

HT# A14011

C/90297

ABNAHMEPRÜFZEUGNIS
 INSPECTION CERTIFICATE
 CERTIFICAT DE RECEPTION
 EN 10204-3.1

ISO 9001:2008 certification
 EN ISO 14001:2004 certification



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Bestell-Nr./Purchaser order No./No. de commande:
 4502298236 / 2015.08.18

Werksauftrags-Nr./Works order-No./No. de la commande de l'usine:
 2023058 / 2015.08.18

Prüfgegenstand/Object of test/Object d'examen:
 BÖHLER A903
 W-Nr. 1.4462
 bar, forged, solution annealed, quenched
 IBO ECOMAX ISO 286/2 ITk14

Empfängerref.-Nr./Receiver reference-No./Référence destinataire:

Lieferschein-Nr./Delivery note-No./Avis d'expédition du client:
 51282921 / 2015.12.03

Anforderungen/Requirements/Exigence:

BUUK UNS 31803/32205 Rev.5, 26 May 2011
 Norsok Standard M-650 Edition 4, September 2011
 Norsok Standard M-630 Edition 6, October 2013
 Norsok MDS D47 Rev.5
 NACE MR0175 / ISO15156-1: 2009
 Ultrasonic inspection acc.to API 6A PSL 3
 Heat treatment inspection acc.to API 6A PSL 3
 EN10088-1:2014 (*)
 X2CrNiMoN22-5-3
 ASTM A182/A182M-15
 ASTM A276/A276M-15
 ASTM A314-15
 ASTM A479/A479M-15
 ASME BPVC 2015 Section II Part A SA-276
 ASME BPVC 2015 Section II Part A SA-479/SA-479M
 ASME BPVC 2015 Section II Part A SA-182/SA-182M
 (*) chemistry only
 UNS S31803, F51 and UNS S32205, F60
 Pressure equipment directive PED 97/23/EC

Volume of delivery

Pos./Los	Dimensions	Length	No. of Pieces	Weight kgs	Mät.-ID	Test No.	Mat. No.
30/1	RD 165,1 MM 6.500 inch	2.000 - 6.000 MM	1	922,0 2032.7 lbs	KCZM	1486364-1	A14011

Reduction ratio
 Reduction ratio = 6.7:1

Quality heat treatment

Heat treatment monitoring method in compliance with API 6A PSL3

	Temperature	Soak time	Cooling
Solution annealed	1060°C	1:29 h T	Water

T ...Holding time at nominal temperature after furnace has reached the tolerance limit.

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Chemical Composition (%)											Heat No.
Chemical Composition Steelmaking Process: Airmelt											A14011
C	Si	Mn	P	S	Cr	Mo	Ni	W	Cu		
0,021	0,60	1,24	0,023	<0,0003	22,63	3,15	5,72	0,05	0,16		A14011
Al	N	FL014*									A14011
0,012	0,17	35,75									
*FL014 = Cr+3,3*Mo+16*N											
Steelmaking Process = Airmelt (EAF+AOD)											
<u>Ferrite content evaluation</u>											
Testing standard = ASTM E562-11, using the point count method											
					Rim					1/2 Radius (1/4T)	
Requirement					40 - 55 %					40 - 55 %	
Ferrite					54 %					52 %	
<u>Microstructural examination</u>											
Testing standard = ASTM A 923-14 method A											
Etch media = ASTM E 407 reagent 98 (NaOH)											
Magnification = 400:1											
					Rim					1/2 Radius (1/4T)	
Microstructure					Austenitic - Ferritic, free from precipitates					Austenitic - Ferritic, free from precipitates	
The material is free from intermetallic and deleterious third phases (max. 0,05% of total area).											
<u>Photomicrographs</u>											
The microstructural photographs were examined at 500x using light microscopy.											
Location = Rim Magnification = 500:1						Location = 1/2 Radius (1/4T) Magnification = 500:1					

