RAFFMETAL

SILVAL®
ALLOYS

PRIMARY PERFORMANCE. CIRCULAR ORIGINS.

HIGH-PERFORMANCE RECYCLED PRIMARY ALUMINIUM ALLOYS.

RECYCLING THAT CHANGES THE PARADIGM

Primary performance. Circular origins.

SILVAL supplies the European industry with reliable, consistent recycled primary aluminium alloys: high-performance metallurgy for advanced technical applications, combining quality, sustainability and a low carbon footprint.

Up to 100%
recycled aluminium

0,61 kg CO_2eq/kg Al
carbon footprint, minimum value
EPD-certified

100%
electricity from
renewable sources

In-house metallurgical service
quality and metal
cleanliness analysis

TAILOR MADE
custom alloys backed by
in-house technical support

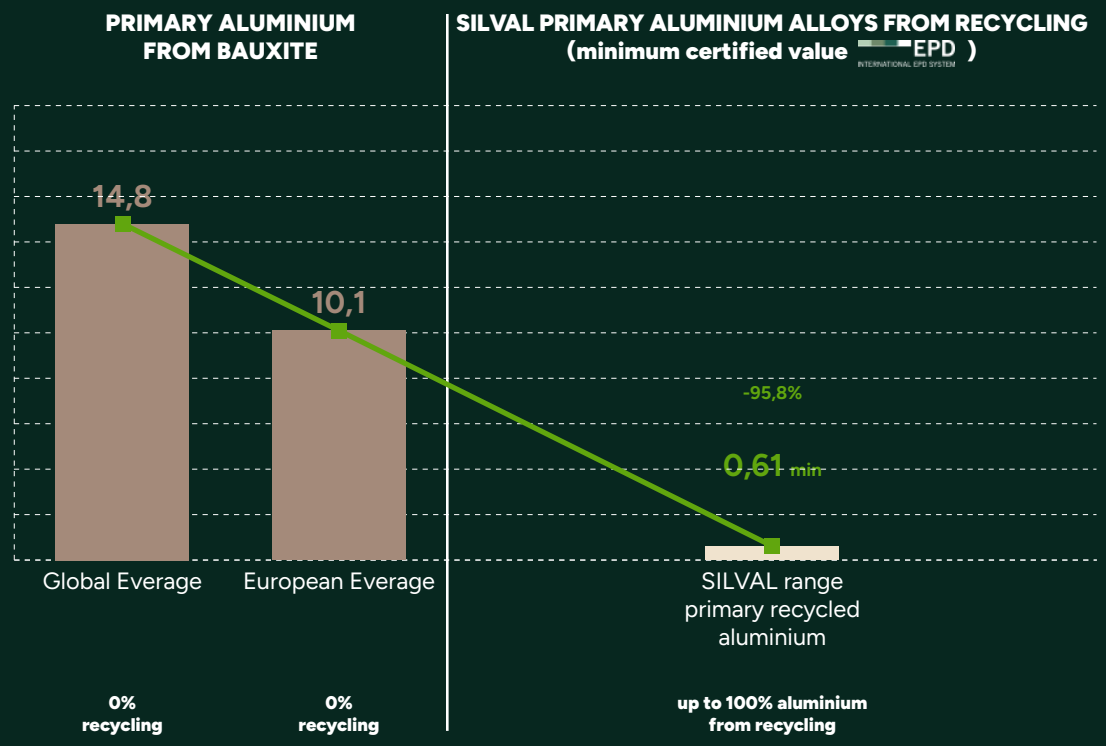
MEASURABLE SUSTAINABILITY

Documented, validated carbon footprint.

EPDs, Product Carbon Footprints and energy data make sustainability transparent and backed by solid evidence.

CARBON FOOTPRINT COMPARISON

(kg CO_2eq/kg of product - cradle to gate)



EPD Raffmetal, University of Siena and INDACO2 srl / Ecoinvent 3.8 database / SimaPro 9.3 software / Method: EN15804 + A2 / PCR: Basic Aluminium Products and Special Alloys 2022:08 v.1 / Central Product Classification: UN CPC 4153 / www.environdec.com – S-P-06061- S-P-06062- S-P-06063, Environmental Profile Report 2024 V.2.0 May 2025 (10.1 refers to primary Al used in EU), IAI Aluminium Carbon Footprint FAQs

EPD

Verified, comparable environmental data.
A world first in the sector.

ISO 14067

Product Carbon Footprint calculation
with a standard-aligned tool.

ENERGY

100% electricity from
certified renewable sources.

% RECYCLED

Controlled, traceable
raw materials.

SILVAL SPECIAL ALLOYS PLANT

An industrial process designed to turn recycling into performance.

A plant dedicated to special recycled alloys, integrating melting, metal treatment and control at every production stage.

- Expertise in scrap processing and selection
- Innovative continuous casting process
- Continuous quality control, assurance and traceability
- Production site with 100% of electricity demand met by renewable sources

ADVANCED RECYCLING

From complex scrap to quality alloys.

Final product quality begins with raw material quality and control at every stage of production.

PROCESSING AND SORTING
Cleaning and sorting reduce organic matter and contaminants.

METALLURGICAL TREATMENTS
Degassing, filtration and inclusion removal.

SCRAP SELECTION
Analysis and selection of scrap fractions best suited to the required alloy specification.

TECHNICAL CONTROL
Chemical composition, hydrogen, density index, microstructure, SEM analysis.

