. INSERT-PIPE - POS.92	R4720-8-2 1.7383
033137	100	40,000	QUANT. DOUBLE END STUDS	1.7709/3.2
000723	110	40,000	QUANT. HEXAGON NUT	1.7258
035466	120	1,000	QUANT. BASE RING	R4679-6 1.4122
021082	130	2,000	QUANT. PACKING RING	
021083	140	2,000	QUANT. PACKING RING	
004032/R01	150	1,000	QUANT. PACK RING	SW4R2019-7 REV.1 1.4122
000305	160	2,000	QUANT. STUD	1.7709/3.1
024621	170	1,000	QUANT. GLAND PLATE	SW4R4234-7 1.7335
024509	180	1,000	QUANT. WIPER RING	
000444	190	2,000	QUANT. HEXAGON NUT	1.7258
037605	200	4,000	QUANT. BOLT	R4720-11 1.4923
037871	210	1,000	QUANT. ADAPTER FLANGE	R4720-10 1.5415
000474	220	4,000	QUANT. HEXAGON NUT	
005905	230	4,000	QUANT. SELF LOCKING COUNTER NUT	
035788	240	1,000	QUANT. HEXAGON NUT	SW4R4707-7 1.0037
036205	250	1,000	QUANT. COUPLING	SW4R4705-9 1.0037
039049	260	1,000	QUANT. COUPLING	SW3R4720-12 1.0460
037287	270	1,000	QUANT. HEXAGON NUT	8
036780	280	1,000	QUANT. INDICATRO	R4720-6 1.0037
053182	290	4,000	QUANT. HEXAGON HEAD SCREW	
000472	300	4,000	QUANT. HEXAGON NUT	
038014	310	2,000	QUANT. SUPPORT LONG	R4770-17 1.4301
039029	320	2,000	QUANT. ROUND STEEL BOW	
039315	330	4,000	QUANT. DISC	A4
039314	340	4,000	QUANT. HEXAGON NUT	
037865	350	1,000	QUANT. HOLE BUSH - ASSEMBLY	R4720-9
037866	351	1,000	QUANT. HOLE BUSH - COVER	R4720-9-1 1.7383
037867	352	1,000	QUANT. HOLE BUSH - THREADED RING	R4720-9-2 1.7383
037868	353	1,000	QUANT. HOLE BUSH	R4720-9 1.7383/3.1
000010	360	1,000	QUANT. HYDRAULIC CYLINDER (ASFA)	



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M1320 5.0

CLIENT PART LIST

Date 26.05.2014 Page 3

Article
036367/R02

Definition
TRANSFORMER RE 750/1000

Drawing-No.
R4720
Order-No.:
29.500/04-12

Article	Pos.	Quantity	Definition	Drawing-No.
012390	370	8,000	QUANT. SPRING LOCK WASHER	
901.405	375	8,000	QUANT. HEXAGON SOCKET HEAD CAP SCREW	
024514	380	1,000	QUANT. STROKE INDICATOR SCALE	
005390	390	2,000	QUANT. CROSS RECESSED RAISED CHEESE HEAD SCREW	
005278	400	1,000	QUANT. TYPE PLATE	
005390	410	4,000	QUANT. CROSS RECESSED RAISED CHEESE HEAD SCREW	



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M1320 5.0

CLIENT SPARE PART LIST

Date 26.05.2014 Page 1


Article
036367/R02Definition
TRANSFORMER RE 750/1000Drawing-No.
R4720
Order-No.:
29.500/04-12


Article	Pos.	Quantity	Definition	Drawing-No.
			TRANSFORMER	
			DN 750/1000 PN 160/25	
			-	
			DRAWING-NO.: R4720	
			-	
			STROKE: 340 MM	
			-	
			ACTUATOR: CO. ASFA	
			TYPE: CD 250 C 63/28 X 360 DBUW	
			ACCESSORIES SEE ACTUATOR DATA SHEET	
			-	
			POS. 60 - MA = 100 NM	
			POS. 110 - MA = 125 NM	
			POS. 190 - MA = 135 NM (ASSEMBLY)	
			POS. 190 - MA = 65 NM (OPERATION)	
			-	
			-	
037966	20	1,000 QUANT.	GASKET	
036374	30	1,000 QUANT.	SEAT BUSH	GRAPHIT SW2R4720-2 1.4923
502209	31	1,000 QUANT.	CONTROL CHARACTERISTIC	R4720-2 A=30,16
037967	40	1,000 QUANT.	GASKET	
037824	70	1,000 QUANT.	CONTROL SPINDLE - ASSEMBLY	GRAPHIT R4720-7
037825	71	1,000 QUANT.	CONTROL SPINDLE - HEAD	SW3R4720-7-1 1.4923
037827	72	1,000 QUANT.	CONTROL SPINDLE - STEM	R4720-7-3 1.4923
036359	73	1,000 QUANT.	CONTROL SPINDLE - RING	SW3R4701-3-3 1.4923
033877	74	1,000 QUANT.	CONTROL SPINDLE - THREADED RING	SW3R4611-3 1.4923
103597	75	1,000 QUANT.	PRESSURE SPRING	
502188	76	1,000 QUANT.	CONTROL CHARACTERISTIC	R4720-7-1 A=1185,83
037609	80	1,000 QUANT.	PISTON RING	
032745	85	1,000 QUANT.	GASKET	STELLITE 6
035466	120	1,000 QUANT.	BASE RING	R4679-6 1.4122
021082	130	2,000 QUANT.	PACKING RING	
021083	140	2,000 QUANT.	PACKING RING	
024509	180	1,000 QUANT.	WIPER RING	




10. Inspection certificates

BOMAFA Armaturen GmbH


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Internet: <http://www.bomafa.de>

 BOMAF Special Valve Solutions	Inspections Certificate 3.1		Record-No.: 00 APZ - 29.500 Page: 1 of 1
	acc. to EN 10 204		
Work-No.: 29.500	Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4	Tag-No.: BMF-4	
Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352	
Component: LP-Transformer		Part/Subassembly: -----	
Description/Type:	Type Desig. and DN: SW1R4720-1 / DN 700/1000	Quantity: Lot 1: 2 pieces / Lot 2: 2 pieces	
Requirements: Materials acc. to DIN EN 10.204/3.1 (Pressure Loaded Parts)			
Documents for Review and Approval: by BOMAF			
Materials of Connections: Inlet : 1.7383 / Butt Weld Outlet : 1.7383 / Butt Weld Cooling Water Nozzle: 1.7335 / Butt Weld			
Designation:	Allowable gage pressure	Allowable temperature	Volum. Capacity
Unit:	barg	°C	l
Inlet Side:	47,5	546	
Outlet Side:	16	200	
Cooling Water Side:	40	50	
Test result:		The requirements have been fulfilled. 2014	
Appendixes:		Record-No.: 01 - 09 (Material-Certificates: Record-No. 10 -16)	
Remarks: This is to confirm that all components and piece parts were manufactured in accordance with the directions imposed by our Quality Assurance System.			
<div style="display: flex; justify-content: space-between;"> <div> Place: Bochum Date: 2014-06-18 The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity. </div> <div> Dirk Orth Work Inspector </div> </div>			

 BOMAF <small>Special Valve Solutions</small>		<p align="center">Surface Crack Examination Record Penetrant Test</p>				Record-No.: 01 PT - 29.500 Page: 1 of 3					
Work-No.: 29.500			Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4			Tag-No.: BMF-4					
Customer: Flowtec			Plant: Vietnam Dongfang			Order-No.: DECLI-DH1-352					
Drawing-No.: SW1R4720-1			Material: 1.7383 / 1.7335			Object: Welding Groove Flanks					
Specification: Rev.: EN 571-1			Process-Spec.: Rev.: AD2000-HP 5/3			Examination-No.: Rev.: -----					
Extend of Examination: Body and all Nozzles					Testing: <input checked="" type="checkbox"/> before <input type="checkbox"/> after <input type="checkbox"/> without Heat Treatment						
Surface Condition: Outside: Machined Inside: Machined					Test Temperature T(°C): <input type="checkbox"/> T < 5 <input checked="" type="checkbox"/> 5 < T < 50 <input type="checkbox"/> T > 50						
Examination System (EN 571-1): II E d					UV-Lamp/Type/Manufacturer:						
Penetrant/Manufacturer: Diffusions-Red BDR, Diffu-Therm			Penetrant Remover/Manufacturer: Cleaner-BRE 3, Diffu-Therm			Developer/Manufacturer: Developer-BEA, Diffu-Therm					
Precleaning: Cleaner-BRE 3, Diffu-Therm					Drying after Precleaning: Ambient Air						
Penetrant Application: Painting					Dwell Time (min): 30						
Penetrant Removal: Water, BRE 3			Drying after Penetrant Removal: Ambient Air			Developer Application: Spraying					
Irradiation Intensity (W/m²): -----					Illumination Intensity (lx): > 500						
Evaluation Time:		<input checked="" type="checkbox"/>	after Drying			<input checked="" type="checkbox"/>	30 min.	<input type="checkbox"/>	60 min.	<input type="checkbox"/>	120 min.
Major Changes:		yes									
		no				<input checked="" type="checkbox"/>					
Valuation:		<input checked="" type="checkbox"/>	Acceptable/No Indications								
		<input type="checkbox"/>	Acceptable/No Unacceptable Indications <input type="checkbox"/> Reexamination required								
		<input type="checkbox"/>	Not Acceptable/Unacceptable Indications								
Remarks:											
Place: Bochum Date: 2014-06-18 The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity. <div style="float: right;"> Dirk Orth Work Inspector </div>											

 BOMAF <small>Special Valve Solutions</small>		<p align="center">Surface Crack Examination Record Penetrant Test</p>				Record-No.: 01 PT - 29.500 Page: 2 of 3					
Work-No.: 29.500			Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4			Tag-No.: BMF-4					
Customer: Flowtec			Plant: Vietnam Dongfang			Order-No.: DECLI-DH1-352					
Drawing-No.: SW1R4720-1			Material: 1.7383 / 1.7335			Object: Body Welding Seams					
Specification: Rev.: EN 571-1			Process-Spec.: Rev.: AD2000-HP 5/3			Examination-No.: Rev.: -----					
Extend of Examination: N 101 V – N 104 V (inside, wherever applicable)					Testing: <input type="checkbox"/> before <input checked="" type="checkbox"/> after <input type="checkbox"/> without Heat Treatment						
Surface Condition: Outside: Partly Machined Inside: Machined					Test Temperature T(°C): <input type="checkbox"/> T < 5 <input checked="" type="checkbox"/> 5 < T < 50 <input type="checkbox"/> T > 50						
Examination System (EN 571-1): II E d					UV-Lamp/Type/Manufacturer:						
Penetrant/Manufacturer: Diffusions-Red BDR, Diffu-Therm			Penetrant Remover/Manufacturer: Cleaner-BRE 3, Diffu-Therm			Developer/Manufacturer: Developer-BEA, Diffu-Therm					
Precleaning: Cleaner-BRE 3, Diffu-Therm					Drying after Precleaning: Ambient Air						
Penetrant Application: Painting					Dwell Time (min): 30						
Penetrant Removal: Water, BRE 3			Drying after Penetrant Removal: Ambient Air			Developer Application: Spraying					
Irradiation Intensity (W/m²): -----					Illumination Intensity (lx): > 500						
Evaluation Time:		<input type="checkbox"/>	<input checked="" type="checkbox"/>	after Drying		<input checked="" type="checkbox"/>	30 min.	<input type="checkbox"/>	60 min.	<input type="checkbox"/>	120 min.
Major Changes:		yes									
		no			X						
Valuation:		<input checked="" type="checkbox"/>	Acceptable/No Indications								
		<input type="checkbox"/>	Acceptable/No Unacceptable Indications <input type="checkbox"/> Reexamination required								
		<input type="checkbox"/>	Not Acceptable/Unacceptable Indications								
Remarks:											
Place: Bochum Date: 2014-06-18 The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity. <div style="float: right;"> Dirk Orth Work Inspector </div>											




**Surface Crack
Examination Record
Penetrant Test**

Record-No.: **01**

PT - 29.500

Page: **3** of **3**

Work-No.: 29.500		Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4		Tag-No.: BMF-4	
Customer: Flowtec		Plant: Vietnam Dongfang		Order-No.: DECLI-DH1-352	
Drawing-No.: SW1R4720-1		Material: 1.7383 / 1.7335		Object: Welding Ends	
Specification: EN 571-1		Process-Spec.: AD2000-HP 5/3		Examination-No.: -----	
Extend of Examination: Inlet, Outlet and Cooling Water Nozzle				Testing: <input type="checkbox"/> before <input checked="" type="checkbox"/> after <input type="checkbox"/> without Heat Treatment	
Surface Condition: Outside: Machined Inside: Machined				Test Temperature T(°C): <input type="checkbox"/> T < 5 <input checked="" type="checkbox"/> 5 < T < 50 <input type="checkbox"/> T > 50	
Examination System (EN 571-1): II E d				UV-Lamp/Type/Manufacturer:	
Penetrant/Manufacturer: Diffusions-Red BDR, Diffu-Therm		Penetrant Remover/Manufacturer: Cleaner-BRE 3, Diffu-Therm		Developer/Manufacturer: Developer-BEA, Diffu-Therm	
Precleaning: Cleaner-BRE 3, Diffu-Therm				Drying after Precleaning: Ambient Air	
Penetrant Application: Painting				Dwell Time (min): 30	
Penetrant Removal: Water, BRE 3		Drying after Penetrant Removal: Ambient Air		Developer Application: Spraying	
Irradiation Intensity (W/m²):				Illumination Intensity (lx): > 500	
Evaluation Time:		<input checked="" type="checkbox"/>	after Drying		<input checked="" type="checkbox"/> 30 min. <input type="checkbox"/> 60 min. <input type="checkbox"/> 120 min.
Major Changes:		yes			
		no			<input checked="" type="checkbox"/>
Valuation:		<input checked="" type="checkbox"/>	Acceptable/No Indications		
		<input type="checkbox"/>	Acceptable/No Unacceptable Indications <input type="checkbox"/> Reexamination required		
		<input type="checkbox"/>	Not Acceptable/Unacceptable Indications		
Remarks:					
Place: Bochum Date: 2014-06-18 The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.					
Dirk Orth Work Inspector					

 BOMAF Special Valve Solutions		Surface Crack Examination Record Magnetic Particle Test		Record-No.: 02 MT - 29.500 Page: 1 of 1										
Work-No.: 29.500		Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4		Tag-No.: BMF-4										
Customer: Flowtec		Plant: Vietnam Dongfang		Order-No.: DECLI-DH1-352										
Drawing-No.: SW1R4720-1		Material: 1.7383 / 1.7335		Object: Body Welding Seams										
Specification: Rev.: DIN EN ISO 9934-1		Process Spec.: Rev.: AD2000-HP 5/3		Examination-No: Rev.: -----										
Extend of Examination: N 101 V – N 104 V <i>(inside/outside wherever applicable)</i>			Testing: <input type="checkbox"/> before <input checked="" type="checkbox"/> after <input type="checkbox"/> without Heat Treatment											
Surface Condition: Outside: Partly Machined Inside: Machined			Test Temperature T (°C): <input type="checkbox"/> T < 5 <input checked="" type="checkbox"/> 5 < T < 50 <input type="checkbox"/> T > 50											
Method of Magnetisation (EN ISO 9934-1) Picture: 5, 7, 9			Type of Equipment/Manufacturer: Ferrotest 8000, Ferrotest 20, TWM 220, Messrs. Tiede											
Magnetic Particle Powder Trade Name/Manufacturer: Fluoflux			Carrier Fluid and Additives: Water											
Contrast Medium:			UV-Lamp/Type/Manufacturer: Mercury-Vapor Lamp											
Tangent. Field Strength (kA/m): 2.5 – 5.5			Measuring Instrument: FSM-1											
Duration of Magnetisation: Magnetisation and Rinsing min. 3 sec			Enduring Magnetisation: min. 5 sec											
Irradiation Intensity (W/m²): > 10			Illumination Intensity (lx): < 20											
Check by Berthold Testkörper: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			Demagnetisation: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>											
Valuation: <table border="0"> <tr> <td><input checked="" type="checkbox"/></td> <td>Acceptable/No Indications</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td>Acceptable/No Unacceptable Indications</td> <td><input type="checkbox"/> Reexamination required</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Not Acceptable/Unacceptable Indications</td> <td></td> </tr> </table>						<input checked="" type="checkbox"/>	Acceptable/No Indications		<input type="checkbox"/>	Acceptable/No Unacceptable Indications	<input type="checkbox"/> Reexamination required	<input type="checkbox"/>	Not Acceptable/Unacceptable Indications	
<input checked="" type="checkbox"/>	Acceptable/No Indications													
<input type="checkbox"/>	Acceptable/No Unacceptable Indications	<input type="checkbox"/> Reexamination required												
<input type="checkbox"/>	Not Acceptable/Unacceptable Indications													
Remarks: Test for Defects in Longitudinal and Transversal Direction.														
Place: Bochum Date: 2014-06-18 The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity. <div style="text-align: right;"> Dirk Orth Work Inspector </div>														

Record

Work-No.: 29.500	Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4	Tag-No.: BMF-4
Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352
Drawing-No.: SW1R4720-1	Material: 1.7383 / 1.7335	Object: Body Welding Seams
Specification: -----	Rev.: -----	Process Spec.: -----
Examination-No.: -----	Rev.: -----	

Description of Heat Treatment:

 Weld-No.: **N 101 V + N 102 V + N 104 V**

 Type of Heat Treatment: **Furnace Glow**

 Date of Heat Treatment: **2014-04-03**

 Mode of Heating: **Gas**

 Heat Treatment Plan No.: **-----**

 Mode of Annealing: **Stress Relief Annealing**
Normalizing
Temper Glowing

X

 Temperature: [°C] **700**

 Time: [min] **150**

 Heat Rate: [K/h] **80**

 Cooling Rate: [K/h] **80**

 Mode of Cooling: **Furnace cooling down to approx. 300 °C**

 Thermometry: **Thermo-elements on component and chart recorder**

 The requirements as per Heat-Treatment-Plan have been: **fulfilled**
not fulfilled

X

Remarks:

 Place: **Bochum**

 Date: **2014-06-18**
Dirk Orth

The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.

Work Inspector



**Radiographic
Examination
Record for Welds**

Record-No.: **04**

RT - **29.500**

Page: **1** of **10**

Work-No.: 29.500	Item-No.: 04.1 (Lot 1)	Tag-No.: BMF-4
Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352
Drawing-No.: SW1R4720-1	Material: 1.7383 / 1.7335	Object: Body Welding Seams
Specification: DIN EN 1435	Process Spec.: AD2000-HP 5/3	Examination-No.: -----


Extend of Examination: N 101 V + N 103 V	Testing: <input type="checkbox"/> before <input checked="" type="checkbox"/> after <input type="checkbox"/> without Heat Treatment									
Surface Condition: Outside: Partly Machined Inside: Partly Machined	Test Temperature T (°C): <table style="width: 100%;"><tr><td style="width: 30%;"><input checked="" type="checkbox"/></td><td style="width: 30%;">T < 5</td><td style="width: 40%;"></td></tr><tr><td><input type="checkbox"/></td><td>5 < T < 50</td><td></td></tr><tr><td><input type="checkbox"/></td><td>T > 50</td><td></td></tr></table>	<input checked="" type="checkbox"/>	T < 5		<input type="checkbox"/>	5 < T < 50		<input type="checkbox"/>	T > 50	
<input checked="" type="checkbox"/>	T < 5									
<input type="checkbox"/>	5 < T < 50									
<input type="checkbox"/>	T > 50									
Film Location Plan No.: -----	X-Ray Equipment Manufacturer and Type: -----									
Radiation Source: Ir 192	Source/Focal Spot Size: 3.0 mm									
Required Quality Level as per DIN EN 1435: <table style="width: 100%;"><tr><td style="width: 33%;">A</td><td style="width: 33%;">B</td><td style="width: 33%;">X</td></tr></table>	A	B	X	Film Brand and Type: <table style="width: 100%;"><tr><td style="width: 33%;">AGFA D5</td><td style="width: 33%;">C3</td><td style="width: 33%;">C4</td></tr><tr><td></td><td>X</td><td>C5</td></tr></table>	AGFA D5	C3	C4		X	C5
A	B	X								
AGFA D5	C3	C4								
	X	C5								
Exposure Arrangement as per DIN EN 1435, Picture: 5 / 6	Screen Material and Thickness: Front: Pb 0.1 mm Back: Pb 0.1 mm									

Weld-No. Part-No.	Weld Section/ Film Identification:	Selection Thickness mm	Outside Diameter mm	Tube Voltage kV	Tube Current mA	Activity GBq	Exposure Time min	Source-to-Object Distance mm	Image Quality Indicator as per DIN 54,109, Part 1	Film Side	Source Side	Remarks:
N 101 V	Body - Inlet	48	521	---	---	629	15	215	10 FE EN	X		Arrangement 5
N 102 V	Body – Dished End	22.0	649	---	---	629	15	215	10 FE EN	X		Arrangement 6 / 9
N 103 V	Dished End - Outlet	22.0	1016	---	---	629	15	215	10 FE EN	X		Arrangement 5
+ Joint		22.0										

Valuation:	<input checked="" type="checkbox"/>	Acceptable/No Indications	<input type="checkbox"/> Re-Examination required
	<input type="checkbox"/>	Acceptable/No Unacceptable Indications	
	<input type="checkbox"/>	Not Acceptable/Unacceptable Indications	

Remarks:

Place: Bochum Date: 2014-06-18 <small>The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.</small>	Dirk Orth <small>Work Inspector</small>
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 BOMAF Special Valve Solutions		Radiographic Examination Record for Welds						Record-No.: 04 RT - 29.500 Page: 2 of 10	
Work-No.: 29.500			Item-No.: 04.1 (Lot 1)			Tag-No.: BMF-4			

Weld-No. Part-No.	Weld Section/ Film Identification	Density		Image Quality Index as per DIN EN 462, Part 3		Description of Discontinuities as per DIN EN 26.520				Evaluation		Length of Unacceptable Linear Discontinuities
		Minimum	Maximum	Specified	Achieved	Designation	References	Film Flaw	Without Discontinuity	Acceptable	Not Acceptable	
N101V	0 – 35	≥2.3	3.1	9					X		X	
	35 – 75	≥2.3	3.1	9	13					X		
	70 - 115	≥2.3	3.1	9	13					X		
	110 - 150	≥2.3	3.1	9		2011	Aa			X		
	150 - 0	≥2.3	3.1	9	13			X		X		
N102V	A – B	≥2.3	3.1	11	13	2011	Aa				X	
	B – C	≥2.3	3.1	11						X		
	C – D	≥2.3	3.1	11				X		X		
	D – E	≥2.3	3.1	11				X		X		
	E – F	≥2.3	3.1	11	13			X		X		
	F – G	≥2.3	3.1	11				X		X		
	G – H	≥2.3	3.1	11	13	2016	Worm hole	X		X		
	H – I	≥2.3	3.1	11						X		
	I – J	≥2.3	3.1	11				X		X		
	J – K	≥2.3	3.1	11						X		
	K – L	≥2.3	3.1	11		2011	Aa			X		
	L – M	≥2.3	3.1	11	13	301	Slag			X		
	M – A	≥2.3	3.1	11	13			X		X		

Remarks:

Place: Bochum


 Date: 2014-06-18

Dirk Orth

 Work Inspector

The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.

