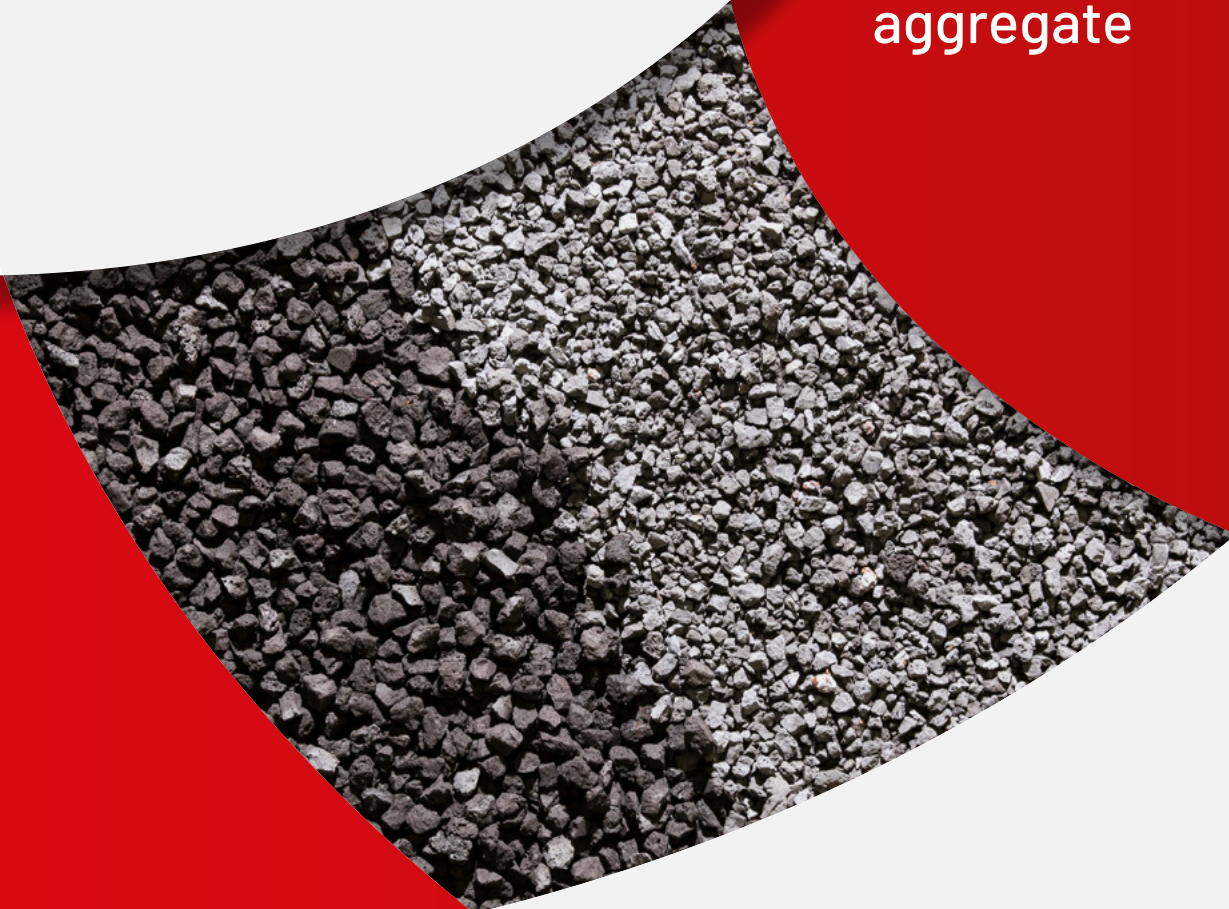




**Production Plant**  
Via San Paolo 152, 25134,  
Brescia - (IT)

# ENVIRONMENTAL PRODUCT DECLARATION

**Gripstone® industrial  
aggregate**



**Based on:**  
PCR ICMQ-001/15 v3  
EN:15804:2012+A2:2019  
UNI EN ISO 14025:2010

**Certification N°:**  
EPDITALY0716  
**Product CPC code:**  
37

**Date of issue:**  
2024/09/11  
**Valid until:**  
2029/09/11

**Declaration number:**  
AA\_EPD\_006



## General information

### EPD REFERENCES

EPD OWNER: Alfa Acciai, via San Polo 152, 25134, Brescia – ITALY; Manufacturing plant is located in the same site

PROGRAM OPERATOR: EPDItaly, Via Gaetano De Castillia 10, 20124 Milano – ITALY

### INDEPENDENT VERIFICATION

This declaration has been developed referring to the EPDItaly, following the last version of “Regolamento di EPDItaly”; further information and the document itself are available at: [www.epditaly.it](http://www.epditaly.it). EPD document valid within the following geographical area: Italy and other countries worldwide according to sales market conditions.