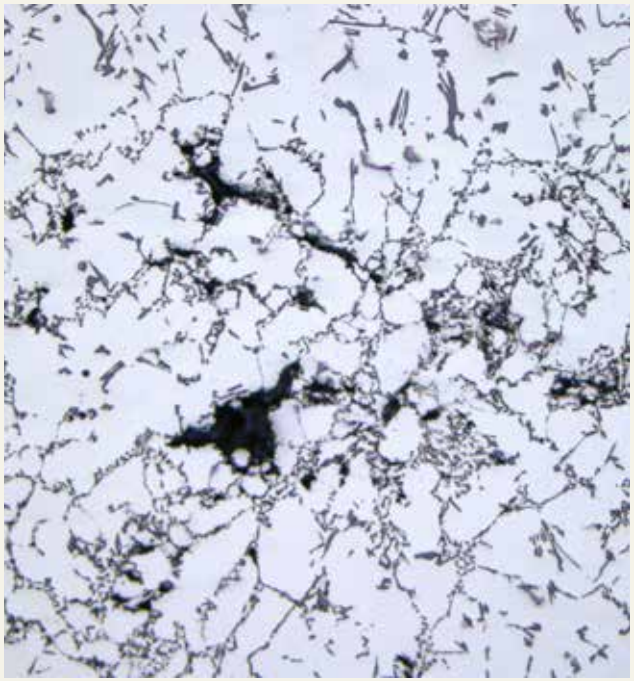
INNOVATIVE MELTING
Controlled parameters preserve alloy quality.

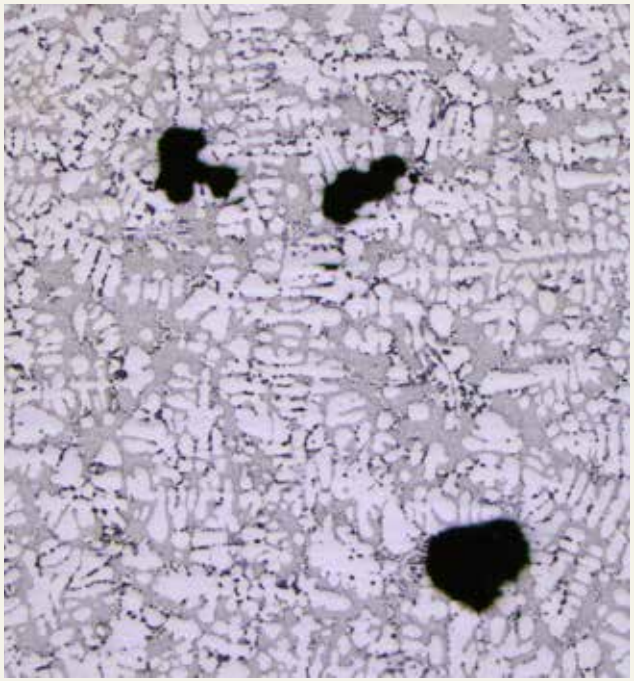
CONTINUOUS CASTING
Production and final conformity checks.

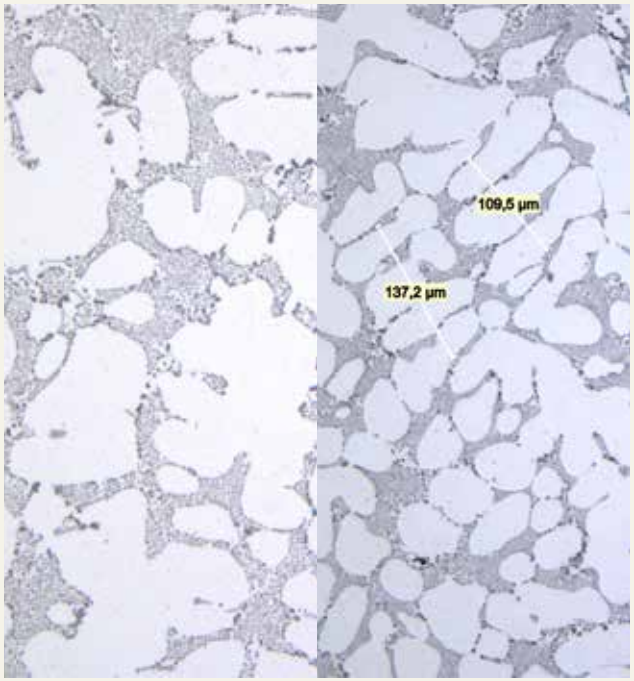
METALLURGICAL CLEANLINESS

Clean metal. Reliable performance.

Quality and performance start with controlled chemical composition and the removal of unwanted inclusions.







INCLUSIONS
Oxides, spinels, carbides and refractory residues under control.

HYDROGEN AND DENSITY INDEX
Low levels ensure soundness, repeatability and product quality.

MODIFICATION & REFINEMENT
Chemical composition is controlled to achieve the required modification and grain refinement.

ADVANCED CONTROL

Quality is controlled at every stage.

Our in-house laboratory and technical support team check the variables that determine alloy behaviour in real time.

CONTROLLED VARIABLES

- Chemical composition
- Trace elements
- Hydrogen
- Density index
- Alloy cleanliness
- Microstructure
- Refinement and modification
- SEM analysis

RESULT

- Process stability
- Repeatable performance
- Reliable supply
- Product quality

RAFFMETAL AND SILVAL MANAGEMENT SYSTEMS AND ESG CONTROLS

From process management to assured performance.

Third-party-verified systems ensure product quality, reliable processes and robust ESG commitments.

