

## AEROSPACE MATERIALS

**BÖHLER High Performance Materials  
for the aerospace industry**



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

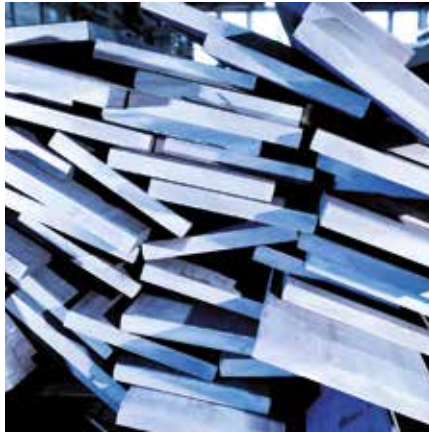
**BÖHLER T200** Alloy 286

**BÖHLER T552** Jethete

### LANDING GEAR

**BÖHLER N701** 15-5 PH

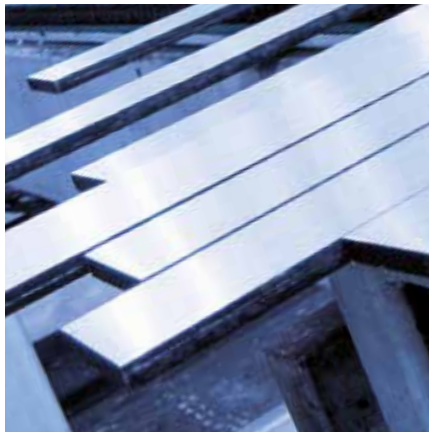
**BÖHLER N709** 13-8 Mo



Flat steel – blasted



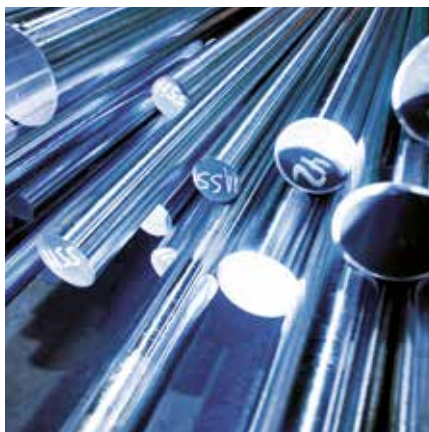
Flat steel – milled



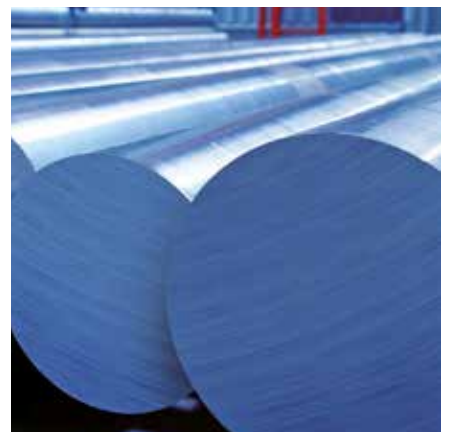
Flat steel – precision ground



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 <sup>2</sup> (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 Boeing DMS QPL 2201
S132	BÖHLER V358	E40CDV12	EAF-VAR			E40CDV12	
S151	BÖHLER T552	Jethete	EAF				Rolls Royce MSRR 6502 Sneema 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	Messier Dowty MAT102

\* Specific customer approval for a specific size or product range

The data contained in this brochure is merely for general information and therefore shall not be binding on the company. We may be bound only through a contract explicitly stipulating such data as binding. Measurement data are laboratory values and can deviate from practical analyses. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer. Printed on an eco-friendly, chlorine-free bleached paper.

