BÖHLER

AEROSPACE MATERIALS

BÖHLER High Performance Materials for the aerospace industry

voestalpine BÖHLER Edelstahl GmbH & Co KG
www.voestalpine.com/bohler-edelstahl

voestalpine
ONE STEP AHEAD.

BÖHLER

MATERIAL INNOVATIONS FOR THE FUTURE SINCE 1870

For generations the name BÖHLER has been synonymous worldwide with top quality special steels.
The BÖHLER companies today are located on sites with a long history in steelworking.
At voestalpine BÖHLER Edelstahl we develop, produce and deliver high-speed steels, tool steels and special steels for customers worldwide. Through research and development of new environmentally friendly manufacturing processes and products, we secure living space for current and future generations.

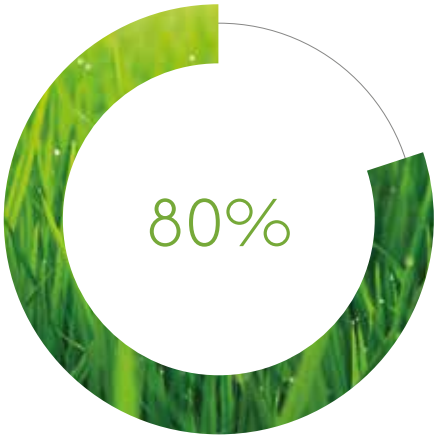
FOCUS ON SUSTAINABILITY OUR ACTIONS

As an innovation leader in the development and production of special steels, we have made sustainable production processes and responsible use of resources an inherent part of our corporate philosophy for decades.
This concerns all areas of the production chain and focuses on using resources, especially raw materials and energy, as economically as possible and minimizing the environmental impact of processes and products.

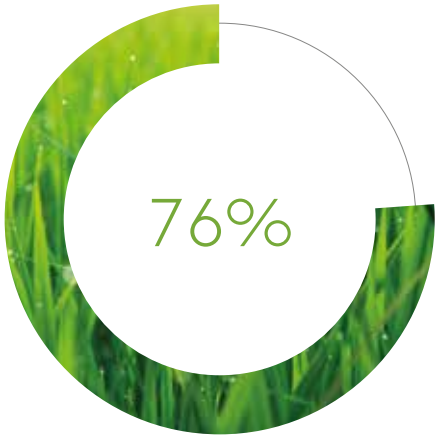
SPECIAL STEEL AN ENVIRONMENTALLY FRIENDLY MATERIAL

Along with innovative solutions for a sustainable future, the raw materials used play a crucial role. Special steel is an indispensable material for our modern world because it is versatile, durable and environmentally friendly.
No other material is recycled as effectively as special steel, in unlimited cycles and with no loss of quality. Worldwide roughly 80 percent of all steel ever produced is still in use today, making it an environmentally exemplary material.

SPECIAL STEEL
IS 100%
RECYCLABLE



WORLDWIDE
ROUGHLY 80 PERCENT
OF ALL STEEL
EVER PRODUCED
IS STILL IN USE TODAY



OUR PRODUCTS
ARE MADE FROM
UP TO 76%
RECYCLED SCRAP

The new electric steel plant in Kapfenberg
sets new standards in production quality, process reliability
and environmental practice.

