The data contained in this brochure shall not be binding and shall, in case of a contract conclusion, not be regarded as warranted. These data shall merely constitute average values that become binding only if explicitly specified in a contract concluded with us. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer.

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BÖHLER France, a division of voestalpine High Performance Metals France SAS, focuses on technologically demanding products and is your reliable partner certified to ISO 9001 & AS 9120.







voestalpine High Performance Metals France SAS

voestalpine BÖHLER Edelstahl	
YOUR MOST RELIABLE PARTNER IN THE AEROSPACE INDUSTRY BÖHLER special materials for the aerospace industry	
YOUR PRODUCTS FOR THE ULTIMATE IN SAFETY bar steel rolled, rolled wire, bar steel forged	
MATERIALS selection according to BS, selection according to DIN, selection according to AMS	
EXPERTISE IN ALL MATERIAL MATTERS main system approvals, laboratory approvals, NDT approvals	1
METALLURGICAL COMPETENCE SINCE 1870 BÖHLER AMPO	1
TRENDSETTING TECHNOLOGIES FOR HIGHEST METALLURGICAL PERFORMANCE flow of material	1:
voestalpine BÖHLER Bleche	
QUALITY IS BEARING A NAME single rolled sheets, plates and blanks for the aerospace industry	1!
THE DISTINCT ADVANTAGE – CROSS-ROLLING state of the art technology and expertise to produce premium materials	1!
SPECIAL ALLOYS AND TITANIUM grades, standards, customer specifications & approvals	1
APPROVALS system approvals, process approvals, customer approvals	10
TAILOR MADE dimensions, finish, order quantities	11



YOUR PRODUCTS FOR THE ULTIMATE SAFETY

BAR STEEL rolled 12.5 - 150 mm (0.49 - 5.91") 15 - 130 mm (0.59 - 5.12") square flat width thickness 15 – 60 mm 5 – 41 mm (0.59 - 2.36")(0.20 - 1.61")60 - 200 mm 5 – 86 mm (2.36 - 7.87")(0.20 - 3.39")100 - 300 mm 15 – 80 mm (3.94 - 11.81")(0.59 - 3.15")

5.0 - 13.5 mm (0.20 - 0.53")

DAD STE	-						
BAR SIE	EL forged						
round	110 - 1200 mm (4.33 - 47.24")						
square	90 – 1200 mm (3.54 – 47.24")						
flat	width	thickness					
	120	50 mm minimum (4.72 – 1.97" minimum)					
	1600	1000 mm maximum (62.99 – 39.37" maximum)					

Surface condition

»blasted / milled / peeled / turned

Ratio width/thickness maximum 10:1

- » peeled and polished
- »belt grinded
- » ground and polished

drawn (dia.)	1.0 - 12.0 mm (0.04 - 0.47")
precision shaped round	1.0 - 28.0 mm (0.04 - 1.10")
precision shaped flat	0.5 - 40.0 mm ² (0.00078 - 0.062 sq.in.)

ROLLED WIRE

rolled (dia.)





Flat steel - precision ground



Bar steel - around with bevelled ends





Bar steel - peeled - polished Bar steel - peeled + ground

MATERIALS

SPECIAL NOTES

DFARS:

DFARS 252.225.7014: Clause c1, DFARS 225.872

Buy American:

Austria is listed as a qualified country in DFARS 225.872-1, 252.225-7012 because the United States and Austria have signed reciprocal defense procurement MoU. Austrian material may be used in "Buy America" applications where the total value of Austrian material is less than 50% of the value of the component.

voestalpine BOHLER Edelstahl is an eligible supply source according to DFARS 252.225-7009.