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Mechanical Properties									
The QTC is a prolongation of the final heat treated bar.									
Tensile test properties									
Orientation and location of the tensile test properties.									
L2 = longitudinal, 1/2 Radius (1/4T); LZ = longitudinal, center; Q2 = transverse, 1/2 Radius (1/4T)									
Tensile test in delivery condition									
*Key H = hardest W = softest		S = Top M = Middle B = Bottom			Yield Strength	Ultimate Tensile Strength	Elongation	Reduction of Area	
Test no.	Place no.	Testing standard	Location	Temp. grad C	YS0.2 MPa	UTS MPa	A4 %	RoA %	
1486364-1	673S	ASTM A370-14	L2	23	>=450 506	680 - 795 728	>=25 42	>=45 83	
1486364-1	673S	ASTM A370-14	Q2	23	>=450 543	680 - 795 730	>=25 34	>=45 64	
Impact test properties									
Orientation and location of the impact test properties.									
L2 = longitudinal, 1/2 Radius (1/4T); LZ = longitudinal, center; Q2 = transverse, 1/2 Radius (1/4T)									
Impact test in delivery condition									
*Key H = hardest W = softest		S = Top M = Middle B = Bottom			Impact energy	Lateral expansion	Shear area		
Test no.	Place no.	Testing standard	Location	Temp. grad C	Charpy-V J	mm	%		
1486364-1	673S	ASTM E23-12c	L2	-50	Info 204 175 123 >=45	Info 1,68 1,55 1,19 Info	Info 100 70 60 Info		
1486364-1	673S	ASTM E23-12c	L2	-46	111 141 301 Info	0,91 1,32 2,02 Info	50 60 100 Info		
1486364-1	673S	ASTM E23-12c	Q2	-50	70 56 37	0,63 0,46 0,32	35 35 30		
Hardness test in delivery condition									
Test no.	Place no.	Testing standard	Location	HRC					
1486364-1	673S	ASTM E18-15	near Surface	<=26 20,8					
1486364-1	673S	ASTM E18-15	near Surface	21,1					
1486364-1	673S	ASTM E18-15	near Surface	21,3					
1486364-1	673S	ASTM E18-15	1/2 Radius (1/4T)	20,0					
1486364-1	673S	ASTM E18-15	1/2 Radius (1/4T)	20,0					
1486364-1	673S	ASTM E18-15	1/2 Radius (1/4T)	20,0					

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Corrosion examination

Pitting corrosion

Testing standard = ASTM G48 method A
Test period = 24h
Test temperature = 35°C
Pickling solution = 20% HNO₃ + 5% HF
Pickling period = 5 min.
Pickling temperature = 60°C
Location = 1/2 Radius (1/4T)
Weight loss = 0.00 g/m², no pitting at 20x magnification

Testing standard = ASTM G48 method A
Test period = 24h
Test temperature = 35°C
Pickling solution = unpickled
Pickling period = unpickled
Pickling temperature = unpickled
Location = 1/2 Radius (1/4T)
Weight loss = 0.00 g/m², no pitting at 20x magnification

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Non-Destructive examination

Material identification test
Inspection quantity = 100% of the bars
Böhler A903 confirmed

Ultrasonic examination
Inspection quantity = 100% of the bars
Inspection specification = ASTM A388/A388M-15
Evaluation standard = API 6A Para. 7.4.2.3.15 - PSL 3
Inspection technique = Contact technique
The material fulfils the requirements

Surface examination
Inspection quantity = 100% of the bars
Inspection technique = Visual test (VT)
The material is without unacceptable surface defects

Statements
The material is free of mercury contamination.
No weld repair has been performed on this material.
Country of origin and melt: AUSTRIA

Attachment:
Ultrasonic Report
Operators Qualification
Furnace chart

Radioaktivitätskontrolle/Radioactivity inspection: Co-60<0,1Bq/g;
hiermit kleiner als Grenzwert in der anzuwendenden Spezifikation IAEA RS-G-1.7 für unbedenkliche Stoffe.
therefore smaller than upper limit required according to specification IAEA RS-G-1.7 for inoffensive material.