CEN standard EN 15804 served as the core PCR (PCR ICMQ-001/15 v3)  
PCR review conducted by Daniele Pace, contact via [info@epditaly.it](mailto:info@epditaly.it)

Independent verification of the declaration and data, according to EN ISO 14025 : 2010

Third party verifier: ICMQ SpA, via De Castillia, 10 20124 Milano  
([www.icmq.it](http://www.icmq.it))

EPD process  
certification  
(Internal)

EPD verification  
(External)

Accredited by: Accredia  
Procedure for follow-up during EPD validity involves third party verifier:

YES

NO

Environmental declarations published within the same product category, though originating from different programs, may not be comparable. In particular, EPDs of construction products may not be comparable if they do not comply with EN 15804.

The EPD Owner exempts EPDItaly from any non-compliance with environmental legislation. The holder of the declaration will be responsible for supporting information and evidence. EPDItaly disclaims all liability for the information, data and results provided by the EPD Owner for life cycle assessment.

### CONTACTS

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 **ALFA ACCIAI**

Technical support to Feralpi Group was provided by Life Cycle Engineering, Italy.  
([info@lcengineering.eu](mailto:info@lcengineering.eu), [www.lcengineering.eu](http://www.lcengineering.eu)).





## Alfa Acciai Group

The Alfa Acciai Group has been among Europe's main manufacturers of reinforced steel and wire rod for 70 years, with over 1,200 employees and a total production capacity of 2.5 million tons per year and is a benchmark in terms of cutting-edge technology, mindful of the employees and with environmental awareness throughout the entire steel supply chain.

The Group has always been renowned for its industrial flexibility, utmost operational efficiency upstream and downstream of the melting process, and great financial and equity strength. It is focused on ethical corporate social responsibility principles, routine maintenance on installations and operations, caring and listening to stakeholders' requirements.

### ALFA ACCIAI

The Brescia-based parent company is one of the largest electric-arc steelmaking plants in Italy and one of the top national wire rod producers, as well as being ranked among the leaders in the production of reinforcing steel for concrete in Europe.

The steel-making plant comprises two EAFs (electric arc furnaces) and 2 LFs (ladle furnaces), 2 five-strand

continuous casting machines (10 lines) and a shredder for proler production. The hot rolling division is equipped with two bars and spool mills and a wire rod mill.

The production cycle is completed by cold rolling mills that produce high-ductility welded mesh for reinforced concrete and recoiled wire.



### Acciaierie di Sicilia

Located in the industrial district of Catania, has been part of the Alfa Acciai Group since 1998 and is the only steel mill in the heart of the Mediterranean. It is one of the main industrial centers of the Region and is characterized by a strong export vocation thanks to its proximity to significant port infrastructures. The company stands out for its constant technological innovation and steel know-how, factors that guarantee increasingly high-quality standards, respecting the environment and the health and safety of its employees. The production process includes an EAF (electric arc furnace), a continuous casting machine (4 lines) and a hot rolling mill using a hot-charge system to produce reinforcing steel in bars and coils.



### FERROBERICA

Has belonged to the Group for over 30 years and has 5 operational sites located in: Vicenza, Montirone (BS), Sedegliano (UD) and 2 in Catania.

The company is the leading operator in Italy and the second in Europe in the cutting and bending, including the assembling of reinforcing steel for use in structural work. Thanks to its expertise, reliable supplies and market competitiveness, today Ferroberica is a production facility with a total annual capacity of 400,000 tonnes boasting the world's most high-tech plant in Montirone.



### TECNOFIL

Located in Gottolengo (BS), has been part of the Alfa Acciai Group since September 2016.

Tecnofil is currently the major drawing mill with a galvanizing plant in Europe. It produces steel wire, galvanized wire, alu-zinc wire, bright wire, annealed wire, redrawn wire and skinpassed wire for use in construction, household appliances, automotive, agricultural and numerous other applications of everyday life. Over the years the company has significantly expanded its overall production capacity (currently over 100,000 tons / year) and the range of products to be offered on the market.