SELECTION ACCORDING TO BS

BS	BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Industry specifications
S80	BÖHLER N352S1	431	EAF			Z15Cn17-03	
S82 S156	BÖHLER E108		EAF or EAF-VAR			EN2767 16NCD17	Liebherr LAT 1-9043
S97 S140 S154	BÖHLER V141		EAF				Bombardier EMCM-001-1013
S98 S99	BÖHLER V118S1		EAF			~40NiMoCr10-5	Bombardier EMCM-001-1013
\$130	BÖHLER A750		EAF			X5CrNiNb18-10 Z6CNNb1810	Airbus ZBF1109, ZBF301438 Boeing DMS QPL 2201
S132	BÖHLER V358	E40CDV12	EAF-VAR			E40CDV12	
\$151	BÖHLER T552	Jethete	EAF				Rolls Royce MSRR 6502 Snecma DMD 0235-20, DMD 0237-20
\$162	BÖHLER V250AMS	Maraging250	VIM-VAR			EZ2NKD18-8-5	Liebherr LAT 1-9018
S162	BÖHLER V250	Maraging250	VIM-VAR			X2NiCoMo18-8-5	Messier Dowty MAT102

Grades on stock

^{*} Specific customer approval for a specific size or product range

SELECTION ACCORDING TO DIN

WL	BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Industry specifications
1.3544 1.4125	BÖHLER N695	440C	EAF or EAF-VAR	S44004		X105CrMo17 X102CrMo17 Z100CD17	
1.3551 ~	BÖHLER R250	M50	VIM-VAR			E80DCV40	GE C50TF56* P&W PWA793*,CPW 378* Snecma DMD119-20*
1.4044	BÖHLER N352	431	EAF			Z15Cn17-03	Airbus ZBF1109 ; IPSWL1.4044.6 Liebherr LAT1-9070 Cl.A Cond.2
1.4108	BÖHLER N360	X30	EAF-ESR			X30CrMoN15-1	FAG FL-LA2486 1SX
1.4534	BÖHLER N709	13-8 Mo	VIM-VAR	S13800	A564	EZ3CNDA 13-8 X3CrNiMoAl13-8-2 EN 3357 EN 3358	Airbus ZBF1109, ZBF301438, IPSWL1.4534.4-01, ABS 5442C, ABS 5259A, IPS 01-04-004 Bombardier EMCM-001-1013 Liebherr LAT1-9048
1.4542	BÖHLER N700	17-4 PH	EAF	S17400	A564	Z6CNU17.04 X5CrNiCuNb17 4 4	Boeing DMS QPL 2201, AMS 5643 P&W CPW-S-5643 Snecma DMD 229-20*
1.4545	BÖHLER N701	15-5 PH	EAF-VAR	S15500	A564	EZ5CNU15.15 X5CrNiCu15.05 EN 2815 EN 2817	Airbus/Eurocopter ASNA 3294, ASNA 3297, ASNA 6116, ABS 5750*, ABS 5455*, IPS 01-04-003-02* Aircelle HMDM0022 Boeing D1 4426 (PC660)* Bombardier EMCM-001-1013 Goodrich_AMS5659* Liebherr LAT 1-9037
