

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



Hot-rolled reinforcing steel for concrete in bars and coils







Based on:

PCR ICMQ-001/15 v.3.1. EN:15804:2012+A2:2019 UNI EN ISO 14025:2010 Certification N°: EPDITALY0963

Product CPC code: 41

Date of issue: 2025/06/25 Valid until: 2030/06/25 **Declaration number:**

AA_EPD_008

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. 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 v.3.1.) PCR review conducted by Daniele Pace, contact via 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

EPD process certification



(www.icmq.it)

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





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

Ing. Aldo Faini (a.faini@alfaacciai.it)
Environmental Management System Manager and Environmental Certifications
Phone: (+39) 030 23918360



Technical support to Feralpi Group was provided by Life Cycle Engineering, Italy. (info@lcengineering.eu, 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.

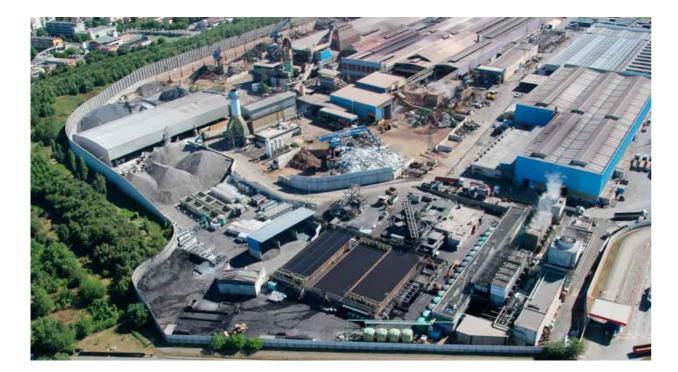
ALFA ACCIAI

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.





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.





OFERROBERICA

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.



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, agricoltural 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

	TABI	TABLE OF MODULES															
	PRODUCT STAGE		PRODUCT STAGE STAGE CONSTRUCTION PROCESS STAGE			USE STAGE						END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES	
MODULE	Raw material supply	Transport	Y Manufacturing	Transport to the gate to the site	A Asseambly	es P1	B2 Mainteinance	Repair	Replacement	R Refurbishment	B Operational energy use	B7 Operational water use	De-construction demolition	C2 Transport	Waste processing	lesodsiQ C4	G Reuse - Recovery - Recycling Potential
modules declared	✓	✓	✓	✓	MND	MND	MND	MND	MND	MND	MND	MND	✓	✓	✓	✓	✓
geography	IT	IT	IT	WLD	-	-	-	-	-	-	-	-	WLD	WLD	WLD	WLD	WLD
specific data used		>90%		-	-	-	-	-	-	-	-	-	-	-	-	-	-
variations - products	NOT	RELEV	ANT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
variations - sites	NOT	RELEV	ANT	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SOFTWARE: SimaPro ver. 10.2.0

MAIN DATABASE: Ecoinvent 3.10

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: World according to sales market conditions

TYPE OF EPD: specific for hot rolled steel products

The Product

Hot-rolled reinforcing steel for concrete in bars and coils



This EPD refers to construction products, hot rolled structural steel bars, produced at Alfa Acciai plant placed in Brescia (Italy), with electric arc furnace technology, starting from post and pre consumer steel scraps. The homogeneous and repeatable mechanical features of steel guarantee excellent performance in any type of construction and geographical area, since they have high ductility.

EPD reference products have a chemical composition in compliance with national regulation of destination countries where they are sent. In general, the main materials of the final product are: iron > 96%; alloy elements (e.g. manganese, silicon, carbon) 2% c.a.; other elements (e.g. copper, nickel, chromium), complementary to 100%.

Declared Unit according to EN:15804, the declared unit is 1 ton of hot rolled product in bars

INFORMATION	DESCRIPTION						
Product identification	Hot-rolled reinforcing steel for concrete in bars and coils						
Product features	Bars: Diameters from 8 mm to 32 mm Length up to 18 m Weight: 2 300 kg per bundle Coils: Diameters from 6 to 16 mm Weight from 2 500 to 5 000 kg according to the diameter						
	Steel coming from post and pre consumer steel scraps produced in electric arc furnace route (EAF) and further hot rolling process.						
	Adherence and surface geometry f_R or f_p : - for $5 \le \emptyset \le 6$ mm f_R or f_p 0.035; - for $6 < \emptyset \le 12$ mm f_R or f_p 0.040; - for $\emptyset > 12$ mm f_R or f_p 0.056.						
Product properties	Weldability: C _{eq} < 0.52						
(under EN10080:2005)	Typical yield stress: 400 MPa ≤ Cv ≤ 600 MPa						
	Elongation: Agt > 5%						
	Successful in bend and rebend test						
	Successful in strength test and oligocyclic strength test						
	Products covered by this EPD, year 2024: 772 085 t						
	Total production, for selling purpose, year 2024: 772 085 t						
	On-site air emission control system						
Plant features	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)						

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.

sum of contributions of the different phases.

The energy sources behind the electricity grid used in manufacturing is a mix between italian residual mix 2023 and renewable energy with Guarantees of Origin related network losses and transformation. Final emission factor is 0,44 kg CO₂ eq./kWh.