## Scope & type of EPD®

The approach used in this EPD is “Cradle to gate with options” one

TABLE OF MODULES																	
MODULE	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
	Raw material supply	Transport	Manufacturing	Transport to the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De- construction demolition	Transport	Waste processing	Disposal	Reuse - Recovery - Recycling Potential
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
modules declared	✓	✓	✓	✓	MND	MND	MND	MND	MND	MND	MND	MND	✓	✓	✓	✓	✓
geography	IT	IT	IT	IT	-	-	-	-	-	-	-	-	IT	IT	IT	IT	IT
specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
variations - products	NOT RELEVANT			-	-	-	-	-	-	-	-	-	-	-	-	-	-
variations - sites	NOT RELEVANT			-	-	-	-	-	-	-	-	-	-	-	-	-	-

**SOFTWARE:** SimaPro ver. 9.5

**MAIN DATABASE:** Ecoinvent 3.9.1

**REPORT LCA:** Life Cycle Assessment (LCA) for hot and cold rolled structural steel and for recycled aggregates produced by Alfa Acciai for EPD® purposes - Final Report

**GEOGRAPHICAL SCOPE OF THE EPD:** Italy

**TYPE OF EPD:** specific for recycled industrial aggregates

## The Product

### Gripstone industrial aggregate



This EPD refers to the artificial aggregate of industrial origin Gripstone, produced at Alfa Acciai plant placed in Brescia (Italy). Production residue arising from the Electric Arc Furnace process represent the core material of the aggregate. Once produced and transformed, the black slag becomes Gripstone. This aggregate is therefore a high-performance synthetic aggregate similar to a natural basalt both in its chemical constitution and in its appearance. Gripstone is sold to external companies to be used in accordance to the reference technical standards of cement aggregates and bituminous conglomerates. The adoption of the Gripstone aggregate allows to avoid the depletion of inert natural materials such as basalt and gravel, with savings in terms of land use. Gripstone is classified as 100% by-product according to UNI/PdR 88:2020 (certificate n°R0449,20/12/2023-ICMQ) and obtained CE mark in 2023 with N° 2716 - CPR - QAID - 0378 from QAID.

Declared Unit according to EN:15804, the declared unit is 1 ton of Gripstone aggregate

INFORMATION	DESCRIPTION
<b>Product identification</b>	Gripstone artificial aggregate with natural origin
<b>Product features</b>	CE mark using 2+ scheme according to the following standards EN 12620:2002+A1: 2008 EN 13043:2002/AC: 2004 EN 13139:2002/AC: 2004 EN 13242:2002+A1: 2007  Water absorption [%] GRIPSTONE: ≤ 2%
<b>Plant features</b>	Total production of EPD covered products, oct- dec 2023: 8 805 t Total production, for selling purpose, oct- dec 2023: 8 805 t On-site air emission control system On-site waste water control system On-site system to recycle water used in process In/out materials/products and melting process monitored to prevent nuclear radiation Plant air emissions accounted under ETS(Emission Trading System)

The used basis of data is considered representative on the basis of the representativeness analysis carried out according to the data of a similar product of the EPD Owner

# Environmental performance

The detailed environmental performance (in terms of use of resources, pollutant emissions and waste generation) is presented for the three phases, Upstream, Core and Downstream and related sub-phases (A1-A2-A3-A4-C1-C2-C3-C4-D). The numbers reported in the following tables are the outcome of rounding.

For this reason total results could slightly differ from the sum of contributions of the different phases. The energy sources behind the electricity grid used in manufacturing is the Italian residual mix 0,457 kg CO<sub>2</sub> eq./kWh (AIB report May 2023) to which LCE adds emissions related to network losses and transformation.