SPECIAL
MATERIALS
AEROSPACE

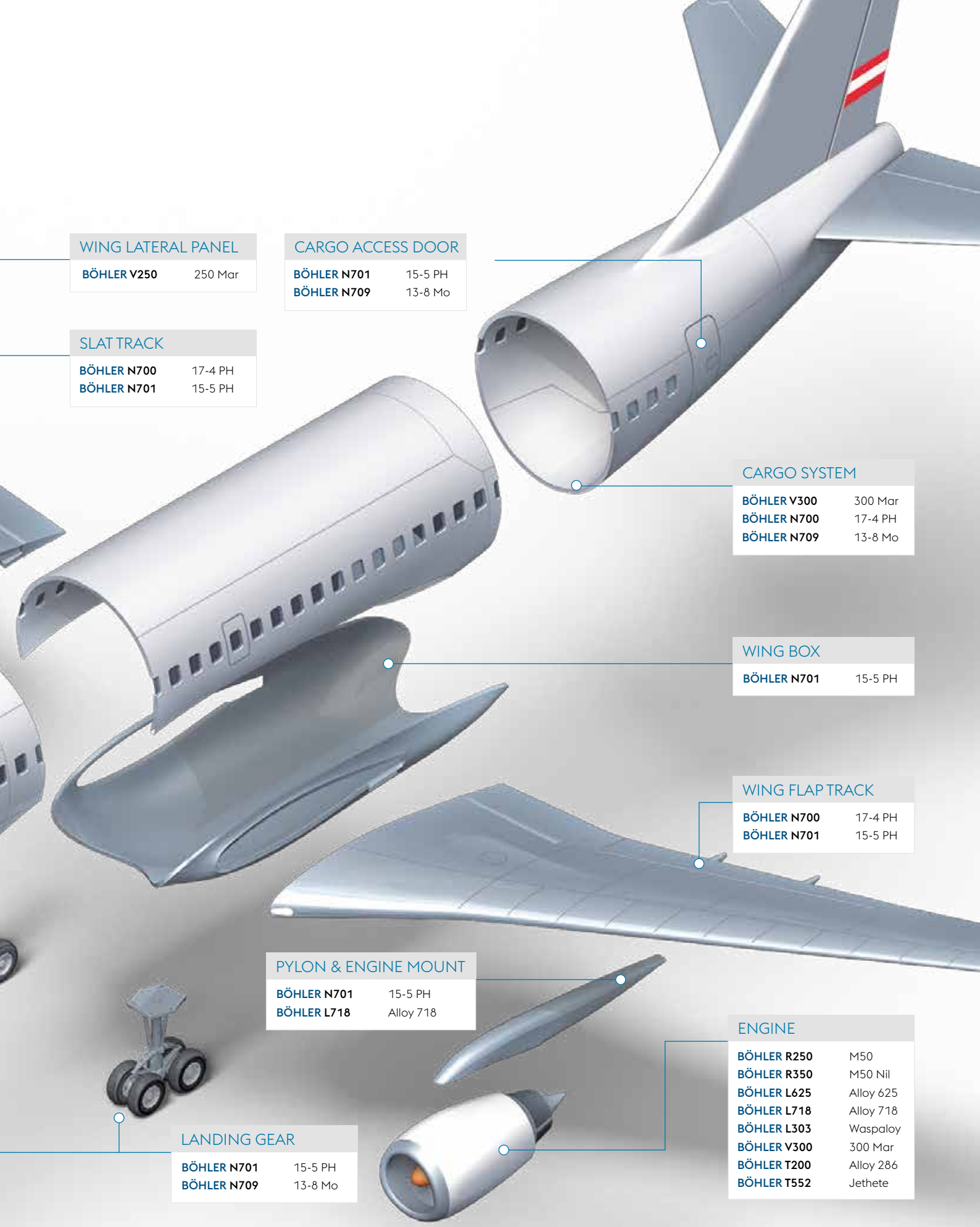
YOUR MOST RELIABLE PARTNER IN THE AEROSPACE INDUSTRY

DOOR SURROUNDS

BÖHLER N701	15-5 PH
BÖHLER N709	13-8 Mo

NOSE GEAR DOOR

BÖHLER N701	15-5 PH
BÖHLER N709	13-8 Mo



WING LATERAL PANEL

BÖHLER V250	250 Mar

SLAT TRACK

BÖHLER N700	17-4 PH
BÖHLER N701	15-5 PH

CARGO ACCESS DOOR

BÖHLER N701	15-5 PH
BÖHLER N709	13-8 Mo

CARGO SYSTEM

BÖHLER V300	300 Mar
BÖHLER N700	17-4 PH
BÖHLER N709	13-8 Mo

WING BOX

BÖHLER N701	15-5 PH

WING FLAP TRACK

BÖHLER N700	17-4 PH
BÖHLER N701	15-5 PH

PYLON & ENGINE MOUNT

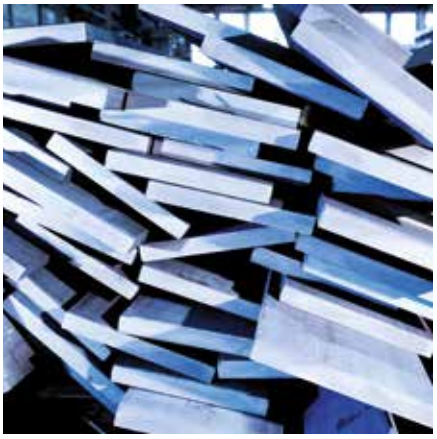
BÖHLER N701	15-5 PH
BÖHLER L718	Alloy 718

ENGINE

BÖHLER R250	M50
BÖHLER R350	M50 Nil
BÖHLER L625	Alloy 625