For this reason total results could slightly differ from the

ENVIRONMENTAL IMPACTS														
		UPSTREAM	STREAM CORE P			DOWNSTREAM								
INDICATORS	UNITS / D.U.	A1	A2	А3	A1:A3	Α4	C1	C2	C3	C4	D			
GWP	kg CO ₂ eq	3,78E+02	2,34E+01	2,02E+02	6,03E+02	3,56E+01	5,29E+01	3,46E+01	5,54E+01	2,72E-01	7,10E+01			
GWP,f	kg CO ₂ eq	3,77E+02	2,34E+01	2,02E+02	6,02E+02	3,56E+01	5,29E+01	3,46E+01	5,53E+01	2,72E-01	7,11E+01			
GWP,b	kg CO ₂ eq	3,26E-01	8,23E-04	9,86E-02	4,25E-01	1,26E-03	2,06E-03	1,49E-03	3,48E-03	2,01E-05	-8,11E-02			
GWP,luluc	kg CO ₂ eq	6,11E-01	5,95E-04	8,88E-02	7,00E-01	9,05E-04	1,82E-03	1,12E-03	5,04E-03	1,11E-05	-1,03E-03			
GWP,ghg	kg CO ₂ eq	3,78E+02	2,34E+01	2,02E+02	6,03E+02	3,56E+01	5,29E+01	3,46E+01	5,54E+01	2,72E-01	7,10E+01			
ODP	kg CFC11 eq	1,01E-05	4,89E-07	1,11E-06	1,17E-05	7,48E-07	8,32E-07	5,01E-07	8,47E-07	4,02E-09	1,05E-07			
AP	mol H+ eq	1,24E+00	4,46E-02	4,61E-01	1,74E+00	5,71E-02	4,95E-01	4,75E-02	5,06E-01	2,47E-03	2,34E-01			
EP,f	kg P eq	8,17E-03	2,02E-05	3,26E-03	1,15E-02	3,08E-05	5,00E-05	8,34E-05	1,64E-04	9,77E-07	-7,74E-03			
EP,m	kg N eq	2,72E-01	1,03E-02	1,58E-01	4,40E-01	1,30E-02	2,33E-01	9,89E-03	2,35E-01	1,12E-03	2,96E-02			
EP,t	mol N eq	3,02E+00	1,13E-01	1,66E+00	4,79E+00	1,42E-01	2,55E+00	1,09E-01	2,57E+00	1,23E-02	6,23E-01			
POCP	kg NMVOC eq	1,24E+00	7,20E-02	5,57E-01	1,87E+00	1,02E-01	7,58E-01	7,65E-02	7,65E-01	3,72E-03	1,82E-01			
ADPE*	kg Sb eq	5,95E-05	7,85E-07	8,70E-05	1,47E-04	1,20E-06	2,21E-06	2,04E-06	2,28E-06	1,07E-08	1,03E-03			
ADPF*	MJ	6,68E+03	3,18E+02	1,21E+03	8,21E+03	4,85E+02	6,97E+02	4,63E+02	7,28E+02	3,49E+00	5,68E+02			
WDP*	m³	9,54E+01	1,35E-01	1,71E+02	2,66E+02	2,06E-01	5,50E-01	4,19E-01	9,13E-01	3,16E-03	-1,03E+01			

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 Abjotic depletion potential fossil

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 enviromental 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													
	UNITS / D.U.	UPSTREAM	CORE PROCESS			DOWNSTREAM							
INDICATORS		A1	A2	А3	A1:A3	Α4	C1	C2	C3	C4	D		
PERE	[MJ]	9,46E+02	1,09E+00	1,64E+02	1,11E+03	1,68E+00	1,53E+00	7,42E-01	5,70E+00	1,54E-02	8,09E+01		
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]	9,46E+02	1,09E+00	1,64E+02	1,11E+03	1,68E+00	1,53E+00	7,42E-01	5,70E+00	1,54E-02	8,09E+01		
PENRE	[MJ]	6,68E+03	3,18E+02	1,20E+03	8,20E+03	4,85E+02	6,97E+02	4,63E+02	7,28E+02	3,49E+00	5,68E+02		
PENRM	[MJ]	0,00E+00	0,00E+00	1,04E+01	1,04E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00		
PENRT	[MJ]	6,68E+03	3,18E+02	1,21E+03	8,21E+03	4,85E+02	6,97E+02	4,63E+02	7,28E+02	3,49E+00	5,68E+02		
SM	[kg]	1,35E+03	0,00E+00	0,00E+00	1,35E+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	[m³]	2,88E+00	8,12E-03	4,24E+00	7,14E+00	1,24E-02	2,18E-02	1,73E-02	3,64E-02	1,21E-04	-4,42E-01		