1.4546	BÖHLER A750		EAF			X5CrNiNb18-10 Z6CNNb1810	Airbus ZBF1109, ZBF301438 Boeing DMS QPL 2201
1.4548	BÖHLER N700	17-4 PH	EAF-VAR		A564	EZ6CNU17.04 X5CrNiCuNb17 4 4	Airbus ZBF1109, ZBF301438 ; IPSWL1.4548 Alenia P19X316
1.4594	BÖHLER T670	520B	EAF	S45000		S143, S144	
1.4939	BÖHLER T552	Jethete	EAF or EAF-ESR	S64152		Z12CNDV12	GE C50TF68 Snecma DMD 0242-20 Turbomeca AMS5719*
1.4943 1.4944	BÖHLER T200SA	A286	EAF-ESR	S66286		EnZ6NCT25 EN2303	Rolls Royce MSRR 6532
1.4944	BÖHLER T200	A286	EAF-ESR	S66286		EnZ6NCT25 EN2303	Snecma DMD 0274-22 Turbomeca AMS 5732*, MSRR 6688* Rolls Royce MSRR 6531
1.6354	BÖHLER V300	Maraging 300	VIM-VAR			EZ2NKD18 ~X2NiCoMo18-9-5	
1.6359	BÖHLER V250	Maraging 250	VIM-VAR			X2NiCoMo18-8-5	Messier Dowty MAT102
1.6604	BÖHLER V145	30CND8	EAF			30CND8 30CrNiMo8	Airbus ZBF1109, ZBF301438
1.6722	BÖHLER E108		EAF or EAF-VAR			EN2767 16NCD17	Liebherr LAT 1-9043
1.6745	BÖHLER V118S1		EAF			~40NiMoCr10-5	Bombardier EMCM-001-1013
1.7734 1.7736	BÖHLER V354	15CDV6	EAF or EAF-ESR			E 15CDV6 ~14CrMoV6 9	Airbus ZBF1109, ZBF301438
1.7765 ~	BÖHLER V361	E32CDV13	VIM-VAR			E32CDV13	Eurocopter ASNA 6128*, ANSA6123*
1.8523	BÖHLER V358	E40CDV12	EAF-VAR			E40CDV12	
2.4632	BÖHLER L090	Alloy 90	VIM-VAR	N07090	B637	NCK20TA NiCr20Co18Ti	MTU MTS 1042-2*
2.4654	BÖHLER L303	Waspaloy	VIM-VAR	N07001	B637	NC20K14 NiCr19Co14MoTi	Snecma DMD 0426-22** on request
2.4665	BÖHLER LHX	Alloy X	VIM-ESR	N06002	B572	NC22FeD	GE B50TF31-A Snecma DMD 491-23 ** on request
2.4668	BÖHLER L718	Alloy 718	VIM-VAR	N07718	B637	NiCr19NbMo NC19FCNb	Boeing D1 4426 (PC696)* GE B50TF15 A/D/E; C50TF6 only melting process and chemistry, spec is for forged parts; B50A809* Goodrich AMS5662* MTU MTS 1424-1*, MTS 1424-3* P&W PWA-S-5662 CI.2, PWA-S-5663 CI.2 Snecma DMD 424-22 ** on request
2.4856	BÖHLER L625	Alloy 625	VIM-ESR	N06002	B446-03 G1 B564-06A	NiCr22Mo9Nb NC22DNb	Honeywell EMS 55425P cond B Snecma DMD 491-23 ** on request