BÖHLER L718	Alloy 718
BÖHLER L303	Waspaloy
BÖHLER V300	300 Mar
BÖHLER T200	Alloy 286
BÖHLER T552	Jethete

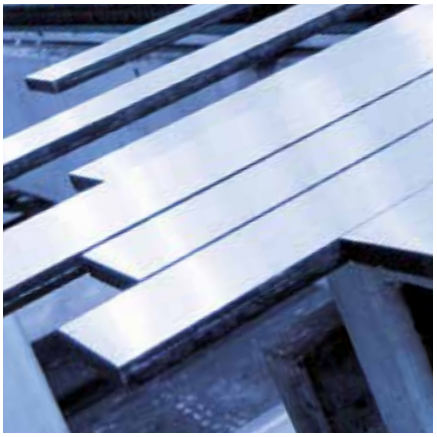
LANDING GEAR

BÖHLER N701	15-5 PH
BÖHLER N709	13-8 Mo

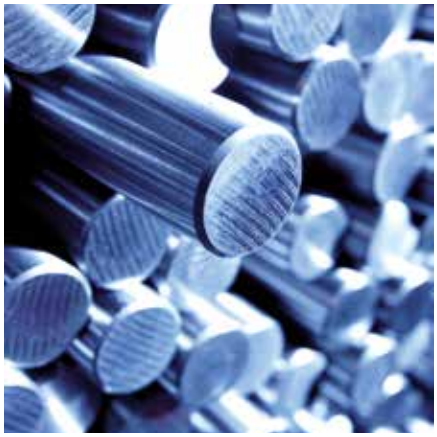


Flat steel – blasted

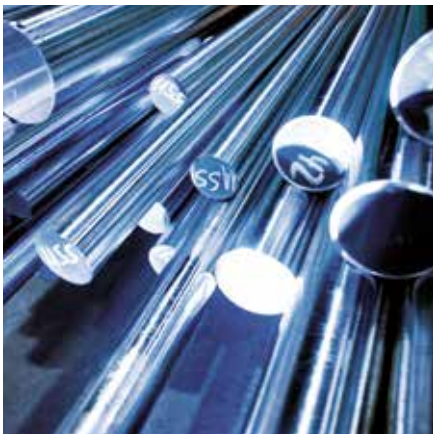
Flat steel – milled



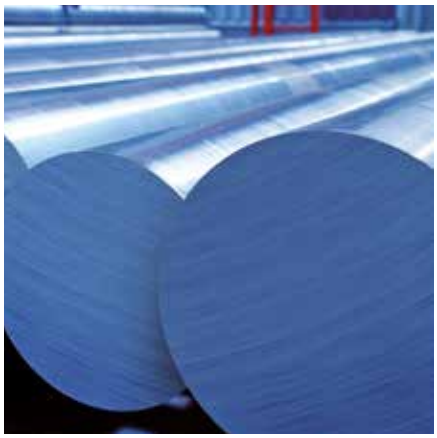
Flat steel – precision ground



Bar steel – ground with bevelled ends



Bar steel – peeled – polished



Bar steel – peeled + ground

YOUR PRODUCTS FOR THE ULTIMATE IN SAFETY

BAR STEEL rolled

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

ROLLED WIRE

rolled (dia.)	5.0 – 13.5 mm (0.20 – 0.53“)
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.)