Formular: QS-RT-01/Eb

 BOMAF Special Valve Solutions		Radiographic Examination Record for Welds						Record-No.: 04 RT - 29.500 Page: 3 of 10				
Work-No.: 29.500			Item-No.: 04.1 (Lot 1)			Tag-No.: BMF-4						
Weld-No. Part-No.	Weld Section/ Film Identification	Density		Image Quality Index as per DIN EN 462, Part 3		Description of Discontinuities as per DIN EN 26.520				Evaluation		Length of Unacceptable Linear Discontinuities
		Minimum	Maximum	Specified	Achieved	Designation	References	Film Flaw	Without Discontinuity	Acceptable	Not Acceptable	
N103V	0 – 40	≥2.3	3.1	11	13					X		
	40 – 85	≥2.3	3.1	11	13					X		
	Joint	0 – 22	≥2.3	3.1	9	13						
Remarks:												
<div> <div>Place: Bochum</div> <div>Date: 2014-06-18</div> <div> The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity. <div>Dirk Orth</div> <div>Work Inspector</div> </div> </div>												



**Radiographic
Examination
Record for Welds**

Record-No.: **04**

RT - **29.500**

Page: **4** of **10**


Work-No.: 29.500	Item-No.: 04.2 (Lot 1)	Tag-No.: BMF-4
Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352
Drawing-No.: SW1R4719-1	Material: 1.7383 / 1.7335	Object: Body Welding Seams
Specification: DIN EN 1435	Process Spec.: AD2000-HP 5/3	Examination-No.: -----


Extend of Examination: N 101 V + N 103 V	Testing: <input type="checkbox"/> before <input checked="" type="checkbox"/> after <input type="checkbox"/> without Heat Treatment									
Surface Condition: Outside: Partly Machined Inside: Partly Machined	Test Temperature T (°C): <table style="width: 100%;"><tr><td style="width: 50%;"><input checked="" type="checkbox"/></td><td style="width: 50%;">T < 5</td></tr><tr><td><input type="checkbox"/></td><td>5 < T < 50</td></tr><tr><td><input type="checkbox"/></td><td>T > 50</td></tr></table>	<input checked="" type="checkbox"/>	T < 5	<input type="checkbox"/>	5 < T < 50	<input type="checkbox"/>	T > 50			
<input checked="" type="checkbox"/>	T < 5									
<input type="checkbox"/>	5 < T < 50									
<input type="checkbox"/>	T > 50									
Film Location Plan No.: -----	X-Ray Equipment Manufacturer and Type: -----									
Radiation Source: Ir 192	Source/Focal Spot Size: 3.0 mm									
Required Quality Level as per DIN EN 1435: <table style="width: 100%;"><tr><td style="width: 25%;">A</td><td style="width: 25%;">B</td><td style="width: 25%;">X</td><td style="width: 25%;"></td></tr></table>	A	B	X		Film Brand and Type: <table style="width: 100%;"><tr><td style="width: 25%;">AGFA D5</td><td style="width: 25%;">C3</td><td style="width: 25%;">C4</td><td style="width: 25%;">X</td><td style="width: 25%;">C5</td></tr></table>	AGFA D5	C3	C4	X	C5
A	B	X								
AGFA D5	C3	C4	X	C5						
Exposure Arrangement as per DIN EN 1435, Picture: 5 / 6	Screen Material and Thickness: Front: Pb 0.1 mm Back: Pb 0.1 mm									


Weld-No. Part-No.	Weld Section/ Film Identification:	Selection Thickness mm	Outside Diameter mm	Tube Voltage kV	Tube Current mA	Activity GBq	Exposure Time min	Source-to-Object Distance mm	Image Quality Indicator as per DIN 54,109, Part 1	Film Side	Source Side	Remarks:
N 101 V	Body - Inlet	48	521	---	---	629	15	215	10 FE EN	X		Arrangement 5
N 102 V	Body – Dished End	22.0	649	---	---	629	15	215	10 FE EN	X		Arrangement 6 / 9
N 103 V	Dished End - Outlet	22.0	1016	---	---	629	15	215	10 FE EN	X		Arrangement 5
+ Joint		22.0										


Valuation:	<input checked="" type="checkbox"/>	Acceptable/No Indications	<input type="checkbox"/> Re-Examination required
	<input type="checkbox"/>	Acceptable/No Unacceptable Indications	
	<input type="checkbox"/>	Not Acceptable/Unacceptable Indications	


Place: Bochum		
Date: 2014-06-18		Dirk Orth
The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.		Work Inspector


 BOMAF Special Valve Solutions		Radiographic Examination Record for Welds						Record-No.: 04 RT - 29.500 Page: 5 of 10				
Work-No.: 29.500			Item-No.: 04.2 (Lot 1)			Tag-No.: BMF-4						
Weld-No. Part-No.	Weld Section/ Film Identification	Density		Image Quality Index as per DIN EN 462, Part 3		Description of Discontinuities as per DIN EN 26.520				Evaluation		Length of Unacceptable Linear Discontinuities
		Minimum	Maximum	Specified	Achieved	Designation	References	Film Flaw	Without Discontinuity	Acceptable	Not Acceptable	
N101V	0 – 35	≥2.3	3.1	9				X		X		
	35 – 75	≥2.3	3.1	9	10			X		X		
	70 - 115	≥2.3	3.1	9	11			X		X		
	110 - 150	≥2.3	3.1	9	11			X		X		
	150 - 0	≥2.3	3.1	9	11					X		
N102V	A – B	≥2.3	3.1	11		2011	Aa			X		
	B – C	≥2.3	3.1	11		2011	Aa			X		
	C – D	≥2.3	3.1	11				X		X		
	D – E	≥2.3	3.1	11						X		
	E – F	≥2.3	3.1	11						X		
	F – G	≥2.3	3.1	11				X		X		
	G – H	≥2.3	3.1	11		2011	Aa			X		
	H – I	≥2.3	3.1	11				X		X		
	I – J	≥2.3	3.1	11						X		
	J – K	≥2.3	3.1	11						X		
	K – L	≥2.3	3.1	11						X		
	L – M	≥2.3	3.1	11						X		
	M – A	≥2.3	3.1	11						X		
Remarks:												
<div style="display: flex; justify-content: space-between;"> <div> Place: Bochum Date: 2014-06-18 </div> <div style="text-align: right;"> Dirk Orth Work Inspector </div> </div> <p style="font-size: small; margin-top: 5px;">The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.</p>												

 BOMAF Special Valve Solutions		Radiographic Examination Record for Welds						Record-No.: 04 RT - 29.500 Page: 6 of 10				
Work-No.: 29.500			Item-No.: 04.2 (Lot 1)			Tag-No.: BMF-4						
Weld-No. Part-No.	Weld Section/ Film Identification	Density		Image Quality Index as per DIN EN 462, Part 3		Description of Discontinuities as per DIN EN 26.520				Evaluation		Length of Unacceptable Linear Discontinuities
		Minimum	Maximum	Specified	Achieved	Designation	References	Film Flaw	Without Discontinuity	Acceptable	Not Acceptable	
N103V	0 – 40	≥2.3	3.1	11	13			X		X		
	40 – 85	≥2.3	3.0	11	13					X		
	Joint	0 - 22	≥2.3	3.1	11	13					X	
Remarks:												
Place: Bochum Date: 2014-06-18 The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.												
												Dirk Orth Work Inspector

 BOMAFA® Special Valve Solutions		Radiographic Examination Record for Welds						Record-No.: 04 RT - 29.500 Page: 7 of 10				
Work-No.: 29.500			Item-No.: 04.3 (Lot 2)			Tag-No.: BMF-4						
Customer: Flowtec			Plant: Vietnam Dongfang			Order-No.: DECLI-DH1-352						
Drawing-No.: SW1R4720-1			Material: 1.7383 / 1.7335			Object: Body Welding Seams						
Specification: DIN EN 1435		Rev.:	Process Spec.: AD2000-HP 5/3		Rev.:	Examination-No.: -----		Rev.:				
Extend of Examination: N 101 V + N 103 V					Testing: <input type="checkbox"/> before <input checked="" type="checkbox"/> after <input type="checkbox"/> without Heat Treatment							
Surface Condition: Outside: Partly Machined Inside: Partly Machined					Test Temperature T (°C): <div style="display: flex; align-items: center;"> <input type="checkbox"/> T < 5 <input checked="" type="checkbox"/> 5 < T < 50 <input type="checkbox"/> T > 50 </div>							
Film Location Plan No.: -----					X-Ray Equipment Manufacturer and Type: -----							
Radiation Source: Ir 192					Source/Focal Spot Size: 3.0 mm							
Required Quality Level as per DIN EN 1435:					Film Brand and Type:							
<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">A</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">B</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">X</div> </div>					<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">AGFA D5</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">C3</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">C4</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">X</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">C5</div> </div>							
Exposure Arrangement as per DIN EN 1435, Picture: 5 / 6					Screen Material and Thickness: Front: Pb 0.1 mm Back: Pb 0.1 mm							
Weld-No. Part-No.	Weld Section/ Film Identification:	Selection Thickness	Outside Diameter	Tube Voltage	Tube Current	Activity	Exposure Time	Source-to-Object Distance	Image Quality Indicator as per DIN 54,109, Part 1	Film Side	Source Side	Remarks:
N 101 V	Body - Inlet	48	521	---	---	1606	15	215	10 FE EN	X		Arrangement 5
N 102 V	Body - Dished End	22.0	649	---	---	1606	15	215	10 FE EN	X		Arrangement 6 / 9
N 103 V	Dished End - Outlet	22.0	1016	---	---	1606	15	215	10 FE EN	X		Arrangement 5
+ Joint		22.0										
Valuation:		<div style="display: flex; align-items: center;"> <input checked="" type="checkbox"/> Acceptable/No Indications <input type="checkbox"/> Acceptable/No Unacceptable Indications <input type="checkbox"/> Re-Examination required <input type="checkbox"/> Not Acceptable/Unacceptable Indications </div>										
Remarks:												
Place: Bochum Date: 2014-06-18 <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div>The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.</div> <div> Dirk Orth Work Inspector </div> </div>												

 BOMAF Special Valve Solutions		Radiographic Examination Record for Welds						Record-No.: 04 RT - 29.500 Page: 8 of 10							
Work-No.: 29.500			Item-No.: 04.3 (Lot 2)			Tag-No.: BMF-4									
Weld-No. Part-No.	Weld Section/ Film Identification	Density		Image Quality Index as per DIN EN 462, Part 3		Description of Discontinuities as per DIN EN 26.520				Evaluation		Length of Unacceptable Linear Discontinuities			
		Minimum	Maximum	Specified	Achieved	Designation	References	Film Flaw	Without Discontinuity	Acceptable	Not Acceptable				
N101V	0 – 42	≥2.3	2.2	9	11			X		X					
	40 – 80	≥2.3	2.2	9				X		X					
	80 - 120	≥2.3	2.2	9	11			X		X					
	120 - 160	≥2.3	2.2	9	11					X					
	155 – 0 – 5	≥2.3	2.2	9						X					
N102V	0 – 45	≥2.3	2.3	11	12				X		X				
	40 – 75	≥2.3	2.3	11						X			X		
	75 – 115	≥2.3	2.3	11	12			501	F		X				
	110 - 150	≥2.3	2.3	11				2011, 501	Aa, F	X	X				
	150 - 195	≥2.3	2.3	11	12			501	F		X				
	180 - 0	≥2.3	2.3	11				501	F	X	X				
N103V Joint	0 – 44	≥2.3	2.9	11	12					X			X		
	0 – 22	≥2.3	2.9	11	12								X		
Remarks:															
<div style="display: flex; justify-content: space-between;"> <div> Place: Bochum Date: 2014-06-18 </div> <div style="text-align: right;"> Dirk Orth Work Inspector </div> </div> <p style="font-size: small; margin-top: 5px;">The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.</p>															

 BOMAF <small>Special Valve Solutions</small>	Radiographic Examination Record for Welds	Record-No.: 04 RT - 29.500 Page: 9 of 10										
Work-No.: 29.500	Item-No.: 04.4 (Lot 2)	Tag-No.: BMF-4										
Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352										
Drawing-No.: SW1R4719-1	Material: 1.7383 / 1.7335	Object: Body Welding Seams										
Specification: DIN EN 1435	Rev.: 	Process Spec.: AD2000-HP 5/3										
Rev.: 	Examination-No.: -----	Rev.: 										
Extend of Examination: N 101 V + N 103 V		Testing: <input type="checkbox"/> before <input checked="" type="checkbox"/> after <input type="checkbox"/> without Heat Treatment										
Surface Condition: Outside: Partly Machined Inside: Partly Machined		Test Temperature T (°C): <div style="display: flex; align-items: center;"> <input type="checkbox"/> T < 5 <input checked="" type="checkbox"/> 5 < T < 50 <input type="checkbox"/> T > 50 </div>										
Film Location Plan No.: -----		X-Ray Equipment Manufacturer and Type: -----										
Radiation Source: Ir 192		Source/Focal Spot Size: 3.0 mm										
Required Quality Level as per DIN EN 1435: <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin: 0 5px;">A</div> <div style="border: 1px solid black; padding: 2px; margin: 0 5px;">B</div> <div style="border: 1px solid black; padding: 2px; margin: 0 5px;">X</div> </div>		Film Brand and Type: <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin: 0 5px;">AGFA D5</div> <div style="border: 1px solid black; padding: 2px; margin: 0 5px;">C3</div> <div style="border: 1px solid black; padding: 2px; margin: 0 5px;">C4</div> <div style="border: 1px solid black; padding: 2px; margin: 0 5px;">X</div> <div style="border: 1px solid black; padding: 2px; margin: 0 5px;">C5</div> </div>										
Exposure Arrangement as per DIN EN 1435, Picture: 5 / 6		Screen Material and Thickness: Front: Pb 0.1 mm Back: Pb 0.1 mm										
Weld-No. Part-No.	Weld Section/ Film Identification:	Selection Thickness mm	Outside Diameter mm	Tube Voltage kV	Tube Current mA	Activity GBq	Exposure Time min	Source-to-Object Distance mm	Image Quality Indicator as per DIN 54.109, Part 1	Film Side	Source Side	Remarks:
N 101 V	Body - Inlet	48	521	---	---	1606	15	215	10 FE EN	X		Arrangement 5
N 102 V	Body – Dished End	22.0	649	---	---	1606	15	215	10 FE EN	X		Arrangement 6
N 103 V	Dished End - Outlet	22.0	1016	---	---	1606	15	215	10 FE EN	X		Arrangement 5
+ Joint		22.0										
Valuation:		<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <input checked="" type="checkbox"/> Acceptable/No Indications <input type="checkbox"/> Acceptable/No Unacceptable Indications <input type="checkbox"/> Not Acceptable/Unacceptable Indications </div> <div> <input type="checkbox"/> Re-Examination required </div> </div>										
Remarks:												
<div style="display: flex; justify-content: space-between; padding: 10px;"> <div> Place: Bochum Date: 2014-06-18 </div> <div style="text-align: right;"> Dirk Orth <small>Work Inspector</small> </div> </div> <p style="font-size: small; margin-top: 10px;">The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.</p>												

 BOMAF Special Valve Solutions		Radiographic Examination Record for Welds						Record-No.: 04 RT - 29.500 Page: 10 of 10				
Work-No.: 29.500			Item-No.: 04.4 (Lot 2)			Tag-No.: BMF-4						
Weld-No. Part-No.	Weld Section/ Film Identification	Density		Image Quality Index as per DIN EN 462, Part 3		Description of Discontinuities as per DIN EN 26.520				Evaluation		Length of Unacceptable Linear Discontinuities
		Minimum	Maximum	Specified	Achieved	Designation	References	Film Flaw	Without Discontinuity	Acceptable	Not Acceptable	
N101V	0 – 42	≥2.3	2.2	9	11			X		X		
	40 – 80	≥2.3	2.2	9				X		X		
	80 - 120	≥2.3	2.2	9	11					X		
	120 - 160	≥2.3	2.2	9	11					X		
	155 – 0 – 5	≥2.3	2.2	9						X		
N102V	0 – 45	≥2.3	2.3	11	12	2011	Aa	X		X		
	40 – 75	≥2.3	2.3	11		2011, 501	Aa, F			X		
	75 – 115	≥2.3	2.3	11	12			X		X		
	110 - 150	≥2.3	2.3	11		2011	Aa	X		X		
	150 - 195	≥2.3	2.3	11	12					X		
	180 - 0	≥2.3	2.3	11		2011, 501	Aa, F			X		
N103V Joint	0 – 44	≥2.3	2.9	11	12			X		X		
	0 – 22	≥2.3	2.9	11	12					X		
Remarks:												
Place: Bochum Date: 2014-06-18 The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity. <div style="float: right;"> Dirk Orth Work Inspector </div>												



**Record of
Leakage Rate and
Tightness Test**

Record-No.: **05**

DIP - 29.500

Page: **1** of **1**

Work-No.: 29.500	Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4	Tag-No.: BMF-4
Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352
Drawing-No.: SW1R4720-1	Material: 1.7383 / 1.7335	Object: LP-Transformer
Specification: EN 60534-4	Rev.: Rev.: DIN EN 12 266-1	Examination-No.: -----

Method of Test:	Body	Shutt Off	Shutt Off	Shutt Off
Short Sign acc. to DIN 12 266:	P11	EN 60534-4 Class IV		
Test Medium:	L / WE	W		
Test Gage Pressure: (barg)	1.0	29,2		
Duration of Test Gage Pressure: (min)	10	5		
Test Temperature: (°C)	RT	RT		
Date of Testing:	2014-05-21/22/23	2014-05-21/22-23		
Test Result:	Tight	Tight		

Remarks:

No recognizable leaks have been ascertained.

L = Air

W = Water

WE = Low-Surface-Tension-Water

Place: **Bochum**

Date: **2014-06-18**

Dirk Orth

The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.