ISO 9001 Quality	**ISO 14001** Environment	**CODE OF ETHICS** Ethics	**MODEL 231** Corporate liability	**IATF 16949** Automotive	**ISO 50001** Energy
ISO 45001 Safety	**ASI** Responsible aluminium stewardship	**ISO 14067-aligned carbon footprint tool** Environment	**ISO 14064** Environment	**AEOF** International trade	**TISAX** Information security
EPD Environment **Recycled aluminium alloy ingots** continuously cast by Raffmetal	**EPD** Environment **Recycled primary aluminium alloy ingots** continuously cast by Silval	**EPD** Environment **Liquid recycled aluminium alloys** by Raffmetal	**EPD** Environment **Aluminium oxide** from recovery, Rapal 01, Raffmetal		

KEY SILVAL ALLOYS AND CHEMICAL PROPERTIES

Alloy		Chemical composition (%)																		
Family	Designation	Si		Fe		Cu		Mn		Mg		Zn		Ti	Sr		Others		% Recycled in total alloy	% Recycled Al in total aluminium
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Max	Min	Max	Each	Tot.		
SILVAL 42100	EN AB 42100 **SILVAL AlSi7Mg0,3**	6,5	7,5	-	0,15	-	0,03	-	0,10	0,30	0,45	-	0,07	0,18	optional		0,03	0,10	**70**	**73**
	SILVAL **42100 100% recycled Al**	6,5	7,5	-	0,23	-	0,05	0,10	0,15	0,25	0,40	-	0,05	0,15	optional		0,02	0,05	**97**	**100**
SILVAL 42200	EN AB 42200 **SILVAL AlSi7Mg0,6**	6,5	7,5	-	0,15	-	0,03	-	0,10	0,50	0,70	-	0,07	0,18	-		0,03	0,10	**70**	**73**
SILVAL 42300	EN AB 42300 **SILVAL AlSi7(Mg)**	6,5	7,5	-	0,15	-	0,03	-	0,10	0,10	0,30	-	0,07	0,18	-		0,03	0,10	**71**	**73**
SILVAL 42400	EN AB 42400 **SILVAL AlSi7MnMg**	6,5	8,5	-	0,20	-	0,03	0,35	0,75	0,15	0,45	-	0,03	0,15	optional		0,05	0,15	**79**	**83**
SILVAL 43300	EN AB 43300 **SILVAL AlSi9Mg**	9,0	10,0	-	0,15	-	0,03	-	0,10	0,25	0,45	-	0,07	0,15	-		0,03	0,10	**68**	**73**
SILVAL 43500	EN AB 43500 **SILVAL AlSi10MnMg**	9,0	11,5	-	0,20	-	0,03	0,40	0,80	0,15	0,60	-	0,07	0,15	optional		0,05	0,15	**76**	**83**
	SILVAL10	9,5	11,0	-	0,35	-	0,05	0,40	0,55	0,25	0,35	-	0,10	0,15	optional		0,05	0,15	**89**	**100**
SILVAL 44000	EN AB 44000 **SILVAL AlSi11**	10,0	11,8	-	0,15	-	0,03	-	0,10	-	0,45	-	0,07	0,15	-		0,03	0,10	**68**	**73**
SILVAL 45500	EN AB 45500 **SILVAL AlSi7MgCu0,5**	6,5	7,5	-	0,25	0,2	0,7	-	0,15	0,25	0,45	-	0,07	0,20	optional		0,03	0,10	**96**	**100**
SILVAL 44600	EN AB 44600 **SILVAL AlSi10Mn**	8,5	10,5	-	0,15	-	0,05	0,48	0,53	-	0,08	-	0,07	0,15	0,015	0,020	0,03	0,10	**29**	**33**
SILVAL 51100	EN AB 51100 **SILVAL AlMg3**	-	0,45	-	0,40	-	0,03	-	0,45	2,7	3,5	-	0,10	0,15	-		0,05	0,15	**96**	**100**
SILVAL 51500	EN AB 51500 **SILVAL AlMg5Si2Mn**	1,8	2,6	-	0,20	-	0,03	0,40	0,80	5,0	6,0	-	0,07	0,20	-		0,05	0,15	**63**	**67**
SILVAL 71100	EN AB 71100 **SILVAL AlZn10Si8Mg**	7,5	9,5	-	0,40	-	0,08	-	0,45	0,25	0,50	9,0	10,15	0,15	-		0,05	0,15	**81**	**100**
SILVAL AlSi5Mg	**SILVAL AlSi5Mg**	5,0	6,0	-	0,15	-	0,02	-	0,10	0,40	0,80	-	0,10	0,20	-		0,05	0,15	**71**	**73**

FOCUS ON

EN AB 42100 SILVAL
AlSi7Mg0,3
70% RECYCLED
IN TOTAL ALLOY

SILVAL 42100
100% recycled Al
97% RECYCLED
IN TOTAL ALLOY

EN AB 43500 SILVAL
AlSi10MnMg
76% RECYCLED
IN TOTAL ALLOY

EN AB 44600 SILVAL
AlSi10Mn
29% RECYCLED
IN TOTAL ALLOY

EN AB 51500 SILVAL
AlMg5Si2Mn
63% RECYCLED
IN TOTAL ALLOY

EN AB 71100 SILVAL
AlZn10Si8Mg
81% RECYCLED
IN TOTAL ALLOY

SILVAL 42100

EN AB 42100 SILVAL AlSi7Mg0,3

MECHANICAL PROPERTIES

(Mechanical properties measured on separately cast test pieces at an ambient temperature of +20°C)

CASTING PROCESS (condition)			GRAVITY	
TEMPER			F	T6
DIAMETER (mm)			6-8	6-8
Ultimate tensile strength	Rm	MPa	180 - 240	290 - 340
0.2% proof stress	Rp02	MPa	90 - 150	220 - 280
Elongation	A	%	4 - 9	5 - 9

F = as cast
T6 = 530°C for 8 hours - 155°C for 8 hours

PHYSICAL PROPERTIES

(These properties depend on variations in chemical composition within the specification, metallurgical structure, casting soundness and casting conditions. Values are therefore indicative.)