BAR STEEL forged

round:	110 – 1200 mm (4.33 – 47.24“)	
square:	90 – 1200 mm (3.54 – 47.24“)	
flat:	width	thickness
	120	50 mm (4.72 – 1.97“) minimum
	1600	1000 mm (62.99 – 39.37“) maximum

Ratio width/thickness maximum 10:1

Surface condition

- blasted / milled / peeled / turned
- peeled and polished
- belt grinded
- ground and polished

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
S130	**BÖHLER A750**		EAF			X5CrNiNb18-10 Z6CNNb1810	**Airbus** ZBF1109, ZBF301438
S132	**BÖHLER V358**	E40CDV12	EAF-VAR			E40CDV12	
S143 **S144** **S145**	**BÖHLER T670**	520B	EAF				
S151	**BÖHLER T552**	Jethete	EAF				**Rolls Royce** MSRR 6502 **Safran** DMD 0235-20, DMD 0237-20
S162	**BÖHLER V250AMS**	Maraging250	VIM-VAR			EZ2NKD18-8-5	**Liebherr** LAT 1-9018
S162	**BÖHLER V250**	Maraging250	VIM-VAR			X2NiCoMo18-8-5	**Safran Landing Systems (SLS)** MAT102

* 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	**P&W** PWA793*,CPW 378* **Safran** 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 N700SA**	17-4 PH	EAF	S17400	A564	Z6CNU17.04 X5CrNiCuNb17 4 4	**P&W** CPW-S-5643 **Safran** DMD 229-20*
1.4545	**BÖHLER N701**	15-5 PH	EAF-VAR	S15500	A564	EZ5CNU15.15 X5CrNiCu15.05 EN 2815 EN 2817	**Airbus Helicopter** 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
1.4594	**BÖHLER T670**	520B	EAF	S45000		S143, S144, S145	
1.4939	**BÖHLER T552**	Jethete	EAF or EAF-ESR	S64152		Z12CNDV12	**GE** C50TF68 **Safran** DMD 0242-20, DMD 0237-20 **(SHE) Safran Helicopter Engine** AMS5719*, CCT_00137
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	**Safran** DMD 0274-22 **Safran Helicopter Engine (SHE)** AMS5732 **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	**Safran Landing Systems (SLS)** 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	**BÖHLER V354**	15CDV6	EAF			E 15CDV6 ~14CrMoV6 9	**Airbus** ZBF1109, ZBF301438
1.7765 ~	**BÖHLER V361**	E32CDV13	VIM-VAR			E32CDV13	**Airbus Helicopter** 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	**Safran** DMD 0426-22** on request
2.4665	**BÖHLER LHX**	Alloy X	VIM-ESR	N06002	B572	NC22FeD	**GE** B50TF31-A **Safran** DMD 491-23 ** on request
2.4668	**BÖHLER L718**	Alloy 718	VIM-VAR	N07718	B637	NiCr19NbMo NC19FCNb	**Airbus** ABS5443* **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 **Safran** DMD 424-22 ** on request
2.4856	**BÖHLER L625**	Alloy 625	VIM-ESR	N06625	B446-03 G1 B564-06A	NiCr22Mo9Nb NC22DNb	**Honeywell** EMS 55425P cond B **Safran** DMD 491-23 ** on request, DMD0436

