

Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Welding Filler Metals: Copper-coated unannealed MAG wire from Vamberk

from

ESAB

EPD of multiple products, based on the average results of the product group. See list of products on page 3.



Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products from a company
EPD registration number:	EPD-IES-0027183
Version date:	2025-12-15
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<i>An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com</i>	



GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>Construction Products, PCR 2019:14, Version 2.01</i> UN CPC 41267
PCR review was conducted by: <i>The Technical Committee of the International EPD® System. Review chair: Rob Rouwette (chair), Noa Meron (co-chair) Contact: EPD International (environdec.com)</i>

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
☒ EPD process certification* without a pre-verified LCA/EPD tool
Third-party verifier: <i>Bureau Veritas Sweden, Fabriksgatan 13, 412 50 Göteborg.</i>
Accredited by: <i>SWEDAC, accreditation number 1236.</i>
*EPD process certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.envrondec.com .
Procedure for follow-up of data during EPD validity involves third party verifier:
☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: ESAB

Address: ESAB AB, Box 8004, 402 77 Göteborg, Sweden

Contact: Phone: +46 31 50 90 00, E-mail: epd@esab.com.

Description of the organisation: ESAB is a world leader in welding and cutting equipment and consumables. We offer a complete line of fabrication solutions for virtually every application.

Product-related or management system-related certifications: ISO 9001, 14001, 45001 in all ESAB sites globally including the manufacturing site in Vamberk.

PRODUCT INFORMATION

Product name: The product group consists of OK Autrod 12.51, OK Autrod 12.58, OK Autrod 12.64, Purus 42, Purus 46 sold in Europe.

Product identification: Item numbers starting with 1251, 1258, 1264, 1C10 or 1C12 are all products in this group.

UN CPC code: 41267

Product description: Copper coated, not annealed, silicon-manganese alloyed solid wires for GMAW (gas metal arc welding) of all general structural and engineering unalloyed and low-alloyed carbon manganese steels. They are delivered on spools or in ESAB Marathon Pac and are mainly used in mechanized welding applications. Applications include automobile frame fabrication, shipbuilding hulls, general fabrication, and truck trailers.

The Reference Service Life for a welded joint depends on a number of factors, including welding method used, quality of welding and joint design, exact alloy composition, the environment in which it is installed (corrosiveness, temperatures, UV-exposure etc), as well as whether the joint is part of a bearing structure exposed to vibrations, movements or dynamic loads. If all factors are optimal, the life span is usually around 40 years. Regular inspections and maintenance prolong the lifetime.

Unused welding filler metals, stored under right conditions, can have a shelf life of two years and longer.

Name and location of production site: ESAB CZ S.R.O., Smetanovo nábř. 334, 517 54 Vamberk, Czech Republic.

CONTENT DECLARATION

The content declaration is based on the average contents of the five product groups included in this EPD.

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material	
			Mass-%	kg C/declared unit
Steel	1,0E+00	4.0%	0	0
Copper	4,1E-03	0	0	0
TOTAL	1,0E+00	0	0	0

The products do not contain any declarable quantities of substances listed on the Candidate List of Substances of Very High Concern for Authorisation (REACH, EC No. 1907:2006). During the welding process, potentially hazardous fumes can arise. See section Additional Environmental Information for further information.

Packaging materials	Mass, kg	Mass-% of product	Biogenic material	
			Mass-%	kg C/ declared unit
Metal	5,3E-03	0,5%	0,0%	0,0E+00
Plastic	2,7E-03	0,3%	0,0%	0,0E+00
Paper	6,3E-05	0,0%	100,0%	2,5E-05
Cardboard	1,3E-02	1,3%	100,0%	5,8E-03
Wood	1,3E-03	0,1%	99,0%	6,1E-04
TOTAL	2,3E-02	2,3%	62,4%	6,4E-03

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO₂.

LCA INFORMATION

Declared unit: 1 kg of copper-coated MAG wire.