DENSITY	2,66 kg/dm³	ELECTRICAL CONDUCTIVITY	EN 1706:2020	20 - 27 MS/m
SPECIFIC HEAT (at 100 °C)	0,92 J/gK	THERMAL CONDUCTIVITY	EN 1706:2020	160 - 180 W/(m K)
ELASTIC MODULUS	73 GPa	THERMAL EXPANSION (from 20 °C to 100 °C)	EN 1706:2020	$22 \cdot 10^{-6}$/K

TECHNOLOGICAL PROPERTIES

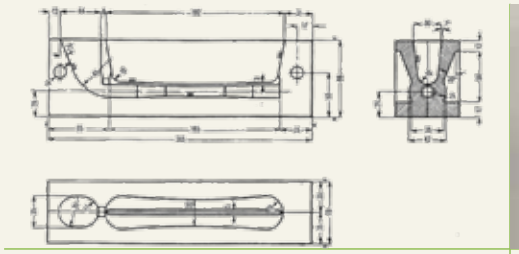
(Qualitative ratings from EN 1706:2020)

CASTABILITY	B	SUITABILITY FOR DECORATIVE ANODISING	D
HOT TEARING RESISTANCE	A	WELDABILITY	B
PRESSURE TIGHTNESS	B	POLISHABILITY	C
MACHINABILITY (as cast)	-	STRENGTH AT ROOM TEMPERATURE	A
MACHINABILITY (after heat treatment)	B	STRENGTH AT HIGH TEMPERATURE (200°C)	C
GENERAL CORROSION RESISTANCE	B	DUCTILITY	A

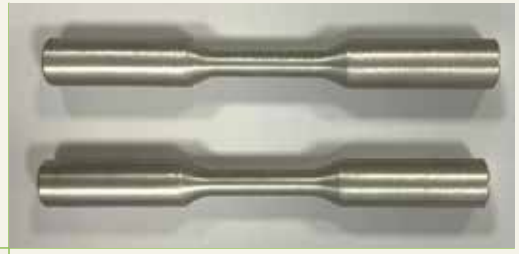
A: EXCELLENT, **B:** GOOD, **C:** AVERAGE, **D:** FAIR, **E:** POOR, **F:** INADEQUATE

TYPICAL APPLICATIONS

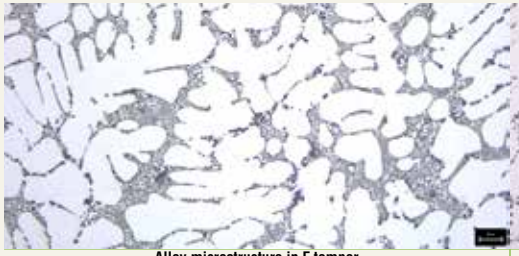
Versatile alloy for complex, thin-walled, heat-resistant castings. Used for automotive components, construction and household appliances.
Alloy **compliant (for information only)** with food-contact standard **EN 601**.



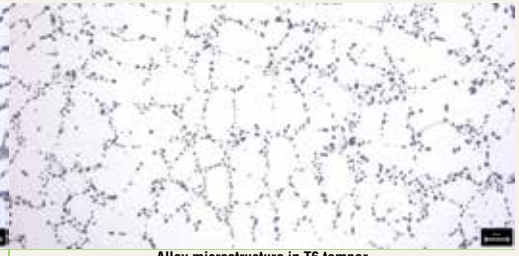
Reference mould for gravity casting (CEN/TR 16748)



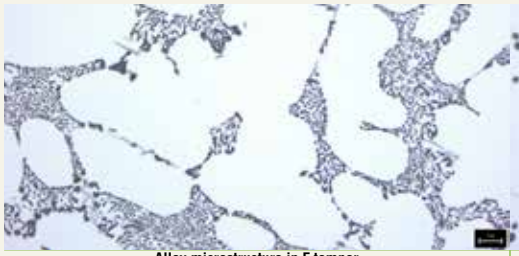
Test pieces ready for testing (6 mm gauge diameter)



Alloy microstructure in F temper (200× magnification)



Alloy microstructure in T6 temper (200× magnification)



Alloy microstructure in F temper (500× magnification)

Alloy microstructure in T6 temper (500× magnification)

SILVAL 42100 100% recycled Al

MECHANICAL PROPERTIES

(Mechanical properties measured on separately cast test pieces at an ambient temperature of +20°C)

CASTING PROCESS (condition)			GRAVITY	
TEMPER			F	T6
DIAMETER (mm)			6-8	6-8
Ultimate tensile strength	Rm	MPa	170 - 230	270 - 330
0.2% proof stress	Rp02	MPa	90 - 140	220 - 280
Elongation	A	%	4 - 8	4 - 8

F = as cast
T6 = 530°C for 8 hours - 155°C for 8 hours

PHYSICAL PROPERTIES

(These properties depend on variations in chemical composition within the specification, metallurgical structure, casting soundness and casting conditions. Values are therefore indicative.)

DENSITY	2,66 kg/dm³	ELECTRICAL CONDUCTIVITY	EN 1706:2020	20 - 27 MS/m
SPECIFIC HEAT (at 100 °C)	0,92 J/gK	THERMAL CONDUCTIVITY	EN 1706:2020	160 - 180 W/(m K)
ELASTIC MODULUS	73 GPa	THERMAL EXPANSION (from 20 °C to 100 °C)	EN 1706:2020	$22 \cdot 10^{-6}$/K

TECHNOLOGICAL PROPERTIES

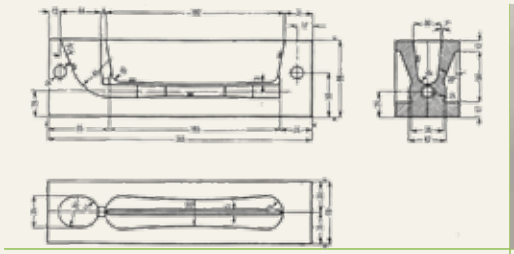
(Qualitative ratings from EN 1706:2020)