SELECTION ACCORDING TO AMS

AMS	BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Industry specifications
5629	**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
5643	**BÖHLER N700SA**	17-4 PH	EAF	S17400	A564	Z6CNU17.04 X5CrNiCuNb17 4 4	**P&W** CPW-S-5643 **Safran** DMD 229-20*
5646	**BÖHLER A750**		EAF			X5CrNiNb18-10 Z6CNNb1810	**Airbus** ZBF1109, ZBF301438
5659	**BÖHLER N701**	15-5 PH	EAF-VAR	S15500	A564	EZ5CNU15.15 X5CrNiCu15.05 EN 2815 EN 2817	**Airbus Helicopter** 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	
5666	**BÖHLER L625**	Alloy 625	VIM-ESR	N06002	B446-03 G1 B564-06a	NiCr22Mo9Nb NC22DNb	**Honeywell** EMS 55425P cond B **Safran** DMD 491-23 ** on request, DMD 0436**
5719	**BÖHLER T552**	Jethete	EAF or EAF-ESR	S64152		Z12CNDV12	**GE** C50TF68 **Safran** DMD 0242-20 **Safran Helicopter Engine (SHE)** AMS5719*
5754	**BÖHLER LHX**	Alloy X	VIM-ESR	N06002	B572	NC22FeD	**GE** B50TF31-A **Safran** 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	**Leonardo** 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	**Airbus Helicopter** ASNA 6128*, ANSA6123*
6491	**BÖHLER R250**	M50	VIM-VAR			E80DCV40	**P&W** PWA793*,CPW 378* **Safran** 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
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, **Safran** DMD 424-22 ** on request
5704 **5706** **5707**	**BÖHLER L303**	Waspaloy	VIM-VAR	N07001	B637	NC20K14 NiCr19Co14MoTi	**Safran** DMD 0426-22** on request
5731 **5732**	**BÖHLER T200**	A286	EAF-ESR	S66286	B637	EnZ6NCT25 EN2303	**Safran** DMD 0274-22 **Safran Helicopter Engine (SHE)** AMS 5732* **Rolls Royce** MSRR 6531, MSRR 6688*

* Specific customer approval for a specific size or product range

EXPERTISE IN ALL MATERIAL MATTERS

Main System Approvals

» TÜV Süd	EN 9100:2016, AS 9100D
Jet Engines	
» GE Aviation	S1000
» ITP	AS9100
» MTU	MTV
» Pratt & Whitney	LCS/MCS
» Rolls Royce	SABRE
» SAFRAN	QDR-01 / GRP-0125
» SKF Aeroengines	IHA-0064
Air Frame	
» Leonardo	AQM-002, A/0698
» Airbus Germany	QVA-V06-02-00
» Airbus UK Ltd.	AUK/SA/001-3 / 228415
» BAE Systems (operations) Ltd.	BAE/AG/QC/SC1 Parts 1 to 7
» BAE Systems Regional Aircraft	RALOA/00503/3 Appendix 1
» BOEING	D1-4426
» Bombardier Aerospace	EMCM001, Code 1013
» Gulfstream	SQAR - 0003
» United Technologies	ASQR-01
» Hawker Beechcraft Corp.	Code HBIFSAS/Part3/0815
» Korean Air	KQMSS-A-05-022
» Safran Landing Systems	GRP 0087
» Westland Helicopters	code V08122
» Spirit Aerosystems (Europe)	AERO-ALL-QU-SC-ALL-125