Reference service life: There is no specific maximum time limit before which filler materials should be used. If stored under ideal storage conditions the time limit is extended, and filler materials can be used many years after the date of supply. The reverse is also true i.e. tough and severe storage conditions shorten the durability of the products. See Storage and Handling Recommendations for Filler Metals. The life span of a welded joint depends on several factors. See Product Information above for more details.

Time representativeness: Data has been collected for the full production year of 2024.

Geographical scope: Our own process is in the Vamberk manufacturing site in Czech Republic and most of the suppliers are based in Europe. The product group is supplied to customers globally.

Database(s) and LCA software used: EcolInvent 3.10 and SimaPro 9.6

Description of system boundaries:

EPD type d) Cradle to gate, A1–A3. The life cycle inventory includes:

- Upstream production of raw material steel, electricity, chemical products, packaging materials/parts,
- Inbound transport on road,
- Internal transports,
- Transport of finished goods from our manufacturing site to our warehouses,
- Energy and heat consumption, water consumption, emissions to water and generation of waste on site, and
- Downstream handling of production and packaging waste.

The production and maintenance of capital goods, infrastructure, tooling, and facilities have not been included, either in upstream processes or own processes, except for electricity production which includes infrastructure due to high importance in said datasets. Business travel has also been excluded. Supplier packaging has also been excluded due to limited use of packaging in the upstream as well as limited primary or secondary data.

The upstream production of steel wire has been modelled using supplier EPDs and generic data to represent production at suppliers without available EPDs. For suppliers without EPDs, European market averages have been used as a basis together with communicated shares of average recycled content from suppliers.

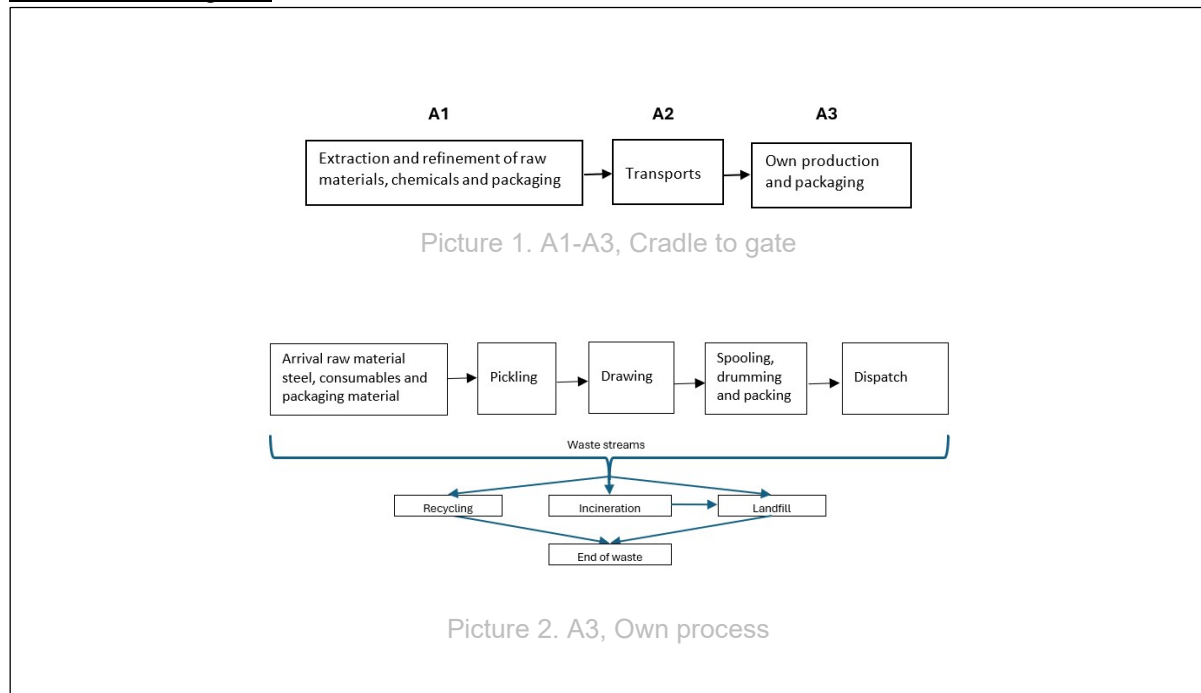
In the end-of-life, the product cannot be separated from the bearer material it has been welded onto, is no longer identifiable and does not contain biogenic carbon. This means that the scope of the study, A1-A3, has been chosen in accordance with Section 2.2.2 in PCR 2019:14.