Work Inspector



Record of

Record-No.: 06

DRP - 29.500

Page: 1 of 1

Pressure Test

Work-No.: 29.500	Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4	Tag-No.: BMF-4
Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352
Drawing-No.: SW1R4720-1	Material: 1.7383 / 1.7335	Object: LP-Transformer
Specification: PED 97/23/EC	Rev.: -----	Process Spec.: -----
	Rev.: -----	Examination-No.: -----
		Rev.: -----

Method of Test:	Inlet-Side	Outlet-Side	Cooling Water Side	
Short Sign acc. to EN 12 266-1:	P10	P10	P10	
Test Medium:	W	W	W	
Test Gage Pressure: (barg)	70	24	31,2	
Duration of Test Gage Pressure: (min)	20	10	10	
Test Temperature: (°C)	AT	AT	AT	
Date of Testing:	2014-05-21/22/23	2014-05-21/22-23	2014-05-21/22-23	
Test Result:	No Complaints	No Complaints	No Complaints	

Remarks:

No recognizable leaks or improper deformations have been ascertained.

L = Air

W = Water

WE = Low-Surface-Tension-Water

Place: Bochum

Date: 2014-06-18

Dirk Orth

The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.

Work Inspector



Record of

Record-No.: 07

FUP - 29.500

Page: 1 of 1

Operational Test

Work-No.: 29.500	Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4	Tag-No.: BMF-4
Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352
Drawing-No.: -----	Material: -----	Object: LP-Transformer with Actuator
Specification: -----	Rev.: -----	Process Spec.: -----
Rev.: -----	Rev.: -----	Examination-No.: -----

Type of Actuator/Designation:

CD 250 C 63/285 x 360 DBUW

Method of Actuator:

☐

Electric

☒

Hydraulic

☐

Pneumatic

Technical Datas:

Floating Time Adjustment „OPEN“ [sec.]:

~10 ; **measured: 7 - 8**

Floating Time Adjustment „CLOSE“ [sec.]:

~10 ; **measured: 6 – 9.5**

Quick-Closing Time [sec.]:

≤2 ; **measured: 1,5 – 1,9**

Quick-Opening Time [sec.]:

≤2 ; **measured: 1,5 – 1,8**

Single Acting:

☐

Double Acting:

☒

Operating Characteristics:

Spring closes
Medium opens☐Spring opens
Medium closes☐

Operating Characteristics:

Medium closes
Medium opens☒

Actuating Power [N]:

30.000

Stroke [mm]:

360 (Valve 340)

Operating Voltage [V DC]:

Signal Transmission:

4 - 20 mA

Test Result:

The requirements have been fulfilled.

Remarks:

Valve Opened: 20 mA**Valve Closed: 4 mA**

Place: Bochum

Date: 2014-06-17

Dirk Orth

The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.

Work Inspector

Work-No.: 29.500	Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4	Tag-No.: BMF-4
Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352
Drawing-No.: SW1R4720-1	Material: -----	Object: LP-Transformer
Specification: -----	Rev.: -----	Examination-No.: -----

Designation:	Nominal Dimension:		Actual Dimension:	
04.1 Inlet - Nozzle	Outside Diameter (mm)	850,0 +0.5	Outside Diameter (mm)	850
	Inside Diameter (mm)	762,0 -0.5	Inside Diameter (mm)	761,5
Outlet - Nozzle	Outside Diameter (mm)	1016,0 +0.5	Outside Diameter (mm)	1014,8
	Inside Diameter (mm)	981,3 -0.5	Inside Diameter (mm)	980,5
Cooling Water Nozzle	Outside Diameter (mm)	219,0 +0.3	Outside Diameter (mm)	219,2
	Inside Diameter (mm)	207,0 -0,4	Inside Diameter (mm)	206,6
04.2 Inlet - Nozzle	Outside Diameter (mm)	850,0 +0.5	Outside Diameter (mm)	850
	Inside Diameter (mm)	762,0 -0.5	Inside Diameter (mm)	761,5
Outlet - Nozzle	Outside Diameter (mm)	1016,0 +0.5	Outside Diameter (mm)	1013 1018
	Inside Diameter (mm)	981,3 -0.5	Inside Diameter (mm)	980,5
Cooling Water Nozzle	Outside Diameter (mm)	219,0 +0.3	Outside Diameter (mm)	219,0
	Inside Diameter (mm)	207,0 -0,4	Inside Diameter (mm)	206,6

Test Result:

The dimensions of the remaining parts / piece parts are within permissible tolerances.

Remarks:

Place: Bochum

Date: 2014-06-18

Dirk Orth

The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.

Work Inspector

Work-No.: 29.500	Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4	Tag-No.: BMF-4
Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352
Drawing-No.: SW1R4720-1	Material: -----	Object: LP-Transformer
Specification: -----	Rev.: -----	Examination-No.: -----

Designation:	Nominal Dimension:		Actual Dimension:	
04.3 Inlet - Nozzle	Outside Diameter (mm)	850,0 +0.5	Outside Diameter (mm)	850,1
	Inside Diameter (mm)	762,0 -0.5	Inside Diameter (mm)	761,5
Outlet - Nozzle	Outside Diameter (mm)	1016,0 +0.5	Outside Diameter (mm)	1015 1016
	Inside Diameter (mm)	981,3 -0.5	Inside Diameter (mm)	980,5
Cooling Water Nozzle	Outside Diameter (mm)	219,0 +0.3	Outside Diameter (mm)	219,1
	Inside Diameter (mm)	207,0 -0,4	Inside Diameter (mm)	206,6
04.4 Inlet - Nozzle	Outside Diameter (mm)	850,0 +0.5	Outside Diameter (mm)	850,1
	Inside Diameter (mm)	762,0 -0.5	Inside Diameter (mm)	761,5
Outlet - Nozzle	Outside Diameter (mm)	1016,0 +0.5	Outside Diameter (mm)	1017
	Inside Diameter (mm)	981,3 -0.5	Inside Diameter (mm)	980,5
Cooling Water Nozzle	Outside Diameter (mm)	219,0 +0.3	Outside Diameter (mm)	219,2
	Inside Diameter (mm)	207,0 -0,4	Inside Diameter (mm)	206,6

Test Result:

The dimensions of the remaining parts / piece parts are within permissible tolerances.

Remarks:

Place: Bochum

Date: 2014-06-18

Dirk Orth

The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.

Work Inspector



**Record of
Material Certificates
of Base Material**

Record-No.: **09**
MAT - 29.500
Page: 1 of 1

Work-No.: 29.500	Item-No.: Lot 1: 04.1 + 04.2; Lot 2: 04.3 + 04.4	Tag-No.: BMF-4
-----------------------------------	---	---------------------------------

Customer: Flowtec	Plant: Vietnam Dongfang	Order-No.: DECLI-DH1-352
------------------------------------	--	---

Serial-No.: Record-No.:	Part: Item-No. of Material List:	Material:	Sort:	Certificate acc. to DIN EN 10.204		Heat-No.: Test-No.:
				Issueing Company: Certificate-No.:	Date:	
01	Body (04.1)	1.7383	3.1	BGH	2013-12-19	714275
10	11			163085		576V5
01	Body (04.2)	1.7383	3.1	BGH	2013-12-19	714275
10	11			163085		576V6
01	Body (04.3)	1.7383	3.1	BGH	2013-12-19	714275
10	11			163085		576V9
01	Body (04.4)	1.7383	3.1	BGH	2013-12-19	714275
10	11			163085		576V11
02	Body-Inlet (04.1)	1.7383	3.1	BGH	2014-01-06	714275
11	12			163104		363X3
02	Body-Inlet (04.2)	1.7383	3.1	BGH	2014-01-06	714275
11	12			163104		363X4
02	Body-Inlet (04.3)	1.7383	3.1	BGH	2014-01-06	714275
11	12			163104		363X5
02	Body-Inlet (04.4)	1.7383	3.1	BGH	2014-01-06	714275
11	12			163104		363X6
03	Torispherical Head	1.7380	3.1	Afflerbach	2013-11-29	40539
12	13			LK6075TÜV		203420
04	Body-Outlet	1.7380	3.1	Esta Rohr	2013-11-15	20332
13	14			10/9512/2013		254708-1
05	Cooling Water Nozzle	1.7380	3.1	VITKOVICE	2012-10-01	E54274
14	15			06.126.385		0689
06	Insert	1.7380	3.1	BGH	2013-10-24	713130
15	91			204758		145M1

Remarks:
Identification Test (spectral analysis): Without Objections

Place: Bochum

Date: 2004-06-18

Dirk Orth

The certificate was generated by data system, acc. to EN 10 204, it must not be signed for validity.

Work Inspector



BGH Edelstahl Lippendorf GmbH

Beleg Record	Blatt Page
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von of	
3	

BGH Edelstahl Lippendorf GmbH Hauptstr. 100 04575 Neukieritzsch

Bomafa Armaturen GmbH

Hohensteinstraße 52

44866 Bochum
DeutschlandKunden-Bestell-Nr. 11606
Customer order no.
Cde. no. du client 29.500/4BGH-Auftrags-Nr. 117285-001-01
BGH works no.
BGH référence

Zeugnis-Nr. 163085

Certificate no.
No. de certificatBescheinigung über Werkstoffprüfung nach DIN EN 10204
Certificate of material tests according to DIN EN 10204 3.1
Certificat des essais des matériaux selon DIN EN 10204Die Lieferung entspricht den vereinbarten Lieferbedingungen.
Delivery in accordance with the agreed terms of delivery.
La livraison correspond aux conditions de livraison convenues.Zeichen des Lieferwerkes Stempel des Werkssachverständigen
Trade mark Inspector's stamp
Signe du fournisseur Poinçon de l'inspecteur

Erzeugnisform Product		Buchsen, geschmiedet, vorgedreht bushes, forged, pre-turned Sach-Nr./code-no.: 104277									
Werkstoff / Quality		1.7383 11CrMo9-10 +QT									
Anforderungen Requirements		DIN EN 10222-2 04/00; Kundenbestellung / customer order									
Besichtigung und Maßnachprüfung Inspection and dimensional control Inspection et contrôle de dimension ohne Beanstandung without objection				Erschmelzung/Nachbehandlung Melting process/secondary refining Mode d'élaboration/traitement ultérieur E - LF / VD				Verwechslungsprüfung (spectroanalytisch) Identification test (spectral-analysis) examination d'identification (analyse spectrale) ohne Beanstandung without objection			
Pos. Item	Anzahl Quantity	Abmessung Dimension						Gewicht Weight	Schmelz-Nr. Heat-No.		
1	4	VDM Ø825 / Ø409 x 1225 mm						s.LS	714275		
Schmelze Heat %	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Nb	V
714275	0,140	0,34	0,56	0,005	0,0010	2,30	1,06	0,22	0,06	0,001	0,015
Wärmebehandlungszustand Condition of heat treatment		vergütet / quenched and tempered 930°C / 4,0h / Öl-oil + 760°C / 9,0h / Luft-air									
Probe-Nr. Test-No.	Lage Loc.	Temp. °C	ReH N/mm ²	Rp0,2 N/mm ²	Rm N/mm ²	A5 %	Kerbschlagarbeit Impact value J			Probenform Shape of test piece Charpy-V	Härte Hardness HB
Soll/Req.	Q	RT	>=265	>=265	>=450 <=600	>=21	>=34			zur Inf. / to inf.	
576V4	Q	RT	*	424	586	30,4	320	334	309	180,184	
576V5	Q	RT	390		562	31,4	308	340	341	176,179	
576V6	Q	RT	398		569	30,8	290	340	304	175,184	
576V7	Q	RT	*	414	579	31,2	324	313	290	174,175	
576V8	Q	RT	*	400	570	30,5	343	342	364	171,174	
576V9	Q	RT	*	405	576	30,2	297	302	306	176,177	
576V10	Q	RT	*	407	576	30,2	305	323	333	176,178	
576V11	Q	RT	417		581	29,8	334	345	349	176,179	
ReH nicht ausgeprägt / no determination of Yield Strength											
Anlagen Encl. Annexe US-Protokoll / UT-certificate				Neukieritzsch, den Place and date Lieu et date 19.12.2013				Abnahmebeauftragter Inspector representative Inspecteur de réception Reichert			
Das Zeugnis wurde maschinell erstellt und ist auch ohne Unterschrift gültig. This certificate was generated by data system and it is valid without signature as well. Ce certificat a été établi sur système informatique et est valable sans signature aussi.											



BGH Edelstahl Lippendorf GmbH

Beleg Record	Blatt Page 2
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BGH Edelstahl Lippendorf GmbH, Hauptstr. 100 04575 Neukieritzsch

Bomafa Armaturen GmbH

Hohensteinstraße 52

44866 Bochum
DeutschlandKunden-Bestell-Nr. 11606
Customer order no.
Cde. no. du client 29.500/4BGH-Auftrags-Nr. 117285-001-01
BGH works no.
BGH référenceZeugnis-Nr. 163085
Certificate no.
No. de certificatBescheinigung über Werkstoffprüfung nach DIN EN 10204
Certificate of material tests according to DIN EN 10204 3.1
Certificat des essais des matériaux selon DIN EN 10204Die Lieferung entspricht den vereinbarten Lieferbedingungen.
Delivery in accordance with the agreed terms of delivery.
La livraison correspond aux conditions de livraison convenues.Zeichen des Lieferwerkes Stempel des Werkssachverständigen
Trade mark Inspector's stamp
Signe du fournisseur Poinçon de l'inspecteur

Überprüft nach AD 2000-Merkblatt W 0 / TRD durch die TÜV SÜD Industrie Service GmbH
Zertifiziert nach Richtlinie 97/23/EG durch die TÜV CERT-Zertifizierungsstelle
für Druckgeräte der TÜV SÜD Industrie Service GmbH, Benannte Stelle, Kenn-Nr. 0036.
Checked to AD 2000-W 0 / TRD by the TÜV SÜD Industrie Service GmbH
Certified to DGRL 97/23/EG by the TÜV department of certification for pressure system
of the TÜV SÜD Industrie Service GmbH, ident-no.: 0036.

Kennzeichnung / marking:

7383 QT
714275
576V4+576V5 (1x)
576V6+576V7 (1x)
576V8+576V9 (1x)
576V10+576V11 (1x)
BGH US
Q303 307Anlagen
Encl. US-Protokoll / UT-certificate
AnnexeNeukieritzsch, den
Place and date
Lieu et date
19.12.2013Abnahmebeauftragter
Inspector representative
Inspecteur de réception
Reichert

Das Zeugnis wurde maschinell erstellt und ist auch ohne Unterschrift gültig.

This certificate was generated by data system and it is valid without signature as well.
Ce certificat a été établi sur système informatique et est valable sans signature aussi.



BGH Edelstahl Lippendorf GmbH

Beleg Record	Blatt Page 3
10	von of 3

Kunden-Bestell-Nr. 11606
Customer order no.
Cde. no. du client 29.500/4BGH-Auftrags-Nr. 117285-001-01
BGH works no.
BGH référenceZeugnis-Nr. 163085
Certificate no.
No. de certificat

Erzeugnisform : Buchsen, geschmiedet, vorgedreht

Product : bushes, forged, pretuned

: Sach-Nr./code-no.: 104277

Werkstoff/Quality : 1.7383 11CrMo9-10 +QT

Abmessung/Dimension: VDM Ø825 / Ø409 x 1225 mm

Anzahl/Quantity : 4 Gewicht /Weight : s.LS kg

Wärmebehandlungszustand : vergütet

Condition of heat treat : quenched and tempered

Prüfrichtlinie

Specification

DIN EN 10228-3 Tab./tab.3 Typ/type 3, Tab./tab.5 Qualitätskl./quality cl.3

Prüfzustand : vorgedreht

Condition of testing : pretuned

Prüfgerät : USK7

Test equipment

Kopplungsmittel : Öl

Coupling medium : oil

Prüfkopf : B2SE, B4S

Probe

Prüfumfang : 100%

Extent of examination

Prüfrichtung : radial, axial

Scanning direction

Registriergrenze : KSR - 3mm

Registration level : FBH -3mm

Befund : keine registrierpflichtigen Anzeigen

Result : no reportable indications

Lippendorf, den
Place and date
Lieu et date
19.12.13Prüfer
Testing operator
Opérateur
Wetzk
EN 473 Stufe IAbnahmebeauftragter
Inspector representative
Inspecteur de réception
Roßa
EN 473 Stufe IIBGH
Q307Überwacher
Supervisor
Surveilleur



BGH Edelstahl Lippendorf GmbH

Beleg Record	Blatt Page 1
11	von of 2

BGH Edelstahl Lippendorf GmbH Hauptstr. 100 04575 Neukieritzsch

Bomafa Armaturen GmbH

Hohensteinstraße 52

44866 Bochum
DeutschlandKunden-Bestell-Nr. 11606
Customer order no.
Cde. no. du client 29.500/4BGH-Auftrags-Nr. 117285-002-01
BGH works no.
BGH référence

Zeugnis-Nr. 163104

Certificate no.
No. de certificatBescheinigung über Werkstoffprüfung nach DIN EN 10204
Certificate of material tests according to DIN EN 10204 3.1
Certificat des essais des matériaux selon DIN EN 10204Die Lieferung entspricht den vereinbarten Lieferbedingungen.
Delivery in accordance with the agreed terms of delivery.
La livraison correspond aux conditions de livraison convenues.Zeichen des Lieferwerkes
Trade mark
Signe du fournisseurStempel des Werkssachverständigen
Inspector's stamp
Poinçon de l'inspecteur

Erzeugnisform Product		Ringe, geschmiedet, vorgedreht rings, forged, pretuned Sach-Nr./code-no.: 104278									
Werkstoff / Quality		1.7383 11CrMo9-10 +QT									
Anforderungen Requirements		DIN EN 10222-2 04/00; Kundenbestellung / customer order									
Besichtigung und Maßnachprüfung Inspection and dimensional control Inspection et contrôle de dimension ohne Beanstandung without objection				Erschmelzung/Nachbehandlung Meltingprocess/secondary refining Mode d'élaboration/traitement ultérieur E - LF / VD				Verwechslungsprüfung (spectroanalytisch) Identification test (spectral-analysis) examen d'identification (analyse spectrale) ohne Beanstandung without objection			
Pos. Item	Anzahl Quantity	Abmessung Dimension						Gewicht Weight	Schmelz-Nr. Heat-No.		
2	4	VDM Ø863 / Ø420 x 578 mm						s.LS	714275		
Schmelze Heat %	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Nb	V
714275	0,140	0,34	0,56	0,005	0,0010	2,30	1,06	0,22	0,06	0,001	0,015
Wärmebehandlungszustand Condition of heat treatment		vergütet / quenched and tempered 930°C / 4,0h / Öl-oil + 760°C / 8,0h / Luft-air									
Probe-Nr. Test-No.	Lage Loc.	Temp. °C	Rp0,2* N/mm²		Rm N/mm²	A5 %		Kerbschlagarbeit Impact value J	Probenform Shape of test piece Charpy-V	Härte Hardness HB	
Soll/Req.	Q	RT	>=265		>=450 <=600	>=21		>=34		zur Inf./ to inf.	
363X3	Q	RT	404		577	31,0		403 387 386		197,198	
363X4	Q	RT	396		572	34,4		388 411 387		178,180	
363X5	Q	RT	388		566	33,6		409 407 395		187,196	
363X6	Q	RT	388		566	32,7		389 393 396		175,176	

* ReH nicht ausgeprägt / no determination of Yield Strength

Überprüft nach AD 2000-Merkblatt W 0 / TRD durch die TÜV SÜD Industrie Service GmbH
 Zertifiziert nach Richtlinie 97/23/EG durch die TÜV CERT-Zertifizierungsstelle
 für Druckgeräte der TÜV SÜD Industrie Service GmbH, Benannte Stelle, Kenn-Nr. 0036.
 Checked to AD 2000-W 0 / TRD by the TÜV SÜD Industrie Service GmbH
 Certified to DGRL 97/23/EG by the TÜV department of certification for pressure system
 of the TÜV SÜD Industrie Service GmbH, ident-no.: 0036.

Kennzeichnung / marking: 7383 QT
714275363X3 (1x); 363X5 (1x)
363X4 (1x); 363X6 (1x)BGH
Q303US
308Anlagen
Encl. US-Protokoll / UT-certificate
AnnexeNeukieritzsch, den
Place and date
Lieu et date
06.01.2014Abnahmebeauftragter
Inspector representative
Inspecteur de réception
Reichert

Das Zeugnis wurde maschinell erstellt und ist auch ohne Unterschrift gültig.

This certificate was generated by data system and it is valid without signature as well.
Ce certificat a été établi sur système informatique et est valable sans signature aussi.



