



Company Profile & ESG Abstract

***Be the change.
Low-carbon aluminium
for a sustainable future.***

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01. SILMAR GROUP



The Silmar Group is an integrated group of leading companies in the heating, aluminium recycling, and plumbing sectors. The Group was founded in 1963 and is now recognised worldwide with a presence of more than 30 plants, while maintaining its headquarters in Italy, in the province of Brescia.

The successful companies belonging to Silmar Group are leaders in several sectors:

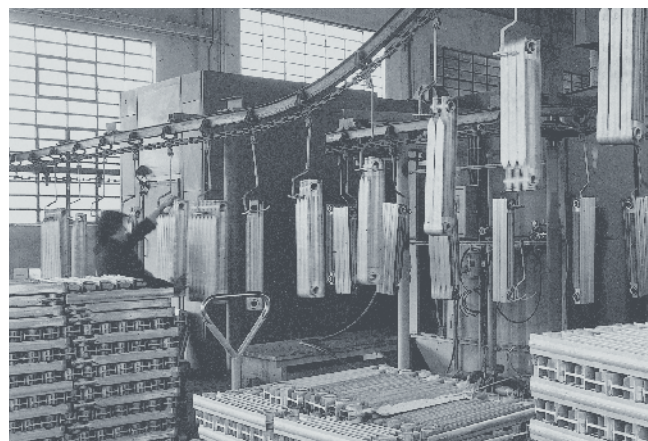
FONDITAL, manufacturer of aluminium radiators, alternative heating systems and energies and structural castings for the automotive sector;

RAFFMETAL, refinery of aluminium alloys from recycling;

VALSIR, manufacturer of water management and drainage systems;





The first factory in Vestone in 1970






The first packaging and coating plant in Vestone in 1970

AGGREGATED DATA




TURNOVER




	2018	2019	2020
	€	€	€
	160.725.000	156.291.000	150.636.000
	469.660.000	398.879.000	336.813.000
	374.137.000	394.224.000	386.147.000
	1.004.522.000	949.394.000	873.596.000

INVESTMENTS

	2018	2019	2020
	€	€	€
	36.318.000	37.685.000	19.553.000
	12.055.000	13.902.000	10.798.000
	31.313.000	23.769.000	27.436.000
	79.686.000	75.356.000	57.787.000

EMPLOYEES

	2018	2019	2020
	n°	n°	n°
	790	811	807
	360	381	404
	2.041	2.095	2.106
	3.191	3.287	3.317

	Heating sector
	Aluminium recycling sector
	Plumbing sector

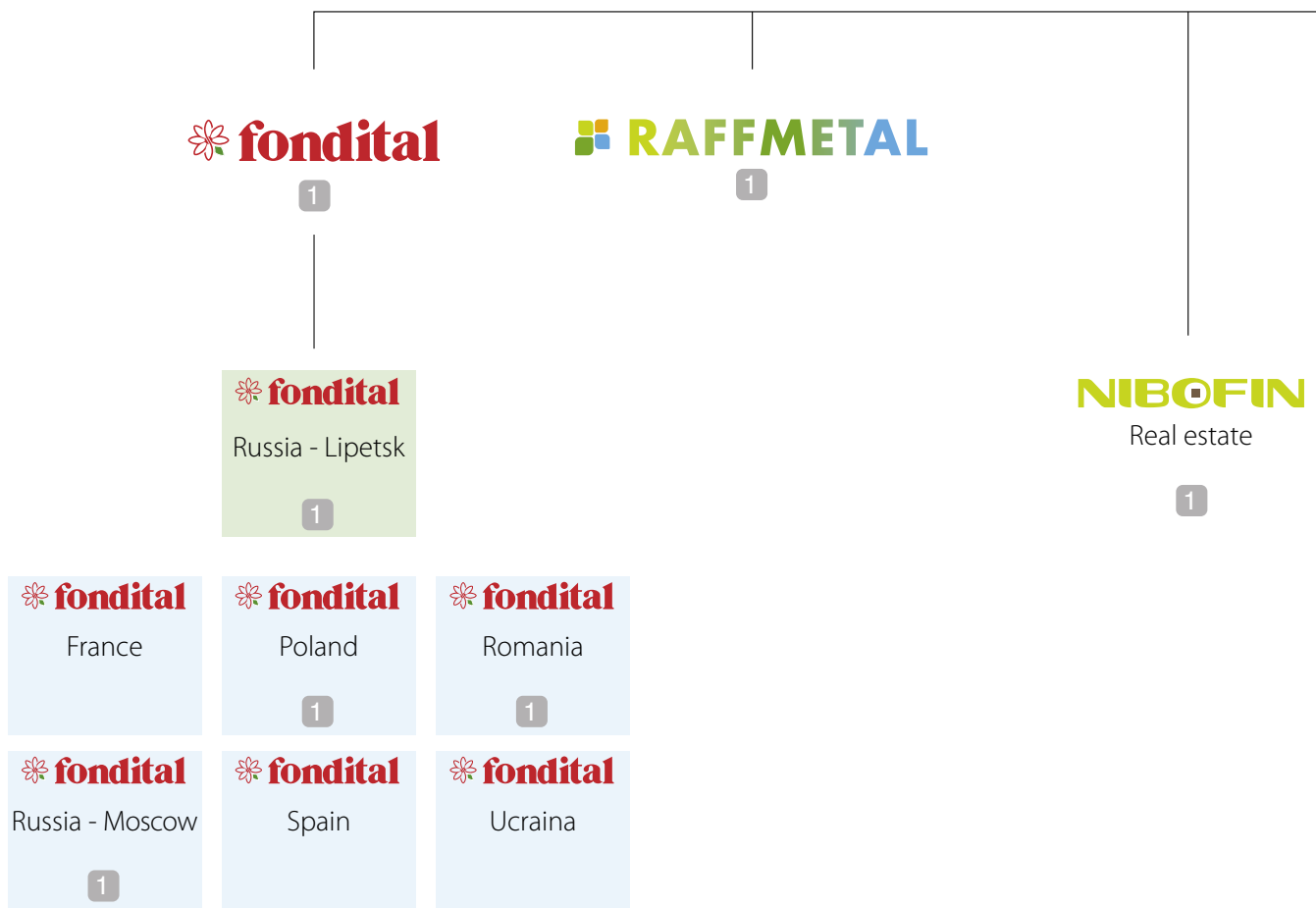
TOTAL SECTORS

		2018	2019	2020
TURNOVER*	€	1.004.522.000	949.394.000	873.596.000
INVESTMENTS	€	79.686.630	75.356.000	57.787.000
EMPLOYEES	n°	3.191	3.287	3.317