The period for which inputs to and outputs from the product system is accounted for is 100 years from the year that the LCA model represents. Forestry is included in the study as part of the techno sphere. Biogenic carbon in packaging materials has been balanced out with a packaging End-of-life treatment in A3.

Cut-off criteria:

When there have been uncertainties or missing data, conservative assumptions have been made. Cut-offs are never more than 1% of total environmental impacts, and all cut-offs together do not exceed 5%. In this LCA, no cut-offs have been made when collecting primary data.

Process flow diagram:



Data quality:

Collection of data has been carried out in an iterative process in close collaboration with EHS professionals at the manufacturing site. Much of the data stems from records in the management system for ISO 14001 or 50001. Where primary data was not available, secondary data from Ecolinvent has been used. All available data have been included in the LCA Report.

As A1 stands for a major part of CO₂-equivalents, the quality of data for raw material steel production has much bearing on results. Representative secondary data for raw material production is from Ecolinvent and is deemed to be representative of geographical, time and technological prerequisites. The dataset is for reference year 2024. All processes have been deemed to fulfil the requirements as “Very good” or “Good” for the geographical, time and technological prerequisites, except for the modelled steel materials without EPDs that that was categorized as “Fair” in its time representativeness. For the technological and geographical levels, it was categorized as “Good”.

Share of primary data in the LCA is 81%, which a majority can be attributed to used supplier EPDs (>65%) and to a lesser degree electricity, heating and transport processes. Inbound transport was calculated based on collected data on transport distances and weights for all ingoing materials to factory which was combined with representative secondary data. This means that inbound transport is a mixture of primary and secondary data which in total contributed 2% to the GWP-GHG impact. Proxy data has been used to reflect the use of energy needed to run warehouses. Proxy data has also been used to represent some chemical products in A3, for which we could not find representative secondary data. The proxy data amounts to 0,4% of total impact. In total the share of primary data reflects 81%, secondary data 18,6% and proxy data 0,4% to the GWP-GHG impact.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Manufacturing of product	Collected data	EPD owner	2024	Primary data	9%
Raw material metal wire, Supplier A	Database	Ecolnvent v3.10	2023	Representative Secondary data	0%
Raw material metal wire, Supplier B	Collected data	Supplier EPD (Confidential) with >95% primary data	2021	Primary data	26%
Raw material metal wire, Supplier C	Collected data	Supplier EPD (Confidential) with >95% primary data	2022	Primary data	43%
Transport processes	Collected data	EPD owner	2021-2024	Primary data	3%
Other processes	Collected data and database	Ecolnvent v3.10	2023	Representative secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					81%

Electricity mix:

The dataset used for residual electricity mix in Czech Republic is from Ecolnvent, and is based on figures from AIB, Association of Issuing Bodies. The GWP(GHG)-factor for this electricity mix is 0.76 kg CO₂-equivalents per kWh.

Allocation procedures:

Allocations for our own processes (A3) have been made based on mass of produced products. The share of environmental impact has been distributed evenly between the product groups as the internal process is the same for all of them.

Allocation has been applied to relevant upstream raw materials datasets to reflect supplier-specific information. Where supplier EPDs were available, these have been used directly to model the raw material flows. For suppliers without EPDs, datasets have been modified using allocation based on communicated shares of recycled content. These models are built using representative secondary data from the European market, adjusted with primary data from suppliers regarding recycled material content.

In line with the cut-off approach, recycled material flows have been modeled as burden-free, based on supplier-provided statistics. For the rest of composition which reflects zero recycled material, the material has been allocated the same burden as a primary (virgin) material and thus carry the full burden according to the conservative approach that is recommended in section 4.5.1 in PCR 2019:14.

