

Inspection certificate 246654/0  
DIN EN 10204/01.05 3.1  
Order No. Purchase Order No.  
611549 82088 Rev 01

Page: 1 / 2  
printed: 15. MAR 2023

N°JACQUET  
INTERNATIONAL :  
103863

JACQUET INTERNATIONAL

7 rue Michel Jacquet  
F - 69802 Saint-Priest



Trademark  
VDM® Alloy 625  
NICROFER 6020 HMO  
2.4856

Product  
plate, hot rolled, soft annealed, descaled, edges plasma cut

Specification

JACQUET Spec. JMS 25 G rev. 15 01-juin-18  
ASTM B 443 - 19  
ASME BPVC.II.B-2021 SB-443  
VdTUV WB 499:2020-01-24  
DIN 17744 12/2020  
DIN 17750 05/2021  
NACE MR0175/ISO 15156-3: 2015  
NACE MR0103/ISO 17945:2015  
SAE AMS 5599J Revised 2022-07

Material

UNS N06625  
UNS N06625  
NiCr22Mo9Nb  
NiCr22Mo9Nb  
UNS N06625  
UNS N06625

Item	Pcs	Dimension [mm]	Cast	Lot	Delivery No.
8	1	20,000 x 2500,0 x 6000,0	133933	105323586	8682095444

Analysis (weight %)

Cast	country of melt
133933	Germany

LE=combustion analysis analysed corresponding to ASTM E1019-18

RF=X-ray fluorescence spectroscopy analysed corresponding to ASTM E572-21, ASTM E1085-16, ASTM E1621-22, ASTM E2465-19

ASTM B 443 - 19; ASME BPVC.II.B-2021 SB-443; VdTUV WB 499:2020-01-24; DIN 17744 12/2020; NACE MR0175/ISO 15156-3: 2015; SAE AMS 5599J Revised 2022-07

Cast	Melting Pr.		C	S	Cr	Ni	Mn	Si	Mo	Ti	Nb	Cu	Fe
133933	EF/VD	top	0,018	<0,002	21,52	R61,52	0,07	0,15	8,44	0,20	3,38	0,01	4,41
		Meth	LE	LE	RF		RF	RF	RF	RF	RF	RF	RF

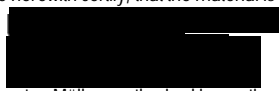
Cast	Melting Pr.		P	Al	Co	Ta	Nb+Ta
133933	EF/VD	top	0,007	0,15	0,03	<0,01	3,39
		Meth	RF	RF	RF	RF	

Sample Condition  
soft annealed

Lot	Sample No.
105323586	17447-F1
105323586	17447-F1
105323586	17447-K1
105323586	17447-K1
105323586	17447-K1

Tensile Test										
1 DIN EN ISO 6892-1 06.2020 meth.B10 / transverse specimen										
2 DIN EN ISO 6892-2 07.2018 meth.B / transverse specimen										
3 ASTM E8/E8M - 22 / transverse specimen										
	Temp	Yield0.2%	Yield1.0%	Tensile	Elongation	RoA				
	[°C]	[MPa]	[MPa]	[MPa]	A [%]	A [%]	A [%]	A [%]	A [%]	A [%]
1	RT	433	490	898	A	50,6				
2	450	308		784						
1	RT	419	467	889	A	52,7				
3	RT	415		893	50	55,1				

We herewith certify, that the material is in conformance with the above mentioned specifications



Email thorsten.mueller@vdm-metals.com

Thorsten Müller, authorized inspection representative

Date of release: 15.03.2023

\* 246654 - 0 - E \*

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103863

Sample Condition soft annealed		Hardness Test		
		1 DIN EN ISO 6506-1 02.2015 2 ASTM E18 - 22		
Lot	Sample No.	HBW 10/3000/ A	HRC	HRBW
105323586	17447-F1	1 231 surface		
105323586	17447-F1	2	<20 surface	96,7 surface
105323586	17447-K1			
105323586	17447-K1			
105323586	17447-K1			