# SELECTION ACCORDING TO DIN

WL	BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Industry specifications
1.3544 1.4125	<b>BÖHLER</b> N695	440C	EAF or EAF-VAR	S44004		X105CrMo17 X102CrMo17 Z100CD17	
1.3551 ~	<b>BÖHLER</b> R250	M50	VIM-VAR			E80DCV40	<b>GE</b> C50TF56* <b>P&amp;W</b> PWA793*,CPW 378* <b>Snecma</b> DMD119-20*
1.4044	<b>BÖHLER</b> N352	431	EAF			Z15Cn17-03	<b>Airbus</b> ZBF1109 ; IPSWL1.4044.6 <b>Liebherr</b> LAT1-9070 Cl.A Cond.2
1.4108	<b>BÖHLER</b> N360	X30	EAF-ESR			X30CrMoN15-1	<b>FAG</b> FL-LA2486 1SX
1.4534	<b>BÖHLER</b> N709	13-8 Mo	VIM-VAR	S13800	A564	EZ3CND4 13-8 X3CrNiMoAl13-8-2 EN 3357 EN 3358	<b>Airbus</b> ZBF1109, ZBF301438, IPSWL1.4534.4-01, ABS 5442C, ABS 5259A, IPS 01-04-004 <b>Bombardier</b> EMCM-001-1013 <b>Liebherr</b> LAT1-9048
1.4542	<b>BÖHLER</b> N700	17-4 PH	EAF	S17400	A564	Z6CNU17.04 X5CrNiCuNb17 4 4	<b>Boeing</b> DMS QPL 2201, AMS 5643 <b>P&amp;W</b> CPW-S-5643 <b>Snecma</b> DMD 229-20*
1.4545	<b>BÖHLER</b> N701	15-5 PH	EAF-VAR	S15500	A564	EZ5CNU15.15 X5CrNiCu15.05 EN 2815 EN 2817	<b>Airbus/Eurocopter</b> ASNA 3294, ASNA 3297, ASNA 6116, ABS 5750*, ABS 5455*, IPS 01-04-003-02* <b>Aircelle</b> HMDM0022 <b>Boeing</b> D1 4426 (PC660)* <b>Bombardier</b> EMCM-001-1013 <b>Goodrich</b> AMS5659* <b>Liebherr</b> LAT 1-9037
1.4546	<b>BÖHLER</b> A750		EAF			X5CrNiNb18-10 Z6CNNb1810	<b>Airbus</b> ZBF1109, ZBF301438 <b>Boeing</b> DMS QPL 2201
1.4548	<b>BÖHLER</b> N700	17-4 PH	EAF-VAR		A564	EZ6CNU17.04 X5CrNiCuNb17 4 4	<b>Airbus</b> ZBF1109, ZBF301438 ; IPSWL1.4548 <b>Alenia</b> P19X316
1.4594	<b>BÖHLER</b> T670	520B	EAF	S45000		S143, S144	
1.4939	<b>BÖHLER</b> T552	Jethete	EAF or EAF-ESR	S64152		Z12CNDV12	<b>GE</b> C50TF68 <b>Snecma</b> DMD 0242-20 <b>Turbomeca</b> AMS5719*