Explanation of product group:

The main differences between the products included is the composition of alloys and dimensions of the wire. The LCA has been carried out using the average results since variations in environmental performance is lower than 10% between the best- and worst-case results for all indicators.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	GLO	EU	CZ	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Primary data used	81%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

ENVIRONMENTAL PERFORMANCE

LCA results - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit		
Indicator	Unit	A1-A3
GWP-fossil	kg CO ₂ eq.	3,0E+00
GWP-biogenic	kg CO ₂ eq.	4,3E-02
GWP-luluc	kg CO ₂ eq.	1,4E-03
GWP-total	kg CO ₂ eq.	3,0E+00
ODP	kg CFC 11 eq.	2,2E-08
AP	mol H ⁺ eq.	1,3E-02
EP-freshwater	kg P eq.	5,5E-04
EP-marine	kg N eq.	2,7E-03
EP-terrestrial	mol N eq.	2,8E-02
POCP	kg NMVOC eq.	9,8E-03
ADP-minerals&metals*	kg Sb eq.	2,1E-05
ADP-fossil*	MJ	4,0E+01
WDP*	m ³	3,9E-01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption	

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator. The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available secondary datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes. Capital goods and infrastructure has only been included in generic datasets for electricity production.*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit		
Indicator	Unit	A1-A3
GWP-GHG ¹	kg CO ₂ eq.	2,9E+00
<i>Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017</i>		

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Resource use indicators

Results per functional or declared unit		
Indicator	Unit	A1-A3
PERE	MJ	1,7E+00
PERM	MJ	2,1E-01
PERT	MJ	1,9E+00
PENRE	MJ	4,0E+01
PENRM	MJ	1,2E-01
PENRT	MJ	4,0E+01
SM	kg	1,7E-01
RSF	MJ	6,9E-09
NRSF	MJ	0,0E+00
FW	m ³	7,0E-03
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water	

Waste indicators

Results per functional or declared unit		
Indicator	Unit	A1-A3
Hazardous waste disposed	kg	1,1E-02
Non-hazardous waste disposed	kg	2,1E+00
Radioactive waste disposed	kg	1,8E-02

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Output flow indicators

Results per functional or declared unit		
Indicator	Unit	A1-A3
Components for re-use	kg	0,0E+00
Material for recycling	kg	3,3E-01
Materials for energy recovery	kg	0,0E+00
Exported energy, electricity	MJ	0,0E+00
Exported energy, thermal	MJ	0,0E+00

ADDITIONAL ENVIRONMENTAL INFORMATION

The welded product is recyclable together with the material it has been welded on to, given that the bearer material is possible to separate from other, non-metal materials, and that there is infrastructure for recycling available where and when it becomes waste. By choosing material recycling at the end-of-life of the welded construction, the end user can contribute to energy savings in the life cycle and re-use of the metals and alloys in the product.

Welding activities give emissions of potentially hazardous fumes. After welding has been finished, there are no emissions from the welded goods (when situated in building). ESAB is committed to reducing hazardous fumes from welding activities and have instructions for proper use of the product to reduce indoor emissions, as well as a range of Personal Protective Equipment products. More information can be found at esab.com.

We have a triple umbrella certificate for ISO 9001, 14001 and 45001 for all our sites globally. More information about our Sustainability work can be found here: [Sustainability | Our Approach | ESAB Corporation](#). For questions about this EPD, please contact us at epd@esab.com.