Sample Condition soft annealed		Notched Bar Impact Testing								Grain size	
		1 DIN EN ISO 148-1 May 2017 Charpy-V sample / transverse / KV <sub>2</sub> 300/10								1 ASTM E112 - 13 (Reappr. 2021) 2 DIN EN ISO 643 - June 2020	
Lot	Sample No.	Temp. [°C]	KV [J]	aK [J/cm²]	Lateral Exp. [mm]						
105323586	17447-F1	1 RT	157	160	158				1 No 7.5		
105323586	17447-F1								2 29µm		
105323586	17447-K1										
105323586	17447-K1	1 RT	169	171	170						
105323586	17447-K1										

Sample Condition soft annealed		Corrosion Test	
		1 SEP 1877 II - delivery condition	
Lot	Sample No.		
105323586	17447-F1	1 without objection	
105323586	17447-F1		
105323586	17447-K1		
105323586	17447-K1		
105323586	17447-K1		

Spectral-analytical mix-up test / PMI check was performed to 100%: without objection

Dimensional and visual inspection performed: without objection

No mercury contamination; no Radium, Luminous or Alpha source materials were used in the manufacture or testing of the items furnished.

No weld repairs performed.

Above VdTUEV-sheet confirmation includes only the examinations confirmed in the certificate.

Grade 1

Certified quality management system for material manufacturers according to pressure equipment directive 2014/68/EU, Annex I, point 4.3 - TÜV NORD Systems GmbH & Co. KG, Certification Body for Pressure Equipment, Notified Body, Code no. 0045

VDM Metals International GmbH has complied with all producer requirements of AS6279 and has instructed and received confirmation by its outsourced toll manufacturers accordingly.

Inspection certificate 245104/0  
DIN EN 10204/01.05 3.1  
Order No. Purchase Order No.  
611549 82088 Rev 01

Page: 1 / 2  
printed: 28. FEB 2023

N°JACQUET  
INTERNATIONAL :  
103794

JACQUET INTERNATIONAL

7 rue Michel Jacquet  
F - 69802 Saint-Priest



Trademark  
VDM® Alloy 625  
NICROFER 6020 HMO  
2.4856

Product  
plate, hot rolled, soft annealed, descaled, edges plasma cut

Specification

JACQUET Spec. JMS 25 G rev. 15 01-juin-18  
ASTM B 443 - 19  
ASME BPVC.II.B-2021 SB-443  
VdTUV WB 499:2020-01-24  
DIN 17744 12/2020  
DIN 17750 05/2021  
NACE MR0175/ISO 15156-3: 2015  
NACE MR0103/ISO 17945:2015  
SAE AMS 5599J Revised 2022-07 (EXC)

Material

UNS N06625  
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NiCr22Mo9Nb  
NiCr22Mo9Nb  
UNS N06625  
UNS N06625

Item	Pcs	Dimension [mm]	Cast	Lot	Delivery No.
11	1	30,000 x 2000,0 x 6000,0	123913	105323588	8682093485

Analysis (weight %)

Cast	country of melt
123913	Germany

LE=combustion analysis analysed corresponding to ASTM E1019-18

RF=X-ray fluorescence spectroscopy analysed corresponding to ASTM E572-21, ASTM E1085-16, ASTM E1621-22, ASTM E2465-19

ASTM B 443 - 19; ASME BPVC.II.B-2021 SB-443; VdTUV WB 499:2020-01-24; DIN 17744 12/2020; NACE MR0175/ISO 15156-3: 2015; SAE AMS 5599J Revised 2022-07 (EXC)

Cast	Melting Pr.		C	S	Cr	Ni	Mn	Si	Mo	Ti	Nb	Cu	Fe
123913	EF/VD	top	0,019	<0,002	21,37	R62,03	0,07	0,20	8,41	0,20	3,40	0,01	4,00
		Meth	LE	LE	RF		RF	RF	RF	RF	RF	RF	RF

Cast	Melting Pr.		P	Al	Co	Ta	Nb+Ta
123913	EF/VD	top	0,006	0,16	0,02	<0,01	3,41
		Meth	RF	RF	RF	RF	

Sample Condition  
soft annealed

Tensile Test

- DIN EN ISO 6892-1 06.2020 meth.B10 / transverse specimen
- DIN EN ISO 6892-2 07.2018 meth.B / transverse specimen
- ASTM E8/E8M - 22 / transverse specimen