BGH Edelstahl Lippendorf GmbH

Bilag Record	Blatt Page 2
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Kunden-Bestell-Nr. 11606
Customer order no.
Cde. no. du client 29.500/4BGH-Auftrags-Nr. 117285-002-01
BGH works no.
BGH référenceZeugnis-Nr. 163104
Certificate no.
No. de certificat

Erzeugnisform : Ringe, geschmiedet, vorgedreht

Product : rings, forged, pretuned

: Sach-Nr./code-no.: 104278

Werkstoff/Quality : 1.7383 11CrMo9-10 +QT

Abmessung/Dimension: VDM Ø863 / Ø420 x 578 mm

Anzahl/Quantity : 4 Gewicht /Weight : s.LS kg

Wärmebehandlungszustand : vergütet

Condition of heat treat : quenched and tempered

Prüfrichtlinie

Specification

DIN EN 10228-3 Tab./tab.3 Typ/type 3, Tab./tab.5 Qualitätskl./quality cl.3

Prüfzustand : vorgedreht

Condition of testing : pretuned

Prüfgerät : USK7

Test equipment

Kopplungsmittel : Öl

Coupling medium : oil

Prüfkopf : B2S, B4SE

Probe

Prüfumfang : 100%

Extent of examination

Prüfrichtung : radial, axial

Scanning direction

Registrierergrenze : KSR - 3mm

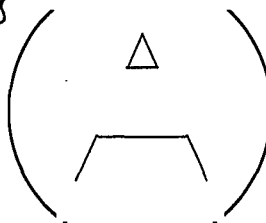
Registration level : FBH - 3mm

Befund : keine registrierpflichtigen Anzeigen

Result : no reportable indications

Lippendorf, den
Place and date
Lieu et date
06.01.14Prüfer
Testing operator
Opérateur
Wetzko
EN 473 Stufe IAbnahmebeauftragter
Inspector representative
Inspecteur de réception
Beuster
EN 473 Stufe IIÜberwacher
Supervisor
Surveilleur

Pos. 13



Afflerbach
Bördenpresserei
GmbH & Co KG
D-56301 Puderbach

Telefon 02684/84-0
Telefax 02684/84-439

Beleg Record	Blatt Page	1
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BOMAFA Armaturen GmbH

Hohensteinstr. 52

D 44866 Bochum

Herr Kelter
84-444

Ihre Bestellung 11599 vom 10.10.13
Your Purchase order

Datum/Date 29.11.2013 BD
Auftrag Nr. 200024728 Pos. 010
Order No.

Beigefügt erhalten Sie die nachstehend genannten Dokumentationsunterlagen :
Ci - joint vous trouverez les documents suivantes :
Attached, please, find the following documents :

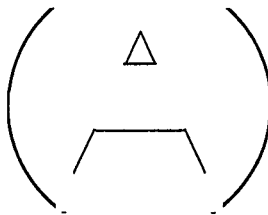
Bescheinigungen / Rapports / Test Reports

- x Blech(e) / Tôle(s) / Plate(s)**
- x Formgebung : warm - kalt / Formage : à chaud - à froid / Forming : hot - cold**
 - Wärmebehandlung(en) / Traitement(s) Thermique(s) / Heat Treatment(s)
 - Werkstoffanalyse(n) / Matériau Analyse / Material Analysis
- x Werkstoffprüfung(en) / Essai(s) Mécaniques / Mechanical Test(s)**
- x US - Prüfung(en) / Examen(s) par Ultra sons / UT - Examination(s)**
 - FE/MP - Prüfung(en) / Ressuage/Magnetoscopie / PT Liquid Penetrant/MT Magnetic Particle
 - Härteprüfung(en) / Essai(s) de Dureté / Hardness Test(s)
 - Werkstoffverwechslungsprüfung(en) / Examen(s) d'Echangeement du Matériaux / Examination(s) on Mix-up of Material
 - IK-Prüfung(en) / Essai(s) de Corrosion Intergranulaire / Intergranular Corrosion Test(s)
 - Gefügeuntersuchung(en) / Examen(s) de la Structure / Structure Verification
 - Schweißen / Soudage / Welding
 - Durchstrahlungsprüfung(en) / Examen(s) par Radiographie / X-ray Radiographic Examination(s)
 - Röntgenfilme / Film(s) / X-Ray film(s)
 - Um-/Ver-/Stempelbescheinigung(en) / Rapport Marquage / Poinçonnage par Erreur / Marking/Transfer/ Wrong Stamping
 - Werksprüfzeugnis 3.1 / Certificate d'usine / Certificate of Compliance
 - Interimsbescheinigung / Certificate Provisoire / Preliminary certificate
 - Maßkontrollblatt(er) / Relevé(s) Dimensionel(s) / Dimensional Control
 - Zertifikat Abnahmegesellschaft / Third Party Inspection Certificate
 - Abweichungs-Bericht / Rapport de Non Conformité / Deviation Report

Afflerbach
Bördenpresserei
GmbH & Co KG

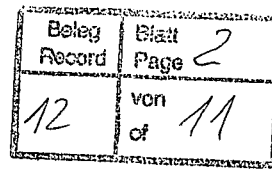
QS - WA / Scc. Qualité / QA-QC Dept.

Anlage(n) / Annexe(s) / Enclosure(s)



Afflerbach
Bödenpresserei
GmbH & Co KG
D-56301 Puderbach

Telefon 02684/84-444
Telefax 02684/84-312



BOMAF A Armaturen GmbH

Hohensteinstr. 52

D 44866 Bochum

Abnahmeprüfzeugnis 3.1 Material Test Report/Certificate

gemäß/acc. to EN 10204

für warmgeprägte Böden, Verschluss-/Preßteile
for hot formed Heads/Dished Ends, Manhole Doors
and other Formed Parts
in Anlehnung an / similar to
DGR / PED 97/23 / EC AD 2000 - Merkblätter
Prüfgrundlage/Requirements AD-HP 8/1/TRD202

Ihre Bestellung 11599 vom 10.10.13
Your Purchase order

Datum/Date 29.11.2013 BD
Auftrag Nr. 200024728
Order No.

Toleranzen gemäß Auftragsbestätigung Tolerances as per order confirmation						
Pos. Item	Stück Quant.	Gegenstand/Abmessungen Product/Dimensions	Werkstoff Material/Grade	Schmelze Heat/Cast No.	Probe Sample/Test No.	Zeugnis Certificate No
010	4	Klöpferböden / torispherical heads gem./ acc. to DIN 28011 1016.0 ä./ o.d. x 22.0 mm (A) Prüf-Nr. / test-no.: B960/1-4	10CRMO9-10	40539	203420	LK6075TUV
Verwendete Bleche: Von Ihnen angeliefert/gem. beiliegenden bzw. uns vorliegenden Zeugnissen nach Plates: your free issue plates/as per certificates attached						
EN 10204 3.2						

Wir bestätigen, daß das Umformen innerhalb des nach der Werkstoffspezifikation für den Werkstoff angegebenen Temperaturbereiches AD 2000 Merkbl. HP 7/1 §3.2, HP 7/2 §3.2, HP 7/4, W8 Abschn. 6 TRD 101 Abschnitt 3.4 mit genügend hoher Temperatur begonnen und beendet wurde (Abkühlung an Luft).
We certify that the hot-forming process has begun and been finished within the range of temperature given in the material specification AD 2000 Merkbl. HP 7/1 & HP 7/2 each § 3.2, HP 7/4, W8 section 6 and TRD 101 section 3.4 (cooling at still air)

Wärmebehandlung nach Warmpressen:

Heat treatment after hot pressing:

normalisiert bei 930-940 °C, Haltezeit 25 Min., Abkühlung an ruhender Luft
angelassen bei 710 ± 10 °C, Haltezeit 40 Min., Abkühlung an ruhender Luft
normalized at 930-940 °C, holding time 25 min., cooling at still air
tempered at 710 ± 10 °C, holding time 40 min., cooling at still air

Beide Werke sind für die Herstellung von Druckbehälterteilen vom TÜV-Rheinland zugelassen entsprechend TRB 100, AD2000 - W0, HP0, HP3, HP4, TRD 100 und DGR 97/23/EC Anhang I, Kap. 4.3; Cert. No.: 01 202 317/Q-01 0006
Both works have been approved and certified by TÜV-Rheinland for the manufacture of pressure / vessel components acc. to TRB 100, AD-W0, HP0, HP3, HP4, TRD 100 and PED 97/23/EC Annexe, Cap. 4.3; Cert. No.: 01 202 317/Q-01 0006

Wir bescheinigen, daß die Teile geprüft wurden gemäß TRB/AD 2000 Merkbl. HP 8/1/TRD202 und den Bestellanforderungen entsprechen.
We hereby certify that the material described above has been inspected acc. to TRB/AD 2000 Merkbl. HP 8/1/TRD202 and complies with the terms of the order

Afflerbach
Bödenpresserei
GmbH & Co KG

Der Abnahmebeauftragte
The Inspection representative

Besichtigung und Ausmessung: ohne Beanstandung
Visual und dimensional control: without objection
Werkstoffprüfungen im Lieferzustand: keine/siehe Protokoll
Material testing: none/see report attached
Die Bleche wurden im Einvernehmen mit dem Sachverständigen umgestempelt und mit dem Stempel (A) versehen.
Für geschweißte Böden verweisen wir auf beigefügte Schweißbescheinigung.
Stamp on plates used has been transferred where necessary, adding (A). For welded heads/parts see attached welding certificate.

Bericht über Werkstoffprüfungen **Report on Material Tests**

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von of	11



Afflerbach
Bördenpresserei
GmbH & Co KG
D-56301 Puderbach

Abnahmeprüfzeugnis 3.1
 gemäß DIN EN 10204
 Works Inspection/Test Certificate
 acc. to DIN EN 10204

Kunde BOMAFA Armaturen GmbH	Kd. Best. Nr. 11599 vom 10.10.13	(A) Auftr. Nr. 200024728
Customer Bochum	Cust. P.O. No.:	Order No.:

Pos. Item	Stück Quant.	Artikel/Abmessungen Product/Dimensions	Werkstoff Material/Grade	Schmelze Heat/Cast No.	Probe Sample/Test No.	(A) Prüf-Nr Test No
010	4	Klöpferböden / torispherical heads gem./ acc. to DIN 28011 1016.0 ä./ o.d. x 22.0 mm	10CRMO9-10	40539	203420	B960/1-4

Spezifikation <i>gem. DIN 10028-2 // DIN ISO 148-1 / DIN ISO 6892-1</i>	Wärmebehandlungszustand Coupons	N + A
Procedure <i>acc. to DIN 10028-2 // DIN ISO 148-1 / DIN ISO 6892-1</i>	Heat Treatment Condition Coupons	N + T

Probeentnahmeort: *mechan. Erprobung an Bordproben vom Fertigteil*
 Place of taking-off Samples: *mech. testing on specimen taken from the s. f. overlength of the finished part*

(A) Prüf-Nr. . Test No	Prüfgerät / Test Machine no. 1717/340 Zugversuch / Tensile Test:								No.: 1713/340 Kerbschlagbiegevers. Impact Test				Fall- versuch Bend Test
	Temp.	1)	2)	Rp 0,2 Streckgrenze Yield stress MPa	Rp 1,0 Streckgrenze Yield stress MPa	Rm Zugfestigkeit Tensile stress MPa	A (%) Dehnung Elongation lo = 5d0	Z (%) Einschnürung Red. of Area	Temp.	1)	2)	3)	
	°C								°C			ISO-V	
Anforderungen Requirements	+20		Q	≥300		480-630	≥18	info	+20		Q	31 J	
B960/1	+20		Q	490		619	20	76,8	+20		Q	292 298 296	

Ergebnis der Prüfungen **x** *Entspricht den Anforderungen / In accordance with requirements*
 Result of Examination
 Entspricht nicht den Anforderungen / Not in accordance with requirements
 Einzelheiten siehe Blatt 2 / Details see page 2

Bemerkungen
 Remarks

(A) Prüfer *H.W. Thiel*
 (A) Operator

Beauftragter Kunde
 Costumer's Inspector

1) Probenlage / Position of Specimen: K=Kopf / Top F=Fuß / Bottom
 thickness ¼t, ½t, ¾t

2) Richtung / Direction of Specimen: L=längs / longit. Q=quer / transv.
 S=senkrecht / vertical

3) Probenform / Type of Specimen

26.11.2013

Datum
 Date

Leiter PP - QS/ Abnahmebeauftragter
 Manager of QA-QC Department

Ultraschallprüfungs - Bericht Ultrasonic Test Report

Beleg Record	Blatt Page
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von of	11



Afflerbach
Bödenpresserei
GmbH & Co KG
D-56301 Puderbach
Abnahmeprüfzeugnis 3.1
gemäß DIN EN 10204
Works Inspection/Test Certificate
acc. to DIN EN 10204

Kunde Customer	BOMAFA Armaturen GmbH Bochum	Kd. Best. Nr. Cust. P.O. No.:	11599 vom 10.10.13	(A) Auftr. Nr. Order No.:	200024728
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Pos. Item	Stück Quant.	Artikel/Abmessungen Product/Dimensions	Werkstoff Material/Grade	Schmelze Heat/Cast No.	Probe Sample/Test No.	(A) Prüf-Nr Test No
010	4	Klöpferböden / torispherical heads gem./ acc. to DIN 28011 1016.0 ä./ o.d. x 22.0 mm	10CRMO9-10	40539	203420	B960/1-4

Verfahrensbeschreibung-QVB/Spezifikation Procedure	EN 10160 S3, E3	FP-Plan MIP
---	-----------------	----------------

Wärmebehandlungszustand Heat Treatment condition	N + A N + T	Prüflflächenzustand Surface Condition	pressroh as pressed
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Prüfumfang / Anforderung - Extent of Examination / Acceptance Standard

1) Flächenprüfung
Grid scanning **Raster 100 mm gem./ acc. to EN 10160 S3**

2) Randzonenprüfung
Edges **≥ 50 mm breit / wide gem./ acc. to EN 10160 E3**

Justierung Equipment calibration	stufenkeil step wedge 10 - 50 mm	Einschallwinkel Angle through steel	0 °	Ankopplungsmittel Couplant	Kleister paste
--	---	--	-----	-------------------------------	---------------------------

Prüfgerät Equipment	Ident No.	Prüfkopf Search unit Type	Frequenz Frequency MHz	Schwingerabm. Search unit mm	Prüfbereich/Schallweg testrange/beam length mm	RG. mmØ	Bezugs- reflektor reference	Abstand Schwinger search unit mm	BEH %	BEHÜ dB	Bemerkung Remarks
1) 1090	1773	SEB 4 0°	4	6 x 20	0 - 50	5	RW	25,0	80	20	AVG
2) 1090	1773	SEB 4 0°	4	6 x 20	0 - 50	5	RW	25,0	80	20	AVG

Ergebnis der Prüfungen Result of Examination	X Entspricht den Anforderungen / In accordance with requirements Entspricht nicht den Anforderungen / Not in accordance with requirements Einzelheiten siehe Blatt 2 / Details see page 2
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Bemerkung
Remarks

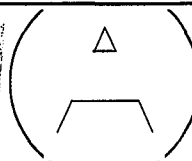
Prüfort Place of Examination	Puderbach	(A) Prüfer (A) Operator	F. Weiber	Level	II
		Beauftragter Kunde Customers Inspector	Level	
Prüfdatum Date of Test	27.11.2013	(A) Prüfaufsicht (A) Examination Survey	H.W. Thiel	Level	II

Leiter PP - QS / Abnahmebeauftragter
The Inspection representative

RG.: Registriergrenze in mm Kreisscheibenreflektor φ/ Recording threshold
BEH.: Bezugsechohöhe in % Bildschirmhöhe / Echo reference height in % of screen
BEHÜ.: Überschreitung der Bezugsechohöhe in dB / Aplication in dB

Ultraschallprüfungen - Bericht Ultrasonic Test Report

Ultrasonic Test Report	Blatt 5
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Afflerbach
Bödenpresserei
GmbH & Co KG
D-56301 Puderbach
Abnahmeprüfzeugnis 3.1
gemäß DIN EN 10204
Works Inspection/Test Certificate
acc. to DIN EN 10204

Kunde BOMAFA Armaturen GmbH Kd. Best. Nr. 11599 vom 10.10.13 (A)Auftr. Nr. 200024728
Customer Bochum Cust. P.O. No.: Order No.:

Pos. Item	Stück Quant.	Artikel/Abmessungen Product/Dimensions	Werkstoff Material/Grade	Schmelze Heat/Cast No.	Probe Sample/Test No.	(A) Prüf-Nr Test No
010	4	Klörperböden / torispherical heads gem./ acc. to DIN 28011 Ronden / discs 1274 Ø x 25.0 mm ED/ init.	10CRMO9-10	40539	203420	B960/1-4

Verfahrensbeschreibung-QVB/Spezifikation Procedure **EN 10160 S3, E3** FP-Plan MIP

Wärmebehandlungszustand **N + A** Prüfflächenzustand **walzglatt**
Heat Treatment condition **N + T** Surface Condition **as rolled**

Prüfumfang / Anforderung - Extent of Examination / Acceptance Standard

1) Flächenprüfung Grid scanning **100 % gem./ acc. to EN 10160 S3, E3**

2) Randzonenprüfung Edges

Justierung **stufenkeil** Einschalwinkel **0°** Ankopplungsmittel **Wasser**
Equipment calibration **step wedge 2 - 50 mm** Angle through steel **0°** Couplant **water**

Prüfgerät Equipmet	Ident No.	Prüfkopf Search unit Type	Frequenz Frequency MHz	Schwingerabm. Search unit mm	Prüfbereich/Schallweg testrange/beam length mm	RG. mmØ	Bezugs- reflektor reference	Abstand Schwinger search unit mm	BEH %	BEHÜ dB	Bemerkung Remarks
1) 1090	1773	SEB 4 0°	4	6 x 20	0 - 60	5	RW	25	80	20	AVG
2) 1090	1773	SEB 4 0°	4	6 x 20	0 - 60	5	RW	25	80	20	AVG

Ergebnis der Prüfungen **X Entspricht den Anforderungen / In accordance with requirements**
Result of Examination Entspricht nicht den Anforderungen / Not in accordance with requirements
Einzelheiten siehe Blatt 2 / Details see page 2

Bemerkung Remarks

Prüfort **Puderbach** (A) Prüfer **H.W. Thiel** Level **II**
Place of Examination (A) Operator
Beauftragter Kunde Level
Customers Inspector

Prüfdatum **04.11.2013** (A) Prüfaufsicht **F. Weiber** Level **II**
Date of Test (A) Examination Survey

Leiter PP QS / Abnahmebeauftragter
The Inspection representative

RG.: Registriergrenze in mm Kreisscheibenreflektor ø / Recording threshold
BEH : Bezugsechohöhe in % Bildschirmhöhe / Echo reference height in % of screen
BEHÜ : Überschreitung der Bezugsechohöhe in dB / Amplification in dB


**ILSENBURGER
GROBBLECH**

Ein Unternehmen der Salzgitter Gruppe

Abnahmeprüfzeugnis 3.2
Inspection certificate 3.2
Certificat de reception 3.2
DIN EN 10204
(A02)

Nr./No./N° (A03) 727263
Seite/Page/Page 1/6
Datum/Date/Date 28.11.2011

Nr. (A07) 703475.00
Besteller Interfer Stahl GmbH
Purchaser 44016 Dortmund
Acheteur
(A06)

29.07.2011

Nr. (A07)
Empfänger Interfer Stahl GmbH
Customer 44016 Dortmund
Destinataire
(A06)

Erzeugnis Grobblech
Product Heavy plate
Produit Tôle forte
(B01)

Geprüft und freigegeben

Attest-Nr.: LK 6075/TÜV

Datum:

Name: 28.10.13 OA

Werksauftrags-Nr. 0000053995
Werk order No.
N° de commande
(A04)
Litherschein-Nr. 0083473918
Dispatch note No.
Date d'expédition N°

Werkstoff und Lieferbedingung 10 CrMo 9-10
Steel grade and terms of delivery DIN EN 10028-2 09/09
Nuance et conditions de livraison AD 2000 W1 07/06
(B02-B03) DIN EN 10029 B 02/11
DIN EN 10163-2 Kl. B UG2 03/05

Abnahme
Inspection
Reception
(A05)

(TÜV 11)

Kanzelzeichnung des Materials / Marking of the product / Marquage du produit (B06)
Herstellerzeichen/Stahlsorte/Schmelzen-Nr./
Erzeugnis-Nr./Sachverständigenstempel
Trademark/Steelgrade/Heat-No/Product-No/
Inspector's stamp
Sigle de l'usine/Nuance de l'acier/N° coulée/
N° produit/Poinçon de l'expert

Materialdaten / Material data / Données des matériaux (B07-B09)

Pos. Item Poste	Anzahl Quantity Nombre (B08)	Erzeugnis-Nr. Product No. N° produit (B07)	Schmelzen-Nr. Heat No. N° Coulée (B07)	Lieferzustand Cond. of delivery Etat de livraison (B04)	Dicke x Breite x Länge Thickness x Width x Length Epaisseur x Largeur x Longueur (B09-B11)	mm x mm x mm
12	1	203420 1 X	40539	V1	25,00 x 3000,0 x 12000	
15	1	218728 1	18288	V1	40,00 x 2500,0 x 12000	
12	1	Gewicht 7.065	kg	V1: normalisiert und angelassen / normalized and tempered / normalisé et revenu		
15	1	Weight 9.420	kgs			
Σ	2	Poids 16.485	kgs			