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
PCR	Product Category Rules
c-PCR	Complementary Product Category Rules
CEN	European Committee for Standardization
CLC	Co-location centre
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
GRI	Global Reporting Initiative
Environmental Impact Indicators (EN 15804)	
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO ₂ eq.)
GWP-fossil	Global Warming Potential from fossil sources (kg CO ₂ eq.)
GWP-biogenic	Global Warming Potential from biogenic sources (kg CO ₂ eq.)
GWP-luluc	Global Warming Potential from land use and land use change (kg CO ₂ eq.)
GWP-total	Total Global Warming Potential (kg CO ₂ eq.)
GWP-GHG	Global Warming Potential for greenhouse gases (kg CO ₂ eq.)
ODP	Ozone Depletion Potential (kg CFC-11 eq.)
AP	Acidification Potential (mol H ⁺ eq.)
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential (kg P eq.)
EP-marine	Marine eutrophication potential (kg N eq.)
EP-terrestrial	Terrestrial eutrophication potential (mol N eq.)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
ADP	Abiotic Depletion Potential
ADP-minerals&metals	Abiotic depletion potential for non-fossil resources (kg Sb eq.)
ADP-fossil	Abiotic depletion potential for fossil resources (MJ)
WDP	Water Deprivation Potential (m ³)
Resource Use Indicators	
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)
PERT	Total use of renewable primary energy resources (MJ)
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non-renewable primary energy resources used as raw materials (MJ)
PENRT	Total use of non-renewable primary energy resources (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non-renewable secondary fuels (MJ)
FW	Use of net fresh water (m ³)
Waste Indicators	
HW	Hazardous Waste (disposed) (kg)
NHW	Non-Hazardous Waste (disposed) (kg)
RW	Radioactive Waste (disposed) (kg)
Output Flow Indicators	
CFR	Components for Reuse (kg)

MR	Material for Recycling (kg)
MER	Materials for Energy Recovery (kg)
EEE	Exported Energy, Electricity (MJ)
EET	Exported Energy, Thermal (MJ)
Lifecycle Stages / Modules	
A1	Raw material supply
A2	Transport of raw materials
A3	Manufacturing
A4	Transport to site
A5	Construction/Installation
B1	Use
B2	Maintenance
B3	Repair
B4	Replacement
B5	Refurbishment
B6	Operational energy use
B7	Operational water use
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse-Recovery-Recycling potential
Other Relevant Terms	
SVHC	Substances of Very High Concern
EC No.	European Community Number
CAS No.	Chemical Abstracts Service Number
MJ	Megajoule
kg	Kilogram
m ³	Cubic Meter
NMVOC	Non-Methane Volatile Organic Compounds
Sb eq.	Antimony Equivalents
P eq.	Phosphorus Equivalents
N eq.	Nitrogen Equivalents
CFC-11 eq.	Chlorofluorocarbon-11 Equivalents
CO ₂ eq.	Carbon Dioxide Equivalents
kg C	Kilograms of Carbon
kg CO ₂ eq.	Kilograms of Carbon Dioxide Equivalent
ND	Not Declared

REFERENCES

- a) General Programme Instructions of International EPD System. Version 5.0.1.
- b) PCR 2019:14. Construction Products. Version 2.0.1.
- c) ISO 14025:2006 Environmental labels and declarations — Type III environmental declarations — Principles and procedures
- d) EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- e) EN 14044:2006 + Am 1 + Am 2 Environmental Management – Life Cycle Assessments – Requirements and guidelines
- f) Engineering Report: Life Cycle Assessment for Unannealed Copper-coated MAG wire from Vamberk, 2025-12-08
- g) <https://ecoquery.ecoinvent.org>
- h) <https://www.aib-net.org/facts/european-residual-mix>
- i) <https://phyllis.nl>

The following standards apply to the product groups and calculations:

ISO 14025:2006 Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

EN 14044:2006 + Am 1 + Am 2 Environmental Management – Life Cycle Assessments – Requirements and guidelines

ISO 14341:2020 Welding consumables – Rods, wires and deposits for gas shielded metal arc welding of non-alloy and fine-grain steels – Classification

ISO 14344 Welding consumables – Procurement of filler materials and fluxes

ISO 544 Welding consumables – Technical delivery conditions for filler materials and fluxes, Type of product, dimensions, tolerances and markings

EN 13479 Welding consumables – General product standard for filler metals and fluxes for fusion welding of metallic materials

VERSION HISTORY

Original Version of the EPD, 2025-12-15