1.4943 1.4944	<b>BÖHLER</b> T200SA	A286	EAF-ESR	S66286		EnZ6NCT25 EN2303	<b>Rolls Royce</b> MSRR 6532
1.4944	<b>BÖHLER</b> T200	A286	EAF-ESR	S66286		EnZ6NCT25 EN2303	<b>Snecma</b> DMD 0274-22 <b>Turbomeca</b> AMS 5732*, MSRR 6688* <b>Rolls Royce</b> MSRR 6531
1.6354	<b>BÖHLER</b> V300	Maraging 300	VIM-VAR			EZ2NKD18 ~X2NiCoMo18-9-5	
1.6359	<b>BÖHLER</b> V250	Maraging 250	VIM-VAR			X2NiCoMo18-8-5	<b>Messier Dowty</b> MAT102
1.6604	<b>BÖHLER</b> V145	30CND8	EAF			30CND8 30CrNiMo8	<b>Airbus</b> ZBF1109, ZBF301438
1.6722	<b>BÖHLER</b> E108		EAF or EAF-VAR			EN2767 16NCD17	<b>Liebherr</b> LAT 1-9043
1.6745	<b>BÖHLER</b> V118S1		EAF			~40NiMoCr10-5	<b>Bombardier</b> EMCM-001-1013
1.7734 1.7736	<b>BÖHLER</b> V354	15CDV6	EAF or EAF-ESR			E 15CDV6 ~14CrMoV6 9	<b>Airbus</b> ZBF1109, ZBF301438
1.7765 ~	<b>BÖHLER</b> V361	E32CDV13	VIM-VAR			E32CDV13	<b>Eurocopter</b> ASNA 6128*, ANSA6123*
1.8523	<b>BÖHLER</b> V358	E40CDV12	EAF-VAR			E40CDV12	
2.4632	<b>BÖHLER</b> L090	Alloy 90	VIM-VAR	N07090	B637	NCK20TA NiCr20Co18Ti	<b>MTU</b> MTS 1042-2*
2.4654	<b>BÖHLER</b> L303	Waspaloy	VIM-VAR	N07001	B637	NC20K14 NiCr19Co14MoTi	<b>Snecma</b> DMD 0426-22** on request
2.4665	<b>BÖHLER</b> LHX	Alloy X	VIM-ESR	N06002	B572	NC22FeD	<b>GE</b> B50TF31-A <b>Snecma</b> DMD 491-23 ** on request
2.4668	<b>BÖHLER</b> L718	Alloy 718	VIM-VAR	N07718	B637	NiCr19NbMo NC19FCNb	<b>Boeing</b> D1 4426 (PC696)* <b>GE</b> B50TF15 A/D/E; C50TF6 only melting process and chemistry, spec is for forged parts; B50A809* <b>Goodrich</b> AMS5662* <b>MTU</b> MTS 1424-1*, MTS 1424-3* <b>P&amp;W</b> PWA-S-5662 Cl.2, PWA-S-5663 Cl.2 <b>Snecma</b> DMD 424-22 ** on request
2.4856	<b>BÖHLER</b> L625	Alloy 625	VIM-ESR	N06002	B446-03 G1 B564-06A	NiCr22Mo9Nb NC22DNb	<b>Honeywell</b> EMS 55425P cond B <b>Snecma</b> DMD 491-23 ** on request