CASTABILITY	B	SUITABILITY FOR DECORATIVE ANODISING	D
HOT TEARING RESISTANCE	A	WELDABILITY	B
PRESSURE TIGHTNESS	B	POLISHABILITY	C
MACHINABILITY (as cast)	-	STRENGTH AT ROOM TEMPERATURE	A
MACHINABILITY (after heat treatment)	B	STRENGTH AT HIGH TEMPERATURE (200°C)	C
GENERAL CORROSION RESISTANCE	B	DUCTILITY	A

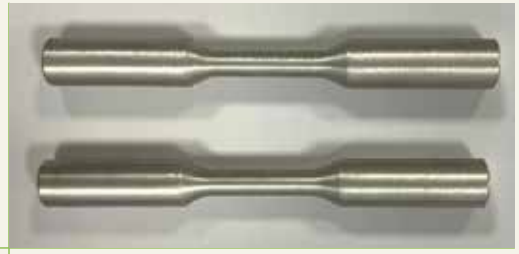
A: EXCELLENT, **B:** GOOD, **C:** AVERAGE, **D:** FAIR, **E:** POOR, **F:** INADEQUATE

TYPICAL APPLICATIONS

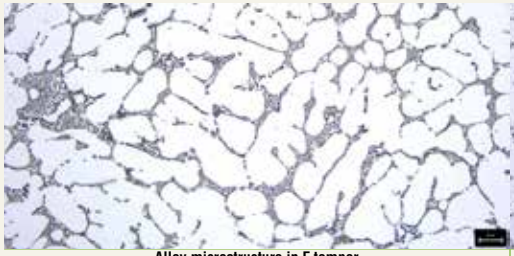
Versatile alloy for complex, thin-walled, heat-resistant castings. Used for automotive components, construction and household appliances.
Alloy **compliant (for information only)** with food-contact standard **EN 601**.



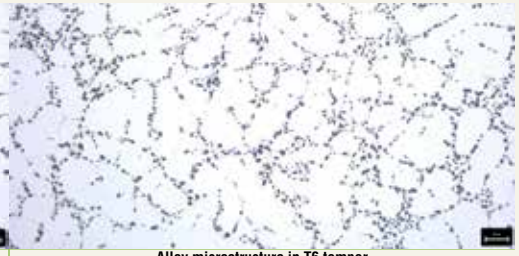
Reference mould for gravity casting (CEN/TR 16748)



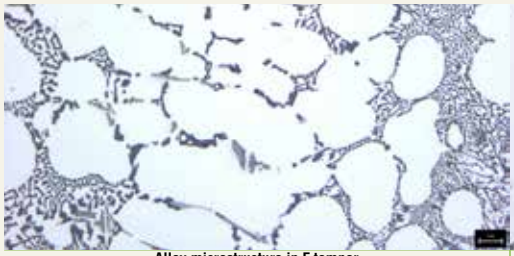
Test pieces ready for testing (6 mm gauge diameter)



Alloy microstructure in F temper (200× magnification)



Alloy microstructure in T6 temper (200× magnification)



Alloy microstructure in F temper (500× magnification)

Alloy microstructure in T6 temper (500× magnification)

SILVAL 43500

EN AB 43500 SILVAL AlSi10MnMg

MECHANICAL PROPERTIES

(Mechanical properties measured on separately cast test pieces at an ambient temperature of +20°C)

CASTING PROCESS (condition)			DIE CASTING	
TEMPER			F	T6
THICKNESS (mm)			2-4	2-4
Ultimate tensile strength	Rm	MPa	250 - 290	290 - 350
0.2% proof stress	Rp02	MPa	120 - 150	200 - 280
Elongation	A	%	5 - 10	6 - 12

F = as cast
T6 = 490°C for 3 hours - 155°C for 3 hours

PHYSICAL PROPERTIES

(These properties depend on variations in chemical composition within the specification, metallurgical structure, casting soundness and casting conditions. Values are therefore indicative.)

DENSITY	2,66 kg/dm³	ELECTRICAL CONDUCTIVITY	EN 1706:2020	19 - 25 MS/m
SPECIFIC HEAT (at 100 °C)	0,92 J/gK	THERMAL CONDUCTIVITY	EN 1706:2020	140 - 170 W/(m K)
ELASTIC MODULUS	74 GPa	THERMAL EXPANSION (from 20 °C to 100 °C)	EN 1706:2020	$21 \cdot 10^{-6}$/K

TECHNOLOGICAL PROPERTIES

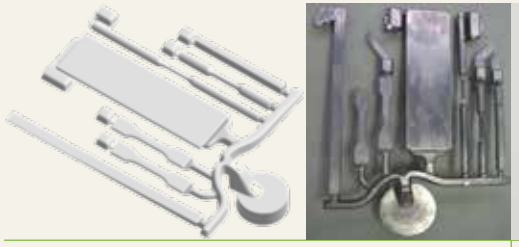
(Qualitative ratings from EN 1706:2020)

CASTABILITY	A	SUITABILITY FOR DECORATIVE ANODISING	E
HOT TEARING RESISTANCE	A	WELDABILITY	B
PRESSURE TIGHTNESS	C	POLISHABILITY	D
MACHINABILITY (as cast)	B / C	STRENGTH AT ROOM TEMPERATURE	A
MACHINABILITY (after heat treatment)	B	STRENGTH AT HIGH TEMPERATURE (200°C)	C
GENERAL CORROSION RESISTANCE	B	DUCTILITY	A

A: EXCELLENT, **B:** GOOD, **C:** AVERAGE, **D:** FAIR, **E:** POOR, **F:** INADEQUATE

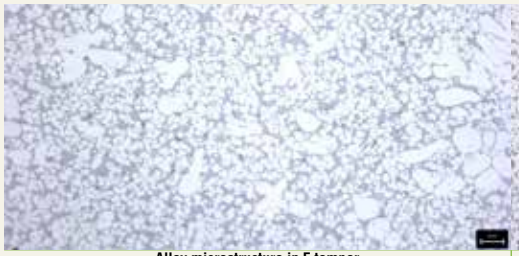
TYPICAL APPLICATIONS

Excellent castability across all casting methods. Suitable for thin-walled parts that require good elongation rather than high mechanical strength.
Alloy **compliant (for information only)** with food-contact standard **EN 601**.