ENVIRONMENTAL IMPACTS											
INDICATORS	UNITS / D.U.	UPSTREAM		CORE PROCESS			DOWNSTREAM				
		A1	A2	A3	A1:A3	A4	C1	C2	C3	C4	D
GWP	kg CO <sub>2</sub> eq	9.44E-01	3.15E-02	2.49E+00	3.46E+00	0.00E+00	5.85E+01	7.61E+00	0.00E+00	2.70E+00	0.00E+00
GWP,f	kg CO <sub>2</sub> eq	9.43E-01	3.15E-02	2.49E+00	3.46E+00	0.00E+00	5.84E+01	7.61E+00	0.00E+00	2.70E+00	0.00E+00
GWP,b	kg CO <sub>2</sub> eq	3.28E-04	1.90E-06	2.25E-04	5.55E-04	0.00E+00	3.48E-03	4.53E-04	0.00E+00	2.85E-04	0.00E+00
GWP,luluc	kg CO <sub>2</sub> eq	2.41E-04	6.30E-07	6.80E-05	3.10E-04	0.00E+00	2.40E-03	1.50E-04	0.00E+00	1.36E-04	0.00E+00
GWP,ghg	kg CO <sub>2</sub> eq	9.44E-01	3.15E-02	2.49E+00	3.46E+00	0.00E+00	5.85E+01	7.61E+00	0.00E+00	2.70E+00	0.00E+00
ODP	kg CFC11 eq	5.36E-08	6.95E-10	1.15E-09	5.55E-08	0.00E+00	9.22E-07	1.65E-07	0.00E+00	4.02E-08	0.00E+00
AP	mol H+ eq	4.47E-03	5.44E-05	2.56E-02	3.02E-02	0.00E+00	5.60E-01	3.32E-02	0.00E+00	2.51E-02	0.00E+00
EP,f	kg P eq	8.95E-05	2.19E-07	2.66E-05	1.16E-04	0.00E+00	4.41E-04	5.22E-05	0.00E+00	8.07E-05	0.00E+00
EP,m	kg N eq	8.85E-04	1.72E-05	1.29E-02	1.38E-02	0.00E+00	2.63E-01	1.48E-02	0.00E+00	1.14E-02	0.00E+00
EP,t	mol N eq	8.39E-03	1.76E-04	1.41E-01	1.50E-01	0.00E+00	2.86E+00	1.59E-01	0.00E+00	1.24E-01	0.00E+00
POCP	kg NMVOC eq	6.86E-03	9.44E-05	3.36E-02	4.06E-02	0.00E+00	8.41E-01	5.11E-02	0.00E+00	3.71E-02	0.00E+00
ADPE*	kg Sb eq	1.77E-07	1.10E-09	7.53E-08	2.53E-07	0.00E+00	2.46E-06	2.63E-07	0.00E+00	1.07E-07	0.00E+00
ADPF*	MJ	4.41E+01	4.28E-01	1.01E+00	4.55E+01	0.00E+00	7.69E+02	1.02E+02	0.00E+00	3.47E+01	0.00E+00
WDP*	m <sup>3</sup>	7.10E-02	3.91E-04	1.27E-01	1.99E-01	0.00E+00	9.85E-01	9.32E-02	0.00E+00	4.78E-02	0.00E+00

**GWP** Global warming potential, total

**GWP,f** Global warming potential, fossil

**GWP,b** Global warming potential, biogenic

**GWP,luluc** Global warming potential, land use & land use change

**ODP** Ozone depletion potential

**AP** Acidification Potential

**EP,f** Eutrophication potential, freshwater

**EP,m** Eutrophication potential, marine

**EP,t** Eutrophication potential, terrestrial

**POCP** Photochemical ozone creation potential

**ADPE** Abiotic depletion potential minerals & metals

**ADPF** Abiotic depletion potential fossil fuels

**WDP** Water use deprivation potential

Additional environmental impact indicators are computed in the LCA report but not reported in the EPD.

\*The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

RESOURCES USE											
INDICATORS	UNITS / D.U.	UPSTREAM		CORE PROCESS			DOWNSTREAM				
		A1	A2	A3	A1:A3	A4	C1	C2	C3	C4	D
PERE	[MJ]	4.21E-01	1.12E-03	1.24E-01	5.46E-01	0.00E+00	1.50E+00	2.68E-01	0.00E+00	1.55E-01	0.00E+00
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	4.21E-01	1.12E-03	1.24E-01	5.46E-01	0.00E+00	1.50E+00	2.68E-01	0.00E+00	1.55E-01	0.00E+00
PENRE	[MJ]	4.55E+01	4.32E-01	1.16E+00	4.71E+01	0.00E+00	7.78E+02	1.03E+02	0.00E+00	3.57E+01	0.00E+00
PENRM	[MJ]	0.00E+00	0.00E+00	1.21E-02	1.21E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	4.55E+01	4.32E-01	1.17E+00	4.71E+01	0.00E+00	7.78E+02	1.03E+02	0.00E+00	3.57E+01	0.00E+00
SM	[kg]	1.00E+03	0.00E+00	0.00E+00	1.00E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m <sup>3</sup> ]	2.76E-03	1.79E-05	3.22E-03	6.00E-03	0.00E+00	3.82E-02	4.26E-03	0.00E+00	1.82E-03	0.00E+00