# SELECTION ACCORDING TO AMS

AMS	BÖHLER grade	Market grade	Melting route	UNS	ASTM	Others	Industry specifications
5629	<b>BÖHLER</b> N709	13-8 Mo	VIM-VAR	S13800	A564	EZ3CND4 13-8 X3CrNiMoAl13-8-2 EN 3357 EN 3358	<b>Airbus</b> ZBF1109, ZBF301438, IPSWL1.4534.4-01, ABS 5442C, ABS 5259A, IPS 01-04-004 <b>Bombardier</b> EMCM-001-1013 <b>Liebherr</b> LAT1-9048
5643	<b>BÖHLER</b> N700	17-4 PH	EAF	S17400	A564	Z6CNU17.04 X5CrNiCuNb17 4 4	<b>Boeing</b> DMS QPL 2201, AMS 5643 <b>P&amp;W</b> CPW-S-5643 <b>Snecma</b> DMD 229-20*
5646	<b>BÖHLER</b> A750		EAF			X5CrNiNb18-10 Z6CNU17.04	<b>Airbus</b> ZBF1109, ZBF301438 <b>Boeing</b> DMS QPL 2201
5659	<b>BÖHLER</b> N701	15-5 PH	EAF-VAR	S15500	A564	EZ5CNU15.15 X5CrNiCu15.05 EN 2815 EN 2817	<b>Airbus/Eurocopter</b> ASNA 3294, ASNA 3297, ASNA 6116, ABS 5750*, ABS 5455*, IPS 01-04-003-02* <b>Aircelle</b> HMDM0022 <b>Boeing</b> D1 4426 (PC660)* <b>Bombardier</b> EMCM-001-1013 <b>Goodrich</b> AMS5659* <b>Liebherr</b> LAT 1-9037
5659	<b>BÖHLER</b> N701AMS	15-5 PH	EAF-VAR		A564	EZ5CNU15.15 X5CrNiCu15.05	<b>Liebherr</b> LAT 1-9037 Cond A; only AMS5659
5666	<b>BÖHLER</b> L625	Alloy 625	VIM-ESR	N06002	B446-03 G1 B564-06a	NiCr22Mo9Nb NC22DNb	<b>Honeywell</b> EMS 55425P cond B <b>Snecma</b> DMD 491-23 ** on request
5719	<b>BÖHLER</b> T552	Jethete	EAF or EAF-ESR	S64152		Z12CNDV12	<b>GE</b> C50TF68 <b>Snecma</b> DMD 0242-20 <b>Turbomeca</b> AMS5719*
5754	<b>BÖHLER</b> LHX	Alloy X	VIM-ESR	N06002	B572	NC22FeD	<b>GE</b> B50TF31-A <b>Snecma</b> DMD 491-23 ** on request
5773	<b>BÖHLER</b> T6715B	Custom 450	EAF-ESR				
5829	<b>BÖHLER</b> L090	Alloy 90	VIM-VAR	N07090	B637	NCK20TA NiCr20Co18Ti	<b>MTU</b> MTS 1042-2*
5898	<b>BÖHLER</b> N360	X30	EAF-ESR			X30CrMoN15-1	<b>FAG</b> FL-LA2486 1SX
6278	<b>BÖHLER</b> R350	M50 Nil	VIM-VAR			E13DCNV40	<b>GE</b> B50TF211*
6414	<b>BÖHLER</b> V124SC	4340	EAF-ESR or EAF-VAR	G43400		SAE 4340 ~40NiCrMo6 ~E40NCD7	<b>Agusta</b> 199-20-007 <b>Bombardier</b> EMCM-001-1013
6444	<b>BÖHLER</b> R100	52100	EAF-VAR or VIM-VAR			100Cr6 E100C6	
6481	<b>BÖHLER</b> V361	E32CDV13	VIM-VAR			E32CDV13	<b>Eurocopter</b> ASNA 6128*, ANSA6123*
6491	<b>BÖHLER</b> R250	M50	VIM-VAR			E80DCV40	<b>GE</b> C50TF56* <b>P&amp;W</b> PWA793*, CPW 378* <b>Snecma</b> DMD119-20*
6512	<b>BÖHLER</b> V250AMS	Maraging 250	VIM-VAR			EZ2NKD18-8-5	<b>Liebherr</b> LAT 1-9018
6514	<b>BÖHLER</b> V300	Maraging 300	VIM-VAR			EZ2NKD18 ~X2NiCoMo18-9-5	
5618 5630	<b>BÖHLER</b> N695	440C	EAF or EAF-VAR	S44004		X105CrMo17 X102CrMo17 Z100CD17	
5622 5643	<b>BÖHLER</b> N700	17-4 PH	EAF-VAR		A564	EZ6CNU17.04 X5CrNiCuNb17 4 4	<b>Airbus</b> ZBF1109, ZBF301438 ; IPSWL1.4548 <b>Alenia</b> P19X316
5662 5663	<b>BÖHLER</b> L718	Alloy 718	VIM-VAR	N07718	B637	NiCr19NbMo NC19FCNb	<b>Boeing</b> D1 4426 (PC696)* <b>GE</b> B50TF15 A/D/E; C50TF6 only melting process and chemistry, spec is for forged parts; B50A809* <b>Goodrich</b> AMS5662* <b>MTU</b> MTS 1424-1*, MTS 1424-3* <b>P&amp;W</b> PWA-S-5662 Cl.2, PWA-S-5663 Cl.2, <b>Snecma</b> DMD 424-22 ** on request
5704 5706 5707	<b>BÖHLER</b> L303	Waspaloy	VIM-VAR	N07001	B637	NC20K14 NiCr19Co14MoTi	<b>Snecma</b> DMD 0426-22** on request
5731 5732	<b>BÖHLER</b> T200	A286	EAF-ESR	S66286	B637	EnZ6NCT25 EN2303	<b>Snecma</b> DMD 0274-22 <b>Turbomeca</b> AMS 5732*, MSRR 6688* <b>Rolls Royce</b> MSRR 6531

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# EXPERTISE IN ALL MATERIAL MATTERS

## Main System Approvals

» TÜV Süd EN 9100:2016, AS 9100D

## Jet Engines

» GE Aviation S1000  
» ITP AS9100  
» MTU MTV  
» NHBB AS9100  
» 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