Maßprüfung und Sichtkontrolle auf äußere Beschaffenheit: ohne Beanstandung
Dimensional check and visual examination of the surface condition:
without objection
Contrôle dimensionnel et examen visuel de l'état de surface: satisfaisants

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la livraison répond aux conditions de livraison.
(Z01)
GMA-System Certification as per ISO 9001 since 22 February 1990

Herstellerzeichen
Trademark
Sigle du producteur
(A04)

Ilsenburg Grobblech GmbH
Veckenstedter Weg 10
D-36671 Ilsenburg
(A01)

Abnahme-stempel
Inspection Stamp
Poinçon de l'Expert
(Z03)

TUV NORD

Systems GmbH & Co. KG
Benannte Stelle / Notified Body 0045
22522 Hamburg, Germany

Dipl.-Ing. Behrer EN: 10204-3.2

Sachverständiger / Abnahmebeauftragter
Expert / Inspection Representative
TUV-AZ. / Rie

Abnahmebeauftragter
Inspection Representative
Représentant autorisé
(Z02)

Langemann

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LU 6075 / TUV



**ILSENBURGER
GROBBLECH**

Ein Unternehmen der Salzgittr Gruppe

Abnahmeprüfzeugnis 3.2
Inspection certificate 3.2
Certificat de reception 3.2
DIN EN 10204
(A02)

Nr./No./N° (A03) 727263
Seite/Page/Seite 2/6
Datum/Date/Date 28.11.2011

Nr. (A01) 703475.00
Besteller
Purchaser
Acheteur
(A05)
Interfer Stahl GmbH
44016 Dortmund

29.07.2011

Nr. (A01) Empfänger
Customer
Destinataire
(A05)
Interfer Stahl GmbH
44016 Dortmund

Erzeugnis
Product
Produit
(B01)
Grobblech
Heavy plate
Tôle forte

Werksauftrags-Nr.
Works order No.
N° de commande
(A06)
0000053995
Lieferschein-Nr.
Dispatch note No.
Avis d'expédition N°
0083473918
25.11.2011

Werkstoff und Lieferbedingung 10 CrMo 9-10
Steel grade and terms of delivery DIN EN 10028-2 09/09
Nuance et conditions de livraison AD 2000 W1 07/06
(B02-B03) DIN EN 10029 B 02/11
DIN EN 10163-2 Kl. B UG2 03/05

Abnahme
Inspection
Reception
(A05)

(TUV 11)

Schmelzenanalyse / Ladle analysis / Analyse de coulée (C78-C98)
Herstellungsverfahren / Manufacturer standard / Données du fabricant

Schmelzen-Nr. Heat No. N° Coulée (B07)	C %	Si %	Mn %	P %	S %	N %	Al %	Cu %	Cr %	Ni %
18288 40539	0,11 0,11	0,27 0,30	0,58 0,58	0,012 0,010	0,006 0,002	0,006 0,008	0,035 0,037	0,08 0,02	2,10 2,13	0,07 0,05
Schmelzen-Nr. Heat No. N° Coulée (B07)	Mo %	V %	Ti %	Nb %	EV1 1) %	EV2 2) %				
18288 40539	0,95 0,92	0,01 0,01	0,003 0,003	0,004 0,004	3,20 3,12	0,83 0,82				

1) EV1: Cr-Cu-Mo-Ni

2) EV2: CEV=C+Mn/6+Mo/5+Ni/15+Cr/5+V/5+Cu/15

Stahlherstellung: Sauerstoffaufblasverfahren
Steel making: Basic oxygen process
Fabrication d'acier: Procédé au convertisseur à l'oxygène
(C78)

Die Werkstoffverwechslungsprüfung wurde (spektralanalytisch)
durchgeführt: keine Beanstandung

The material identification was made by spectrophot analysis
Accepted

Developpement d'une epreuve de Confusion de Matière par Analyse
Spectrale.

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la fourniture répond aux conditions de livraison.
(Z01)
GM-System: Certification as per ISO 9001 since 23 February 1990

Herstellerzeichen
Trademark
Sigle du producteur
(A04)

Ilsenburger Grobblech GmbH
Veckenstedter Weg 10
D-38871 Ilsenburg
(A01)

Abnahme-stempel
Inspection Stamp
Sceau pour l'Expert
(Z03)

TUV NORD
Systeme GmbH & Co. KG
Benannte Stelle / Notified Body 0045
22525 Hamburg, Germany
EN: 10204-3.2
Sachverständiger / Abnahmebeauftragter
Expert / Inspection Representative
TUV-Az./file

Abnahmebeauftragter
Inspection Representative
Représentant autorisé
(Z02)

Langemann

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LK 6075/TUV



**ILSENBURGER
GROBBLECH**

Ein Unternehmen der Salzgitter Gruppe

Abnahmeprüfzeugnis 3.2		Nr./No./N° (A03) 727263	
Inspection certificate 3.2		Seite/Page/Seite 3/6	
Certificat de reception 3.2		Datum/Date/Date 28.11.2011	
DIN EN 10204			
(A02)			
Nr. (A07) 703475.00	29.07.2011	Nr. (A07)	
Besteller Interfer Stahl GmbH		Empfänger Interfer Stahl GmbH	
Purchaser 44016 Dortmund		Customer 44016 Dortmund	
Acheteur		Destinataire	
(A06)		(A06)	
Erzeugnis Grobblech		Werkauftrags-Nr. 0000053995	
Product Heavy plate		Works order No.	
Produit Tôle forte		N° de commande	
(B01)		(A08)	
Werkstoff und Lieferbedingung 10 CrMo 9-10		Lieferschein-Nr. 0083473918	
Steel grade and terms of delivery DIN EN 10028-2 09/09		Dispatch note No. 25.11.2011	
Neuve et conditions de livraison AD 2000 W1 07/06		Avis d'expédition N°	
(B02-B03)			
	DIN EN 10029 B 02/11		
	DIN EN 10163-2 Kl. B UG2 03/05		
		Abnahme	
		Inspection	
		Reception	
		(A05)	

(TUV 11)

Zugversuch / Tensile test / Essai de traction (C10-C29)										
Proben-Nr. Specimen No. N° épreuve (C00)	Schmelz-Nr. Heat No. N° Couée (B07)	Ort Location Lieu (C01)	Richt. Direct. Orient. (C02)	Zustand Cond. Cond. (B05)	Form Type Type (C10)	Streckgrenze Yield point Limite d'élasticité (C11) ReH N/mm2 2398	Zugfestigkeit Tensile strength Résistance (C12) Rm N/mm2 468-538	Bruchdehnung Elongation Allongement (C13) A5 7) %	ReH/Rm ReH/Rm ReH/Rm	
203420	40539	K4G	Q	V1	P	352	519	29	0,68	
203420	40539	F4G	Q	V1	P	350	520	29	0,67	
218728	18288	K4G	Q	V1	P	385	535	25	0,72	
218728	18288	F4G	Q	V1	P	386	536	25	0,72	

- | | |
|--|--|
| 1) F: Fuß / Bottom / Pied | 4) Q: quer / transversal / transversal |
| K: Kopf / Top / Tête | 5) V1: normalisiert und angelassen / normalized and tempered / normalisé et revenu |
| 2) 4: 1/4 Breite / 1/4 Width / 1/4 Largeur | 6) P: prismatisch / prismatic / prismatique |
| 3) G: Erzeugnisdicke / Thickness of product / Epaisseur du produit | 7) A5: $L_0=5,65 \sqrt{S_0}$ |

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la fourniture répond aux conditions de livraison.
(Z01)
CEC-System: Certification as per ISO 9001 since 28 February 1990

Herstellerzeichen
Trademark
Signe de producteur
(A04)

Ilsenburger Grobblech GmbH
Veckenstedter Weg 10
D-36871 Ilsenburg
(A01)

TUV NORD
Systems GmbH & Co. KG
Benannte Stelle / Notified Body 0045
22525 Hamburg, Germany
EN: 10204-3.2
Sachverständiger / Abnahmebeauftragter
Expert / Inspection Representative
TUV-Az. / file

Abnahmebeauftragter
Inspection Representative
Représentant autorisé
(Z02)
Langemann



**ILSENBURGER
GROBBLECH**

Ein Unternehmen der Salzgitter Gruppe

Abnahmeprüfzeugnis 3.2
Inspection certificate 3.2
Certificat de reception 3.2
DIN EN 10204
(A02)

Nr./No./N° (A03) 727263
Seite/Page/Page 4/6
Datum/Date/Data 28.11.2011

Nr. (A07) 703475.00
Besteller Interfer Stahl GmbH
Purchaser 44016 Dortmund
Acheteur
(A06)

29.07.2011 Nr. (A07)

Empfänger Interfer Stahl GmbH
Customer 44016 Dortmund
Destinataire
(A06)

Erzeugnis Grobblech
Product Heavy plate
Produit Tôle forte
(B01)

Werkauftrags-Nr. 0000053995

Works order No.
N° de commande
(A08)

Lieferschein-Nr. 0083473918
Dispatch note No. 25.11.2011
Avis d'expédition N°

Werkstoff und Lieferbedingung 10 CrMo 9-10
Steel grade and terms of delivery DIN EN 10028-2 09/09
Nuance et conditions de livraison AD 2000 W1 07/06
(B02-B03) DIN EN 10029 B 02/11
DIN EN 10163-2 Kl. B UG2 03/05

Abnahme
Inspection
Reception
(A05) (TUV 11)

Warmzugversuch / Hot tensile test / Essai de traction à chaud (C10-C29)

Proben-Nr. Specimen No. N° épreuve (C00)	Schmelzen-Nr. Heat No. N° Coulee (B07)	Ort Location Lieu (C01)	Richt. Direct. Orient. (C02)	Zustand Cond. (B05)	Form Type (C10)	Temperatur Temperature Température (C03)	Dehngrenze Yield strength Limite d'élasticité (C11) Rp0,2 N/mm2 ≥ 205			
203420 215326 *)	40539 18288	K40 K40	Q Q	V1 V1	C C	+400 +400	212 301			

- 1) K: Kopf / Top / Tête
2) 1/4: 1/4 Breite / 1/4 Width / 1/4 Largeur
3) O: oberflächennah / near surface / près de la peau
4) Q: quer / transversal / transversal
5) V1: normalisiert und angelassen / normalized and tempered / normalisé et revenu
6) C: zylindrisch / cylindric / cylindrique
*) Das Probekstück ist nicht Bestandteil der Lieferung / The sample product is not part of the delivery / Le produit-échantillon ne fait pas partie de la livraison

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la fourniture répond aux conditions de livraison.

(D01)

QM-System: Certification ex par ISO 9001 since 28 February 1999

Herstellerzeichen
Trademark
Sigle du producteur
(A04)

Ilsenburger Grobblech GmbH
Veckenstedter Weg 10
D-38871 Ilsenburg
(A01)

TUV NORD
Systeme GmbH & Co. KG
Benannte Stelle / Notified Body 0045
22525 Hamburg, Germany
Dipl.-Ing. Behrens

EN: 10204-3.2
Sachverständiger / Abnahmebeauftragter
Expert / Inspection Representative
TUV-Az. / file

Abnahmeempfang
Inspection Stamp
Empfangsstempel
(Z01)

Abnahmebeauftragter
Inspection Representative
Représentant agréé
(Z02)

Langemann


**ILSENBURGER
GROBBLECH**

Ein Unternehmen der Salzgitter Gruppe

Abnahmeprüfzeugnis 3.2
Inspection certificate 3.2
Certificat de reception 3.2
DIN EN 10204
(A02)

Nr./No./N° (A03) **727263**
Seite/Page/Page **5/6**
Datum/Date/Date **28.11.2011**

Nr. (A07) **703475.00**
Besteller **Interfer Stahl GmbH**
Purchaser **44016 Dortmund**
Acheteur
(A06)

29.07.2011 Nr. (A07)

Empfänger **Interfer Stahl GmbH**
Customer **44016 Dortmund**
Destinataire
(A06)

Erzeugnis **Grobblech**
Product **Heavy plate**
Produit **Tôle forte**
(B01)

Werkauftrags-Nr. **0000053995**

Werk order No.
N° de commande
(A08)

Lieferschein-Nr. **0083473918**
Dispatch note No.
Avis d'expédition N°

Werkstoff und Lieferbedingung **10 CrMo 9-10**
Steel grade and terms of delivery **DIN EN 10028-2 09/09**
Nuance et conditions de livraison **AD 2000 W1 07/06**
(B02-B03) **DIN EN 10029 B 02/11**
DIN EN 10163-2 K1. B UG2 03/05

Abnahme
Inspection
Reception
(A05)

(TUV 11)

Kerbschlagbiegeversuch / Impact test / Essai de résilience (C40-C49)

Proben-Nr. Specimen No. N° épreuve (C00)	Schmelze-Nr. Heat No. N° Couée (B07)	Ort Location Lieu (C01)	Richt. Direct. Orient. (C02)	Zustand Cond. Cond. (B05)	Probenform Type of specimen Type d'éprouvette (C40-C41)	Temperatur Temperature Température (C03)	Schlagarbeit Impact energy Energie de rupture (C42-C43)				
		1) 2) 3)	4)	5)		°C	1 J ≥22	2	3	MW 6) J ≥31	
203420	40539	K40	Q	V1	KV600	+020	299	287	290	292	
203420	40539	F40	Q	V1	KV600	+020	284	306	303	298	
218728	18288	K40	Q	V1	KV600	+020	251	246	255	251	
218728	18288	F40	Q	V1	KV600	+020	238	256	245	246	

- 1) F: Fuß / Bottom / Pied
K: Kopf / Top / Tête
2) 4: 1/4 Breite / 1/4 Width / 1/4 Largeur
3) 0: oberflächennah / near surface / près de la peau

- 4) Q: quer / transversal / transversal
5) V1: normalisiert und angelassen / normalized and tempered / normalisé et revenu
6) MW: Mittelwert / Average / Moyenne

Unsere Produkte sind frei von radioaktiven Stoffen. Der Freigabegrenzwert von 100 Bq/kg, der die Einhaltung der Grenzwerte der Strahlenschutzverordnung (StrlSchV) für die uneingeschränkte Freigabe von festen Stoffen (StrlSchV Anlage III, Spalte 5) für eisenverwandte Nuklide gewährleistet, wird nicht überschritten.

Our products are free of radioactive substances and do not exceed the clearing limit value of 100 Bq/kg, which guarantees the compliance with limit values given in the Radiation Protection Ordinance (StrlSchV) for the unrestricted clearance of solid material (StrlSchV Annex III, Section 5) for ferrous nuclides.

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la fourniture répond aux conditions de livraison.
(Z01)

GM-System: Certification as per ISO 9001 since 28 February 1990

Herstellzeichen
Trademark
Sigle du producteur
(A04)

Ilsenburger Grobblech GmbH
Veckenstedter Weg 10
D-38471 Ilsenburg
(A01)

Abnahme-stempel
Inspection Stamp
Stempel des Experten
(Z03)

TUV NORD

Systeme GmbH & Co. KG
Benannte Stelle / Notified Body 0045
22525 Hamburg, Germany

DN: 10204-3.2
Sachverständiger / Abnahmebeauftragter
Expert / Inspection Representative
TUV-Az. / file

Abnahmebeauftragter
Inspection Representative
Représentant autorisé
(Z02)

Langemann

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	11

LK 60751UV



**ILSENBURGER
GROBBLECH**

Ein Unternehmen der Salzgitter Gruppe

Abnahmeprüfzeugnis 3.2		Nr./No./N° (A03)	727263
Inspection certificate 3.2		Seite/Page/Pages	6/6
Certificat de reception 3.2		Datum/Data/Date	28.11.2011
DIN EN 10204			
(A02)			
Nr. (A07)	703475.00	29.07.2011	Nr. (A07)
Besteller	Interfer Stahl GmbH		Empfänger
Purchaser	44016 Dortmund		Customer
Acheteur			Destinataire
(A05)			(A05)
Erzeugnis	Grobblech	Werkauftrags-Nr.	0000053995
Product	Heavy plate	Work order No.	
Produit	Tôle forte	N° de commande	
(B01)		(A08)	
Werkstoff und Lieferbedingung	10 CrMo 9-10	Lieferschein-Nr.	0083473918
Steel grade and terms of delivery	DIN EN 10028-2 09/09	Dispatch note No.	25.11.2011
Matériau et conditions de livraison	AD 2000 W1 07/06	Avis d'expédition N°	
(B02-B03)	DIN EN 10029 B 02/11		
	DIN EN 10163-2 Kl. B UG2 03/05	Abnahme	
		Inspection	
		Reception	
		(A09)	

(TUV 11)

Normalisierungstemperatur: 940°C	
Haltezeit: 1 min/mm	
Abkuehlung: an ruhender Luft	
Anlasstemperatur: 710°C	
Haltezeit: 2 min/mm, min. 30 Minuten	
Abkuehlung: an ruhender Luft	
HOLDINGTEMPERATURE NORMALIZING 940°C	
SOAKING TIME: 1 MIN/MM	
COOLING : STILL AIR	
HOLDINGTEMPERATURE TEMPERING: 710°C	
SOAKING TIME: 2 MIN/mm, MIN 30 MINUTES	
COOLING : STILL AIR	
Temperature de normalisation:	940°C
Temps de maintien:	1 min/ mm
Refroidissement par air	
Temperature de revenu:	710°C
Temps de maintien:	2 min/ mm, min. 30 min
Refroidissement par air	

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la fourniture répond aux conditions de livraison.
(Z01)
QM-System: Certification as per ISO 9001 since 28 February 1990

Herstellerzeichen
Trademark
Sigle du producteur
(A04)

Ilsenburger Grobblech GmbH
Veckersfelder Weg 18
D-38871 Ilmenburg
(A01)

TUV NORD
Systeme GmbH & Co. KG
Benannte Stelle/Notified Body 0045
22625 Hamburg, Germany
EN: 10204-3.2
Sachverständiger/Abnahmebeauftragter
Expert/Inspection Representative
TUV-Az./file
Abnahmebeauftragter
Inspection Representative
Représentant autorisé
(Z02)
Langemann

Zertifikat Nr.: 6662
 Esta-Rohr GmbH - Mühlenweg 26 - D-57339 Erndtebrück
 Telefon +49(0) 2753-5926-30 - Fax 5926-31
 Internet www.esta-rohr-erndtebrueck.de
 e-mail info@esta-rohr-erndtebrueck.de

Beleg Record	Blatt Page 1
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esta rohr
 germany

Abnahmeprüfzeugnis EN 10204 / 3.1
Inspection certificate EN 10204 / 3.1

Besteller : BOMAFA Armaturen GmbH
Orderer : Hohensteinstraße 52; 44866 Bochum
Hersteller/Lieferer : Esta-Rohr-GmbH, Mühlenweg 26
Manufacturer/Supplier : 57339 Erndtebrück

Bestell-Nr.:
Order No. : 11596

Prüfgegenstand : Längsnahtgeschweißte Stahlrohre
Test item : Steel pipes SAW longitudinal

Werks.-Nr.:
Works-No. : 10/9512/2013

Anforderungen : gefertigt nach (produced to) AD 2000 HP O.
Requirements : - Schweißfaktor (welded factor) V = 1,0
 - Nähte 100% RT-geprüft (seams 100% rt-tested) *

Werkstoff : 10 CrMo 9-10
Material(standard designation) : entsprechend DIN EN 10028-2
according to Ausgabe 2009
Edition

Kennzeichnung : Kom.-Nr., P.-Nr., R.-Nr., Werkstoff, erE
Marking :

Erschmelzungsart (MEW) : Anlage (enclosures)
Melting method (MEW) :

Zeichen des Herstellers :
Manufacturer's sign :



Markenbezeichnung : Anlage (enclosures)
Trade mark :

Umfang der Lieferung : Kompl.- Lieferung (compl. delivery)
Extend of supply :

Pos.-Nr. Pos.-No.	Stückzahl Quantity	Gegenstand Item	Schmelze Heat No.	Probe-Nr. Assay No.
1	4	1016,0 mm ä.D. x 30,0 mm Wdd. - 380 mm lg. * sowie Schweißfugen 100% MT-geprüft Schweißnaht innen und außen 100% MT-geprüft ä.D = outer diameter / lg = long Wdd. = wallthickness Wir bestätigen, dass die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht. We confirm, that shipment was tested and that it is in conformity with the agreements taken in the sales contact.	siehe Rohrliste look at the pipelist	siehe Rohrliste look at the pipelist

Zertifiziert nach DIN EN ISO 9001:2008 Zertifikat Nr. 04 100 940359
 QS-System nach Richtlinie 97/23/EG Anhang I, Kap. 4.3 Zertifikat Nr. 07-202-1405 WZ-1098/11
 Benannte Stelle (notified body) Kennnummer: 0045