Wir bestätigen hiermit, dass die obengenannten Erzeugnisse den Bestellvorschriften entsprechen.
We hereby certify that the above mentioned products are consistent with the order prescriptions.
Nous certifions que les produits énumérés ci-dessus sont conformes aux prescriptions de la commande.

Zeichen des Lieferwerks: Brand of Manufacturer: Marques de l'usine:		Besichtigung und Nachmessung: Keine Beanstandung Inspection and Checking of Dimensions: Satisfactory Inspection of Control des dimensions: Satisfaisant	Zeichen des Prüfers: Symbol of Inspector: Symbole de l'inspecteur:	
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8605 Kapfenberg, AUSTRIA
www.bohler-edelstahl.com

Wolfgang.Mlatschnig@bohler-edelstahl.at
AUSSTELLER/
ORIGINATOR/AUTEUR

DER ABNAHMEBEAUFTRAGTE
INSPECTION REPRESENTATIVE

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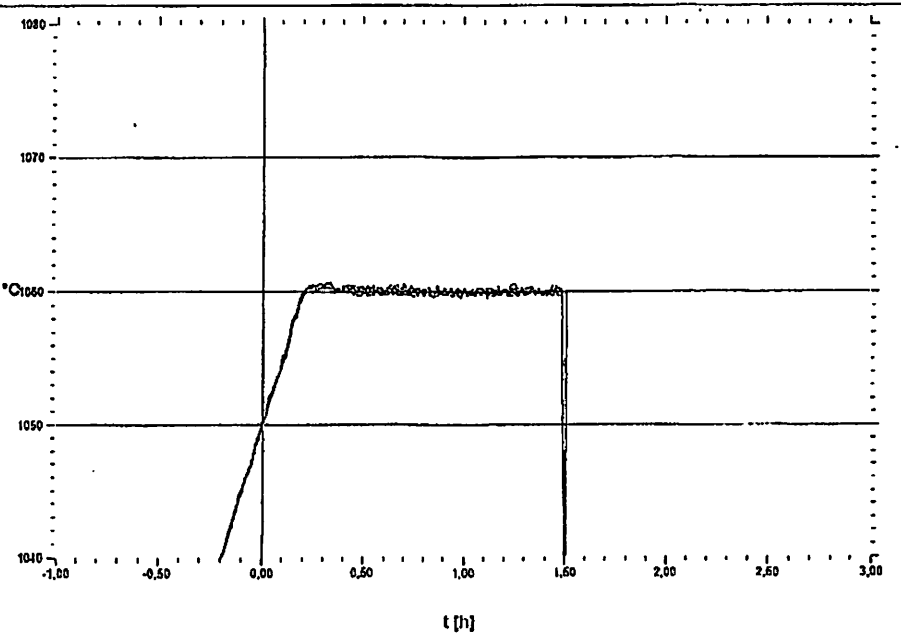
Abteilung/Department **Wärmebehandlungsprotokoll** **BÖHLER EDELSTAHL**
EHW **Heat treatment report**

Kunde/customer: **CDN BOHLER-UDDEHOLM LIMITED 2595**
WA/Pos/Los/works order:: **2023058 / 3 / 1** FA/Los/Spill/Internal order: **1486364 / 1 / 0**
Marke/material: **A903** Charge/heat no.: **A14011 / 0**
Abmessungen/dimension: **0 x 173 [mm]** Einsatzgewicht/weight: **1175 KG**
EKK Nr.: **-** Einsatzmenge/quantity: **1 STK**

Arbeitsgang/process: **LÖSUNGSGLÜHEN / SOLUTION ANNEALING**
Ofen/furnace no.: **41** Einsatznummer/lot no.: **3516**
Einsatzzeitpunkt/start of process: **12.11.2015 12:52** Austrittszeitpunkt/end of process: **12.11.2015 16:38**