Grades on stock

SELECTION ACCORDING TO AMS

AMS	BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Industry specifications
5629	BÖHLER N709	13-8 Mo	VIM-VAR	\$13800	A564	EZ3CNDA 13-8 X3CrNiMoAl13-8-2 EN 3357 EN 3358	Airbus ZBF1109, ZBF301438, IPSWL1.4534.4-01, ABS 5442C, ABS 5259A, IPS 01-04-004 Bombardier EMCM-001-1013 Liebherr LAT1-9048
5643	BÖHLER N700	17-4 PH	EAF	S17400	A564	Z6CNU17.04 X5CrNiCuNb17 4 4	Boeing DMS QPL 2201, AMS 5643 P&W CPW-S-5643 Snecma DMD 229-20*
5646	BÖHLER A750		EAF			X5CrNiNb18-10 Z6CNNb1810	Airbus ZBF1109, ZBF301438 Boeing DMS QPL 2201
5659	BÖHLER N701	15-5 PH	EAF-VAR	\$15500	A564	EZ5CNU15.15 X5CrNiCu15.05 EN 2815 EN 2817	Airbus/Eurocopter ASNA 3294, ASNA 3297, ASNA 6116, ABS 5750*, ABS 5455*, IPS 01-04-003-02* Aircelle HMDM0022 Boeing D1 4426 (PC660)* Bombardier EMCM-001-1013 Goodrich_AMS5659* Liebherr LAT 1-9037
5659	BÖHLER N701AMS	15-5 PH	EAF-VAR		A564	EZ5CNU15.15 X5CrNiCu15.05	Liebherr LAT 1-9037 Cond A; only AMS5659
5666	BÖHLER L625	Alloy 625	VIM-ESR	N06002	B446-03 G1 B564-06a	NiCr22Mo9Nb NC22DNb	Honeywell EMS 55425P cond B Snecma DMD 491-23 ** on request
5719	BÖHLER T552	Jethete	EAF or EAF-ESR	S64152		Z12CNDV12	GE C50TF68 Snecma DMD 0242-20 Turbomeca AMS5719*
5754	BÖHLER LHX	Alloy X	VIM-ESR	N06002	B572	NC22FeD	GE B50TF31-A Snecma DMD 491-23 ** on request
5773	BÖHLER T671SB	Custom 450	EAF-ESR				
5829	BÖHLER L090	Alloy 90	VIM-VAR	N07090	B637	NCK20TA NiCr20Co18Ti	MTU MTS 1042-2*
5898	BÖHLER N360	X30	EAF-ESR			X30CrMoN15-1	FAG FL-LA2486 1SX
6278	BÖHLER R350	M50 Nil	VIM-VAR			E13DCNV40	GE B50TF211*
6414	BÖHLER V124SC	4340	EAF-ESR or EAF-VAR	G43400		SAE 4340 ~40NiCrMo6 ~E40NCD7	Agusta 199-20-007 Bombardier EMCM-001-1013
6444	BÖHLER R100	52100	EAF-VAR or VIM-VAR			100Cr6 E100C6	
6481	BÖHLER V361	E32CDV13	VIM-VAR			E32CDV13	Eurocopter ASNA 6128*, ANSA6123*
6491	BÖHLER R250	M50	VIM-VAR			E80DCV40	GE C50TF56* P&W PWA793*,CPW 378* Snecma DMD119-20*
6512	BÖHLER V250AMS	Maraging 250	VIM-VAR			EZ2NKD18-8-5	Liebherr LAT 1-9018
6514	BÖHLER V300	Maraging 300	VIM-VAR			EZ2NKD18 ~X2NiCoMo18-9-5	
5618 5630	BÖHLER N695	440C	EAF or EAF-VAR	S44004		X105CrMo17 X102CrMo17 Z100CD17	
5622 5643	BÖHLER N700	17-4 PH	EAF-VAR		A564	EZ6CNU17.04 X5CrNiCuNb17 4 4	Airbus ZBF1109, ZBF301438 ; IPSWL1.4548 Alenia P19X316
5662 5663	BÖHLER L718	Alloy 718	VIM-VAR	N07718	B637	NiCr19NbMo NC19FCNb	Boeing D1 4426 (PC696)* GE B50TF15 A/D/E; C50TF6 only melting process and chemistry, spec is for forged parts; B50A809* Goodrich AMS5662* MTU MTS 1424-1*, MTS 1424-3* P&W PWA-S-5662 Cl.2, PWA-S-5663 Cl.2, Snecma DMD 424-22 ** on request
5704 5706 5707	BÖHLER L303	Waspaloy	VIM-VAR	N07001	B637	NC20K14 NiCr19Co14MoTi	Snecma DMD 0426-22** on request
5731	BÖHLER T200	A286	EAF-ESR	S66286	B637	EnZ6NCT25 EN2303	Snecma DMD 0274-22 Turbomeca AMS 5732*, MSRR 6688*
5732							Rolls Royce MSRR 6531

Grades on stock

EXPERTISE IN ALL MATERIAL MATTERS

Main System Approvals

» TÜV Süd

Jet Engines

» GE Aviation

» ITP

» MTU

» NHBB

» Pratt & Whitney

» Rolls Royce

» SAFRAN » SKF Aeroengines

Air Frame

» Leonardo

» Airbus Germany

» Airbus UK Ltd.

» BAE Systems (operations) Ltd.

» BAE Systems Regional Aircraft

» BOEING

» Bombardier Aerospace

» Gulfstream

» United Technologies

» Hawker Beechcraft Corp.