**PERE** Use of renewable primary energy excluding renewable primary energy resources used as raw materials

**PERM** Use of renewable primary energy resources used as raw materials

**PERT** Total use of renewable primary energy resources

**PENRE** Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials

**PENRM** Use of non-renewable primary energy resources used as raw materials

**PENRT** Total use of non-renewable primary energy resources

**SM** Use of secondary raw materials

**RSF** Use of renewable secondary fuels

**NRSF** Use of non-renewable secondary fuels

**FW** Use of net fresh water

OUTPUT FLOWS											
INDICATORS	UNITS / D.U.	UPSTREAM		CORE PROCESS			DOWNSTREAM				
		A1	A2	A3	A1:A3	A4	C1	C2	C3	C4	D
HWD	[kg]	0.00E+00	0.00E+00	2.68E-03	2.68E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	[kg]	0.00E+00	0.00E+00	5.97E-02	5.97E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+03	0.00E+00
RWD	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	2.99E-01	2.99E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

**HWD** Hazardous waste disposed

**NHWD** Non-hazardous waste disposed

**RWD** Radioactive waste disposed

**CRU** Components for re-use

**MFR** Materials for recycling

**MER** Materials for energy recovery

**EE** Exported energy

## Calculation Rules

The environmental burden of the product has been calculated according to EN 15804:2012+A2:2019<sup>1</sup> and PCR ICMQ-001/15 v3. This declaration is a cradle to gate with options EPD type, based on the application of Life Cycle Assessment<sup>2</sup> (LCA) methodology to the whole life-cycle system.

In the whole LCA model, infrastructures and production equipments are not taken into account.

Hot rolled steel products at plant level, were described by using specific data from manufacturing facility (Brescia, Italy) for 2023 for months of october, november and december.

Customized LCA questionnaires were used to gather in-depth information about all aspects of the production system (for example, raw materials contents and specifications, pre treatments, process efficiencies, air and water emissions, waste management), in order to provide a complete picture of the environmental burden of the system from raw materials supply (A1) to Transport (A2) and Manufacturing (A3).

The use phase was not considered according to EN:15804 and PCR ICMQ-001/15 v3. Transport to final destination has been considered (A4), but the

sale is made while the Gripstone is placed in the storage bays and there is no mobilisation of the Gripstone, the sale is in fact made on ex work mode (description of the module on page 13). End of life (C1-C2-C3-C4-D) were considered. However, there are no C3 related activities for this industrial aggregate. The product is designed for being used exposed to water and air. Therefore, in nominal installation and operating conditions, no emissions to air nor to water shall occur. Alfa Acciai performs several tests to carefully assess these properties and to ensure the complete safety of the Gripstone aggregate.

According to ISO 14040 and 14044, allocation is avoided whenever possible by dividing the system into sub-systems. When allocation cannot be avoided physical properties are used to drive flow analysis. In this case, an economic allocation was made to calculate the environmental impacts of Gripstone.

Data quality has been assessed and validated during data collection process.

According to EN:15804 the applied cut-off criterion for mass and energy flows is 1%.



## System boundaries

Broad scheme of Gripstone aggregate production, in which the main activities included in the system boundaries, are listed and divided in the three subsystems:



### UPSTREAM process

A1

- » Scrap pretreatment  
Shearing / Shredding / Sorting
- » Raw material and Energy production

### CORE module

A2/A3

- » Supplying transport
- » Billets production
- » Gripstone treatment
- » Internal handling
- » Ancillary materials and activities
- » Air emission
- » Water emission
- » Waste management

### DOWNSTREAM process

A4/C1/C2/C3/C4/D

- » Distribution
- » De-construction demolition
- » Transport
- » Waste processing
- » Disposal
- » Reuse - Recovery - Recycling potential

<sup>1</sup>EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations Core rules for the product category of construction products.

<sup>2</sup>The LCA methodology is standardized at international level by ISO 14040 and ISO 14044.