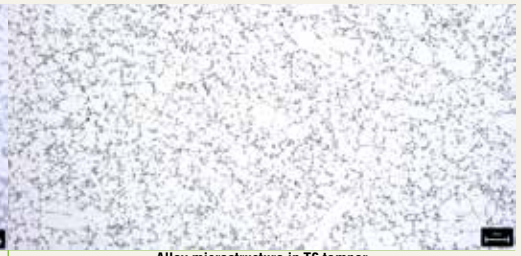


NADIA reference die for die casting (CEN/TR 16748)

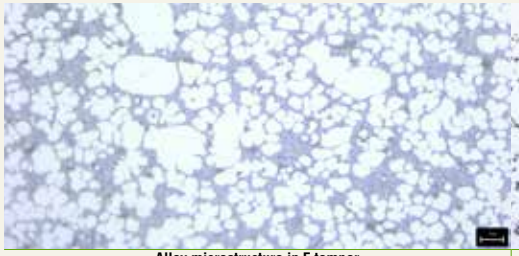
Test pieces ready for testing (3 mm thick)



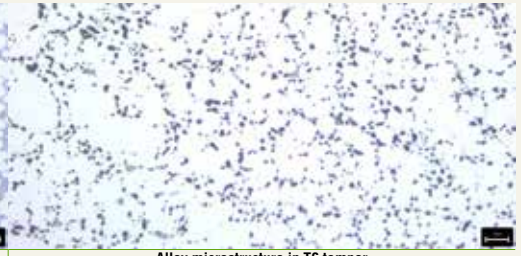
Alloy microstructure in F temper (200× magnification)



Alloy microstructure in T6 temper (200× magnification)



Alloy microstructure in F temper (500× magnification)



Alloy microstructure in T6 temper (500× magnification)

SILVAL 44600

EN AB 44600 SILVAL AlSi10Mn

MECHANICAL PROPERTIES

(Mechanical properties measured on separately cast test pieces at an ambient temperature of +20°C)

CASTING PROCESS (condition)			DIE CASTING
TEMPER			F
THICKNESS (mm)			2-4
Ultimate tensile strength	Rm	MPa	240
0.2% proof stress	Rp02	MPa	100
Elongation	A	%	10

F = as cast

PHYSICAL PROPERTIES

(These properties depend on variations in chemical composition within the specification, metallurgical structure, casting soundness and casting conditions. Values are therefore indicative.)

DENSITY	2,66 kg/dm³	ELECTRICAL CONDUCTIVITY	EN 1706:2020	20 - 25 MS/m
SPECIFIC HEAT (at 100 °C)	0,92 J/gK	THERMAL CONDUCTIVITY	EN 1706:2020	145 - 170 W/(m K)
ELASTIC MODULUS	74 GPa	THERMAL EXPANSION (from 20 °C to 100 °C)	EN 1706:2020	$21 \cdot 10^{-6}$/K

TECHNOLOGICAL PROPERTIES

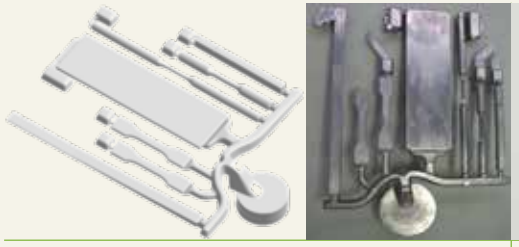
(Qualitative ratings from EN 1706:2020)

CASTABILITY	A	SUITABILITY FOR DECORATIVE ANODISING	E
HOT TEARING RESISTANCE	A	WELDABILITY	A
PRESSURE TIGHTNESS	B	POLISHABILITY	D
MACHINABILITY (as cast)	B / C	STRENGTH AT ROOM TEMPERATURE	B
MACHINABILITY (after heat treatment)	B	STRENGTH AT HIGH TEMPERATURE (200°C)	C
GENERAL CORROSION RESISTANCE	B	DUCTILITY	A

A: EXCELLENT, **B:** GOOD, **C:** AVERAGE, **D:** FAIR, **E:** POOR, **F:** INADEQUATE

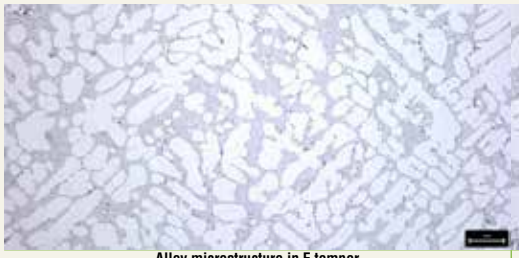
TYPICAL APPLICATIONS

Suitable for complex castings, with good pressure tightness and weldability. Used in automotive, engine manufacturing, rail, aerospace and defence applications. Alloy **compliant (for information only)** with food-contact standard **EN 601**.