*aggregate turnover of the Group's production companies

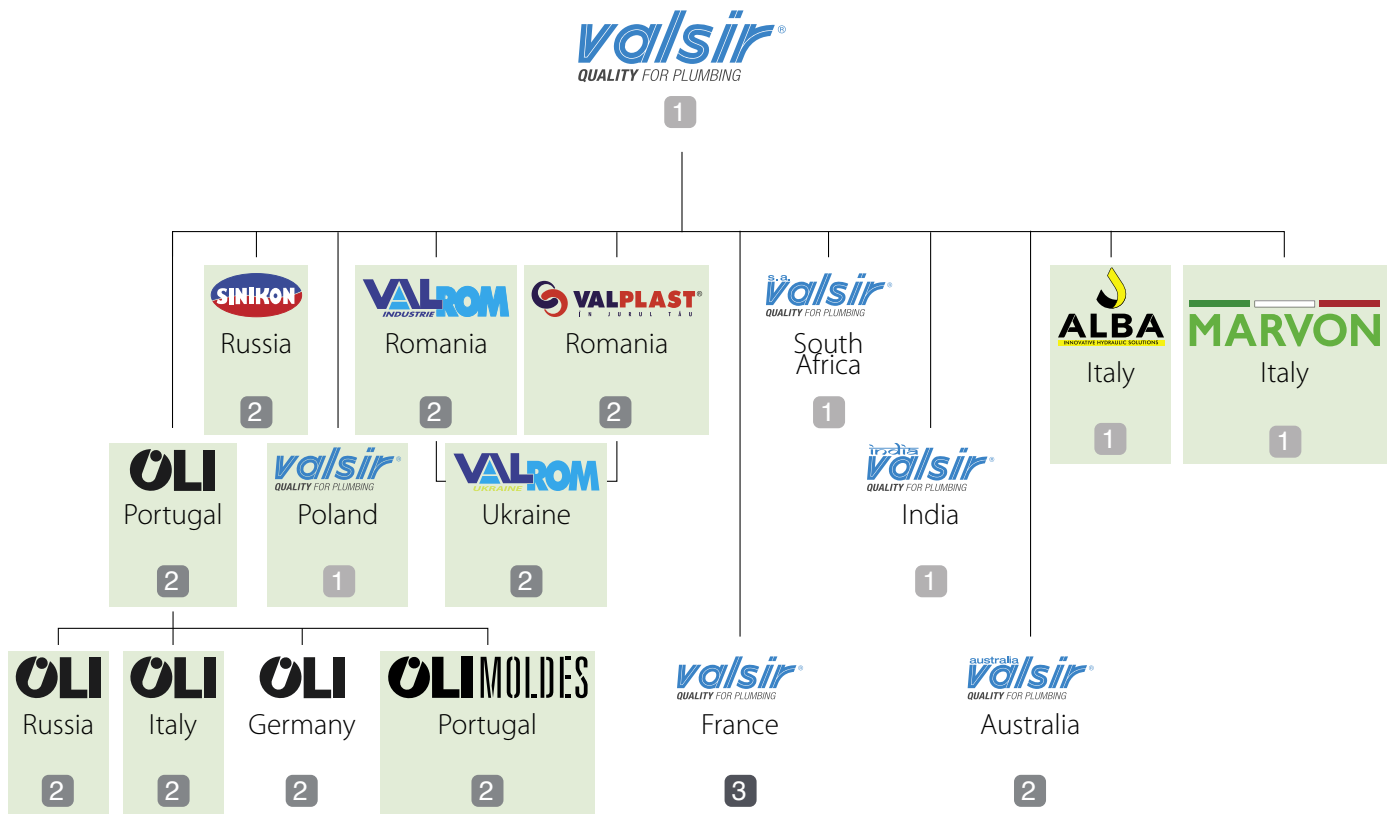
SILMAR GROUP ORGANISATIONAL CHART

SILMAR

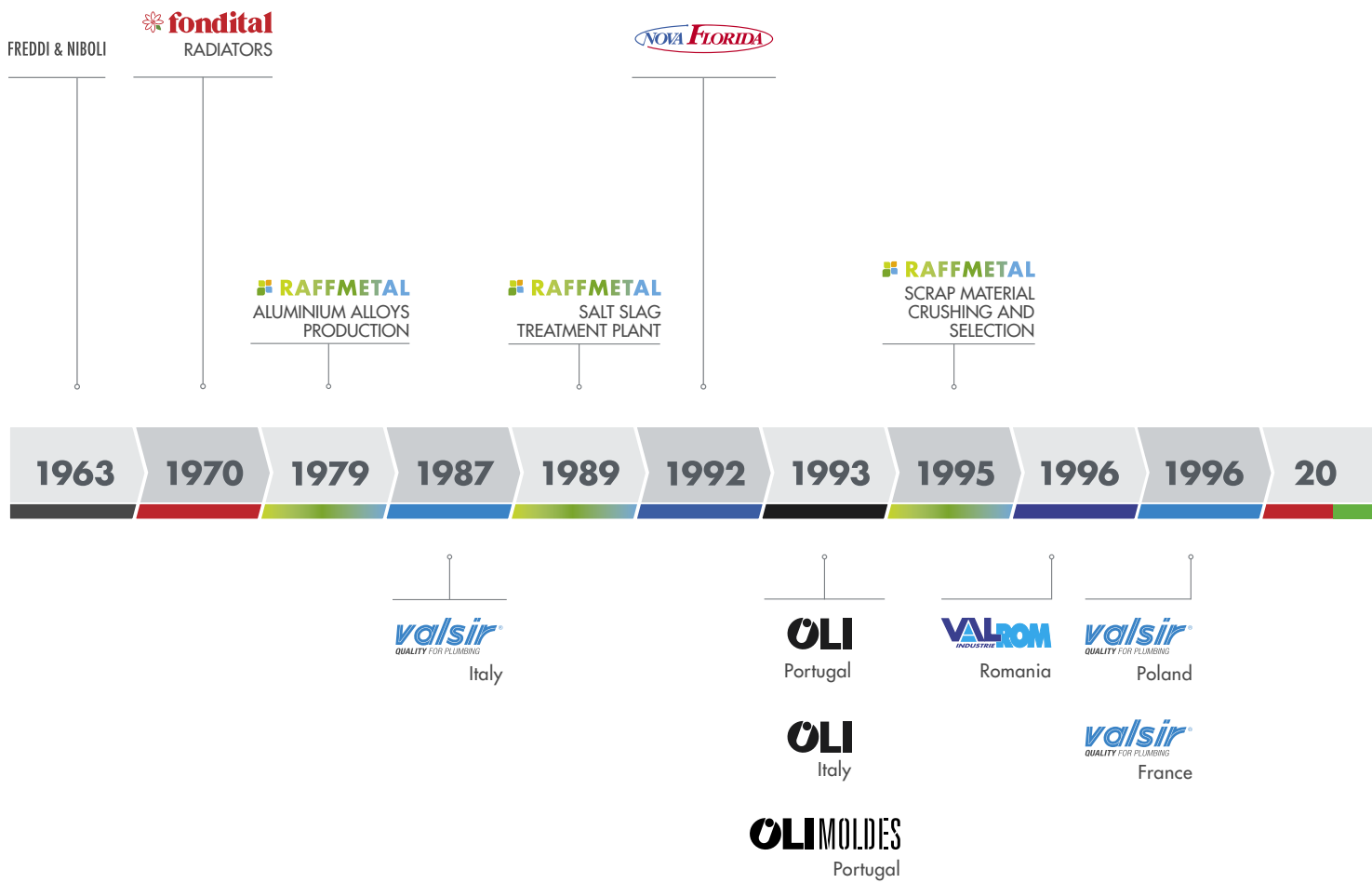


- 1** Subsidiary
- 2** Associate
- 3** Storage facility
- Production company
- Sales and service network

GROUP



THE SILMAR GROUP STORY



fondital
BOILERS
RENEWABLE
ENERGIES

fondital
ELECTRIC
RADIATORS

fondital
Russia

fondital
AUTOMOTIVE
STRUCTURAL
PARTS

fondital
HEAT PUMPS

fondital
AUTOMOTIVE
ELECTRIC CARS
AND MACHINING

NIBOFIN
REAL ESTATE

RAFFMETAL
ENERGY RECOVERY
AND PRODUCTION

RAFFMETAL
SPECIAL ALLOYS

02

2006

2009

2013

2015

2016

2017

2019

2020

2021

2022



Russia



Ukraine



South Africa



India



Australia



Italy



Italy



Romania



Russia



Germany



Romania

02. RAFFMETAL

Today, Raffmetal is Europe's largest manufacturer of recycled aluminium alloys.

With an annual productive capacity of over 350,000 tons/year, 404 employees, 2 production plants in Casto and Odolo, in the Brescia area, the company is able to respond to the needs of international customers operating in different industrial sectors.

The total control of the supply chain, the application of technological solutions among the most advanced in the industry in the treatment and selection of scrap and the strict control of the production process, allow us to offer high quality alloys with a low carbon footprint.

RAFFMETAL AUXILIARY INFORMATION

	YEAR	2018	2019	2020
REVENUE	€	469.600.000	398.879.000	336.813.000
INVESTMENTS	€	12.000.000	14.000.000	10.798.000
EMPLOYEES	no.	360	381	404



Via Malpaga 82, 25070 Casto (BS) Italy

Loc. Ferriera 5, 25070 Casto (BS) - Italy



Via Brescia 60, 25076 Odolo (BS) Italy

145.000 m² of which 89.000 m² are covered

THE PRODUCT RANGE

Raffmetal is the reference point and benchmark of the circular economy. The policy of continuous improvement allows the recycling capacity of each type of aluminium scrap to be increased, enhancing its chemical and physical components, ensuring high quality alloys.

Raffmetal offers its customers **a range of recycled and low carbon footprint products:**

- **Continuously cast 100% recycled aluminium alloys.** Produced at the Malpaga plant, these alloys can also be supplied in liquid form, thus guaranteeing the customer considerable energy savings.
- **Primary aluminium alloys from recycling with continuous casting featuring the same performance as primary aluminium alloys from mining, with a low carbon footprint and high circularity rate.** Manufactured at the Special Alloys facility, this innovative range enables a significant reduction in the energy consumption and carbon footprint of customer's castings.



Malpaga plant dedicated to the production of 100% recycled aluminium alloys



Special Alloys production facility for the production of recycled primary aluminium alloys

THE ADVANTAGES OF RAFFMETAL 100% RECYCLED ALUMINIUM ALLOYS



CONTINUOUS CASTING ALUMINIUM INGOTS

- High **metal yield** of the product;
- A **finer and more homogeneous** structure;
- **Storage optimisation**;
- **Traceability** system.

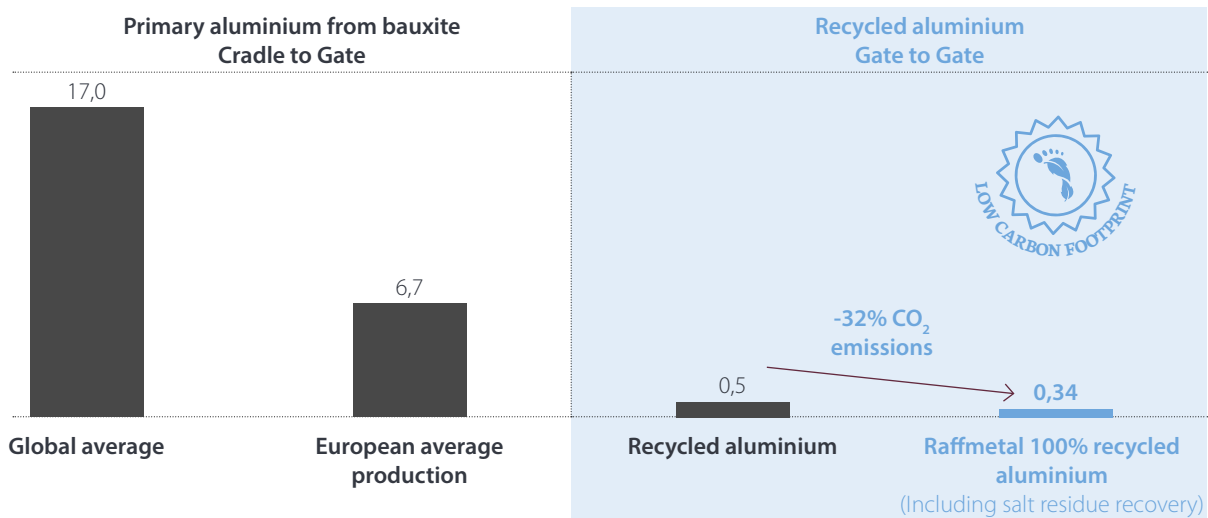


LIQUID ALUMINIUM

- Reduction of **156 kg of CO₂/ton of aluminium**;
- **Saving of 80 m³ of natural gas/ton of aluminium**;
- **2% increase in metal yield** per ton of aluminium;
- **Zeroing of loading-unloading and storage costs.**

CARBON FOOTPRINT OF THE DIFFERENT TYPES OF ALUMINIUM PRODUCTION*

(kg of CO₂e/ kg of Al produced)



*Data source: EA Circular Aluminium Action Plan (2020), Raffmetal's gate to gate LCA and University of Siena, Database Ecoinvent 3.6, Software SimaPro 9.1.1, Method CML-IA.

THE ADVANTAGES OF PRIMARY ALUMINIUM ALLOYS FROM RECYCLING

SILVAL[®]

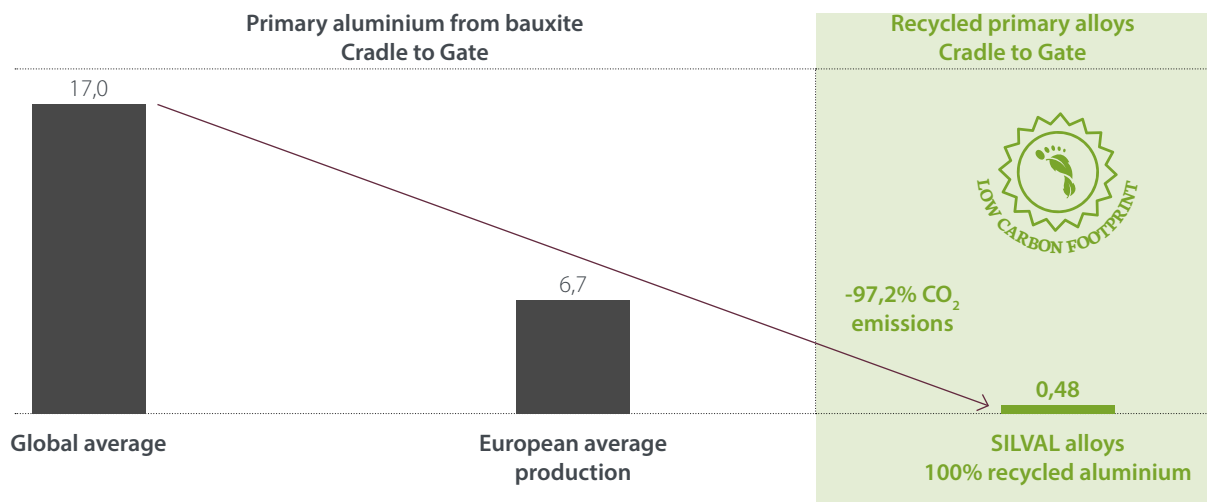
1. **Aluminium** content **from recycling greater than 80%**;
2. **Customised alloys** according to customer requirements;
3. **Low carbon footprint**;
4. **Zero waste** production process;
5. Traceability system.