Die gestellten Anforderungen sind lt. Anlage erfüllt

Erndtebrück den 15.11.13
 on

Anlagen APZ - Ausgangsblech
Enclosures certificate sheet

Prüfergebnis element
test result element

RT - Bericht
rt - report

MT - Bericht
mt - report

Rohrliste
pipelist

esta rohr Qualitätsstelle
 gmbH
 Mühlenweg 26 57339 Erndtebrück
 Tel. 027 53 / 5926-30 Fax 5926-56
 B.Birkelbach@esta-rohr-erndtebrueck.de
 Leiter Qualitätsstelle
 Björn Birkelbach


Birkelbach

Prüfbericht / Test report:

Mechanische Prüfungen / Mechanical tests

1 3 1 1 0 7 0 7 0 1 4 7

Probeneingang: 0 5 . 1 1 . 1 3

Kom.-Pos./ Order no. Client 10-9512-2013		Probe-Nr.-Test no. 11614 /13070		Kunden-Nr. - Order no. 13070							
Material 10CrMo9-10		Dimension (mm) t 30.0		Schmelze - Heat no.: 20332 Blech Nr.-Plate no.: 254708-1							
AP-Nr. - WPS no.		VP-Nr. - PQR no. 7.1.30 A -20		Wärmebehandlung - Heat treatment AP mit den Rohren geglüht.							
Spezifikation: AD 2000 HP 5/2 Specification:		Schweißer-Nr. - Welder no.: A20									
Zugversuch - Tensile test: IS04136 / IS06892-1											
Probenlage Position	b x a dimension (mm)	Lo G (mm)	Re-Rp-Rt YS MPa	Rm UTS MPa	A elongation (%)	Re/Rm YS/TS (%)	Bruchlage fracture	Temp (°C)			
Wertforderung: Acceptance criteria:		min. max.	300 Rp0.2	480 630	18.0			R.T.			
S-Q	25.00x 29.90	110.0	335.7	504.3	24.6	67	GW				
Biegeversuch - Bend test: IS05173 DornØ - mandrel: 3 x t						DWT-test:					
Probenlage Position	Ergebnis result	Lo (mm) G	E ges. (%) elong.	Probenlage Position	Ergebnis result	Lo (mm) G	E ges. (%) elong.	Probenlage Position	Temp. °C	shear (%)	
TFBB TRBB	180°e 180°e										
Kerbschlagbiegevers. - Impact test: IS0148-1 / IS09016 / KV2-450											
Wertforderung: Acceptance criteria:		Einzelwert - single value 31 Joules		Mittelwert - average Joules		b x a - size 10 x 10		Temp. °C RT			
Probenlage Position Form / notch	joules	lat. Breite lat. ext.	shear (%)	Probenlage Position Form / notch	joules	lat. Breite lat. ext.	shear (%)	Probenlage Position Form / notch	joules	lat. Breite lat. ext.	shear (%)
S-Q	289 283 256										
Ü	288 278 296										
Bemerkung: 1 Makroschliff Remarks: Makrogefüge: Keine unzulässigen Unregelmäßigkeiten erkennbar.								Schliffe (Stck): 1 Fotos (Stck):			
Herne, 07.11.2013		 element Schüchtermannstr. 4a - D-44628 Herne		esta rohr gmbH Mühlenweg 26 57339 Erndtebrück Tel. 027 53 / 59 26-39 Telefax 027 53 / 59 26-56 B.Birkelbach@esta-rohr-erndtebrueck.de Leiter Qualitätsstelle Björn Birkelbach							
Labor: Laboratory:		Nohl Material Tester		Unterschrift: Signature:							

Hinweis: Die Prüfergebnisse beziehen sich ausschließlich auf die Prüfgegenstände. Dieser Bericht darf ohne schriftliche Genehmigung des Prüflabors nicht auszugsweise vervielfältigt werden.

BERICHT
über Durchstrahlungsbefunde bei Schweißnahtprüfungen
REPORT

about radiographic results of weld seam testings

1. Prüfdatum: 5.11.13
Date of test:

2. Prüfort: Esta-Rohr-GmbH, Mühlenweg 26
Place of test:

3. Besteller: BOMAF A Armaturen GmbH
Customer: Hohensteinstraße 52; 44866 Bochum

Bestell-Nr.: 11596
Order No.:

4. Angaben zum Prüfgegenstand nach Mitteilung des Herstellers
Data of test-specimen as per producer's statement

Hersteller: Esta-Rohr-GmbH, Mühlenweg 26
Producer: 57339 Erndtebrück

Kom-Nr.: 10/9512/2013
Sales-No.:

Schweißart: 121
Kind of welding:

Prüfgegenstand: Längsnahtgeschweißte Stahlrohre
Test-specimen: Steel pipes SAW longitudinal

Schweißnähte: LN (LW)
Weld seams:

Abmessung: 1016,0 mm ä.D. x 30,0 mm Wdd. - 380 mm lg.
Dimensions:

Nahtform: V - Naht (seam)
Section of seam:

Baujahr: 2013
Year of construction:

Schweißnahtfaktor: V = 1,0
Weld seam factor:

Werkstoff: 10 CrMo 9-10
Material No.:

Zusatzwerkstoff: S1 CrMo 2
Filler metal: OP 121 TT

5. Prüfungsfang und Lage der geprüften Nahtabschnitte

Amount of inspection and position of inspected seam parts

Röntgenaufnahmen nach (X-ray in acc. to) DIN EN ISO 1435 Prüfl. B.

Schweißnähte 100% geröntgt (Welded seams 100% x-rayed).

Bewertung nach (Valuation in acc. to) AD 2000 HP 5/3.

6. Prüftechnische Angaben nach Mitteilung des Herstellers der Aufnahmen

Data of testing-method as stated by the maker of the radiographies

Hersteller der Aufnahmen: Esta-Rohr-GmbH, Mühlenweg 26
Maker of the radiographies:

Strahlenquelle: Röntgenstrahler (X-ray apparatus)
Radiation apparatus:

Belichtungszeit: 1,0 min.
Speed ratign:

angelegte Röhrenspannung: 300 kV
Fed tube voltage:

Röhrenstromstärke: 4,5 mA
Tubular strenght:

Prüfanordnung n. : DIN EN 1435 Bild (pic.) 1
Test rule per:

FFA: 700 mm
Taget plate distance:

Aufnahmemittel: D5 PB
Film type:

Brennfleck: 1,5 x 1,5
Focal point:

Verbleib der Filme: Die 4 Filme
The films remain at: bei: ESTA-Rohr GmbH

Format: 10x48
Size:

7. Die Prüfbefunde sind als Anlage 1
Testing reports are enclosed to this record as annexe no.:

diesem Bericht beigelegt.

8. Zusammenfassende Beurteilung

Summarizing criticism:

erfüllt (accepted)

Prüfer (Tester): Tester: M. Kilian (RT1 EN473 / DGRL 97/23/EG)
D. Herling (RT2 FAS EN 473 / DGRL 97/23/EG)

esta rohr gmbH
Mühlenweg 26 Erndtebrück
Tel: 027 53 / 59 26 30 - Telefax 027 53 / 59 26 56
B. Birkelbach@esta-rohr-erndtebrueck.de
Leiter Qualitätsstelle
Björn Birkelbach

[illegible]

esta rohr gmbH
Mühlenweg 26 57339 Erndtebrück
Tel. 02753/92753-1 Qualitätsstelle
Fax 02753/6926-56
B.Birkelbach@esta-rohr-erndtebrueck.de
Leiter Qualitätssicherung
Björn Birkelbach

Gebr. Löcher Glüherei GmbH

57271 Hilchenbach

Tel. (0 27 33) 89 68-0 • Fax (0 27 33) 89 68 10

E-mail: info@loecher-glueherei.de

Internet: www.loecher-glueherei.de


Providing special heat-treatment solutions

Wärmebehandlungs-Protokoll

Heat-treatment Certificate

Certificat du traitement thermique

zertifiziert durch den TÜV Nord nach
DIN EN ISO 9001:2008


Auftrag-Nr.: 10000231084

Contract no.:

No. d'usine:

Bestell-Nr.: 10/9512/2013 und 10/9488/2013

Order no.:

No. de commande:

Besteller: Esta-Rohr GmbH, 57339 Erndtebrück

Purchaser:

Acheteur:

Stück quantity quantité	Gegenstand objet objet	Abmessung dimension dimension	Werkstoff material matériau	Gewicht weight poids
1	Kom. 10/9512/2013 Pos. 1 Rohr + Arbeitsproben	1016,0 ä.Drm. x 30,0 Wd. x 2.000 mm lg.	10CrMo9-10	1.108 kg
1	Kom. 10/9488/2013 Pos. 1 Rohr + Arbeitsproben	762,0 ä. Drm. x 30,0 Wd. x 1.000 mm lg.	10CrMo9-10	384 kg
	Temperaturmessung mittels	1 Stck. Schlepplement		

Geglüht bei annealed at recuit a	700 - 720 °C °C °C	Haltezeit holding period duree d'arret	60 Min. min. min.	Entspricht den Bedingungen des AD-Merkblattes Conforms to the requirements of the code of practice AD Conforme aux exigences du code de bonne pratique AD
Abgeschreckt in / abgekühlt an quenched in / cooled in trempé dans / refroidi a	Ofenabkühlung bis 400 °C danach an ruhender Luft			VdTÜV-Werkstoffbl. VdTÜV material spec. VdTÜV spec. des matériaux

Bemerkungen: Dieses Wärmebehandlungsprotokoll entspricht zusammen mit dem Glühdiagramm und der Unterschrift des Abnahmebeauftragten
einem Prüfzeugnis 3.1 nach DIN EN 10204

Observations: This document corresponds together with the heat-treatment diagram and authorized signature to a test certificate 3.1 according DIN EN 10204.

Observations:

Anlage: Glühdiagramm

Unsere Wärmebehandlungsvorrichtungen sind durch die TÜV Rheinland Industrie Service GmbH überprüft und zugelassen. Wir sind im Besitz der
Zulassungen nach dem AD 2000-Merkblatt HP7/1.

Our heat treatment facilities have been examined and approved by TÜV Rheinland Industrie Service GmbH. We are in possession of the approvals
acc. to AD 2000 code of practice HP7/1.

Nos installations de traitement thermique ont été examinées et autorisées par le TÜV Rheinland Industrie Service GmbH. Nous disposons des
autorisations suivant AD 2000 code de bonne pratique HP7/1.

Datum 31.10.2013

Gebr. Löcher Glüherei
GmbH

Werksabnahme / Quality control
Service du control

Schleppemente

Kom. 10/9512/2013

Pos. 1

1 Stck. Rohr

+ Arbeitsproben

Kom. 10/9488/2013

Pos. 1

1 Stck. Rohr

+ Arbeitsproben

Unsere Kom. : 10000231084

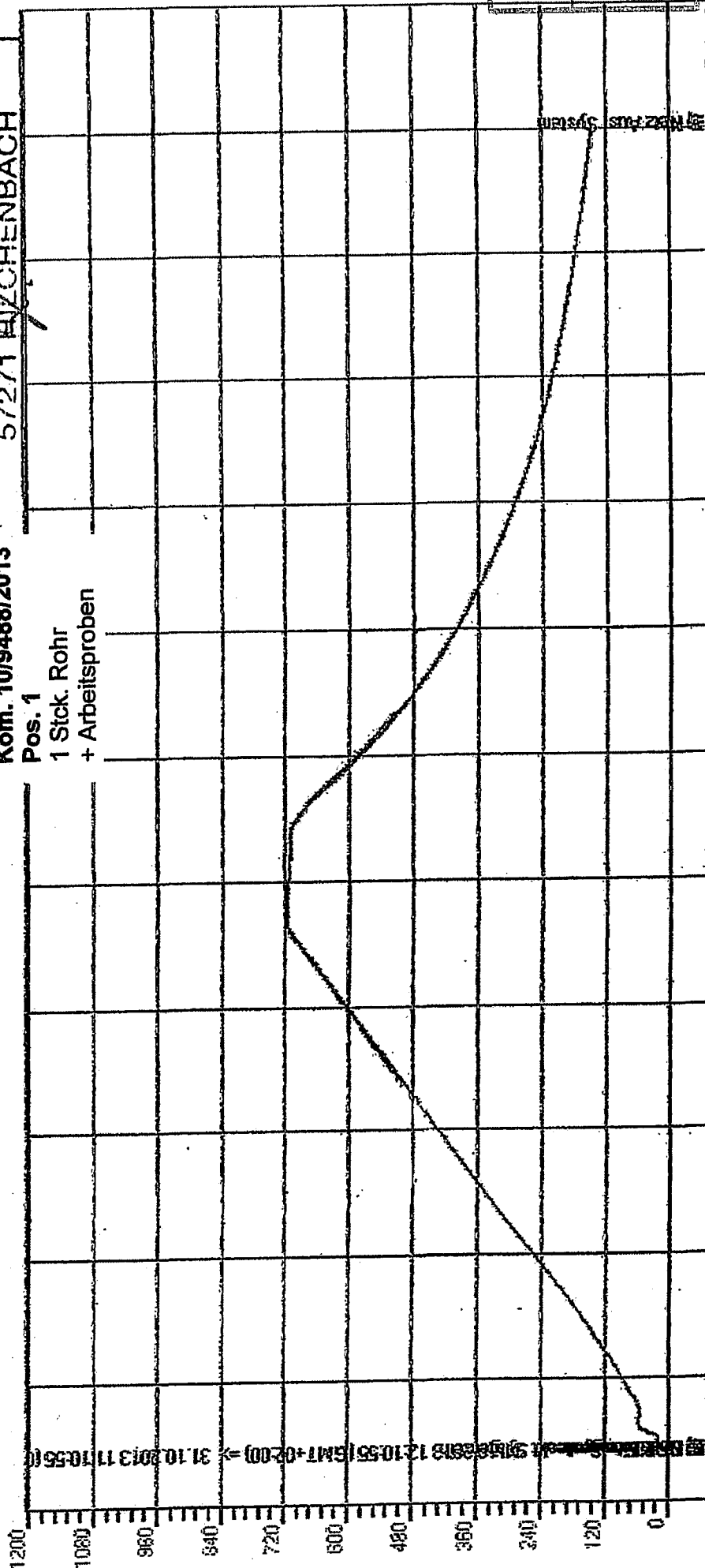
Ihre Kom. : 10/9512/2013

Best.-Nr. : 10/9488/2013

Glühdatum : 31.10.2013

Gebr. Löcher Glüherei GmbH

57271 HILFENBACH



GERMANISCHER LLOYD PRÜFLABOR GMBH
 Akkreditiertes Prüflabor nach DIN EN ISO 17025 (DAkkS Verfahrensnummer D-PL-11166-01)



Germanischer Lloyd Prüflabor GmbH Südstrasse 59 D 44625 Herne
 Telefon: 02325 / 98838 - 0 Telefax: 02325 / 98838 - 30

Seite 1 von 1
 Page 1 of 1

Prüfbericht Ultraschallprüfung
ultrasonic test report

Prüf-Nr.: **13 10 0405 HE**
test-no.:

Auftraggeber:
order: Interfer Stahl GmbH
 Bölowstr. 12
 44147 Dortmund

Auftrags-Nr.: **351257**
order-no.:
 Kunden-Nr.: **387959**
customer-no.:

Gegenstand:
object: Blech
 Prüfort:
place of testing: Dortmund

Abnahmeges.: **-**
inspection by:
 Anlage zu: **---**
appendix to:

Werk/Zeichn.-Nr.: **---**
workdrawing-no.:

Prüfdatum: **15.10.2013**
date of testing:

Anzahl number	Abmessungen [mm] dimension	Norm / Werkstoff standard / material-no.	Schmelze-Nr. heat-no.	Probe-Nr. test piece-no.	Kennzeichnung identification
1	30 x 2000 x 12000	10 CrMo 9-10	20332	254708-1	

Prüfung gem. <i>Test in acc. with</i>	DIN EN 10160 (09/99)		
Prüfgerät <i>Test unit</i>	USN 58 L	Prüfkopf <i>Probe</i>	SEB 4 T
Prüfflächenzustand <i>Condition of examination surface</i>	walzrauh	Koppelmittel <i>Coupling medium</i>	Wasser
Prüfklasse (Fläche) <i>Test class (flat)</i>	S 3	Prüfklasse (Randzone) <i>Test class (edge)</i>	E 3
Registriergrenze (Fläche) <i>Reporting level (flat)</i>	KSR 5	Registriergrenze (Randzone) <i>Reporting level (edge)</i>	KSR 5
Zul.-grenze (Fläche) <i>Tolerance limit (flat)</i>	DIN EN 10160, Tabelle 3	Zul.-grenze (Randzone) <i>Tolerance limit (edge)</i>	DIN EN 10160, Tabelle 5
Fläche Raster [mm] <i>Area Scan [mm]</i>	100	Rand Breite [mm] <i>Width of the edge [mm]</i>	50
Geräteeinstellung <i>Instrument setting</i>	RW 80 % BSH + AVG	Bewertungsverfahren <i>Evaluation method</i>	AVG / HWM

Bemerkung:
Remark:

Die Anforderungen sind erfüllt.

The requirements are complied with.

Kennzeichnung des Prüfgegenstandes:

Stempel des GLP:

identification of the test pieces, stamp of GLP:

Z 26



Herne, den 16.10.2013

Stempel / stamp

Die Prüfergebnisse beziehen sich auf die oben genannten Probennummern.
 Der Prüfbericht darf ohne schriftliche Genehmigung des GLP nicht auszugsweise vervielfältigt werden.

-Panhorst-
 UT Stufe 2 gem. DIN EN 473
 Zertifikat Nr. 30906

[Signature]

61163



Ein Unternehmen der Salzgitter Gruppe

Abnahmeprüfzeugnis 3.2 Inspection certificate 3.2 Certificat de reception 3.2 DIN EN 10204 (A02)		Nr./No./N° (A03) 746111 Seite/Page (A04) 1/6 Datum/Date (A05) 02.04.2012
Nr. (A07) 703585.00 Besteller Interfer Stahl GmbH Purchaser 44016 Dortmund Acheteur (A06)	12.01.2012 Empfänger Interfer Stahl GmbH Customer 44016 Dortmund Destinataire (A06)	Werkauftrags-Nr. 0000056939 Works order No. N° de commande (A08) Lieferchein-Nr. 0083653927 Dispatch note No. 30.03.2012 Avis d'expédition N°
Erzeugnis Grobblech Product Heavy plate Produit Tôle forte (B01)		Abnahme Inspection Reception (A09)
Werkstoff und Lieferbedingung 10 CrMo 9-10 Steel grade and terms of delivery DIN EN 10028-2 09/09 Nuance et conditions de livraison AD 2000 W1 07/06 (B02-B03) DIN EN 10029 B 02/11 DIN EN 10163-2 Kl. B UG2 03/05		(TUV 11)
Kennzeichnung des Materials / Marking of the product / Marquage du produit (B04) Herstellerzeichen/Stahlsorte/Schmelzen-Nr./ Erzeugnis-Nr./Sachverständigenstempel Trademark/Steelgrade/Heat-No/Product-No/ inspector's stamp Sigle de l'usine/Nuance de l'acier/N° coulée/ N° produit/Poinçon de l'expert		

Materialdaten / Material data / Données des matériaux (B01-B06)					
Pos. Item	Anzahl Quantity Partie Nombre (B08)	Erzeugnis-Nr. Product No. N° produit (B07)	Schmelzen-Nr. Heat No. N° Coulee (B07)	Lieferzustand Cond. of delivery Etat de livraison (B04)	Dicke x Breite x Länge Thickness x Width x Length Epaisseur x Largeur x Longueur (B09-B11)
04	1	254708 1	20332	V1	30,00 x 2000,0 x 12000
Σ	1	Gewicht Weight Poids (B12)	5.652 kg lbs kg	V1: normalisiert und angelassen / normalized and tempered / normalisé et revenu	
Maßprüfung und Sichtkontrolle auf äußere Beschaffenheit: ohne Beanstandung Dimensional check and visual examination of the surface condition: without objection Contrôle dimensionnel et examen visuel de l'état de surface: satisfaisants					

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
 We hereby certify that the delivered material complies with the terms of the order.
 Nous certifions que la fourniture répond aux conditions de livraison.
 (Z01)
 QM-System: Certification ab par ISO 9001 since 28 February 1990

Herstellerzeichen
 Trademark
 Sigle du producteur
 (A04)

ILSENBURGER GROBBLECH GmbH
 Vöckensdorfer Weg 10
 D-36871 Ilseburg
 (A01)

TUV NORD
 Systems GmbH & Co. KG
 Benannte Stelle/Notified Body 0045
 22525 Hamburg, Germany
 Dipl.-Ing. Pieper
 Sachverständiger/Abnahmebeauftragter
 Expert/Inspection Representative
 TÜV-Az./file

Abnahmeort
 Inspection Site
 Pöbgen der Export
 (Z02)

Abnahmebeauftragter
 Inspection Representative
 Représentant autorisé
 (Z02)

Cyron



Ein Unternehmen der Salzglitter Gruppe

Abnahmeprüfzeugnis 3.2 Inspection certificate 3.2 Certificat de reception 3.2 DIN EN 10204 (A02)		Nr./No./N° (A03) 746111 Seite/Page/Page 2/6 Datum/Date/Date 02.04.2012	
Nr. (A07) 703585.00 Besteller Interfer Stahl GmbH Purchaser 44016 Dortmund Acheteur (A06)	12.01.2012	Nr. (A07) Interfer Stahl GmbH Empfänger Customer 44016 Dortmund Destinataire (A06)	
Erzeugnis Grobblech Product Heavy plate Produit Tôle forte (B01)		Werkauftrags-Nr. 0000056939 Works order No. N° de commande (A08) Lieferschein-Nr. 0083653927 Dispatch note No. 30.03.2012 Avis d'expédition N°	
Werkstoff und Lieferbedingung 10 CrMo 9-10 Steel grade and terms of delivery DIN EN 10028-2 09/09 Nuance et conditions de livraison AD 2000 W1 07/06 (B02-B03) DIN EN 10029 B 02/11 DIN EN 10163-2 Kl. B UG2 03/05		Abnahme Inspection Reception (A05)	(TUV 11)

Schmelzenanalyse / Ladle analysis / Analyse de coulée (C70-C80)										
Herstellerangaben / Manufacturer standard / Données du fabricant										
Schmelzen-Nr. Heat No. N° Coulée (B07)	C %	Si %	Mn %	P %	S %	N %	Al %	Cu %	Cr %	Ni %
20332	0,10	0,28	0,57	0,009	0,001	0,007	0,029	0,05	2,12	0,06
Schmelzen-Nr. Heat No. N° Coulée (B07)	Mo %	V %	Ti %	Nb %	EV1 1) %	EV2 2) %				
20332	0,92	0,01	0,002	0,004	3,15	0,81				
1) EV1: Cr-C-Mn-Ni 2) EV2: CEV=C-Mn-Ni-Mo-Si-Ni/15+D/Si-V/5+Cu/15										
Stahlherstellung: Sauerstoffaufblasverfahren Steel making: Basic oxygen process Fabrication d'acier: Procédé au convertisseur à l'oxygène (C70) Die Werkstoffverwechslungsprüfung wurde (spektralanalytisch) durchgeführt: keine Beanstandung The material identification was made by spectograph analysis Accepted Developpement d'une epreuve de Confusion de Matiere par Analyse Spectrale.										