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

FW Use of net fresh water

OUTPUT FLO	ows												
	DICATORS UNITS / D.U.	UPSTREAM	CORE PROCESS			DOWNSTREAM							
INDICATORS		A1	A2	А3	A1:A3	Α4	C1	C2	C3	C4	D		
HWD	[kg]	3,18E+01	6,76E-03	2,62E+00	3,44E+01	1,02E-02	3,67E-02	1,04E-01	1,28E-01	5,01E-04	3,78E+01		
NHWD	[kg]	6,59E+01	4,56E-01	6,35E+01	1,30E+02	6,98E-01	6,97E-01	4,23E-01	8,14E-01	1,00E+02	-1,21E+03		
RWD	[kg]	4,83E-03	2,96E-05	4,73E-03	9,59E-03	4,53E-05	3,56E-05	1,63E-05	1,17E-04	2,14E-07	-2,51E-04		
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	1,39E+02	1,39E+02	0,00E+00	0,00E+00	0,00E+00	9,00E+02	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+A2:2019¹ and PCR ICMQ-001/15 v.3.1. This declaration is a cradle to gate with options EPD type, based on the application of Life Cycle Assessment² (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 year 2024.

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 v.3.1., while transport to final destination (A4) and end of life (C1-C2-C3-C4-D) were considered. The product is designed for being incorporated into concrete structures. Therefore, in nominal installation and operating conditions, no emissions to air nor to water shall occur.

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.

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%.



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

²The LCA methodology is standardized at international level by ISO 14040 and ISO 14044.

System boundaries

Broad scheme of hot-rolled reinforcing steel for concrete 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
- » Hot rolling process
- » 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

Upstream process

Δ.



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

Specific secondary materials pre-treatments, where appropriate

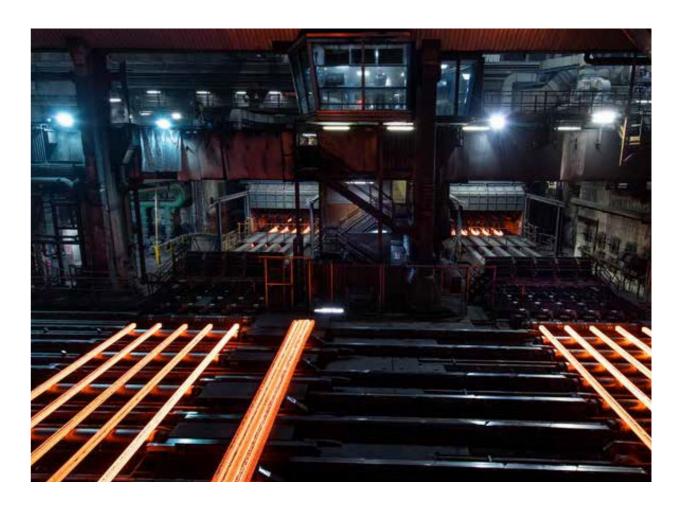


Production of alloy elements

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

Core module

A2/A3



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





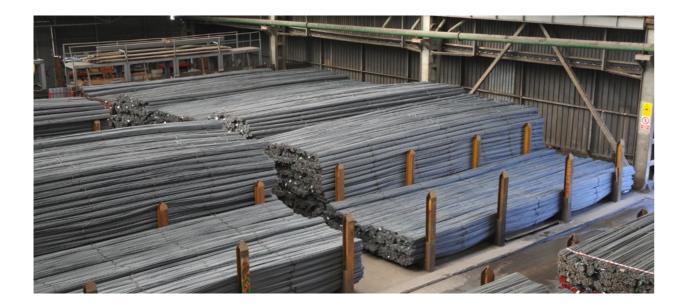
Steel mill production, including utilities

Rolling mill, production, including utilities

Treatment of waste generated from the manufacturing processes

Downstream process

A4/C1/C2/C3/C4/D



A4 DISTRIBUTION Transport to the customers (general market average). Distances estimated considering the transported quantities and the distances from Brescia plant to the client. From Brescia (in the North of Italy) final products are delivered to many national and international areas such as Germany, France and Austria, mentioning the main countries. The means of transport used to deliver steel bars are truck and freight ship.

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.

REUSE - RECOVERY - RECYCLING POTENTIAL

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

In this module impacts arising from steel recycling are accounted, including avoided impacts associated to primary steel production. The result is expressed as net value between direct impact (i.e. recycling steel in EAF furnace) and avoided impact (i.e. producing steel from iron ore in BOF furnace.

Minimum content of recycled, recovered, by-product materials

TABLE OF MODULES								
PRODUCT TYPE	PRODUCT			RECYCLED MATERIAL		RECOVERED MATERIAL	BY-PRODUCT MATERIAL	TOTAL CONTENT OF RECYCLED, RECOVEREDBY-PRODUCT MATERIAL
			TOTAL %	PRE-CONSUMER%	POST - CONSUMER %			
Steel for armed concrete and wire rod for drawing	Hot rolled bars and coils	2	99%	36,2%	62,8%	0	0	≥99%

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

Certificate n. R0449, of 25/06/2025 Valid until: 09/09/2027

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 CO₂ 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 v2-2025-06-12
- EPDItaly General Programme Information v6.0
- PCR ICMQ-001/15 v.3.1.





All-round sustainability

Via San Polo, 152

25134 Brescia - Italy

-Log on towww.alfaacciai.it