## Upstream process

A1



Steel scrap collection (shredded both in external and internal plants) and other raw materials production

Specific secondary materials pre-treatments, where appropriate

Production of alloy elements

Generation of electricity and other fuels from primary and from secondary energy resources (excluding waste treatments)

**A1**  
RAW MATERIALS SUPPLY

## Core module

A2 / A3



Raw materials transportation from production or collection facilities to the production plant and internal transportation

Steel mill production, including utilities

Gripstone aggregate production, including utilities

Treatment of waste generated from the manufacturing processes

**A2**  
TRANSPORTATION  
+  
**A3**  
MANUFACTURING



## Downstream process

A4 / C1 / C2 / C3 / C4 / D



### A4 DISTRIBUTION

Transport to the customers. Gripstone is entirely sold to the company ZEROCENTO-B S.R.L. and the sale is being made while the Gripstone is in the bays of storage bays and there is no mobilisation (sale ex work), consequently the shipment to customers is considered with a distance of 0 km.

### C1 DE-CONSTRUCTION DEMOLITION

Dismantling and demolition operations required to remove the product from the building. Initial onsite sorting of the materials is included as well.

### C2 TRANSPORT

Transportation of the discarded product as part of the waste processing (to recycling site or to a final disposal site).

### C3 WASTE PROCESSING

Waste processing, including collection of waste fraction from deconstruction and waste processing of material flows intended for reuse, recycling and energy recovery.

### C4 DISPOSAL

Waste disposal including physical pre-treatment and management of the disposal site.

### D REUSE - RECOVERY - RECYCLING POTENTIAL

Environmental impacts associated to waste use after the investigated system (including recycling).

## Minimum content of recycled, recovered, by-product materials

TABLE OF MODULES

PRODUCT TYPE	PRODUCT NAME		RECYCLED MATERIAL			RECOVERED MATERIAL	BY-PRODUCT MATERIAL	TOTAL CONTENT OF RECYCLED, RECOVERED BY-PRODUCT MATERIAL
			TOTAL	PRE - CONSUMER	POST - CONSUMER			
Industrial aggregate	Gripstone	≥	0%	0%	0%	0%	100%	100%

**Content of recycled materials  $\geq 99,0\%$   
(Certified by ICMQ SpA following UNI/PdR 88:2020)**

**Certificate n. R0449, of 11/09/2024**



## Other optional additional environmental information

### Other environmental characteristics of Alfa Acciai plant

The production process involves scrap melting in the two electric arc furnaces (EAFs) with a total annual production capacity of about 2,000,000 tonnes, liquid steel tapping and secondary metallurgical processing in the two ladle furnaces, and finally casting in the two 5-line continuous casting machines. Alfa Acciai plant is equipped with powerful off-gas filtering system for both furnaces with active carbons injection to prevent and reduce the organic micro pollutants in air emissions (PCDD /F and PCB).

Alfa Acciai in Brescia is a model of circular economy as through the rational consumption of materials and recycling strategies it minimizes the use of raw natural resources and enhances the residues produced. In recent years, environmental issues have assumed increasing importance worldwide, Alfa Acciai has shown itself to be sensitive to these aspects, undertaking actions aimed at reducing its impact.

Among the main projects the following stand out:

- SmartGrid Pilot Project recovers heat from the offgas plant cooling system serving the furnaces at the steel mill and through an highly energy-efficient heat exchange system connects the Alfa Acciai process and the A2A district heating network. Thanks to this plant more than 6,000 residential units should be heated and at the same time reduces heat loss into the atmosphere and make-up water consumption;
- Decarbonisation, achieved among other, through the partial replacement of the coal and its derivatives, in the EAF process, with recycled polymers reach in biomass carbon with the aim of reduce CO<sub>2</sub> emissions;
- Energy efficiency, through the implementation of initiatives geared towards optimising the use of energy resources and reducing consumption, e.g., through energy optimisation processes based on the recovery of heat generated by industrial facilities and increased use of energy from renewable sources.

### REFERENCES

- EN 15804:2012+A2:2019
- ISO 14040:2021
- ISO 14044:2021
- Life Cycle Assessment (LCA) for hot and cold rolled structural steel and for Sinstone recycled industrial aggregate produced by Alfa Acciai for EPD® purposes - Final Report
- EPDIItaly General Programme Information v6.0
- PCR ICMQ-001/15 v3







All-round sustainability

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25134 Brescia - Italy

Log on to

[www.alfaacciai.it](http://www.alfaacciai.it)