THE RECYCLED PRIMARY ALUMINIUM ALLOY FROM RECYCLING PRODUCTION PROCESS



CARBON FOOTPRINT OF THE DIFFERENT TYPES OF PRIMARY ALUMINIUM PRODUCTION* (kg of CO₂e/ kg of Al produced)



*Data source: EA Circular Aluminium Action Plan (2020), Raffmetal's Cradle to Gate LCA and University of Siena, Database Ecoinvent 3.6, Software SimaPro 9.1.1, Method CML-IA.

THE ADVANTAGES OF RAFFMETAL ALLOYS OVER TRADITIONAL INGOTS

BETTER QUALITY, LESS DEFECTS

- 1** Speed of solidification = less defects. Solidification without contact with air.
A fine and homogeneous structure.
-

HIGHER METAL YIELD, LESS OXIDES

- 2** Solidification without contact with air = less oxides.
Speed of solidification = less intermetallic compounds.
-

SPACE OPTIMISATION

- 3** Package compactness = 40% saving in the area dedicated to package storage.
Customisation of bar length and weight = faster unloading, storage and picking up of packages from the warehouse = shorter furnace package loading time.
-

INCREASED SAFETY

- 4** **Furnace bar loading.** Reduction of possible explosions from damp ingots loaded into the furnace. Reduced furnace maintenance time. Less ingot pre-heating time.
Package stability. Reduced package handling and storage times. Reduced package breakage during handling.
-

TRACEABILITY

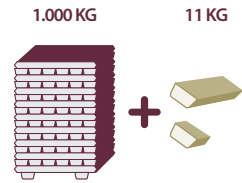
- 5** Raffmetal's aluminium ingots have a traceability system: the casting number is engraved on each individual bar, giving the customer the guarantee that the entire aluminium production cycle can be traced at any time.



Traditional ingot section



Ingot section in continuous casting - Raffmetal technology



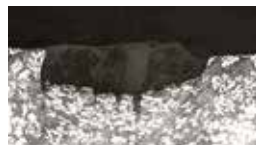
+1,1%



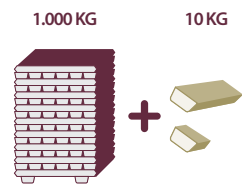
Oxide



Oxide



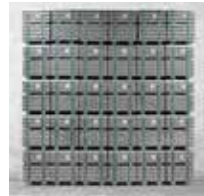
Hard spot



+1%



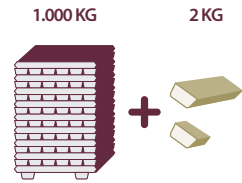
Standard packages



Examples of warehouse storage



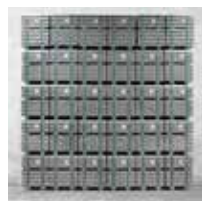
Striko packages



+0,2%



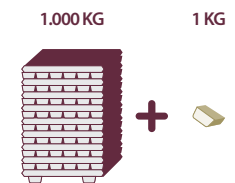
(1)



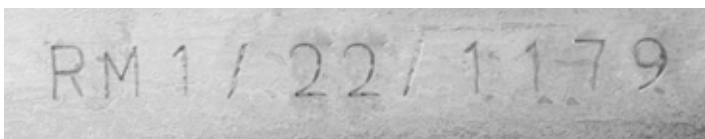
(2)

Package stability:

comparison between ingots for traditional casting (1) and ingots for continuous casting (2)



+0,1%



RM1: Identification of the production line

2022: Year of production

1179: Progressive casting number

+2,4%

**AVAILABLE
ALUMINIUM**

RAW MATERIALS

Recycling represents the heart of Raffmetal's production. The raw materials used in the production process result from the collection of processing scraps and components that have fulfilled their original function.

The scrap used is sourced throughout Europe and classified and processed by highly sophisticated and cutting-edge technological systems.

The knowledge acquired in over forty years of experience in the treatment of scrap, as well as the most modern sorting and separation technologies, have made it possible to start production in 2020 of the new range of primary aluminium alloys from recycling with a low carbon footprint.

The initiation of this production allowed the range of purchased scrap to be completed. Traditional scrap was joined by:

- Extruded
- Low-iron primary aluminium casings
- Wheel rims (troma)
- 1.000 Series alloy Sheets/Wires/Cables



TURNINGS



SHEETS/PLATES



**CASINGS
(ALUMINIUM
TENSE - CAST)**



**FLOATED FRAG
ALUMINIUM SCRAP
(TWITCH)**



**SHREDDED MIXED
METAL SCRAP**



**PRODUCTION
WASTE**



**WHEEL RIMS
(TROMA)**



**LITHOGRAPHIC
SHEETS**



**SECTION BARS
(ALUMINIUM TREAD-
EXTRUSION)**



**WIRES AND
CABLES**

over 1.800 suppliers

Internal team dedicated to raw material purchasing

R&D AND CUSTOMER CARE

The Raffmetal Research and Development team, thanks to the competence, preparation and latest generation instrumentation present in the internal laboratories covering an area of over 860 m², works daily in order to:

- **Increase the exploitation of each type of scrap**, from a point of view of both chemical and physical composition. The team of metallurgical engineers and chemists monitors the whole procedure: **from the design to the proper functioning of the alloy in the customer's plant** in order to ensure its productivity in the long run;
- **Develop new alloys with better properties, sustainable and competitive** also offering a service dedicated to the **customisation of the alloy**.

Customer service in both the development and the use of new alloys

Dialogue and collaboration with customers allow us to meet their needs in a constantly evolving market, developing high-performance, competitive and low carbon footprint products.



*Source: R&D of Raffmetal



SEM Microscope



Chemical laboratory

WHY CHOOSE RAFFMETAL'S RECYCLED ALUMINIUM?

The strengths of Raffmetal's internal production process allow for a sustainable product with a low carbon footprint.

RAW MATERIALS

Raffmetal's raw material is end-of-life scrap and processing waste. This brings benefits along the supply chain, as it allows:

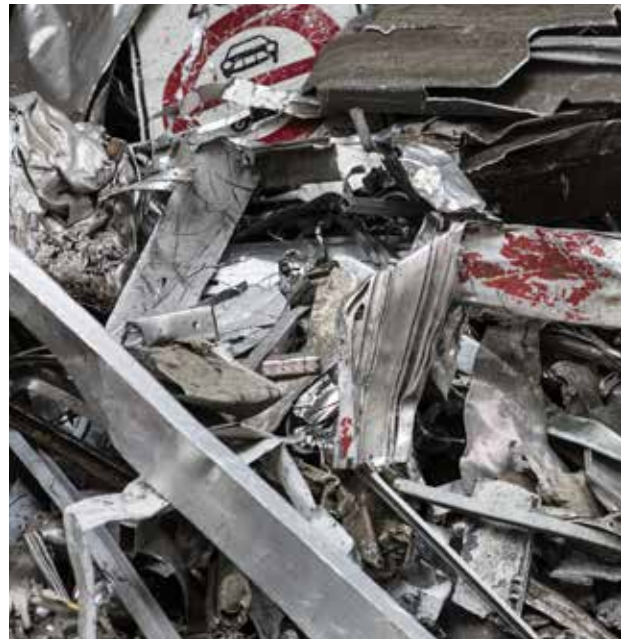
- Upstream: to **avoid the exploitation of natural resources by mining**.
- Downstream: to **reduce to zero the cost of disposing of scrap metal** that would otherwise be sent to landfill and therefore considered waste.

**Thanks to the circular production of Raffmetal more than
2.200.000 tonnes of CO₂ are avoided each year *
=
Consumption/year of a city of about 380.000 inhabitants**

*Compared to the European average of primary aluminium production



Scrap: Turnings



Scrap: Sheets/Plates

CONTINUOUS INNOVATION IN THE PRODUCTION PROCESS

Raffmetal's refining process generates zero waste.

All residues from the refining process are recycled and exploited thanks to the revolutionary **salt residue recovery system**, installed back in 1989, which has made it possible to outline the winning path to recycling and still represents **excellence in the circular economy**.



Salt recovered and reused in the refining process

The supply of aluminium alloys in the liquid form allows considerable energy savings to our customers avoiding the re-melting of ingots as well as an important reduction in terms of CO₂ emissions into the atmosphere, thereby lowering the carbon footprint of the finished product.

ENERGY EFFICIENCY

Raffmetal has always applied a company strategy aimed at the **recovery of all thermal waste available in the company**, constantly innovating systems and reducing the need for energy from fossil fuels.

The heat recovery plant, installed in 2014 with an investment of over 35 million €, provides for the recovery of the heat contained in the exhaust gases coming from the afterburners of the rotary kilns, from the plant for the recovery of the melting by-products and from the drying plant. The self-produced heat **saves natural gas equivalent to the emissions of 12.500 tons of CO₂ per year**.

ENVIRONMENTAL SUSTAINABILITY

The environmental policy reinforces the approach to sustainable development that Raffmetal has always pursued. Management procedures, system investments and actions to mitigate emissions, monitor water consumption and protect biodiversity and woodland flora are proof of this.

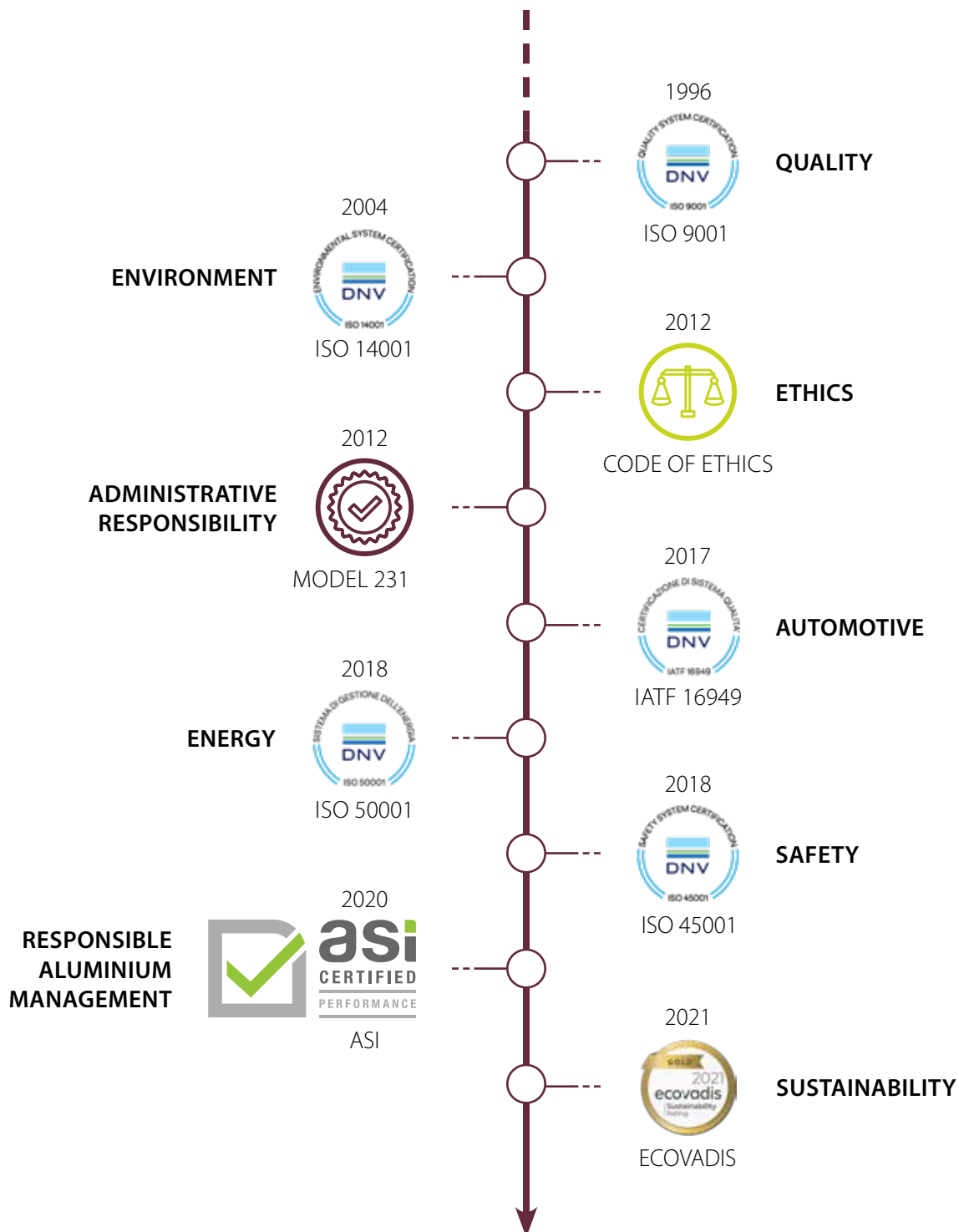
In 2013, an **oxygen pipeline** was built, with an investment of over 7 million €, which reduces CO₂ emissions and, in terms of safety, takes 2.500 trucks/year off the road.