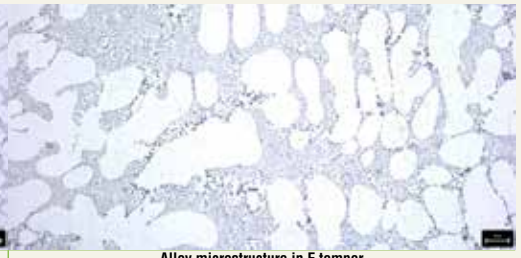


NADIA reference die for die casting (CEN/TR 16748)

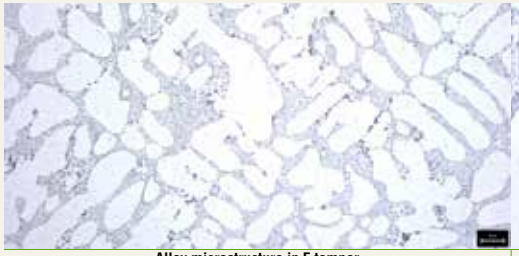
Test pieces ready for testing (3 mm thick)



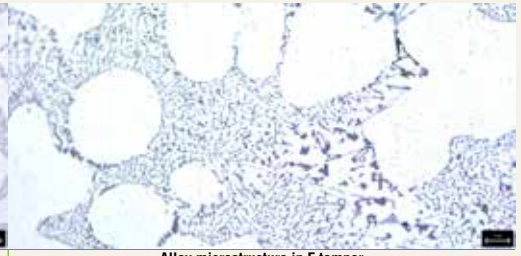
Alloy microstructure in F temper (100× magnification)



Alloy microstructure in F temper (200× magnification)



Alloy microstructure in F temper (200× magnification)



Alloy microstructure in F temper (500× magnification)

SILVAL 51500

EN AB 51500 SILVAL AlMg5Si2Mn

MECHANICAL PROPERTIES

(Mechanical properties measured on separately cast test pieces at an ambient temperature of +20°C)

CASTING PROCESS (condition)			DIE CASTING		
TEMPER			F		
THICKNESS (mm)			2-4	4-6	6-12
Ultimate tensile strength	Rm	MPa	270 - 310	250 - 280	210 - 250
0.2% proof stress	Rp02	MPa	150 - 200	130 - 170	100 - 145
Elongation	A	%	10 - 18	9 - 14	7 - 10

F = as cast

PHYSICAL PROPERTIES

(These properties depend on variations in chemical composition within the specification, metallurgical structure, casting soundness and casting conditions. Values are therefore indicative.)

DENSITY	2,66 kg/dm³	ELECTRICAL CONDUCTIVITY	EN 1706:2020	14 - 16 MS/m
SPECIFIC HEAT (at 100 °C)	0,92 J/gK	THERMAL CONDUCTIVITY	EN 1706:2020	110 - 130 W/(m K)
ELASTIC MODULUS	74 GPa	THERMAL EXPANSION (from 20 °C to 100 °C)	EN 1706:2020	$24 \cdot 10^{-6}$/K

TECHNOLOGICAL PROPERTIES

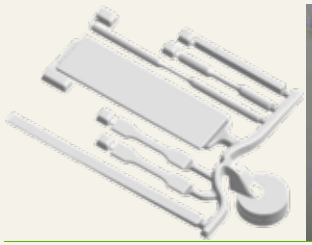
(Qualitative ratings from EN 1706:2020)

CASTABILITY	B	SUITABILITY FOR DECORATIVE ANODISING	E
HOT TEARING RESISTANCE	D	WELDABILITY	C
PRESSURE TIGHTNESS	C	POLISHABILITY	A
MACHINABILITY (as cast)	A	STRENGTH AT ROOM TEMPERATURE	B
MACHINABILITY (after heat treatment)	-	STRENGTH AT HIGH TEMPERATURE (200°C)	B
GENERAL CORROSION RESISTANCE	A	DUCTILITY	A

A: EXCELLENT, **B:** GOOD, **C:** AVERAGE, **D:** FAIR, **E:** POOR, **F:** INADEQUATE

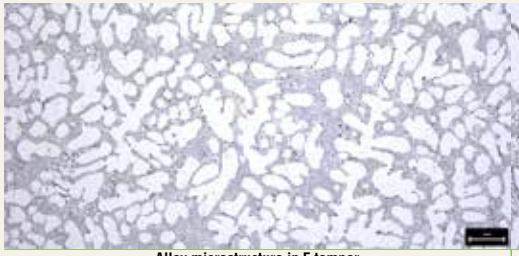
TYPICAL APPLICATIONS

Suitable wherever high ductility and good strength are required without heat treatment, such as safety components in engineering vehicles.
Alloy **not compliant** with food-contact standard **EN 601**.

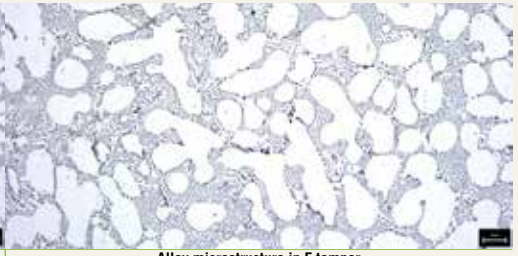


NADIA reference die for die casting (CEN/TR 16748)

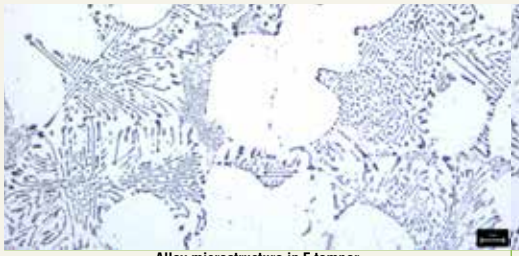
Test pieces ready for testing (3 mm thick)



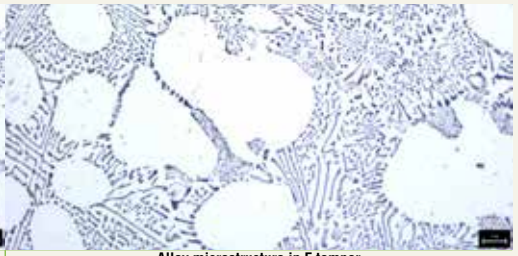
Alloy microstructure in F temper (100× magnification)