» Korean Air

» Safran Landing Systems

» Westland Helicopters

» Spirit Aerosystems (Europe)

Chemical, Mechanical, Corrosion Testing,

S400

» SAFRAN FAL n°310 acc. PRO 0430

> MSRR 9951 MM 049

P3TF34, P3TF15 » GE Aviation

RRP 58002 **GAMPS 9102**

EN 9100:2016, AS 9100D

S1000 AS9100 MTV AS9100 LCS/MCS SABRE

QDR-01 / GRP-0125

IHA-0064

AQM-002, A/0698

QVA-V06-02-00

AUK/SA/001-3 / 228415 BAE/AG/QC/SC1 Parts 1 to 7

RALOA/00503/3 Appendix 1

D1-4426

EMCM001. Code 1013

SQAR - 0003 ASQR-01

Code HBIFSAS/Part3/0815

KQMSS-A-05-022

GRP 0087

code V08122

AERO-ALL-QU-SC-ALL-125



Laboratory Approvals

» NADCAP

» GE Aviation » Pratt & Whitney

» Airbus France

» Rolls Royce

» BOEING

NDT Approvals » NADCAP

» Pratt & Whitney

» Gulfstream

» BOEING

» Pratt & Whitney, Canada » SAFRAN » Rolls Royce

Metallography and Hardness, Heat treatment

LCS/MCS MCL F17

D1-4426

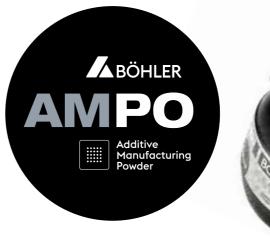
AMS-STD 2154

SIM 14. SIS 45 CPW 382

DMC0022 / Pr-5125

D1-4426

METALLURGICAL COMPETENCE **SINCE 1870**





BÖHLER AMPO TECHNICAL DATA

We offer powders with the right properties for every application and printing technology. In our global development and testing center we produce test objects with 3D printing in order to acquire experience and explore new application areas for additive manufacturing of components.

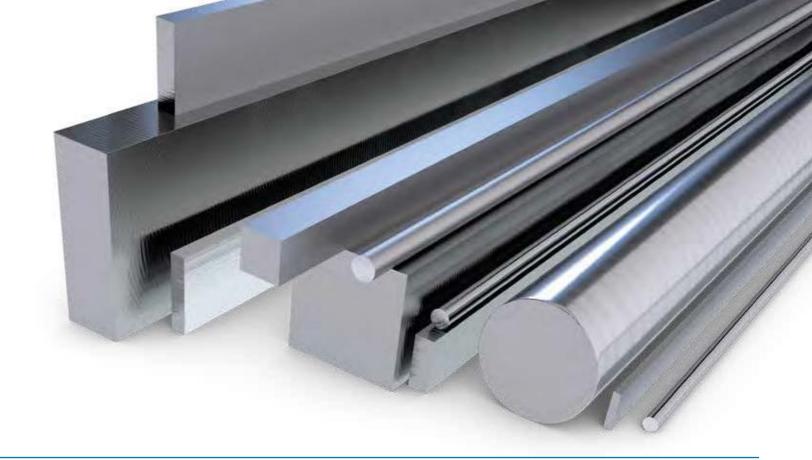
Particle size distribution*

		• 45 μm wder bed fusion)	45 - 150 μm (e.g. direct laser deposition)		
BÖHLER AMPO grade	Flowability* [s]	Apparent density* [g/cm³]	Flowability* [s]	Apparent density* [g/cm³]	
BÖHLER W360 AMPO	17	4.01	19	3.61	
BÖHLER M789 AMPO	4.80**	3.69	18	3.92	
BÖHLER L625	< 22	3.80	< 19	3.80	
BÖHLER L718 AMPO	< 18	3.96	< 21.5	3.50	
BÖHLER N700	< 19	3.96	< 21.5	3.40	
BÖHLER W722 AMPO	< 18	3.90	< 22.0	3.30	