	Solldaten / nominal values	Istdaten / actual data
Ofensettemperatur/set temperature:	1060 °C	1060 °C
Ofenklasse/furnace class *:	4 und besser/and better	3
Haltezeit / Typ **/holding time/type:	1:24 - 1:54 h / T	1:29 h / T
Abkühlung/cooling:	Wasser / water	Wasser / water
Transport Zeit / transport time:	max. 60 sec.	45 sec.
Wasseranfangstemp. / water start temp.:		22,9 °C
Wasserendtemp. / water end temp.:		22,0 °C

*... Ofenqualifizierung lt./furnace qualification in accordance with: AMS 2750 aktuelle Rev./current revision
**... Ofenklasse/furnace class: 2 (+/-5°C) / 3 (+/-8°C) / 4 (+/-10°C) / 5 (+/-14°C)
***... M = Materialzeit/material time / T = Ofenzeit/furnace time



Die Richtigkeit der durchgeführten Wärmebehandlung wird bestätigt:
correctness of the performed heat treatment is confirmed:
3.11.2015 07:06 Unterschrift/signature: *Gradischnig H.* Gradischnig H. / EHW



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Akkreditierte Konformitätsbewertungsstelle nach EN ISO/IEC 17024
Accredited Conformity assessment body to EN ISO/IEC 17024
Organisme de évaluation de la conformité à la EN ISO/IEC 17024
Identifikationsnummer: 909
ANERKANNTE UNABHÄNGIGE PRÜFSTELLE
gemäß Art. 13 Druckgeräterichtlinie 97/23/EG



CERTIFICATE ZERTIFIKAT CERTIFICAT

Hiermit zertifizieren wir die Kompetenz.
We hereby certify the competence. Nous certifions la compétence.

Herrn Andreas Neurieser.

geboren am 26.05.1981
date of birth
né(e), le

Register Nr. 00/24343/2/00278
Registration N°
N° d'immatriculation

für/for/pour

Prüfverfahren und Stufe
NDT method and level
Méthode contrôle et niveau

Ultraschallprüfung UT Stufe 2 (zwei)

-Industrie-*/Produktsektoren**)
Industrial-*/Product sectors**)
Secteurs Industriels-*/produits**)

Herstellung

nach den Normen
based on the Standards
en selon des normes

ÖNORMEN: EN ISO 9712, M 3042, M 3041

Gültigkeit der Zertifizierung

Validity of the certification Validité de la certification.

23.01.2014 bis 22.01.2019

Österreichische Gesellschaft für Zerstörungsfreie Prüfung

Austrian Society for Nondestructive Testing

Association d'Autriche des Essais Non Destructifs

A 1015 Wien, 11.02.2014

für den Zentralen Programmausschuss der Zertifizierungsstelle
for the Steering Committee of the Certifying Body
Comité de Direction de l'organisme de certification

für die Zertifizierungsstelle
for the Certifying Body
pour l'organisme de certification

der Präsident
the president le président
Dipl.-Ing. Dr. H. Eberhardt



der Prüfungsbeauftragte
the examiner l'examinateur
Ing. G. Balas (0014)

- *) Herstellung (enthält c, f, t, v, vp)
- *) Dienstleistungsprüfung bei Fertigung und Instandhaltung, eingeschlossen Herstellung (enthält c, f, v, t, vp, u.a)
- *) Eisenbahn-Instandhaltung (enthält c, f, v, vp, u.a)
- *) Luft- und Raumfahrt (enthält c, f, v, t, vp, p, u.a)
- *) Produktsektoren gemäß ÖNORM EN ISO 9712

Unterschrift des Inhabers
Signature of holder Signature du titulaire

Der Zertifikatsinhaber verpflichtet sich zur Einhaltung der Ethischen Regeln (RÖIZ760/Rev.04)
Jede missbräuchliche Verwendung dieses Zertifikates und inkorrekte Hinweise darauf werden gesetzlich geahndet
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