CERTIFICATIONS

The certifications of its management and organisation systems and the certificates of responsibility and ethics give Raffmetal undisputed added value.

They are **synonymous with quality, attention, safety, prevention and responsibility.**

They are also a selection and preference tool for customers and suppliers, as a demonstration of the company's commitment.



An aerial photograph of a mountain valley. In the foreground, a river flows through a lush green valley. A small town is visible in the middle ground, nestled in the valley. The background features large, rugged mountains with some snow on their peaks. The sky is clear and blue.

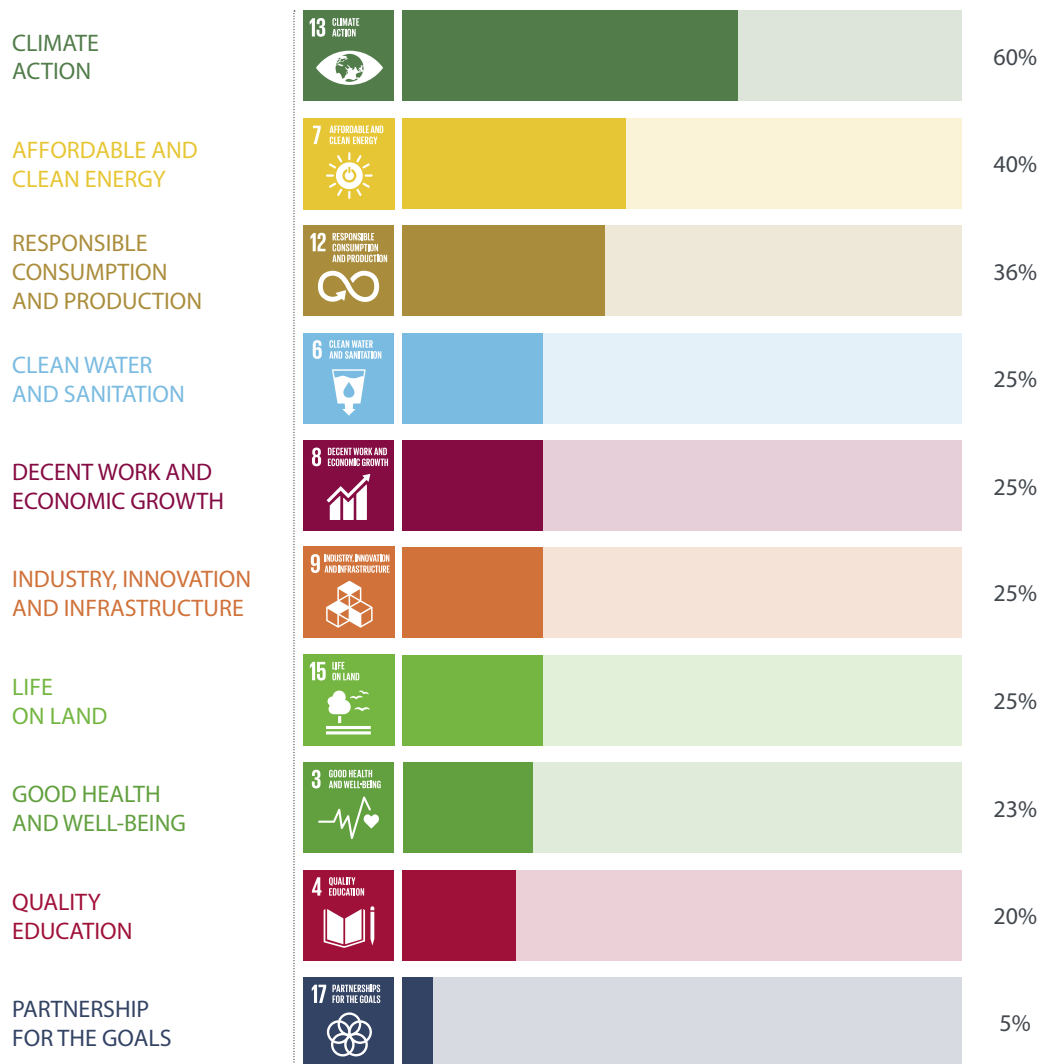
Sustainability
for
Raffmetal

THE SUSTAINABLE DEVELOPMENT GOALS IN RAFFMETAL'S SUSTAINABILITY POLICY

In September 2015, the United Nations endorsed the 2030 Agenda consisting of 17 Sustainable Development Goals (SDGs) and 169 sub-goals or targets as a strategy “to achieve a better and more sustainable future for all”.

Raffmetal, after having mapped in previous sustainability reports the adherence of the company's missions and projects to the objectives of sustainable development, in 2020 has decided to quantify in an objective way through a software program its commitment to achieve the targets established and shared at universal level.

HOW MUCH RAFFMETAL'S ACTIVITY CONTRIBUTES TO REACHING THE SDGS



Data source: DNV Tools

The percentage specifies how well the company fulfils, with its policy, the total of the targets for each goal.

RAFFMETAL'S APPROACH TO SUSTAINABILITY



CIRCULARITY

We are convinced that the circular economy is one of the best responses to the many environmental and social problems we are experiencing.

Being part of a virtuous and circular system, where our role is to produce aluminium by recovering materials that have reached the end of their life cycles by giving them a new value, is a tangible demonstration of our active role in opposing a system based on linear economy.



ECO-EFFICIENCY

Efficiency and effectiveness have always been principles dear to us: also from a sustainability point of view we pay great attention to making the right choices in order to adopt procedures that maximise the economic benefit and minimise the social and environmental impact.



EVOLUTION

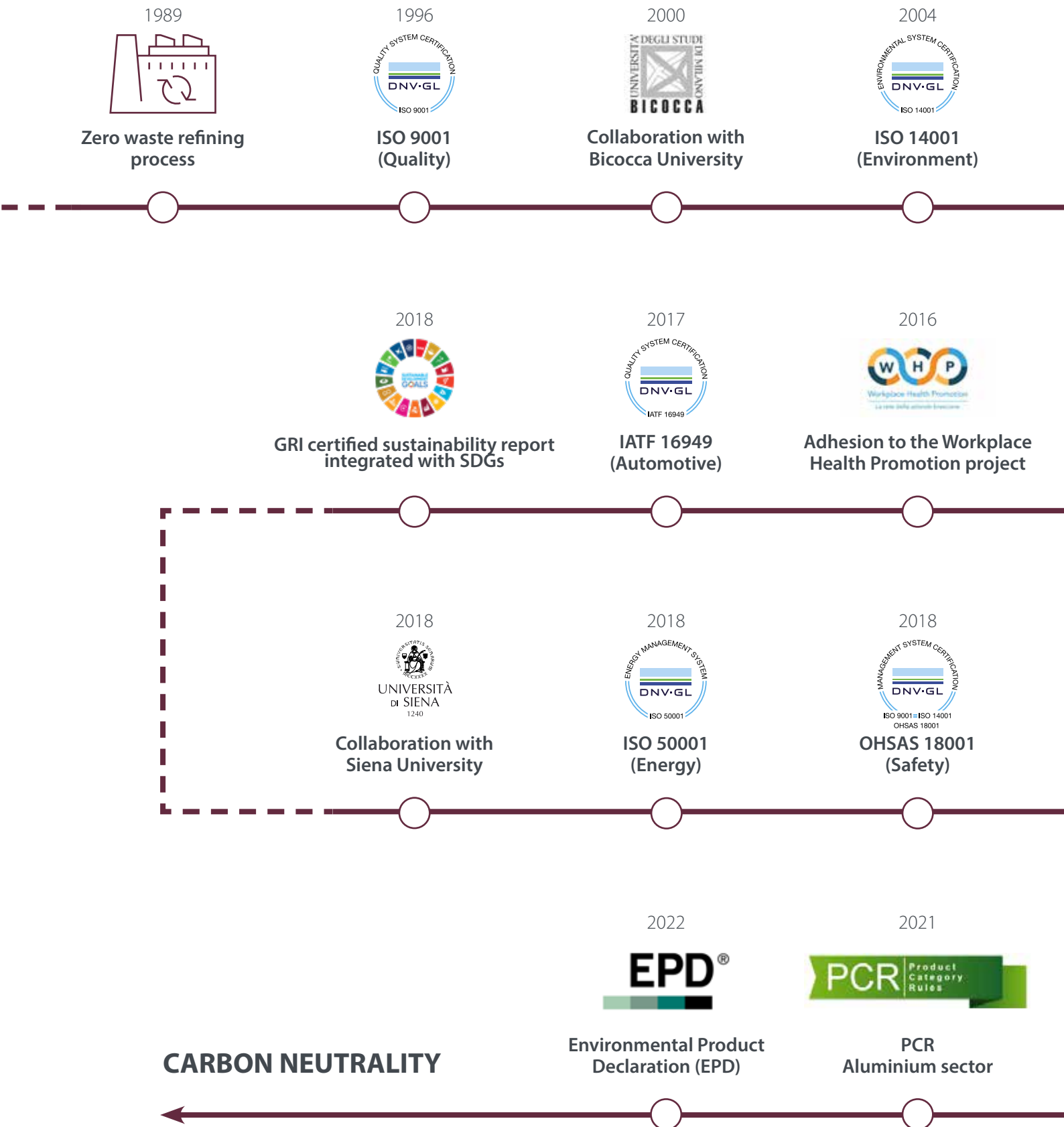
While a few years ago some areas of Raffmetal's sustainability were understood at project level, today we can see that "sustainable" practices, attitudes and ways of thinking and working have become part of the company processes.



SUSTAINABLE DEVELOPMENT

The idea of sustainable development is a dynamic concept for us and is closely linked to innovation. We are always on the move and each material theme is approached on the basis of the three keys of interpretation mentioned above, that guide us in our way of thinking and acting.