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la fourniture répond aux conditions de livraison.
(Z01)
QM-System: Certification en par ISO 9001 since 28 February 1990

Herstellerzeichen
Trademark
Signe du producteur
(A04)

Ilsenburger Grobblech GmbH
Verkehrsweg 10
D-36887 Ilseburg
(A01)

TUV NORD
Systems GmbH & Co. KG
Benannte Stelle/Notified Body 0045
22525 Hamburg, Germany
Dipl.-Ing. Pieper
N: 10204-3.2
Sachverständiger/Abnahmebeauftragter
Expert/Inspection Representative
TUV-Az./file
Abnahmeempfang
Inspection Stamp
Poignée de l'expert
(Z03)
Abnahmebeauftragter
Inspection Representative
Représentant autorisé
(Z02)
Cyron



Ein Unternehmen der Solzgitter Gruppe

Abnahmeprüfzeugnis 3.2 Inspection certificate 3.2 Certificat de reception 3.2 DIN EN 10204 (A02)		Nr./No./N° (A03) 746111 Seite/Page/Page 3/6 Datum/Date/Data 02.04.2012
Nr. (A07) 703585.00 Besteller Interfer Stahl GmbH Purchaser 44016 Dortmund Acheteur (A06)	12.01.2012 Empfänger Interfer Stahl GmbH Customer 44016 Dortmund Destinataire (A06)	Werkauftrags-Nr. 0000056939 Works order No. N° de commande (A04) Liefererschein-Nr. 0083653927 Dispatch note No. 30.03.2012 Avis d'expédition N°
Erzeugnis Grobblech Product Heavy plate Produit Tôle forte (B01)	Werkstoff und Lieferbedingung 10 CrMo 9-10 Steel grade and terms of delivery DIN EN 10028-2 09/09 Matériau et conditions de livraison AD 2000 W1 07/06 (B02-B03) DIN EN 10029 B 02/11 DIN EN 10163-2 Kl. B UG2 03/05	Abnahme Inspection Reception (A05)

(TUV 11)

Zugversuch / Tensile test / Essai de traction (C10-C20)									
Probe-Nr. Specimen No. N° épreuve (C06)	Schmelz-Nr. Heat No. N° Couée (B07)	Ort Location Lieu (C01)	Richt. Direct. Orient. (C02)	Zustand Cond. (B05)	Form Type (C10)	Streckgrenze Yield point Limite d'élasticité (C11) ReH N/mm ² ≥ 300	Zugfestigkeit Tensile strength Résistance (C12) Rm N/mm ² 480-630	Rel/Rm Rel/Rm Rel/Rm	Bruchdehnung Elongation Allongement (C13) A5 7) %
254708 254708	20332 20332	K4G F4G	Q Q	V1 V1	P P	354 354	521 524	0,68 0,68	31 31

1) F: Fuß / Bottom / Pied
K: Kopf / Top / Tête
2) 4: 1/4 Breite / 1/4 Width / 1/4 Largeur
3) G: Erzeugnisdicke / Thickness of product / Epaisseur du produit
4) Q: quer / transversal / transversal
5) V1: normalisiert und abgehasst / normalized and tempered / normalisé et revenu
6) P: prismatisch / prismatic / prismatique
7) A5: L₀=5,65 l₀

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la livraison répond aux conditions de livraison.
(Z01)
GM-Systeme Certification as per ISO 9001 since 28 February 1995

Herstellerzeichen
Trademark
Signe du producteur
(A04)

Ilsenburger Grobblech GmbH
Vockensdorf Weg 10
D-38471 Ilsenburg
(A01)

TUV NORD
Systems GmbH & Co. KG
Benannte Stelle / Notified Body 0045
22525 Hamburg, Germany
Dipl.-Ing. Pieper
Sachverständiger / Abnahmebeauftragter
Expert / Inspection Representative
TUV-AZ / file
Abnahmeprüfstempel
Inspection Stamp
Pouton de l'inspection
(Z02)
Abnahmebeauftragter
Inspection Representative
Représentant autorisé
(Z02)
Cyron



Ein Unternehmen der Salzgitter Gruppe

Abnahmeprüfzeugnis 3.2 Inspection certificate 3.2 Certificat de réception 3.2 DIN EN 10204 (A07)		Nr./No./N° (A03) 746111 Seite/Page/Page 4/6 Datum/Data/Data 02.04.2012	
Nr. (A07) 703585.00 Besteller Interfer Stahl GmbH Purchaser 44016 Dortmund Acheteur (A06)	12.01.2012	Nr. (A07) Interfer Stahl GmbH Empfänger 44016 Dortmund Customer (A06)	
Erzeugnis Grobblech Produkt Heavy plate Produit Tôle forte (B01)		Werkauftrags-Nr. 0000056939 Works order No. N° de commande (A08) Lieferschein-Nr. 0083653927 Dispatch note No. Avis d'expédition N°	
Werkstoff und Lieferbedingung 10 CrMo 9-10 Steel grade and terms of delivery DIN EN 10028-2 09/09 Mention et conditions de livraison AD 2000 W1 07/06 (B02-B03) DIN EN 10029 B 02/11 DIN EN 10163-2 Kl. B UG2 03/05		Abnahme Inspection Réception (A05)	(TUV 11)

Warmzugversuch / Hot tensile test / Essai de traction à chaud (C14-C24)

Proben-Nr. Specimen No. N° éprouvette (C03)	Schmelz-Nr. Heat No. N° Couille (B07)	Ort Location Lieu (C01)	Richt. Direct. Orient. (C02)	Zustand Cond. Cond. (B05)	Form Type Type (C10)	Temperatur Temperature Température (C05)	Dehngrenze Yield strength Limite d'élasticité (C11) Rp0,2 N/mm2 ≥ 205			
247527 *)	20332	K40	Q	V1	C	+400	274			

1) K: Kopf / Top / Tête
2) 1/4 Breite / 1/4 Width / 1/4 Largeur
3) 0: oberflächennah / near surface / près de la peau
4) 0: quer / transversal / transversal
5) V1: normalisiert und angelassen / normalized and tempered / normalisé et revenu
6) C: zylindrisch / cylindric / cylindrique
*) Das Probekörper ist nicht Bestandteil der Lieferung / The sample product is not part of the delivery / Le produit-échantillon ne fait pas partie de la livraison

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la fourniture répond aux conditions de livraison.

(Z01)

GdS-System: Certification as per ISO 9001 since 22 February 1990

Hersteller:
Trademark
Signe du producteur
(A04)

Ilsenburger Grobblech GmbH
Vechersfelder Weg 10
D-38871 Ilsenburg
(A01)

TUV NORD
Systems GmbH & Co. KG
Benannte Stelle / Notified Body 0045
22525 Hamburg, Germany
Dipl.-Ing. Pieper
EN: 10204-3.2
Sachverständiger / Abnahmebeauftragter
Expert / Inspection Representative
TUV-AZ / file
A) Abnahmeempfang
Inspection Stamp
Poignon de l'expert
(Z02)
Abnahmebeauftragter
Inspection Representative
Représentant autorisé
(Z02)
Cyron



Ein Unternehmen der Salzglitter Gruppe

Abnahmeprüfzeugnis 3.2 Inspection certificate 3.2 Certificat de réception 3.2 DIN EN 10204 (A02)		Nr./No./N° (A03) 746111 Seite/Page 5/6 Datum/Date 02.04.2012
Nr. (A07) 703585.00 Besteller Interfer Stahl GmbH Purchaser 44016 Dortmund Acheteur (A06)	12.01.2012 Empfänger Interfer Stahl GmbH Customer 44016 Dortmund Destinataire (A06)	Werkauftrags-Nr. 0000056939 Works order No. N° de commande (A05) Lieferschein-Nr. 0083653927 Dispatch note No. Avis d'expédition N°
Erzeugnis Grobblech Product Heavy plate Produit Tôle forte (B01)	Werkstoff und Lieferbedingung 10 CrMo 9-10 Steel grade and terms of delivery DIN EN 10028-2 09/09 Nuance et conditions de livraison AD 2000 W1 07/06 (B02-B03) DIN EN 10029 B 02/11 DIN EN 10163-2 Kl. B UG2 03/05	Abnahme Inspection Réception (A05)

(TUV 11)

Kerbschlagbiegeversuch / Impact test / Essai de résilience (C40-C48)

Proben-Nr. Specimen No. N° d'éprouvette (C40)	Schmelzen-Nr. Heat No. N° Ceuille (B07)	Ort Location Lieu (C01)	Richt. Orient. Orient. (C02)	Zustand Cond. (B05)	Probenform Type of specimen Type d'éprouvette (C40-C41)	Temperatur Temperature Température (C03)	Schlagarbeit Impact energy Energie de rupture (C42-C43)				
		1) 2) 3)	4)	5)		°C	1 2 3 MW 6)				
							J ≥ 22				
254708	20332	K40	Q	V1	KV600	+020	278	277	273	276	
254708	20332	F40	Q	V1	KV600	+020	268	283	269	273	

1) F: Fuß / Bottom / Pied
K: Kopf / Top / Tête
2) 1/4 Breite / 1/4 Width / 1/4 Largeur
3) O: oberflächennah / near surface / près de la peau
4) Q: quer / transversal / transversal
5) V1: normalisiert und angelassen / normalized and tempered / normalisé et revenu
6) MW: Mittelwert / Average / Moyenne

Unsere Produkte sind frei von radioaktiven Stoffen. Der Freigabegrenzwert von 100 Bq/kg, der die Einhaltung der Grenzwerte der Strahlenschutzverordnung (StrlSchV) für die uneingeschränkte Freigabe von festen Stoffen (StrlSchV Anlage III, Spalte 5) für eisenverwandte Nuklide gewährleistet, wird nicht überschritten.

Our products are free of radioactive substances and do not exceed the clearing limit value of 100 Bq/kg, which guarantees the compliance with limit values given in the Radiation Protection Ordinance (StrlSchV) for the unrestricted clearance of solid material (StrlSchV Annex III, Section 5) for ferrous nuclides.

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la fourniture répond aux conditions de livraison.
(B01)
GMA-System Certification no per ISO 9001 since 28 February 1990

Herstellerzeichen
Trademark
Sigle du producteur
(A04)

Ilsenburger Grobblech GmbH
Vestnieder Weg 10
D-39471 Hamburg
(A01)

Pieper
TUV NORD
Systems GmbH & Co. KG
Benannte Stelle / Notified Body 0045
22625 Hamburg, Germany
Dipl.-Ing. Pieper
EN: 10204-3.2
Sachverständiger / Abnahmebeauftragter
Expert / Inspection Representative
TUV-Az./file

Abnahmeempel
Inspection Stamp
Poinçon de l'expert
(Z03)

Abnahmebeauftragter
Inspection Representative
Représentant autorisé
(Z02)

Cyron



Abnahmeprüfzeugnis 3.2 Inspection certificate 3.2 Certificat de reception 3.2 DIN EN 10204 (A02)		Nr./No./N° (A03) 746111 Satz/Page/Page 6/6 Datum/Date/Data 02.04.2012	
Nr. (A07) 703585.00 Besteller Interfer Stahl GmbH Purchaser 44016 Dortmund Archeur (A06)	12.01.2012	Nr. (A07) Empfänger Interfer Stahl GmbH Customer 44016 Dortmund Destinataire (A06)	
Erzeugnis Grobblech Product Heavy plate Produit Tôle forte (B01)		Werkauftrags-Nr. 0000056939 Works order No. N° de commande (A08) Lieferchein-Nr. 0083653927 Dispatch note No. 30.03.2012 Avis d'expédition N°	
Werkstoff und Lieferbedingung 10 CrMo 9-10 Steel grade and terms of delivery DIN EN 10028-2 09/09 Nuance et conditions de livraison AD 2000 W1 07/06 (B02-B03) DIN EN 10029 B 02/11 DIN EN 10163-2 Kl. B UG2 03/05		Abnahme Inspection Reception (A05)	(TUV11)

Normalisierungstemperatur: 940°C Haltezeit: 1 min/mm Abkuehlung: an ruhender Luft Anlasstemperatur: 710°C Haltezeit: 2 min/mm, min. 30 Minuten Abkuehlung: an ruhender Luft
HOLDINGTEMPERATURE NORMALIZING 940°C SOAKING TIME: 1 MIN/MM COOLING : STILL AIR HOLDINGTEMPERATURE TEMPERING: 710°C SOAKING TIME: 2 MIN/mm, MIN 30 MINUTES COOLING : STILL AIR
Temperature de normalisation: 940°C Temps de maintien: 1 min/ mm Refroidissement par air Temperature de revenu: 710°C Temps de maintien: 2 min/ mm, min. 30 min Refroidissement par air

Es wird bestätigt, daß die Lieferung den Anforderungen der Lieferbedingung entspricht.
We hereby certify that the delivered material complies with the terms of the order.
Nous certifions que la livraison répond aux conditions de livraison.
(Z01)
GM-System: Certification as per ISO 9001 since 28 February 1999

Herstellerzeichen
Trademark
Signe du producteur
(A04)

Ilsenburger Grobblech GmbH
Vestkorsender Weg 10
D-39871 Ilsenburg
(A01)

Pieper
TUV NORD
Systems GmbH & Co. KG
Benannte Stelle/Notified Body 0046
22525 Hamburg, Germany
DN: 10204-3.2
Sachverständiger / Abnahmebeauftragter
Expert / Inspection Representative
TUV-Az./file

Abnahmeempfang
Inspection Stamp
Polycopie de l'inspection
(Z03)

Abnahmebeauftragter
Inspection Representative
Représentant autorisé
(Z02)

Cyron

Beleg Record	Blatt Page
14	1
von	8

16 OKT. 2012

Pos. 15

Stangen-Nr.
2340

10043 B

TÜV SÜD Industrie Service GmbH
Notified Body 0036
Westendstrasse 199
80686 München

Abteilung AW - Ostrava, CZ



Industrie Service

Inspekční certifikát - 3.2 (ČSN EN 10204:2005)

Abnahmeprüfzeugnis

Inspection Certificate

vydaný podle ČSN EN ISO/IEC 17020

Odběratel - Besteller - Customer :

ESRO STAAL SERVICES

Výrobce - Hersteller - Manufacturer :

VÍTKOVICE HAMMERING a.s.

706 02 Ostrava-Vítkovice, CZ

Číslo - Prüf-Nr. - Inspection No :

06.126.385

Strana č. - Blatt-Nr. - Sheet No: 1 from 3

Číslo objednávky - Bestell-Nr. - Order No:

SL1200134 /12P400082

ze dne - vom - dated :

2.7.2012

Zkušební podmínky/požadavky - Prüfgrundlagen/Anforderungen - Technical requirements/Demand:

PED 97/23/EC; AD2000-Merkbl./W13, A4, TRD100,107,110, EN 10222-1,2, DIN 17243

Spec.ESRO 134FQT-120312

Jakost - Werkstoff - Material:

13CrMo4-5 V / 13CrMo44 V

odpovídá - entspricht - according to:

EN 10222 - 1,2

Vydání - Ausgabe - Edition:

10.2000, 04.2000

Stav dodání - Lieferzustand - State of delivery :

+QT

Značka kontroly - Kontrollezeichen - Stamp of the control :



Proces tavby - Erschmelzungsart - Melting process :

E

Značka inspektora - Stempel des Sachverständigen - Inspector's stamp :



Rozsah dodávky - Umfang der Lieferung - Extent of material delivery

Pos. Pos. Item	Ks Stück Pcs	Prüfgegenstand - Article - Produit - Prodotto:	Tyč č. Stab-Nr. forg. No.	Tavba č. Schmelze Nr. Heat No.	Čís. zkoušky Probe-Nr. Test No
2	1	Tyč kovaná / Stabstahl geschmiedet / hammer forged D250+2/-0 x 4428 mm	216811	E54274	0689

Podklad - Angaben - Basis remarks :

Atest - Certificat EN 10204-3.1 : Nr./No. 0689/HM vom / dated 27.09.2012.

Stanovené požadavky jsou splněny (viz. přílohy) - Die gestellten Anforderungen sind lt. Anlagen erfüllt. - The requirements are fulfilled as per Annex.

Ostrava

1.10. 2012

(Místo - Ort - Location/
Datum - Datum - Date)

Ing. Vendula Stoupencová

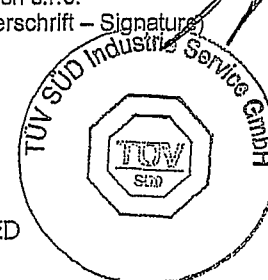
Výrobce - Hersteller - Producer
(Podpis - Unterschrift - Signature)

Ing. Andrej ZAJAC

Sachverständiger / inspector
TÜV SÜD Czech s.r.o.
(Podpis - Unterschrift - Signature)

Přílohy - Anlagen - Annexes :

Výsledky zkoušek - Ergebnis der Prüfungen - Test Results



TÜV SÜD Industrie Service GmbH
Notified Body 0036
Westendstrasse 199
80686 München

Abteilung AW - Ostrava , CZ

Beleg Record	Blatt Page 2
14	von of 8



Industrie Service

Výsledky zkoušek Ergebnis der Prüfungen Test Results

Číslo - Prüf-Nr. - Inspection No :
06.126.385

Příloha č. - Anlage Nr. - Annex No: 1
Str.č. - Blatt-Nr. - Sheet No : 2 from 3

Požadované hodnoty - Anforderungen - Requirements

Teplota - Temperatur- Temperature °C	Zkouška tahem			Zk.rázem v ohybu - Kerbschlagbiegeversuch - Impact test (J)	Zkouška tvrdosti - Härteprüfung - Hardness test (HB)
	Mez kluzu - Streckgrenze - Yield point (N/mm ²)	Pevnost - Zugfestigkeit - Tensile strenght (N/mm ²)	Tažnost - Bruchdehnung - Elongation A5 %		
20 500	Re min 275 R _{p0,2} min 150	485 - 570	min 20	KV min 27 J (+20°C) 10x10x55 mm	min. 143 max. 207

Mechanické zkoušky - Mechanische Prüfungen - Mechanical Tests

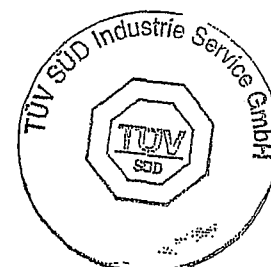
Cis. zkoušky - Probe Nr. - Test No	Rozměr zkušební tyče - Probenabmessung - Dim. of specimen		Odběr vzorku - Probenentnahme - Specimen		Teplota Temperatur Temperature °C	Zkouška tahem - Zugversuch - Tensile test				Zkouška rázem v ohybu - Kerbschlagbiegeversuch - Impact test				Zkouška tvrdosti - Härteprüfung - Hardness test (HB)
	Tloušťka - Dicke - Thickness (mm)	Šířka - Breite - Width (mm)	Místo - Ort - Location/	Směr - Richtung - Direction		R _{elt} R _{p0,2} (N/mm ²)	R _m (N/mm ²)	A ₅ %	Z % min. 30%	1 J	2 J	3 J	Ø J	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0689	-	D10	1	T	20	439	554	27,8	69,8	224	232	246	234	175, 177
0689	-	D10	1	T	500	296								177

Místo odběru / Abnahmestelle / Location :

- 1- Povrch/ surface : Ort der Abnahme in D/4 vom Oberfläche und gleichzeitig 90 mm von einem Ende des Stabstahls
/ Sampling point in D/4 and simultaneously from the surface 90 mm from one end .