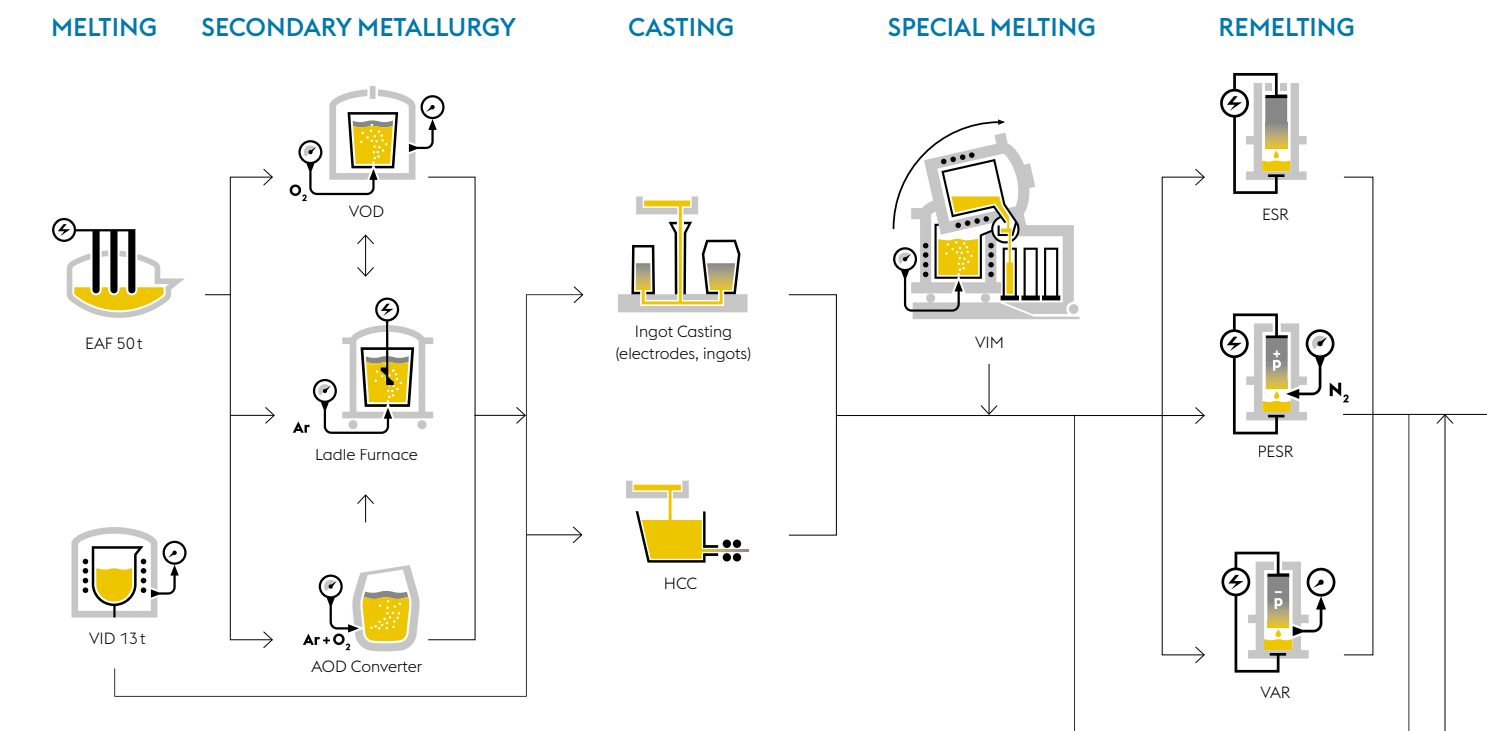
» NADCAP Chemical, Mechanical, Corrosion Testing,  
Metallography and Hardness, Heat treatment  
» GE Aviation S400  
» Pratt & Whitney LCS/MCS MCL F17  
» SAFRAN FAL n°310 acc. PRO 0430  
» Rolls Royce MSRR 9951  
» Airbus France MM 049  
» BOEING D1-4426

## NDT Approvals

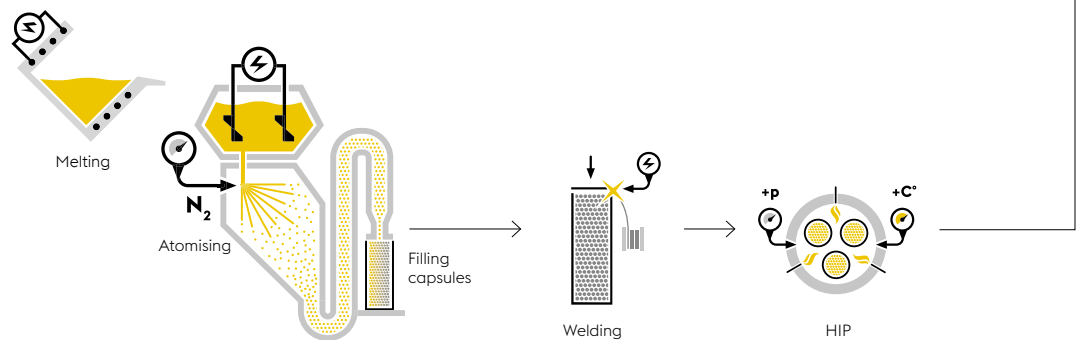
» NADCAP AMS-STD 2154  
» GE Aviation P3TF34, P3TF15  
» Pratt & Whitney SIM 14, SIS 45  
» Pratt & Whitney, Canada CPW 382  
» SAFRAN DMC0022 / Pr-5125  
» Rolls Royce RRP 58002  
» Gulfstream GAMPS 9102  
» BOEING D1-4426