THE SUSTAINABILITY PATH OF RAFFMETAL



2012



Code of Ethics and Model 231

2013



Oxygen pipeline

2013



Start CSR path

2015



Certified sustainability report

2014



We love sport
We love schools

2014



Heat recovery plant

2019



40th anniversary

2019



Life Cycle Assessment (LCA)

2020



ISO 45001 (Safety)

2021



LOW CARBON FOOTPRINT department

2020



Primary alloys from recycling

2020



Aluminium Stewardship Initiative (ASI)

03. ENERGY

Over the years, Raffmetal has made constant investments in production systems and in efficiency works able to lead to an almost total replacement of the steam produced by methane with steam produced through the recovery of heat from thermal residues.

Following the European directives for climate neutrality by 2050, Raffmetal has put all its efforts and resources into Research and Development aimed at the energy transition of its production processes.

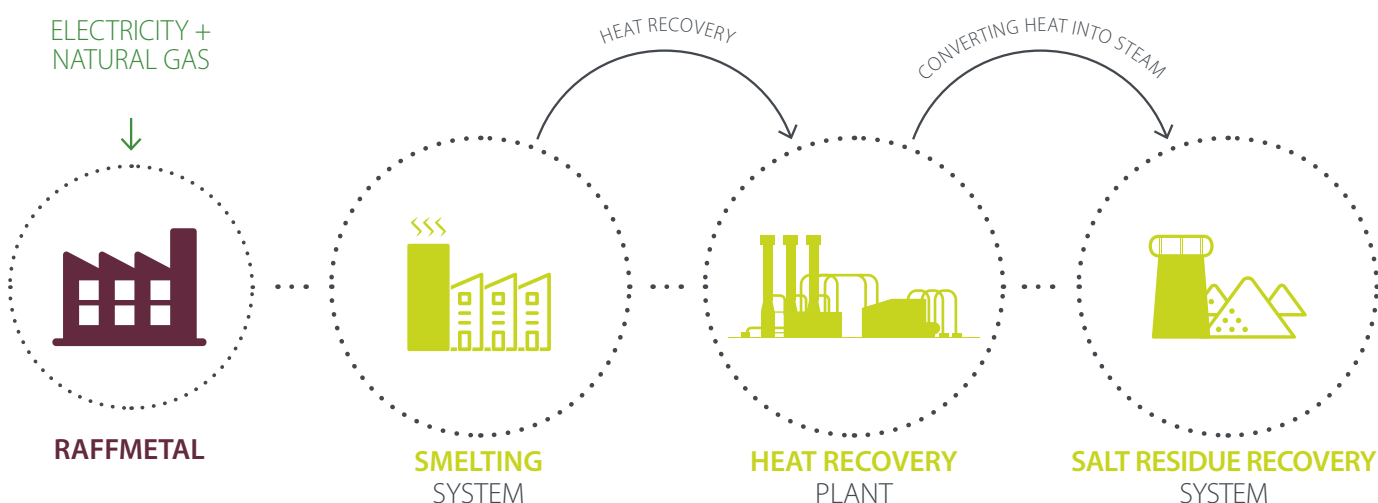
The strategy, which will be constantly implemented over the next few years, includes actions in the field of production and an increase in the purchase of renewable energy, as well as experiments in system upgrading for the use of new energy sources.



Heat Recovery Plant (IRC)

HEAT RECOVERY PLANT

From 2014, Raffmetal's Management has taken the brave and innovative decision to invest over 35 million € in a Heat Recovery Plant which involves the recovery of the heat contained in the exhaust gases from the afterburner of the rotary furnaces, from the by-product recovery system and from the drying system. The recovered heat is used to power the salt residue recovery system, thus eliminating the consumption of natural gas necessary for this process.



Thanks to the heat recovery system, every year we save around 30% of the total natural gas need

=

Consumption/year of 800 households *

*Per capita emission in Italy: 7,20 tons CO₂ / inhab*year

04. ENVIRONMENT

Raffmetal's commitment and dedication to contribute to the fight against climate change emerge from real actions that have accompanied the company's evolution since its inception. Management procedures, dedicated staff, continuous monitoring and innovative technologies applied throughout the production process are proof of this.

Today's world is highly interconnected and requires everyone to take responsibility for each other on a global level, which is why **Raffmetal attaches the utmost importance to environmental protection.**

AIR PROTECTION

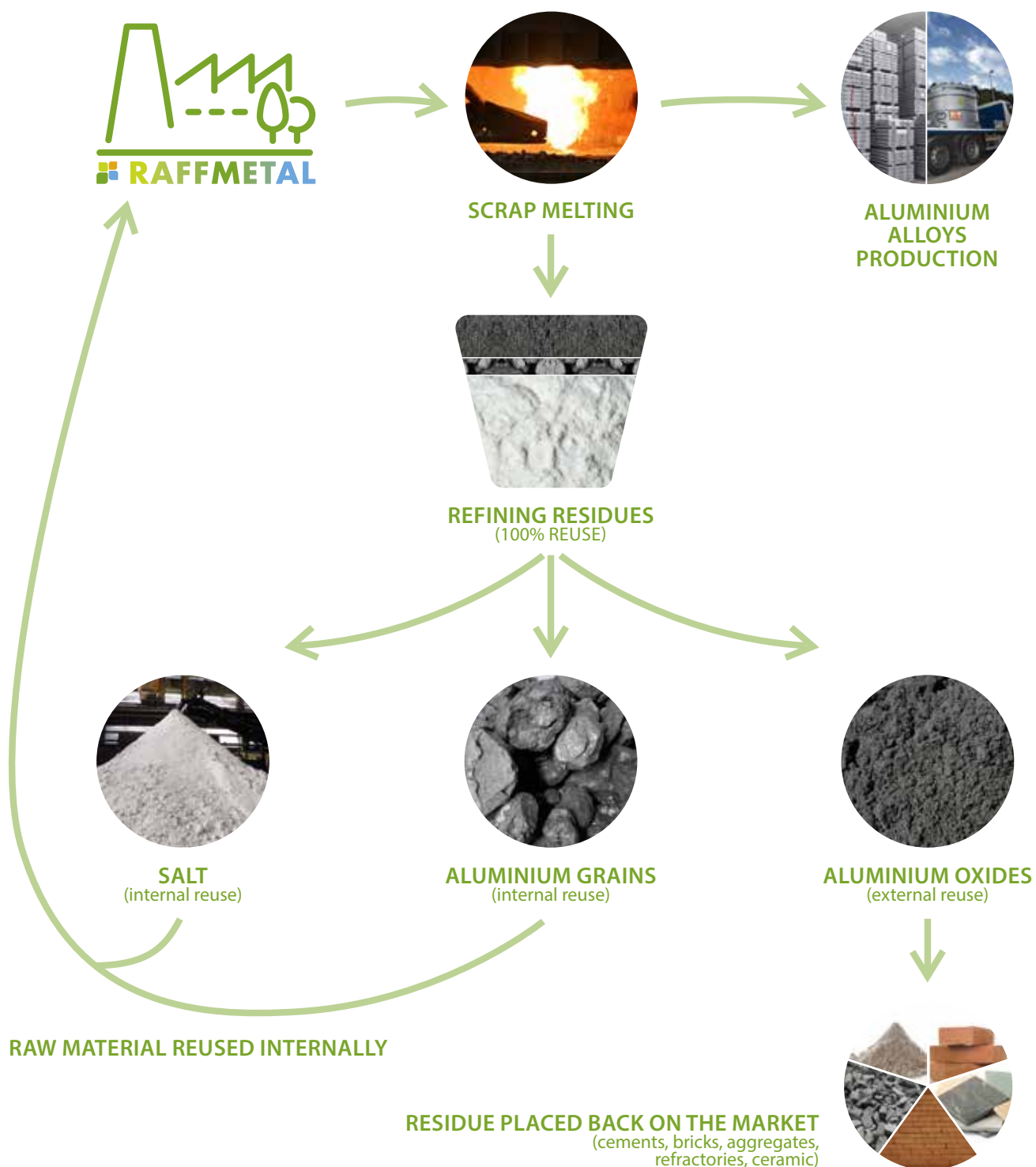
Raffmetal's systems comply with the Best Available Technology for the non-ferrous metals sector and are operated by experienced and qualified personnel; the application of an **environmental management system compliant with international ISO 14001** certification has over the years allowed the achievement **of emission values well below the legal limits.**



ZERO WASTE REFINING PROCESS

The production salt residue recovery system represents the first concrete action adopted by Raffmetal to achieve sustainability, efficiency and zero waste. The system was installed in 1989 and it allows the recovery and exploitation of the chemical components present in the residues of the smelting process: salt and aluminium granules are reintroduced in the Raffmetal cycle, while aluminium oxides are put back on the market.

RAFFMETAL ZERO WASTE REFINING PROCESS



WATER PROTECTION

The use of water in our production processes is of particular importance, especially during the casting and cooling phase of the metal. Significant quantities are also used in the pre-treatment of scrap and the recovery of melting by-products.

In order to protect the water resource, it has been chosen to include systems and technologies that minimise its consumption.

The water resource, currently drawn from the “delle Melie” spring in the Municipality of Casto and from the A2A waterworks in Vestone, is recycled several times through the cooling process in an evaporative tower, **limiting the withdrawal to the reintegration of the dispersed quantity due to evaporation.**

Currently, the only discharges are those from rain water that flow, after treatment, into the sewer system or into a surface water body.

These discharges are constantly analysed according to a monitoring plan in compliance with the Technical Annexes of the Integrated Environmental Authorisations.

PROTECTION OF BIODIVERSITY

Over the years, Raffmetal has acquired 104 hectares of meadows and woodland adjacent to its own facilities, more than half of which is woodland alone. Assuming an average of **280 shrubs** per hectare and calculating an average absorption of the vegetative population - composed of maple and ash tree wood, chestnut wood, beechwood, oak and hornbeam groves - of **15 kg of CO₂/year**, **Raffmetal's territory alone allows a CO₂ absorption of about 250.000 kg of CO₂/year***.

ABSORPTION CAPACITIES OF RAFFMETAL'S WOOD AREA*



*Data source: SunHeartTools.com

**Excluding those for industrial use

05. SOCIAL

Any production business has an impact on the social fabric of the territory where it is located, going well beyond the economic and employment effects, becoming a driving force for the diffusion of culture and values for the population, especially towards the new generations.

Therefore, Raffmetal supports **territorial development initiatives in order to create value in the local community.**

DONATIONS TO THE LOCAL COMMUNITY

OVER **€2.400.000**
DONATED TO THE REGION FROM 2014 TO 2020.

€1.000.000
IN SPORTS FACILITIES.

€1.400.000
IN SUPPORT OF ASSOCIATIONS, PARISHES, INSTITUTIONS, SCHOOLS AND SPORTS.