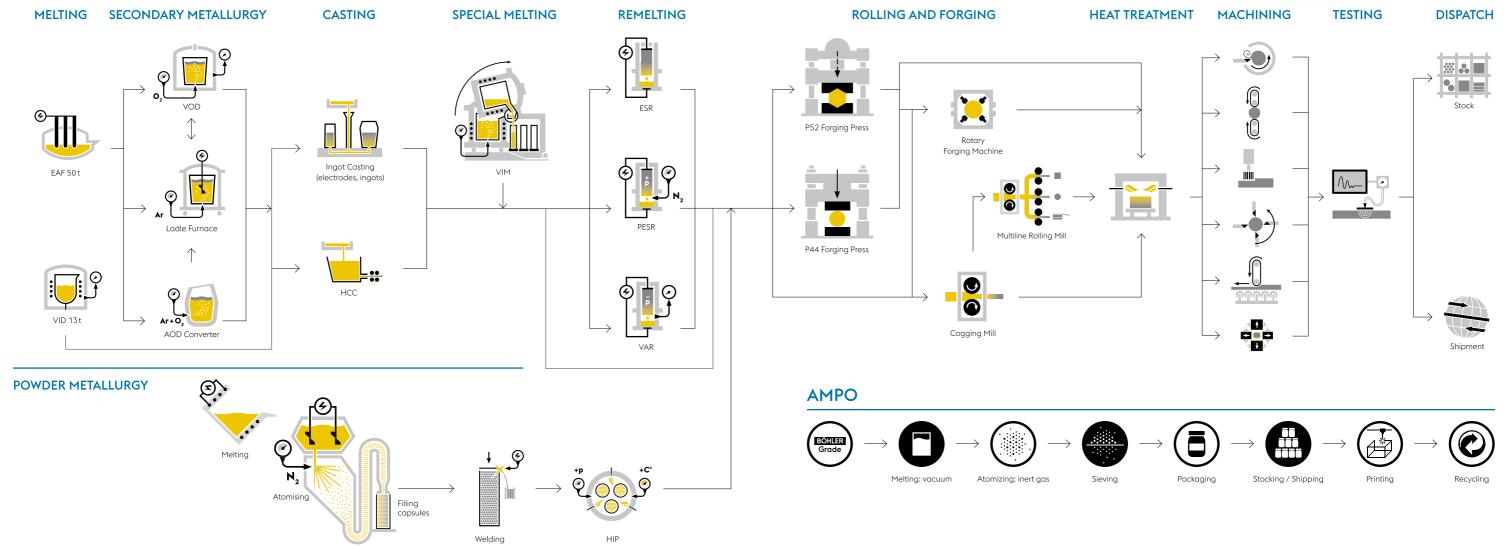
^{*} Measurement of particle size distribution is based on ISO 13322-2 (Dynamic image analysis methods); Flowability and apparent density are based on DIN EN ISO 4490 resp. DIN EN ISO 3923-1 and correspond to typical measured values.

 $^{^{\}star\star}$ Data measured with Carney flowmeter ASTM B964 and correspond to typical measured values.

TRENDSETTING TECHNOLOGIES FOR HIGHEST METALLURGICAL PERFORMANCE



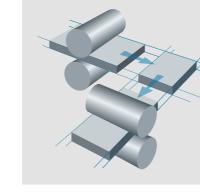
FLOW OF MATERIAL





Duo III





Heat treatment furnace

Water jet cutting unit

Cross rolling technology

QUALITY IS BEARING A NAME

voestalpine BÖHLER Bleche

SPECIALIZED IN MANUFACTURING SINGLE ROLLED SHEETS, PLATES AND BLANKS FOR THE AEROSPACE INDUSTRY.

In combination with our cross-rolling technology, we are able to support you with a homogenous product having excellent material properties.

THE DISTINCT ADVANTAGE – CROSS-ROLLING

WE RELY ON OUR STATE OF THE ART TECHNOLOGY AND EXPERTISE TO PRODUCE PREMIUM MATERIALS.

The main advantage of the cross-rolling technique is the uniform microstructure after heat treatment which creates excellent mechanical-, technological- and physical properties in the longitudinal and transverse direction.