Alloy microstructure in F temper (200× magnification)



Alloy microstructure in F temper (500× magnification)



Alloy microstructure in F temper (500× magnification)

EN AB 71100 SILVAL AlZn10Si8Mg

MECHANICAL PROPERTIES

(Mechanical properties measured on separately cast test pieces at an ambient temperature of +20°C)

CASTING PROCESS (condition)			DIE CASTING	GRAVITY
TEMPER			T1	T1
THICKNESS/DIAMETER (mm)			2-4	6-8
Ultimate tensile strength	Rm	MPa	300 - 350	280 - 320
0.2% proof stress	Rp02	MPa	230 - 280	220 - 250
Elongation	A	%	1 - 4	1 - 4

T1 = Controlled cooling and natural aging

PHYSICAL PROPERTIES

(These properties depend on variations in chemical composition within the specification, metallurgical structure, casting soundness and casting conditions. Values are therefore indicative.)

DENSITY	2,85 kg/dm³	ELECTRICAL CONDUCTIVITY	EN 1706:2020	17 - 20 MS/m
SPECIFIC HEAT (at 100 °C)	0,86 J/gK	THERMAL CONDUCTIVITY	EN 1706:2020	120 - 130 W/(m K)
ELASTIC MODULUS	75 GPa	THERMAL EXPANSION (from 20 °C to 100 °C)	EN 1706:2020	$21 \cdot 10^{-6}$/K

TECHNOLOGICAL PROPERTIES

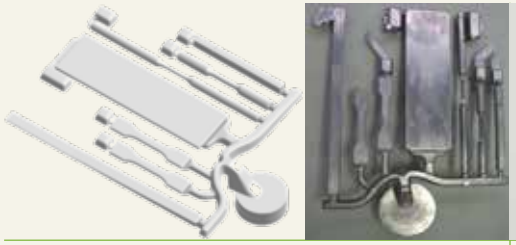
(Qualitative ratings from EN 1706:2020)

CASTABILITY	B	SUITABILITY FOR DECORATIVE ANODISING	E
HOT TEARING RESISTANCE	A	WELDABILITY	A
PRESSURE TIGHTNESS	B	POLISHABILITY	C
MACHINABILITY (as cast)	A	STRENGTH AT ROOM TEMPERATURE	B
MACHINABILITY (after heat treatment)	-	STRENGTH AT HIGH TEMPERATURE (200°C)	C
GENERAL CORROSION RESISTANCE	C	DUCTILITY	C

A: EXCELLENT, **B:** GOOD, **C:** AVERAGE, **D:** FAIR, **E:** POOR, **F:** INADEQUATE

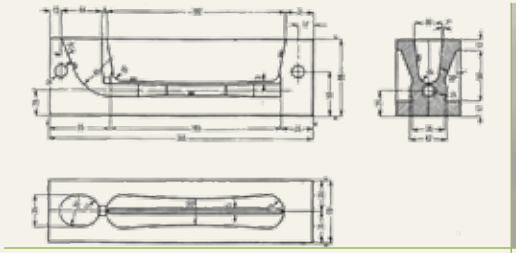
TYPICAL APPLICATIONS

Self-hardening alloy with excellent strength and elongation, especially in permanent mould casting, and excellent polishability. Used in mechanical engineering, transport and hydraulic castings.
Alloy **not compliant** with food-contact standard **EN 601**.



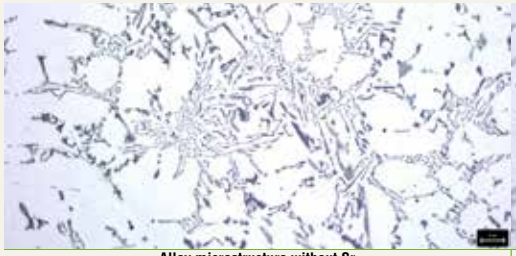
NADIA reference die for die casting (CEN/TR 16748)

Test pieces ready for testing (3 mm thick)

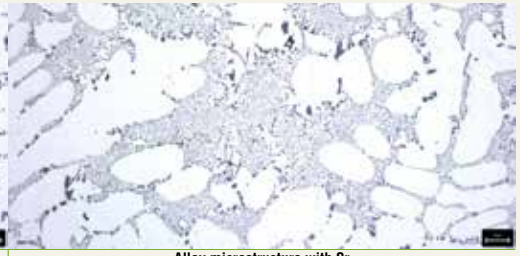


Reference mould for gravity casting (CEN/TR 16748)

Test pieces ready for testing (6 mm gauge diameter)

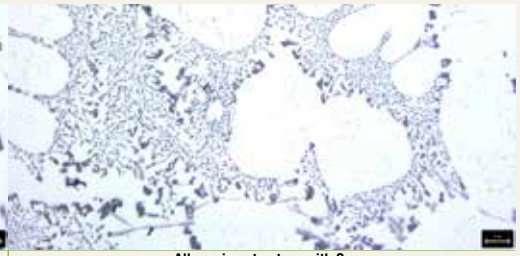


Alloy microstructure without Sr
(200× magnification)



Alloy microstructure with Sr
(200× magnification)

Alloy microstructure without Sr
(500× magnification)



Alloy microstructure with Sr
(500× magnification)

The right alloy is developed with the customer.

LET'S DISCUSS YOUR APPLICATION

Our R&D, Quality, Technical Support and Sustainability teams guide alloy selection through lab testing, process compatibility, melting parameters and environmental data assessment.

To speak to a technical adviser, email **qualita@raffmetal.it** or contact your sales representative.

DOWNLOAD THE DIGITAL BROCHURE HERE

https://www.raffmetal.com/wp-content/uploads/sites/4/Brochure_Silval_2026-EN.pdf

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SILMAR

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