In particular, two projects were founded by Raffmetal with the aim of supporting high-quality school and sports education.

we ♥ schools



Donation of state-of-the-art teaching materials and tools



Vocational courses in the company for high schools and universities held by company technicians



Initiatives for the dissemination of the culture of recycling



Internships and dual education

we ♥ sport



Donation of sports and recreational equipment and facilities



Meetings with sports personalities and experts promoting a healthy lifestyle

Standard EN 1676:2010

Alloy designation			Chemical composition (as a % of mass)									
Alloy type	Numerical designation	Chemical symbols	Si		Fe		Cu		Mn		Mg	
	EN AB		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
AlCu	21000	Al Cu4MgTi	-	0.15	-	0.30	4.2	5.0	-	0.10	0.20	0.35
	21100	Al Cu4Ti	-	0.15	-	0.15	4.2	5.2	-	0.55	-	-
AlSiMgTi	41000	Al Si2MgTi	1.6	2.4	-	0.50	-	0.08	0.30	0.50	0.50	0.65
AlSi7Mg	42000	Al Si7Mg	6.5	7.5	-	0.45	-	0.15	-	0.35	0.25	0.65
	42100	Al Si7Mg0.3	6.5	7.5	-	0.15	-	0.03	-	0.10	0.30	0.45
	42200	Al Si7Mg0.6	6.5	7.5	-	0.15	-	0.03	-	0.10	0.50	0.70
	42300	Al Si7(Mg)	6.5	7.5	-	0.15	-	0.03	-	0.10	0.10	0.30
	42400	Al Si7MnMg	6.5	8.5	-	0.20	-	0.03	0.35	0.75	0.15	0.45
AlSi10Mg	43000	Al Si10Mg	9.0	11.0	-	0.40	-	0.03	-	0.45	0.25	0.45
	43200	Al Si10Mg(Cu)	9.0	11.0	-	0.55	-	0.30	-	0.55	0.25	0.45
	43300	Al Si9Mg	9.0	10.0	-	0.15	-	0.03	-	0.10	0.25	0.45
	43400	Al Si10Mg(Fe)	9.0	11.0	0.45	0.9	-	0.08	-	0.55	0.25	0.50
	43500	Al Si10MnMg	9.0	11.5	-	0.20	-	0.03	0.40	0.80	0.15	0.60
AlSi	44000	Al Si11	10.0	11.8	-	0.15	-	0.03	-	0.10	-	0.45
	44100	Al Si12 (b)	10.5	13.5	-	0.55	-	0.10	-	0.55	-	0.10
	44200	Al Si12 (a)	10.5	13.5	-	0.40	-	0.03	-	0.35	-	-
	44300	Al Si12(Fe) (a)	10.5	13.5	0.45	0.9	-	0.08	-	0.55	-	-
	44400	Al Si9	8.0	11.0	-	0.55	-	0.08	-	0.50	-	0.10
	44500	Al Si12(fe) (b)	10.5	13.5	0.45	0.90	-	0.18	-	0.55	-	0.40
	44600	Al Si10Mn	9.5	11.5	0.10	0.20	-	0.03	0.30	0.75	-	0.15
AlSi5Cu	45000	Al Si6Cu4	5.0	7.0	-	0.9	3.0	5.0	0.20	0.65	-	0.55
	45100	Al Si5Cu3Mg	4.5	6.0	-	0.50	2.6	3.6	-	0.55	0.20	0.45
	45300	Al Si5Cu1Mg	4.5	5.5	-	0.55	1.0	1.5	-	0.55	0.40	0.65
	45400	Al Si5Cu3	4.5	6.0	-	0.50	2.6	3.6	-	0.55	-	0.05
	45500	Al Si7Cu0.5Mg	6.5	7.5	-	0.25	0.2	0.7	-	0.15	0.25	0.45
	45600	Al Si7Cu1Mg0.6	6.5	7.5	-	0.15	0.8	1.6	-	0.10	0.50	0.70
AlSi9Cu	46000	Al Si9Cu3(Fe)	8.0	11.0	0.6	1.1	2.0	4.0	-	0.55	0.15	0.55
	46100	Al Si11Cu2(Fe)	10.0	12.0	0.45	1.0	1.5	2.5	-	0.55	-	0.30
	46200	Al Si8Cu3	7.5	9.5	-	0.7	2.0	3.5	0.15	0.65	0.15	0.55
	46300	Al Si7Cu3Mg	6.5	8.0	-	0.7	3.0	4.0	0.20	0.65	0.35	0.60
	46400	Al Si9Cu1Mg	8.3	9.7	-	0.7	0.8	1.3	0.15	0.55	0.30	0.65
	46500	Al Si9Cu3(Fe)(Zn)	8.0	11.0	0.6	1.2	2.0	4.0	-	0.55	0.15	0.55
	46600	Al Si7Cu2	6.0	8.0	-	0.7	1.5	2.5	0.15	0.65	-	0.35
AlSi(Cu)	47000	Al Si12(Cu)	10.5	13.5	-	0.7	-	0.9	0.05	0.55	-	0.35
	47100	Al Si12Cu1(Fe)	10.5	13.5	0.6	1.1	0.7	1.2	-	0.55	-	0.35
	47200	Al Si12(Fe)	10.5	13.5	0.6	1.1	-	0.4	0.10	0.50	0.10	0.40
AlSiCuMg	48000	Al Si12CuMgNi	10.5	13.5	-	0.6	0.8	1.5	-	0.35	0.9	1.5
	48100	Al Si17Cu4Mg	16.0	18.0	-	1.00	4.0	5.0	-	0.50	0.45	0.65
	48200	Al Si15Cu3MgFe	14.5	16.5	0.7	1.2	3.0	4.0	0.40	0.60	0.55	0.95
AlMg	51100	Al Mg3	-	0.45	-	0.4	-	0.03	-	0.45	2.7	3.5
	51200	Al Mg9	-	2.5	0.45	0.9	-	0.08	-	0.55	8.5	10.5
	51300	Al Mg5	-	0.35	-	0.45	-	0.05	-	0.45	4.5	6.8
	51400	Al Mg5(Si)	-	1.3	-	0.45	-	0.03	-	0.45	4.8	6.5
	51500	Al Mg5Si2Mn	1.8	2.6	-	0.20	-	0.03	0.4	0.8	5.0	6.0
AlZnSiMg	71100	Al Zn10Si8Mg	7.5	9.5	-	0.40	-	0.08	-	0.45	0.25	0.50

Cr		Ni		Zn		Pb	Sn	Ti		Others	
Min	Max	Min	Max	Min	Max	Max	Max	Min	Max	Single	Total
-	-	-	0.05	-	0.10	0.05	0.05	0.15	0.25	0.03	0.10
-	-	-	-	-	0.07	-	-	0.15	0.25	0.03	0.10
-	-	-	0.05	-	0.10	0.05	0.05	0.07	0.15	0.05	0.15
-	-	-	0.15	-	0.15	0.15	0.05	-	0.20	0.05	0.15
-	-	-	-	-	0.07	-	-	-	0.18	0.03	0.10
-	-	-	-	-	0.07	-	-	-	0.18	0.03	0.10
-	-	-	-	-	0.07	-	-	-	0.18	0.03	0.10
-	-	-	-	-	0.03	-	-	-	0.15	0.05	0.15
-	-	-	0.05	-	0.10	0.05	0.05	-	0.15	0.05	0.15
-	-	-	0.15	-	0.35	0.10	0.05	-	0.15	0.05	0.15
-	-	-	-	-	0.07	-	-	-	0.15	0.03	0.10
-	-	-	0.15	-	0.15	0.15	0.05	-	0.15	0.05	0.15
-	-	-	-	-	0.07	-	-	-	0.15	0.05	0.15
-	-	-	-	-	0.07	-	-	-	0.15	0.03	0.10
-	-	-	0.10	-	0.15	0.10	-	-	0.15	0.05	0.15
-	-	-	-	-	0.10	-	-	-	0.15	0.05	0.15
-	-	-	-	-	0.15	-	-	-	0.15	0.05	0.25
-	-	-	0.05	-	0.15	0.05	0.05	-	0.15	0.05	0.15
-	-	-	-	-	0.30	-	-	-	0.15	0.05	0.25
-	-	-	-	-	0.03	-	-	-	0.15	0.05	0.15
-	0.15	-	0.45	-	2.0	0.29	0.15	-	0.20	0.05	0.35
-	-	-	0.10	-	0.20	0.10	0.05	-	0.20	0.05	0.15
-	-	-	0.25	-	0.15	0.15	0.05	-	0.20	0.05	0.15
-	-	-	0.10	-	0.20	0.10	0.05	-	0.20	0.05	0.15
-	-	-	-	-	0.07	-	-	-	0.20	0.03	0.10
-	-	-	-	-	0.07	-	-	-	0.18	0.03	0.10
-	0.15	-	0.55	-	1.2	0.29	0.15	-	0.20	0.05	0.25
-	0.15	-	0.45	-	1.7	0.25	0.15	-	0.20	0.05	0.25
-	-	-	0.35	-	1.2	0.25	0.15	-	0.20	0.05	0.25
-	-	-	0.30	-	0.65	0.15	0.10	-	0.20	0.05	0.25
-	-	-	0.20	-	0.8	0.10	0.10	-	0.18	0.05	0.25
-	0.15	-	0.55	-	3.0	0.29	0.15	-	0.20	0.05	0.25
-	-	-	0.35	-	1.0	0.25	0.15	-	0.20	0.05	0.15
-	0.10	-	0.30	-	0.55	0.20	0.10	-	0.15	0.05	0.25
-	0.10	-	0.30	-	0.55	0.20	0.10	-	0.15	0.05	0.25
-	0.05	-	0.20	-	0.50	0.20	0.10	-	0.15	0.05	0.25
-	-	0.7	1.3	-	0.35	0.05	0.05	-	0.20	0.05	0.15
-	-	-	0.3	-	1.5	-	0.15	-	0.20	0.05	0.25
0.05	0.30	-	0.30	-	1.0	-	0.30	-	0.15	0.05	0.25
-	-	-	-	-	0.10	-	-	-	0.15	0.05	0.15
-	-	-	0.10	-	0.25	0.10	0.10	-	0.15	0.05	0.15
-	-	-	-	-	0.10	-	-	-	0.15	0.05	0.15
-	-	-	-	-	0.10	-	-	-	0.15	0.05	0.15
-	-	-	-	-	0.07	-	-	-	0.20	0.05	0.15
-	-	-	-	9.0	10.5	-	-	-	0.15	0.05	0.15

NOTE 1: digits in parentheses are melt compositions [EN AC prefix instead of EN AB] in which they differ from the ingot. See EN 1706 for information.

NOTE 2: limits are expressed as maximum values shown as a range.