Směr vláken / direction :

T - tangenciálně /tangential/ tangentially



TÜV SÜD Industrie Service GmbH
Notified Body 0036
Westendstrasse 199
80686 München

Abteilung AW - Ostrava , CZ

Beleg Record	Blatt Page	3
14	von of	8



Industrie Service

**Výsledky zkoušek
Ergebnis der Prüfungen
Test Results**

Číslo - Prüf-Nr. - Inspection No :

06.126.385

Příloha č. - Anlage Nr. - Annex No: 1

Str.č.- Blatt-Nr.- Sheet No.: 3 from 3

Ostatní zkoušky - Weitere Prüfungen - Other tests :

- ☒ Vizuální a rozměrová kontrola - Maß- und Sichtprüfung - Dimension and visual test - Vyhovující / o.B. / Satisfactory
☒ Zkouška UT - Ultraschallprüfung - UT test acc. to EN 10228-3 Class 3, spec UT1, Protokoll - Nr./No. 2026/2012 .
- ohne Beanstandung / Satisfactory
☒ Zkouška identity - Werkstoffverwechslungsversuch - Identity Test - ohne Beanstandung / Satisfactory
☒ Zkouška rozměr. a tvar.přesnosti - Prüfung der Maß-und Formgenauigkeit - Test the dimensional and Shape accuracy
- ohne Beanstandung / Satisfactory
☒ Jiné zkoušky - Andere Prüfungen - Other tests:

Chemický rozbor - Chemische Zusammensetzung - Chemical analysis

Schm.-Nr./ Heat-No.	C	Mn	Si	P	S	Cu	Cr	Mo	V	Ti	Al	N
E 54274	0,17	0,62	0,23	0,006	0,005	0,15	0,96	0,46	0,002	0,002	0,023	0,007

Wärmebehandlung / Heat treatment :

E 54724 : 940°C - 7 Std./hour - Wasser/Water

Austenitizováno
/Austenisierung
/ Austenitized

E 54724 : 700°C - 9 Std./hour - Luft/ Air

Popouštěno / Anlassen / tempered



Ostrava

1.10. 2012

(Místo - Ort - Location)

(Datum - Datum - Date)

Ing. Andrej Zajac
Sachverständiger / Inspector
TÜV SÜD Czech s.r.o.
(Podpis - Unterschrift - Signature)



**VÍTKOVICE
HAMMERING**
a.s.

**ULTRASONIC EXAMINATION RECORD,
AUFZEICHNUNG DER ULTRASCHALL
TESTMATERIAL**

No./č.: 2026/2012

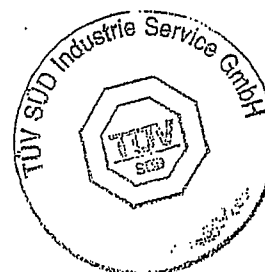
Page: 1 of 1
Seite: 1 of 1

Purchaser :
Kommittent : ESRO STAAL Services

Identification no. : Aktuelle zahl : 216811	Heat no. : Schmelzen : E 54274	Component : Komponente : Bar / Stange
Order no. : Vertrag : 12P400082	Condition surface : Oberfläche : Trimmed / Getrimmt	Apparatus : Gerät : USM Go
Material : Material : 13crMo4-5+QT	Heat Treatment: After heat treatment / Wärmebehan Nach der dlung: Wärmebehandlung	Transducer : Art de sonde : B2S
Dimensions : Größe : D 250 mm	Specification : ČSN EN 10228-3,class 3 ; Spezifikat : SEP 1921/1984-3/D/d ; spec.ESRO UT-1,rev.02	Couplant : Kopplung : starch/ Stärke
Test number : Anzahl Tests : 0689	Extent of examination : ČSN EN 10228-3,class 3 ; SEP 1921/1984-3/D/d ; Prüfumfang : spec.ESRO UT-1,rev.02	
Registration limit : Registrierung D=3 mm sschwelle :	Sensitivity adjustment : Empfindlichkeitsein DGS stellungen :	Frequency,MHz : Frequenz,MHz : 2 MHz
Test range : Testbereich : 300 mm	Calibrate gauge : Eichkaliber : K 1	Setting intensivity : Einstellung zu 54dB gewinnen :
Date of examination : Datum der Prüfung : 17.9.2012	Operator : Regler : Korpas	Level : Qualifikationsniveau : II.

Comment :
Beachten :

Classification :
Einstufung : Accepted for according/entspricht der Spezifikation





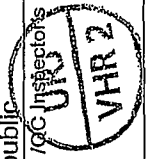
Manager NDT :
Manager NDT : ZAORAL

Date:
Datum: 17.9.2012

Signature: VÍTKOVICE HAMMERING a.s.
Unterschrift: 210 - LINKA HKS
NDT

10043 A

CONTROLLED
DATE 7/16

 VITKOVICE VITKOVICE HAMMERING a.s. Zákazník / Customer		INSPEKČNÍ CERTIFIKÁT INSPECTION CERTIFICATE EN 10204 - 3.1		Čís. / No. 0689/HM		2. Strana / Page 1/1	
ESRO STAAL SERVICES		6. Smlouva č. / Contract No. 20700		7. Zakázka / Shop Order Nr. 12P400082		4. Přílohy / Attachments 2	
10. Výrobce / Manufacturer VITKOVICE HAMMERING a.s. Ruská 2887/101, Ostrava - Vítkovice 706 02, Czech Republic		11. Značka výrobce / Manufacturer's Brand 		12. Výkres č. / Drawing No. NA		9. Stav zkoušený/AS tested 13CrMo4-5 V 13CrMo44 V	
15. Znak inspektora RJ / QC Inspector's Stamp 		16. Specifikace ověřované položky / Specification of the certified item BAR/STANGE		13. Množství / Quantity 1 pc / St		14. Rozměry / Dimensions D 250 x 4428 mm - 1720 kg	
17. Dodací podmínky / Delivery Spec. ESRO 134FQT-120312 (12.03.2012) ; AD2000A4 ; TRD 100 ; TRD 107 ; TRD 110		18. Výsledky - přílohy / Results-Attachments - chem. analys/ chem. Analyse in %: C 0,17 Mn 0,62 Si 0,23 P 0,006 S 0,005 Cu 0,15 Cr 0,96 Mo 0,46 V 0,002 Ti 0,002 Al N 0,007		Item No./Position Nr.2 Heat No./Schmelze Nr. E 54274 Current No./Lauf Nr. 216811 Test No./ Probe Nr. 0689			
- Attachments / Anlagen: - 1. Results of Mechanical Tests No. / Abnahmeprüfzeugnis von Material Nr. 5536 - 5537L12 - 2. Ultrasonic report No./Werkprüfzeugni über die Ultraschallprüfung Nr. 2026 / 2012 - Hardness / Härte : 151, 150, 151 HB - Forging ratio / Verchmiedungsgrad : 4,08 - Hardening / Härten : 7 hour/Std. 940°C Water/Wasser - Tempering / Anlassen: 9 hour./ Std 700°C Air/ Luft - Method of forging: open die forging / Art Schmieden: Freiformschmieden - Material mix up tested - no objection / Verwechslungsprüfung- ohne Beanstandung Size inspection and visual inspection is ok / Masskontrolle und besichtigungsprüfung in ordnung. Erschmelzungsart / Steelmaking-Process EV. 19. Zmocněný pracovník řízení jakosti (RJ) Tímto potvrzují, že všechny kontroly a zkoušky byly provedeny v souladu se smlouvou a s přesně stanovenými požadavky. Osvědčení udává skutečné vlastnosti dodávaného materiálu a uvedené hodnoty jsou správné a pravdivé. Tímto potvrzují, že hodnoty jsou v souladu s požadavky, specifikovanými smlouvou. Businessman / Verkäufer : Ing. Klimša Prepared by / Vorbereitet von: p. Marková Marking / Kennzeichnung : Material / Werkstoff : Heat No. / Schmelze Nr. Current No. / Laufende Nr. ; Test No. / Proben Nr.							

p. Hájek 2012-09-27
20. Zmocněný inspektor RJ - jména, datum, podpis, razítko
Authorized QC Inspector - Name/Date, Signature, Stamp

VITKOVICE HAMMERING a.s.
ŘÍZENÍ KVALITY



VÍTKOVICE
VÍTKOVICE TESTING CENTER S.R.O.
Pohraniční 584/142
709 00 Ostrava - Hulvíky



L 1036
Testing laboratory No. 1036 accredited of ČIA

Test Record

To the Testing Form: 0689/12

Customer

VÍTKOVICE HAMMERING a.s.
Ruská 2887/101
706 02 Ostrava-Vítkovice

ESRO STAAL

Shop Order 12P400082

Purchase Order No. 20700

Product

BAR Item No. 2

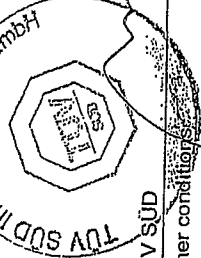
No. of pieces
Standard 1 pc

Quality
Drawing No. 13CrMo4-5 V / 13CrMo44 V
D250

Testing Equipment No.

946.30/007 946.30/027 946.30/037
946.30/003

Delegate of acceptance organization



TÜV SÜD

Other conditions

ISO-V at +20°C min.27 J (Ø 3 Tests)
Z inf. HBW 143 - 207

A 5

Elongation

min. 20

Tensile strength

485 - 570

Rm

MPa

Required values of mechanical properties

Yield point

Temper. °C

+20

+500

R_{eH}

R_{p0,2}

R_m

MPa

%

A 5

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**VÍTKOVICE
HAMMERING**
a.s.

**ULTRASONIC EXAMINATION RECORD,
AUFZEICHNUNG DER ULTRASCHALL
TESTMATERIAL**

No./č.: 2026/2012

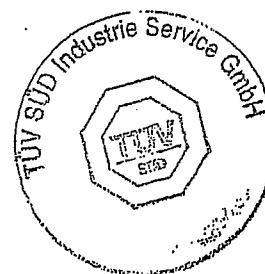
Page: 1 of 1
Seite: 1 of 1

Purchaser :
Kommittent : ESRO STAAL Services

Identification no. : Aktuelle zahl : 216811	Heat no. : Schmelzen : E 54274	Component : Komponente : Bar / Stange
Order no. : Vertrag : 12P400082	Condition surface : Oberfläche : Trimmed / Getrimmt	Apparatus : Gerät : USM Go
Material : Material : 13crMo4-5+QT	Heat Treatment: After heat treatment / Wärmebehandlung: Nach der Wärmebehandlung	Transducer : Art de sonde : B2S
Dimensions : Größe : D 250 mm	Specification : ČSN EN 10228-3,class 3 ; Spezifikat. : SEP 1921/1984-3/D/d ; spec.ESRO UT-1,rev.02	Couplant : Kopplung : starch/ Stärke
Test number : Anzahl Tests : 0689	Extent of examination : ČSN EN 10228-3,class 3 ; SEP 1921/1984-3/D/d ; Prüfumfang : spec.ESRO UT-1,rev.02	
Registration limit : Registrierung sschwelle : D=3 mm	Sensitivity adjustment : Empfindlichkeitsein stellungen : DGS	Frequency,MHz : Frequenz,MHz : 2 MHz
Test range : Testbereich : 300 mm	Calibrate gauge : Eichkaliber : K 1	Setting intensivity : Einstellung zu gewinnen : 54dB
Date of examination : Datum der Prüfung : 17.9.2012	Operator : Regler : Korpas	Level : Qualifikationsniveau : II.

Comment :
Beachten :

Classification :
Einstufung : Accepted for according/entspricht der Spezifikation



Manager NDT :
Manager NDT : ZAORAL

Date:
Datum: 17.9.2012

Signature: VÍTKOVICE HAMMERING a.s.
Unterschrift: 210 LINKA HKŠ

NDT



BGH Edelstahl Siegen GmbH

28500-04

Beleg Record	Blatt Page 1
15	von of 3

BGH Edelstahl Siegen GmbH Industriestr. 9 57076 Siegen

Bomafa Armaturen GmbH

Bescheinigung zur Materialidentität 204758
Certificate of material identity
Certificat d'identité du matériel

Hohensteinstraße 52

44866 Bochum

Kunden-Bestell-Nr. 11621

Customer order no.

Cde. no. du client

Artikel 104286

BGH-Auftrags-Nr.

247679 1/638678_001

BGH works no.

BGH référence

Erzeugnisform Product		Stab, rund, geschmiedet, gedreht Round bars, forged, turned		
Werkstoff / Quality		1.7383 11CrMo9-10		
Anforderungen Requirements		1.7383 11CrMo9-10 / DIN EN 10222 - 2 04/00		
Wärmebehandlungszustand Condition of heat treat		vergütet quenched and tempered		
Pos. Item	Anzahl Quantity	Abmessung Dimension	Gewicht kg Weight kg	Schmelz-Nr. Heat-No.
1	4	675.00 RD	2320	713130
Wir bestätigen, dass die gelieferten Teile aus unten genannter Zeugnis-Nr. entnommen wurden. We confirm that the delivered parts were taken from the certificate-no. mentioned below.				
Ausgewiesen durch : Abnahmeprüfzeugnis nach / inspection certificate Certified by as per EN 10204 / 3.2 / 3.1C / 3.1A : x Werksabnahmeprüfzeugnis nach / works certificate as per EN 10204 / 3.1				
✱				
Die Stempelung / the stamping		Firmenzeichen/company's sign.: Schmelzen-Nr. / heat.no. : 713130 Werkstoff / material : 1.7383 Probe-Nr. / specimen-no. : 145M1		
ist vor dem Trennen übertragen worden. was transferred prior to cutting. Zum Zeichen der ordnungsgemäßen Umstempelung wurden die Teile mit dem Stempel Q55 versehen./As proof of the orderly restamping, the material was stamped with.				
Bemerkung/remark:				
Anlagen Kopie Zeugnis Nr. Encl. Annexe 308109		Siegen, den Place and date Lieu et date 24.10.2013	Abnahmebeauftragter Third Party Inspector Inspecteur de réception HOMM	
Das Zeugnis wurde maschinell erstellt und ist auch ohne Unterschrift gültig. This certificate was generated by data system and it is valid without signature as well. Ce certificat a été établi sur système informatique et est valable sans signature aussi.				



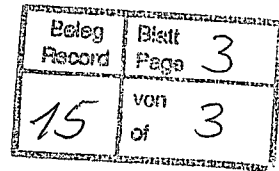
Beleg Record	Blatt Page 2
15	Von of 3

BGH Edelstahl Siegen GmbH

BGH Edelstahl Siegen GmbH Industriestr. 9 57076 Siegen

Zeugnis-Nr. 308109
Certificate no.
No. de certificatBescheinigung über Werkstoffprüfung nach DIN EN 10204
Certificate of material tests according to DIN EN 10204 3.1
Certificat des essais des matériaux selon DIN EN 10204Die Lieferung entspricht den vereinbarten Lieferbedingungen.
Delivery in accordance with the agreed terms of delivery.
La livraison correspond aux conditions de livraison convenues.Zeichen des Lieferwerkes Stempel des Werkstoffverständigen
Trade mark Inspector's stamp
Signe du fournisseur Poinçon de l'inspecteurKunden-Bestell-Nr. 08894400100
Customer order no.
Cde. no. du clientBGH-Auftrags-Nr. 088944-001-01
BGH works no.
BGH référence

Erzeugnisform Stab, rund, gedreht Product Round bars, turned														
Werkstoff / Quality 1.7383 11CrMo9-10 / 1.7380 10CrMo9-10														
Anforderungen BGH-Werkstoffblatt 1.7383 Rev. 2 04/10 Requirements 1.7383 11CrMo9-10 ,DIN EN 10222 - 2 04/00 1.7380 10CrMo9-10 ,DIN 17243 01/87 1.7380 10CrMo9-10 ,Techn. LV 2181 ZN 83 Rev. 09 11.07.2007 Die mechanisch - technologischen Eigenschaften beziehen sich auf das Auslieferungsmaß. Hergestellt als geschmiedeter Stabstahl, wärmebehandelt und erprobt nach DIN EN bei D/4 max. 80 mm. The mechanical and technological properties are referring to the size as delivered.														
Besichtigung und Maßnachprüfung Inspection and dimensional control Inspection et contrôle de dimension ohne Beanstandung without objection				Erschmelzung/Nachbehandlung Meltingprocess/secondary refining Mode d'élaboration/traitement ultérieur E LF VD				Verwechslungsprüfung (spectroanalytisch) Identification test (spectral-analysis) examination d'identification (analyse spectrale) ohne Beanstandung without objection						
Pos. Item	Anzahl Quantity	Abmessung Dimension								Gewicht Weight	kg			Schmelz-Nr. Heat-No.
1	1	675 mm rd. x 5560 mm								15680				713130
Schmelze Heat %	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Nb	V	Al		
713130	0,140	0,34	0,55	0,008	0,0010	2,41	1,06	0,26	0,085	0,001	0,020	0,022		
N	0,0044													
Wärmebehandlungszustand vergütet Condition of heat treat quenched and tempered Traitement thermique 920°C 12h Wasser/water, 750°C 24h Luft/air														
Probe-Nr.	Lage	Temp.	Rp0,2		Rm	A5	Z	Kerbschlagarbeit Impact value	Probenform Shape of test piece	Härte Hardness				
Test-No.	Loc.	°C	N/mm²		N/mm²	%	%	J	Charpy-V	HB				
Soll/Req.	Q	RT	>=265		>=450 <=580	>=21		>=50	RT					
145M1 /K	Q	RT	382		575	28	76	197 197	191 RT	173-176				
145M1 /F	Q	RT	381		576	31	77	230 231	189 RT					
Probenlage entspricht der Spezifikation Position of the test piece acc. to the specification														
Stückanalyse / Check analysis:														
C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Nb	V	Al	N		
0,146	0,33	0,55	0,007	0,0010	2,40	1,01	0,25	0,082	0,001	0,022	0,025	0,0052		
Anlagen Encl. Annexe					Siegen, den Place and date Lieu et date 24.07.2013					Abnahmebeauftragter Inspector representative Inspecteur de réception Sänger				
Das Zeugnis wurde maschinell erstellt und ist auch ohne Unterschrift gültig. This certificate was generated by data system and it is valid without signature as well. Ce certificat a été établi sur système informatique et est valable sans signature aussi.														



BGH Edelstahl Siegen GmbH

BGH Edelstahl Siegen GmbH Industriestr. 9 57076 Siegen

Zeugnis-Nr. 308109
Certificate no.
No. de certificat

Beschneigung über Werkstoffprüfung nach DIN EN 10204
Certificate of material tests according to DIN EN 10204 3.1
Certificat des essais des matériaux selon DIN EN 10204

Die Lieferung entspricht den vereinbarten Lieferbedingungen.
Delivery in accordance with the agreed terms of delivery.
La livraison correspond aux conditions de livraison convenues.

Zeichen des Lieferwerkes
Trade mark
Signe du fournisseur

Stempel des Werkssachverständigen
Inspector's stamp
Poinçon de l'inspecteur

Kunden-Bestell-Nr. 08894400100
Customer order no.
Cde. no. du client

BGH-Auftrags-Nr. 088944-001-01
BGH works no.
BGH référence



Visuelle Oberflächenkontrolle wurde durchgeführt: ohne Beanstandung
Visual surface control was done : without objection

Kontrolle auf Radioaktivität ohne Befund, der Messwert liegt unter der Nachweisgrenze von 0,1 Bq/g.

Radioactivity inspection without objection, the measured value is below the detection limit of 0.1 Bq/g.

US-Prüfung / UT examination:

- DIN EN 10228-3 - 07/98, Tab.3 Type 1a (100%) + Tab.5 QK/quality class 3
- TRD 110, KSR/CRR 6.0 mm
- AD-2000 A4, KSR/CRR 6.0 mm

ohne Beanstandung / without objection

Abschließende Beurteilung durch den TÜV.

Final evaluation by TÜV.

Anlagen
Encl.
Annexe

Siegen, den
Place and date
Lieu et date
24.07.2013


Abnahmebeauftragter
Inspector representative
Inspecteur de réception
Sänger


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11. Actuator

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