Lot	Sample No.	Temp [°C]	Yield0.2% [MPa]	Yield1.0% [MPa]	Tensile [MPa]	Elongation		RoA	
						A [%]	A [%]	A [%]	A [%]
105323588	16794-F1	RT	415	447	875	A	51,5		
105323588	16794-F1	3	RT	406	873	50	54,7		
105323588	16794-K1	2	450	301	769				
105323588	16794-K1	1	RT	414	448	880	A	53,2	

We herewith certify, that the material is in conformance with the above mentioned specifications



Email thorsten.mueller@vdm-metals.com

Thorsten Müller, authorized inspection representative

Date of release: 28.02.2023

\* 245104 - O - E \*

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Inspection certificate 245104/0  
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Page: 2 / 2  
printed: 28. FEB 2023

N°JACQUET  
INTERNATIONAL :  
103794

Sample Condition soft annealed		Hardness Test		
Lot	Sample No.	HBW 10/3000/ A	HRC	HRBW
105323588	16794-F1	1 219 surface		
105323588	16794-F1	2	<20 surface	95,9 surface
105323588	16794-K1			
105323588	16794-K1			

Sample Condition soft annealed		Notched Bar Impact Testing								Grain size		
Lot	Sample No.	Temp. [°C]	KV [J]	aK [J/cm²]	Lateral Exp. [mm]			1 DIN EN ISO 148-1 May 2017 Charpy-V sample / transverse / KV <sub>2</sub> 300/10				
105323588	16794-F1	1 RT	165	164	162							1 ASTM E112 - 13 (Reappr. 2021)
105323588	16794-F1											2 DIN EN ISO 643 - June 2020
105323588	16794-K1											
105323588	16794-K1	1 RT	174	153	175							2 24µm
												1 No 8

Sample Condition soft annealed		Corrosion Test	
Lot	Sample No.	1 SEP 1877 II - delivery condition	
105323588	16794-F1		
105323588	16794-F1		
105323588	16794-K1		
105323588	16794-K1	1	without objection

Spectral-analytical mix-up test / PMI check was performed to 100%: without objection

Dimensional and visual inspection performed: without objection

No mercury contamination; no Radium, Luminous or Alpha source materials were used in the manufacture or testing of the items furnished.

No weld repairs performed.

Above VdTUEV-sheet confirmation includes only the examinations confirmed in the certificate.

Grade 1

Certified quality management system for material manufacturers according to pressure equipment directive 2014/68/EU, Annex I, point 4.3 - TÜV NORD Systems GmbH & Co. KG, Certification Body for Pressure Equipment, Notified Body, Code no. 0045

VDM Metals International GmbH has complied with all producer requirements of AS6279 and has instructed and received confirmation by its outsourced toll manufacturers accordingly.

This material is certified as SAE AMS 5599 (EXC) because of the following exception: The material thickness is outside of specified range



# MUSSARI S.r.l.

Trafileria tubi inox di alta precisione  
Via Repubblica 11/B - Tel 031/390677 - 031/492476  
Fax 031/390010

22075 LURATE CACCIVIO/COMO (ITALY)  
web-site: www.mussari.com

## TEST CERTIFICATE ACCORDING TO

EN 10204 / 3.1

ABNAHMEPRUFZEUGNIS

CERTIFICAT D'ESSAIS

CERTIFICATO DI COLLAUDO

N. 297 -2024

DATE - Datum/Data

14 febbraio 2024

CUSTOMER - Besteller/Client/Ciente:

DAL BEN S.p.a. - Via Giuseppe di Vittorio 12 - 30029 SAN STINO DI LIVENZA (VE)

Lot. Nr. - Comm. Nr

234/2024

DELIVERY BILL - Lieferschein/Bulletin de Livraison/Bolla di consegna

183

CUSTOMER ORDER N° - Bestellung/Commande Client/Ordine Cliente

240194

### MECHANICAL TEST

Mechanische Prüfungen/Essai Mécaniques/Caratteristiche meccaniche

SPECIFICATIONS Anforderugen/Specifications/Normative:

ASTM B 444 Grade 1

STEEL GRADE	DIMENSIONS mm	QUANTITY			YIELD POINT		TENSILE STRENGTH		ELONGATION		HARDNESS		TECHNOLOGICAL TEST	
		MT	PC.	LGTH	RP0.2%	N/mm <sup>2</sup>	N/mm <sup>2</sup>	% LO2"	HRB	FLARING TEST:	GOOD			
Werkstoff/Nuance Materiale	Abmessungen Dimensions/Dimensioni	Mt	pz.	mm	req.	result	req.	result	req.	result	req.	result	Erweiteversuch/Evasement/Allargamento	GOOD
ALLOY 625 UNS N06625	21.34 X 3.73	4,74			Min 414	473,3	Min 827	908,7	Min 30%	62,0			FLARING TEST:	=
					RP1.0%N/mm2								FLANGE TEST:	=
					req.	result							FLATTENING TEST:	GOOD
													BENDING REV.TEST:	=
													RING FLATTENING TEST:	=
													DRIFT EXPANDING TEST :	=
													Aulweitversuch/Mandrin.ann./Mandrinatura Anello	
STEEL GRADE	DIMENSIONS	HEAT N°	%C	%Mn	%Si	%P	%S	%Ni	%Cr	%Mo	%Ti	REMARKS		
Werkstoff/Nuance Materiale	Abmessungen Dimensions/Dimensioni	Schmelze Coulée/Colata	MAX	MAX	MAX	MAX	MAX	MIN	MIN 20.00	MIN 8.00	MAX	Bemerkungen/Notes/Note		
ALLOY 625 UNS N06625	21.34 X 3.73	WLH8158-01	0,10	0,50	0,50	0,015	0,015	58.00	MAX 23.00	MAX 10.00	0,40	smls tubes cold drawn solution annealed quenching water		
			0,030	0,090	0,130	0,006	0,001	60,700	21,900	8,8000	0,280	pickled Nahtloses rohr kalt gezogen gegluht in wasser abgeschreckt gebeizt - Tubes sans soudure étirés à froid hypertrempés décapés - Tubi senza saldatura trafilati a freddo solubilizzati raffreddati in acqua decapati		
			0,031	0,091	0,138	0,008	0,001	60,708	21,918	8,8020	0,284			
CHEMICAL ANALYS			%Co	%Fe	%Al	%Nb+Ta								
Raw Material 3.1 MTC Nr.			2282536/1777376	Dated	29/03/2018		MAX	MAX	MAX	MIN 3.15				
Certificato origine materiale Nr.				Data			1.00	5.00	0.40	MAX 4.15				
							0,100	4,000	0,240	3,6500	HEAT TREATMENT :			
							0,121	4,021	0,244	3,660	Warmebehandlung/Traitement Termique/trattamento termico 880°C			
													PMI TEST on each tube:	
													Verwechlungsprüfung/Essai P.M.I./Prova anti mescolanze =	
													Intergranular corrosion test acc. To A262/pract. E =	
													Korrosionsfordernde Rückstanden/Essai residues corrosif/Prova residui corrosivi =	

100% hydrostatic pressure tested at ===== During 5 sec :

Wasserdruckversuch/Essai Hydraulique/Prova idraulica

100% eddy current test acc.to A1016-NFA 49872-SEP 1914-ASTM A450/E426-EN 10893-1-EN 10893-2-EN10246-2 :GOOD

Eddy current/Courant de Foucault/Eddy Current

Visual and Dimensional control :

Besichtigung und Ausmessung/Contrôle Visuel et Dimensionel/Controllo Visivo e Dimensionale

OK

Straightness control

Geradheit Kontrolle/Contrôle de rectitude/Controllo rettilineità

=

### MARKING-Kennzeichnung/Marquage/Marcatura

MSR ASTM B 444 UNS N06625 - ALLOY 625 O.D....x....mm A.W. C.D. Heat Nr....

We certify that the material described has been manufactured acc. With above standards and specifications and satisfies the order's requirements.

Wir bestaegen, dass die gelieferte Ware den Bestellevorschriften entspricht/Nous attestons que les produits livres sont conformes aux références de la commande/Noi attestiamo che il materiale spedito e' conforme ai requisiti dell'ordine