Comparison of characteristics

Comparison of casting, mechanical, and other characteristics of castings

Alloy designation			Casting method				Castability					
Alloy type	Numerical designation	Chemical symbols	Sand-casting	Permanent mould casting	Pressure casting	Waste-wax process	Flowability	Resistance to shrinkage cracks	Compression strength	Foundry raw material	After heat treatment	Corrosion strength
	EN AC											
AlCu	21000	Al Cu4MgTi	*	*		*	C	D	D	-	A	D
	21100	Al Cu4Ti	*	*			C	D	D	-	A	D
AlSiMgTi	41000	Al Si2MgTi	*	*			C	C	C	C	B	B
AlSi7Mg	42000	Al Si7Mg	*	*		*	B	A	B	B/C	B	B/C
	42100	Al Si7Mg0.3	*	*		*	B	A	B	-	B	B
	42200	Al Si7Mg0.6	*	*		*	B	A	B	-	B	B
	42300	Al Si7(Mg)	*	*		*	B	A	B	-	B	B
	42400	Al Si7MnMg				*	B	A	B	-	B	B
AlSi10Mg	43000	Al Si10Mg	*	*			A	A	B	B/C	B	C
	43200	Al Si10Mg(Cu)	*	*			A	A	B	B/C	B	B/C
	43300	Al Si9Mg	*	*			A	A	B	B/C	B	B
	43400	Al Si10Mg(Fe)				*	A	A	C	B	-	B/C
	43500	Al Si10MnMg				*	A	A	C	B/C	B	B
AlSi	44000	Al Si11	*	*			A	A	A	C	-	B
	44100	Al Si12	*	*		*	A	A	A	C	-	B/C
	44200	Al Si12	*	*			A	A	A	C	-	B
	44300	Al Si12(Fe)				*	A	A	C	C	-	B/C
	44400	Al Si9	*	*		*	A	A	C	C	-	B/C
	44500	Al Si12(Fe)				*	A	A	C	C	-	B/C
	44600	Al Si10Mn				*	A	A	B	B/C	B	B
AlSi5Cu	45000	Al Si6Cu4	*	*			B	B	B	B	-	D
	45100	Al Si5Cu3Mg		*			B	B	B	B	A	D
	45300	Al Si5Cu1Mg	*	*			C	B	C	B	B	D
	45400	Al Si5Cu3		*			B	B	B	B	B	D
	45500	Al Si7Cu0.5Mg	*	*			B	B	B	B	B	B/C
	45600	Al Si7Cu1Mg0.6	*	*			B	B	B	B	B	C
AlSi9Cu	46000	Al Si9Cu3(Fe)				*	B	B	C	B	-	D
	46100	Al Si11Cu2(Fe)				*	A	B	C	C	-	D
	46200	Al Si8Cu3	*	*		*	B	B	B	B	-	D
	46300	Al Si7Cu3Mg		*			B	B	B	C	-	D
	46400	Al Si9Cu1Mg	*	*			B	B	B	B	B	D
	46500	Al Si9Cu3(Fe)(Zn)				*	B	B	C	B	-	D
AlSi(Cu)	47000	Al Si12(Cu)	*	*			A	A	A	C	-	C
	47100	Al Si12Cu1(Fe)				*	A	A	C	C	-	C
	47200	Al Si12Cu1(Fe)				*	A	A	C	C	-	B/C
AlSiCuMg	48000	Al Si12CuMgNi		*		*	A	A	A	B	B	C
	48100	Al Si17Cu4Mg				*	A	C	B	E	B	D
	48200	Al Si15Cu3MgFe	*	*		*	A	B	B	C	-	D
AlMg	51100	Al Mg3	*	*			C	D	D	A	-	A
	51200	Al Mg9				*	C	D	D	A	-	A
	51300	Al Mg5	*	*		*	C	D	D	A	-	A
	51400	Al Mg5 (Si)	*	*			C	D	D	A	-	A
	51500	Al Mg5Si2Mn				*	B	D	C	A	-	A
AlZnSiMg	71100	Al Zn10Si8Mg	*	*		*	B	A	B	A	-	C

Other workability characteristics								Mechanical characteristics				
Decorative anodising	Weldability	Sanding ability	Linear thermal expansion	Electric conductivity E mS/m		Thermal conductivity W/mK		Resistance to ambient temperature	Resistance to a temperature up to 200°C	Ductility (resistance to impacts)	Fatigue resistance MPa	
				Min	Max	Min	Max				Min	Max
C	D	B	23	16	23	120	150	A	B	A	80	110
C	D	B	23	16	23	120	150	A	B	A	80	110
B	B	B	23	19	25	140	160	B	-	B	-	-
D	B	C	22	19	25	150	170	B	C	C	80	110
D	B	C	22	20	27	160	180	A	C	A	80	110
D	B	C	22	20	26	150	180	A	C	A	80	110
D	B	C	22	20	27	160	180	A	C	A	80	110
E	B	C	22	18	25	140	170	B	C	A	80	110
E	A	D	21	18	25	140	170	B	C	C	80	110
E	A	C	21	16	24	130	170	B	C	C	80	110
E	A	D	21	20	26	150	180	A	C	A	80	110
E	C	B/C	21	16	21	130	150	B	C	C	60	90
E	B	D	21	19	25	140	170	A	C	A	80	90
E	A	D	21	18	24	140	170	D	C	A	60	90
E	A	D	20	16	23	130	160	D	C	B	60	90
E	A	D	20	17	24	140	170	D	C	A	60	90
E	D	D	20	16	22	130	160	B	C	C	60	90
E	D	D	21	16	22	130	150	C	C	C	60	90
E	D	D	20	16	22	130	160	B	C	C	60	90
E	A	D	21	20	25	145	170	B	C	A	80	110
D	C	B	22	14	17	110	120	D	A	C	60	90
D	C	B	22	16	19	-	130	A	A	C	80	110
D	C	B	22	19	23	140	150	B	B	B	70	100
D	C	B	22	16	19	120	130	B	A	A	70	100
D	B	C	22	16	22	150	165	A	B	A/B	80	110
D	B	C	22	16	22	150	165	A	A/B	A/B	80	110
E	F	C	21	13	17	110	120	B	B	D	60	90
E	F	C	20	14	18	120	130	B	B	D	60	90
E	B	C	21	14	18	110	130	B	A	C	60	90
E	B	C	21	14	17	110	120	D	A	C	60	90
E	B	D	21	16	22	130	150	A	B	C	60	90
E	F	C	21	13	17	110	120	B	B	D	60	90
E	C	C	21	15	19	120	130	D	B	C	50	70
E	A	C	20	16	22	130	150	D	B	C	60	90
E	F	C	20	15	20	120	150	B	B	C	60	90
E	F	C	20	15	20	120	150	B	B	C	60	90
E	A	C	20	15	23	130	160	A	A	D	80	110
D	D	D	18	14	17	120	130	B	B	E	60	90
-	D	D	19	10	15	100	120	A	A	D	90	110
A	C	A	24	14	16	130	140	B	B	A	80	110
B	E	A	24	11	14	60	90	C	B	C	60	90
A	C	A	24	15	21	110	130	D	B	B	60	90
B	C	A	24	15	21	110	140	D	B	B	60	90
E	C	A	24	14	16	110	130	B	B	A	80	110
E	A	C	21	17	20	120	130	B	C	C	80	110

It indicates the most commonly used casting process for each alloy:
A = Excellent; B = Good; C = Sufficient; D = Poor; E = Not recommended; F = Not suitable.

Comparison of aluminium alloy designations

Tab. C.1- EN, Din, Uni, BS, AA, Jis, UNE						
Alloy numerical designation - EN	Alloy symbolic designation - EN	Alloy designation - DIN	Alloy designation - UNI	Alloy designation - BS 1490:1988	Alloy designation - AA	Alloy designation - JIS
21000	Al Cu4MgTi	DIN 220	-	-	204.0	AC1B.1
21100	Al Cu4Ti	DIN 220	-	-	-	Al-Cu4Ti
41000	Al Si2MgTi	-	UNI 3055	-	-	-
42000	Al Si7Mg	-	UNI 3599	LM25	356.0	AC4C
42100	Al Si7Mg0.3	-	UNI 8024	-	A356.0	AC4CH
42200	Al Si7Mg0.6	-	UNI 8392	-	357.0	-
42300	Al Si7(Mg)	-	-	-	-	-
42400	Al Si7MnMg	-	-	-	-	-
43000	Al Si10Mg	DIN 239 A	UNI 3051	-	-	AC4A, Al-Si10Mg
43200	Al Si10Mg(Cu)	DIN 233	-	-	-	Al-Si10Mg(Cu)
43300	Al Si9Mg	-	-	-	-	Al-Si9Mg
43400	Al Si10Mg(Fe)	DIN 239 D	-	-	-	ADC3
43500	Al Si10MnMg	-	-	-	365.0	AC4A.2
44000	Al Si11	-	-	-	-	Al-Si11
44100	Al Si12 (b)	DIN 230 A	UNI 4515	LM6	B413.0	AC3A, Al-Si12(b)
44200	Al Si12 (a)	DIN 230 A	UNI 4515	LM6	-	Al-Si12(a)
44300	Al Si12(Fe)(a)	DIN 230 D	UNI 4514	-	A413.2	ADC1
44400	Al Si9	-	-	-	-	-
44500	Al Si12(Fe)(b)	-	-	-	413.0	-
44600	Al Si10Mn	-	-	-	375.0	-
45000	Al Si6Cu4	DIN 225	UNI 7369/5	LM21	A319.0	AC2B, Al-Si6Cu4
45100	Al Si5Cu3Mg	-	UNI 3052	LM4	-	Al-Si5Cu3Mg
45300	Al Si5Cu1Mg	-	UNI 3600	LM16	355.0	AC4D, Al-Si5Cu1Mg
45400	Al Si5Cu3	-	-	LM22	-	Al-Si5Cu3
45500	Al Si7Cu0.5Mg	-	-	-	-	-
45600	Al Si7Cu1Mg0.6	-	-	-	-	-
46000	Al Si9Cu3(Fe)	DIN 226 D	UNI 5075	LM26	A380.0	ADC10
46100	Al Si11Cu2(Fe)	-	UNI 7363 - UNI 5076	LM2	383.0	ADC12Z
46200	Al Si8Cu3	DIN 226 A	-	-	333.0	AC4B, Al-Si8Cu3
46300	Al Si7Cu3Mg	-	-	-	320.0	Al-Si7Cu3Mg
46400	Al Si9Cu1Mg	-	UNI 7369/3	-	-	Al-Si9Cu1Mg
46500	Al Si9Cu3(Fe)(Zn)	-	-	LM24	E380, 383.0	ADC10Z
46600	Al Si7Cu2	-	-	LM27	328.0	-
47000	Al Si12(Cu)	DIN 231 A	UNI 7369/2	LM20	-	Al-Si12Cu
47100	Al Si12Cu1(Fe)	DIN 231 D	UNI 5079	LM20	-	ADC1C
47200	Al Si12(Fe)	-	-	-	-	-
48000	Al Si12CuNiMg	DIN 260	-	LM13	-	AC8A
48100	Al Si17Cu4Mg	-	-	-	B390.0	ADC14, Al-Si17Cu 4Mg
48200	Al Si15Cu3MgFe	-	-	-	-	-
51100	Al Mg3	DIN 242	UNI 3059	-	-	-
51200	Al Mg9	DIN 349	-	-	518.0	-
51300	Al Mg5	DIN 244	UNI 3058	LM5	-	Al-Mg5
51400	Al Mg5(Si)	DIN 245	-	-	-	Al-Mg5Si1
51500	Al Mg5Si2Mn	-	-	-	-	-
71100	Al Zn10Si8Mg	-	-	-	-	Al-Zn10Si8Mg