Laboratory Approvals

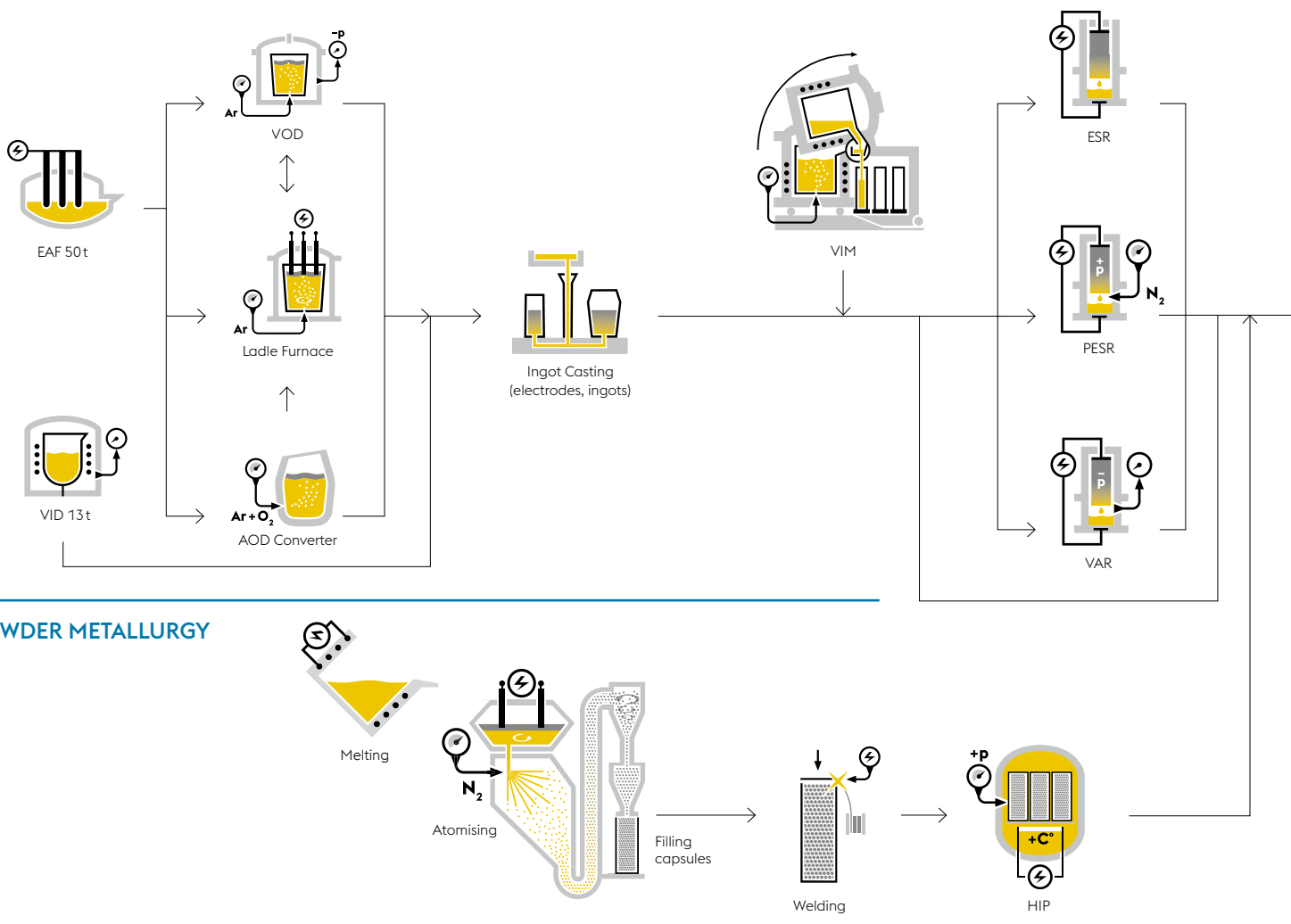
» NADCAP	Chemical, Mechanical, Corrosion Testing, Metallography and Hardness, Heat treatment
» GE Aviation	S400
» Pratt & Whitney	LCS/MCS MCL F17
» SAFRAN	FAL n°310 acc. PRO 0430
» Rolls Royce	MSRR 9951
» Airbus France	MM 049
» BOEING	D1-4426

NDT Approvals

» NADCAP	AMS-STD 2154
» GE Aviation	P3TF34, P3TF15
» Pratt & Whitney	SIM 14, SIS 45
» Pratt & Whitney, Canada	CPW 382
» SAFRAN	DMC0022 / Pr-5125
» Rolls Royce	RRP 58002
» Gulfstream	GAMPS 9102
» BOEING	D1-4426