GRADES, STANDARDS, CUSTOMER SPECIFICATIONS & APPROVALS

			Stando	ırds			
Type of alloy	BÖHLER grade	Market Grade	AMS	W Nr. UNS	BS	Others (AIR)	Industry Specifications
Austenite	BÖHLER A700	Alloy 321	5510	1.4544	S524 S526		
	BÖHLER A750	Alloy 347	5512		S525 S527		
Nickel Base	BÖHLER L625	Alloy 625	5599				
Martensite	BÖHLER N100	Alloy 410	5504				CCTLA327
	BÖHLER N700	17-4 PH	5604	1.4548		Z5CNU17 X5CrNiCuNb 17 44	DMD229-21, CCTLA206
	BÖHLER N701	15-5 PH	5862			EZ5CNU15.05 X5CrNiCu15.05	ASNA6116, ASNA3297, BMS7-240
	BÖHLER N710	Alloy FV520S			S532 S533		DEF STAN95-16, Annex B
	BÖHLER N719	13-8 Mo	5864				IGC04.31.226
	BÖHLER N750	17-7 PH	5528	1.4564			

Other grades on request

SPECIAL ALLOYS AND TITANIUM

BÖHLER provides the materials that aerospace engineers need – in the grade and dimension they want – together with lowest order Quantities.

GRADES, STANDARDS, CUSTOMER SPECIFICATIONS & APPROVALS

			Standa	rds			
Type of alloy	BÖHLER grade	Market Grade	AMS	W Nr. UNS	BS	Others (AIR)	Industry Specifications
Creep Resisting	BÖHLER T200	Alloy A286	5525	1.4943 1.4944		Z6NCT25	ASNA6029, CCTLA78, DMD275-23
	BÖHLER T552SG	Jethete M152		1.4933 1.4939	S538	Z12CNDV12	MSRR6504, DMD237-21, CCTLA125
	BÖHLER T555	Alloy FV607					MSRR6514
	BÖHLER T670	Alloy FV520					DEF STAN95-16, Annex A BACM8, ABM7-1057
Heat Treatable	BÖHLER V330SH	Alloy 4130	6350 6345				RS130
	BÖHLER V340SB			1.7214	S534 S535	25CD4S	AIR9160, DMD174-21
	BÖHLER V354			1.7734		15CDV6	AIR9160, ASNA3100, ASNA3102, CCTLA081, DMD172-21
Maraging	BÖHLER V720	Maragin 300	g	1.6354			
	BÖHLER V721	Maragin 250	g 6520	1.6359			
	Other grades on reques	t					

GRADES, STANDARDS, CUSTOMER SPECIFICATIONS & APPROVALS

		Market Grade	Standards					
Type of alloy	BÖHLER grade		AMS	W Nr. UNS	BS	Others (AIR)	Standards	
Titanium	BÖHLER L512	Grade 2	4902	3.7035			ASTM B265	
	BÖHLER L531	Grade 5	4911	3.7165			ASTM B265	
	BÖHLER L533	Grade 23	4907	3.7165			ASTM B265	
	Other grades on reques	t						

Grades on stock

CUSTOMERS SATISFACTION IS OUR GOAL

NADCAP for Heat Treating,

Material Testing and

Non Destructive Testing

System Approvals **Customer Approvals** ISO9001 Airbus EN9100 All Metal Services ISO14001 **BAE-Systems** ISO50001 Boeing OHSAS 18001 Gulfstream ISO 17025 Rolls-Royce Safran Group **Process Approvals** Spirit AeroSystems (Europe) Limited



TAILOR MADE FOR YOUR NEEDS

Dimensions hot rolled

Width	max. 2,000 mm
Length	max. 7,000 mm
Thickness	2.0 mm up to 90 mm
Weight	max. 3,000 kg

Dimensions cold rolled

Width	max. 1,350 mm
Length	max. 5,000 mm
Thickness	0.8 mm up to 6.0 mm

Stated figures are guide values, special requirements on request.

Edge finish

Shear cut	
Laser cut	
Cold sawn	
Plasma cut	
Water jet cut	

Surface finish	
As rolled	
Shot blasted	

Pickled ——— Ground

Milled

Minimum order quantities

Standard alloys	(output of one slab)
steel	600 – 3,000 kg
Ni-base-alloys	800 - 2,200 kg
Titanium	600 – 1,100 kg
Special alloys (or	utput of one melt)
VID	6 - 8 to
EAF-VOD	25 – 35 to
VIM	5 alt. 10 to

Minimum order quantities for other melting routes on request.

(Ni-base-alloys)



Plasma cutting unit



Laser cutting unit



Water jet cutting unit