Russia - CIS

Chemical composition expressed in percentage																								
Alloy group	Si		Fe		Cu		Mn		Mg		Cr		Ni		Zn		Pb		Sn		Ti		Other impurities	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Each	Total
AK4M4	3.0	5.0	-	1.20	3.5	5.0	0.2	0.6	-	0.50	-	-	-	0.50	-	2.00	-	-	-	-	-	-	-	4.00
AK5M2	4.0	6.0	-	1.00	1.5	3.5	0.2	0.8	0.2	0.85	-	-	-	0.50	-	1.50	-	-	-	-	0.05	0.20	-	2.00
AK7M2	6.0	8.0	-	1.10	1.5	3.0	0.2	0.6	0.2	0.6	-	-	-	0.30	-	0.50	-	-	-	-	-	-	-	1.80
AK8M3	7.5	10.0	-	1.30	2.0	4.0	-	0.5	-	0.45	-	-	-	0.05	-	1.20	-	-	-	-	-	-	-	4.1
AK9	8.0	11.0	-	0.80	-	1.0	0.2	0.5	0.25	0.45	-	-	-	0.30	-	0.50	-	-	-	-	-	-	-	2.40

Japan - JIS

Chemical composition expressed in percentage																								
Alloy group	Si		Fe		Cu		Mn		Mg		Cr		Ni		Zn		Pb		Sn		Ti		Other impurities	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Each	Total
AC3A	10.0	13.0	-	0.70	-	0.25	-	0.35	-	0.15	-	0.15	-	0.10	-	0.30	-	0.10	-	0.10	-	0.20	-	-
AC4B	7.0	10.0	-	0.80	2.0	4.0	-	0.50	-	-	-	0.20	-	0.35	-	1.00	-	0.20	-	0.10	-	0.20	-	-
AC4C	6.5	7.5	-	0.40	-	0.25	-	0.35	0.25	0.45	-	0.10	-	0.10	-	0.35	-	0.10	-	0.05	-	0.20	-	-
AC2B.1	5.0	7.0	-	0.80	2.0	4.0	-	0.50	-	0.50	-	0.20	-	0.35	-	1.00	-	0.20	-	0.10	-	0.20	-	-
ADC1	11.0	13.0	-	0.90	-	1.00	-	0.30	-	0.30	-	-	-	0.50	-	0.50	-	-	-	0.10	-	-	-	-
ADC3	9.0	10.0	-	0.90	-	0.60	-	0.03	0.4	0.6	-	-	-	0.50	-	0.50	-	-	-	0.10	-	-	-	-
AC4B.1	7.0	10.0	-	0.80	2.0	4.0	-	0.50	-	0.50	-	0.20	-	0.35	-	1.00	-	0.20	-	0.10	-	0.20	-	-
AD14.1	16.0	18.0	0.6	1.0	4.0	5.0	-	0.50	0.50	0.65	-	-	-	0.30	-	1.50	-	0.20	-	0.30	-	0.30	-	-
ADC10	7.5	9.5	-	0.90	2.0	4.0	-	0.50	-	0.30	-	-	-	0.50	-	1.00	-	-	-	0.20	-	-	-	-
ADC12	9.6	12.0	-	0.90	1.5	3.5	-	0.50	-	0.30	-	-	-	0.50	-	1.00	-	-	-	0.20	-	-	-	-
ADC10Z	7.5	9.5	-	0.90	2.0	4.0	-	0.50	-	0.30	-	-	-	0.50	-	3.00	-	-	-	0.20	-	-	-	-
ADC12Z	9.6	12.0	-	0.90	1.5	3.5	-	0.50	-	0.30	-	-	-	0.50	-	3.00	-	-	-	0.20	-	-	-	-

USA - AA

Chemical composition expressed in percentage																								
Alloy group	Si		Fe		Cu		Mn		Mg		Cr		Ni		Zn		Pb		Sn		Ti		Other impurities	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Each	Total
356.1	6.5	7.5	-	0.5	-	0.25	-	0.35	0.25	0.45	-	-	-	0.35	-	-	-	-	-	0.25	-	-	-	0.15
360.1	9.0	10.0	-	1.00	-	0.6	-	0.35	0.45	0.6	-	-	-	0.50	-	0.40	-	-	-	0.15	-	-	-	0.15
380.1	7.5	9.5	-	1	3.0	4.0	-	0.5	-	0.1	-	-	-	0.5	-	2.9	-	-	-	0.35	-	-	-	0.5
383.1	9.5	11.5	-	1	2.0	3.0	-	0.5	-	0.10	-	-	-	0.3	-	2.9	-	-	-	0.15	-	-	-	0.5
413.1	11.0	13.0	-	1	-	1	-	0.35	-	0.1	-	-	-	0.5	-	0.4	-	-	-	0.15	-	-	-	0.1
413.2	11.0	13.0	-	0.6	-	0.1	-	0.05	-	0.05	-	-	-	0.05	-	0.05	-	-	-	0.05	-	-	-	0.1
514.1	-	0.35	-	0.4	-	0.15	-	0.35	6.3	4.5	-	-	-	-	0.15	-	-	-	-	0.25	-	-	-	0.15
518.1	-	0.35	-	0.15	-	0.25	-	0.35	7.6	8.5	-	-	-	0.15	-	0.2	-	-	-	0.15	-	-	-	0.25

United Kingdom - ENGLISH BS

Chemical composition expressed in percentage																								
Alloy group	Si		Fe		Cu		Mn		Mg		Cr		Ni		Zn		Pb		Sn		Ti		Other impurities	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Each	Total
LM 2	9.0	11.5	-	1.00	0.7	2.5	-	0.5	-	0.3	-	-	-	0.50	-	2.0	-	0.30	-	0.20	-	0.20	-	0.50
LM 4	4.0	6.0	-	0.8	2.0	4.0	0.2	0.6	-	0.2	-	-	-	0.30	-	0.5	-	0.10	-	0.10	-	0.20	0.05	0.15
LM 5	-	0.3	-	0.6	-	0.1	0.3	0.7	3.0	6.0	-	-	-	0.1	-	0.1	-	0.05	-	0.05	-	0.2	0.05	0.15
LM 6	10	13.0	-	0.6	-	0.10	-	0.5	-	0.1	-	-	-	0.1	-	0.10	-	0.1	-	0.05	-	0.20	0.05	0.15
LM 9	10	13.0	-	0.6	-	0.2	0.3	0.7	0.2	0.6	-	-	-	0.1	-	0.10	-	0.1	-	0.05	-	0.20	0.05	0.15
LM 16	4.5	5.5	-	0.6	1.0	1.5	-	0.5	0.4	0.6	-	-	-	0.25	-	0.1	-	0.10	-	0.05	-	0.20	0.05	0.15
LM 20	10	13.0	-	1	-	0.40	-	0.5	-	0.2	-	-	-	0.1	-	0.20	-	0.1	-	0.1	-	0.20	0.05	0.2
LM 21	5.0	7.0	-	1	3.0	5.0	0.2	0.6	0.1	0.3	-	-	-	0.3	-	2.00	-	0.2	-	0.1	-	0.20	0.05	0.15
LM 22	4.0	6.0	-	0.6	2.8	3.8	0.2	0.6	-	0.05	-	-	-	0.15	-	0.15	-	0.1	-	0.05	-	0.20	0.05	0.15
LM 24	7.5	9.5	-	1.3	3.0	4.0	-	0.5	-	0.3	-	-	-	0.5	-	3.00	-	0.3	-	0.2	-	0.20	-	0.5
LM 25	6.5	7.5	-	0.50	-	0.2	-	0.30	0.2	0.6	-	-	-	0.1	-	0.1	-	0.1	-	0.05	-	0.2	0.05	0.15

Turkey - ETIAL

Chemical composition expressed in percentage																								
Alloy group	Si		Fe		Cu		Mn		Mg		Cr		Ni		Zn		Pb		Sn		Ti		Other impurities	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Each	Total
ETIAL-140	11.50	13.50	-	0.6	-	0.1	-	0.4	-	0.1	-	-	-	0.1	-	0.1	-	0.1	-	0.05	-	0.15	-	-
ETIAL-141	11.50	13.50	-	1	-	0.2	-	0.3	-	0.2	-	-	-	0.1	-	0.1	-	0.1	-	0.05	-	0.15	-	-
ETIAL-150	11.00	13.00	-	1	1.75	2.50	-	0.5	-	0.4	-	-	-	0.3	-	0.7	-	0.1	-	0.1	-	0.15	-	-
ETIAL-160	7.5	9.00	-	1	3.00	4.00	-	0.5	-	0.3	-	-	-	0.2	-	1	-	0.1	-	0.1	-	0.2	-	-
ETIAL-171	9.00	10.00	-	0.5	-	0.1	0.40	0.60	0.30	0.45	-	-	-	0.1	-	0.1	-	0.05	-	0.05	-	0.15	-	-
ETIAL-180	9.00	11.50	-	1	0.7	2.50	-	0.50	-	0.3	-	-	-	0.5	-	2	-	0.1	-	0.2	-	0.2	-	-

SILVAL: PRIMARY ALUMINIUM ALLOYS FROM RECYCLING

Alloy name		Chemical composition (%)																	% Recycling	Carbon footprint - Cradle to Gate - kg CO ₂ e/kg Al
Numerical name	Chemical symbols	Si		Fe		Cu		Mn		Mg		Cr	Ni	Zn	Pb	Sn	Ti	Other		
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Max	Max	Max	Max	Max	Max	Max		
42100	AlSi7Mg0.3	6.5	7.5	-	0.15	-	0.03	-	0.10	0.30	0.45	0.03	0.03	0.07	0.03	0.03	0.18	0.03	80	1.89
42200	AlSi7Mg0.6	6.5	7.5	-	0.15	-	0.03	-	0.10	0.50	0.70	0.03	0.03	0.07	0.03	0.03	0.18	0.03	80	1.95
42300	AlSi7 (Mg)	6.5	7.5	-	0.15	-	0.03	-	0.10	0.10	0.30	0.03	0.03	0.07	0.03	0.03	0.18	0.03	80	1.86
42400	AlSi7MnMg	6.5	7.5	-	0.20	-	0.03	0.35	0.75	0.15	0.45	0.05	0.05	0.03	0.05	0.05	0.15	0.05	90	1.32
43300	AlSi9Mg	9.0	10.0	-	0.15	-	0.03	-	0.10	0.30	0.45	0.03	0.03	0.07	0.03	0.03	0.15	0.03	80	2.15
43500	AlSi10MnMg	9.0	11.5	-	0.20	-	0.03	0.40	0.80	0.15	0.60	0.05	0.05	0.07	0.05	0.05	0.15	0.05	90	1.58
44000	AlSi11	10.0	11.8	-	0.15	-	0.03	-	0.10	-	0.45	0.03	0.03	0.07	0.03	0.03	0.15	0.03	80	2.20
44600	AlSi10Mn	9.5	11.5	0.10	0.20	-	0.03	-	0.15	-	0.15	0.05	0.05	0.03	0.05	0.05	0.15	0.05	80	2.23
45500	AlSi7Cu0.5Mg	6.5	7.5	-	0.25	0.20	0.70	-	0.15	0.20	0.45	0.03	0.03	0.07	0.03	0.03	0.20	0.03	100	0.48
45600	AlSi7Cu1Mg0.6	6.5	7.5	-	0.15	0.8	1.6	-	0.10	0.50	0.70	0.03	0.03	0.07	0.03	0.03	0.18	0.03	80	1.93

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