# TRENDSETTING TECHNOLOGIES FOR HIGHEST METALLURGICAL PERFORMANCE

## FLOW OF MATERIAL



## POWDER METALLURGY





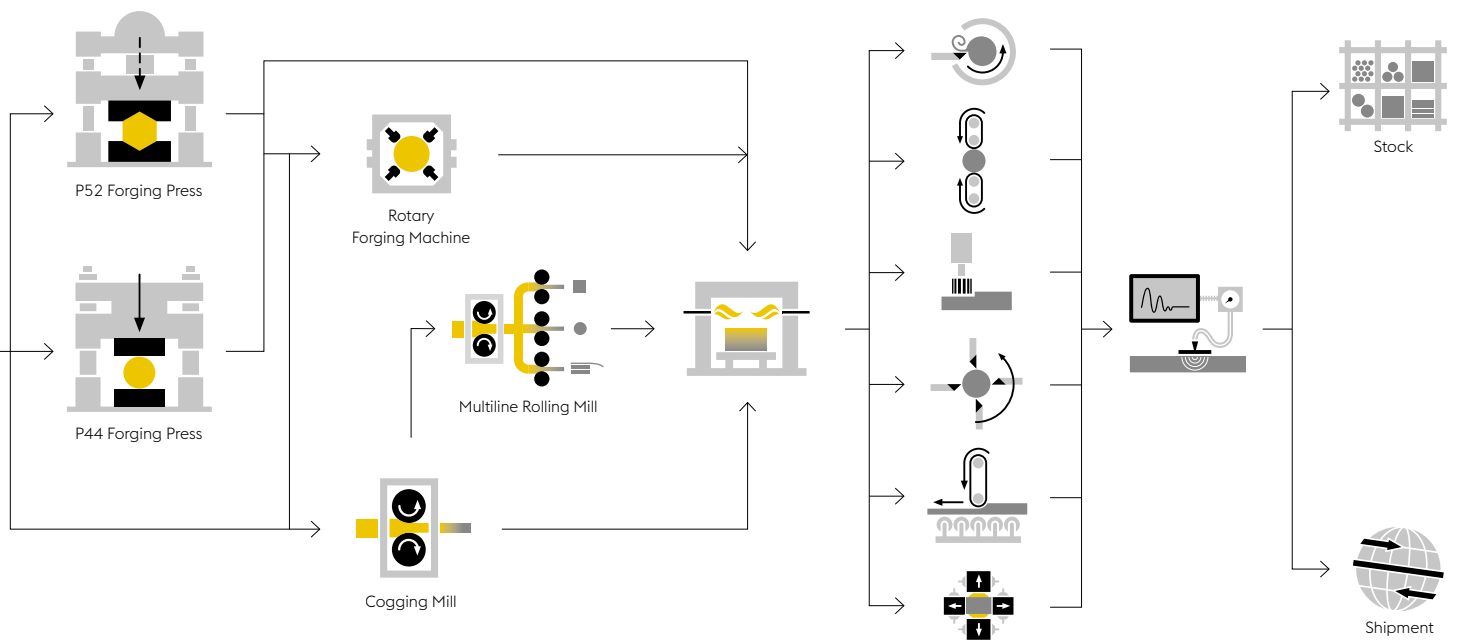
**ROLLING AND FORGING**

**HEAT TREATMENT**

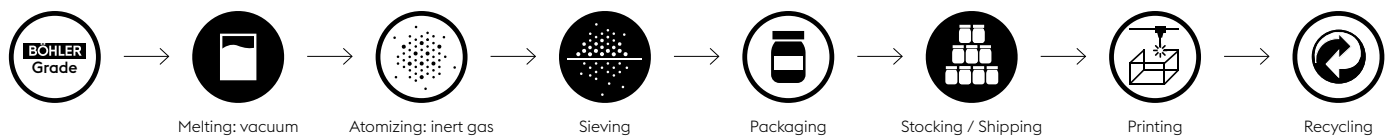
**MACHINING**

**TESTING**

**DISPATCH**



**AMPO**



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**voestalpine**

ONE STEP AHEAD.