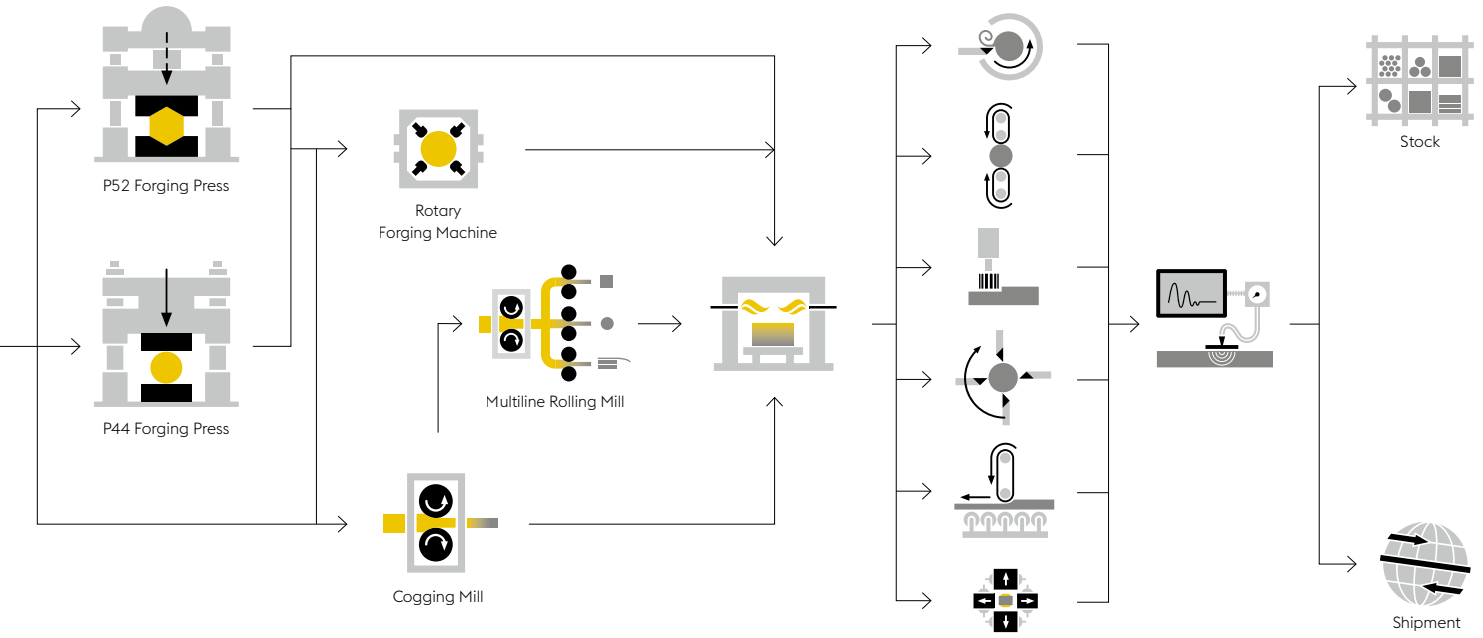
TRENDSETTING TECHNOLOGIES FOR HIGHEST METALLURGICAL PERFORMANCE

FLOW OF MATERIAL

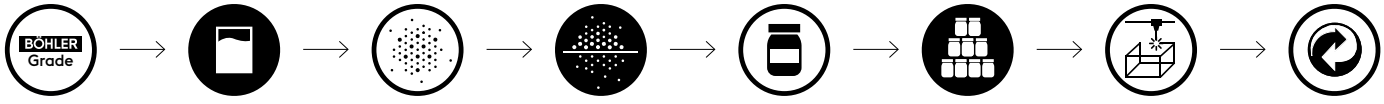


POWDER METALLURGY

ROLLING AND FORGING | HEAT TREATMENT | MACHINING | TESTING | DISPATCH



AMPO



ALWAYS
THE FIRST CHOICE

- Worldwide known supplier of supreme quality material
- State-of-the-art equipment in all shops
- Cutting edge technology
- We offer all known melting & remelting processes an routes – EAF, VID, VIM, ESR, PESR, VAR ...
- Preferred partner of new products and product development
- Attractive and reliable delivery times
- Ongoing investments in advanced production facilities and technologies

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ONE STEP AHEAD.

BW100EN – 06.2024