Environmental Product Declaration

In accordance with ISO 14025:2006 for:

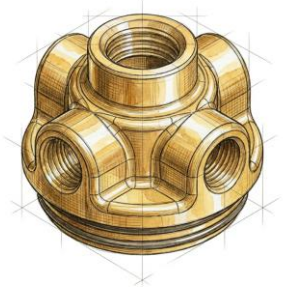
STAMPED AND MACHINED BRASS COMPONENT

from

GnuttiCirillo
FORGING & MACHINING TECHNOLOGY

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-0029120:001
Version date:	2026-03-05
Validity date:	2031-03-05
	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







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)
Product Category Rules (PCR): Fabricated metal products, except construction products*, PCR 2023:01, Version 2.0.0 UN CPC 412, 414, 416, 42*
PCR review was conducted by: ***Aceros Inoxidables Olarra, S.A, CAF MIIRA, Curtin University, Global Steel Wire, Metalsa, S.A.P.I., RISE Research Institutes Of Sweden, Sidenor Special Steels, Tubos Reunidos Group Slu, Vicinay Sestao S.L., World Steel Association, IK INGENIERIA*** ***PCR Moderator: Gorka Benito Alonso, IK INGENIERIA, g.benito@ik-ingenieria.com***

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: *Guido Croce* Approved by: International EPD System *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 ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD:
Gnutti Cirillo S.p.A.

Address:

- **Stamping Plant**
  Via Brescia 7, 25076 Odolo (BS)
- **Processing Plant**
  Via Ruca 96, 25065 Lumezzane (BS)

Contact: ESG Manager: Ing. Francesco Esposto – francesco.esposto@gnutticirillo.it
Address and contact information of the LCA practitioner commissioned by the EPD owner, if applicable:

- Alessandro Rocca – alessandro.rocca@graceconsulting.it
- Benedetta Becchi – benedetta.becchi@graceconsulting.it

Description of the organisation:
Gnutti Cirillo S.p.A. is the parent company of the Gnutti Group. Founded in 1951 by Cirillo Gnutti as a mechanical company for the production of equipment and dies, it is now a world leader in hot forging and machining of brass and other non-ferrous metals.
Over the years, Gnutti Cirillo S.p.A. has developed a high level of technical expertise, enabling it to meet any customer requirement thanks to its complete self-sufficiency across the entire production chain: from brass hot forging to machining, from surface treatments to assembly and final product packaging, all fully customized according to customer specifications.
Non-ferrous metal components are manufactured by Gnutti Cirillo at the following facilities:

- **Via Ruca, 96 – 25065 Lumezzane (BS), Italy**: historic headquarters, where machining operations are carried out;
- **Via Brescia, 7 – 25076 Odolo (BS), Italy**: a modern industrial complex specialized in hot forging, equipped with state-of-the-art production systems.

In 2000, the Odolo plant was added to the Lumezzane headquarters, further strengthening the company's production and technological capabilities.
Gnutti Cirillo S.p.A. successfully operates in numerous application sectors, offering customized solutions and tailor-made products designed to meet specific customer needs. Its wide and diversified product range serves the following sectors:

- Fire protection
- Automotive
- Water and gas meters
- Renewable energy (solar, geothermal, wind)
- HVAC
- High-pressure washers
- Scuba diving
- Transformer insulators
- Coffee machines
- Medical
- Marine
- Pneumatics
- Pumps
- Flow regulation, measurement and control
- Welding

- Beverage dispensing systems
- Meter brackets, nuts and sleeves
- Plumbing and heating
- Coating and painting

The Gnutti Group has been one of the leading industrial players in the Brescia area since the 1950s, with strong roots in the local territory. It is a group of companies that controls the entire technical and production supply chain, transforming raw materials into finished products. A perfect balance of Tradition, Professionalism, Quality, Technology and Know-how allows the Group to deliver the best possible service every day.

Product-related or management system-related certifications:
Gnutti Cirillo operates in accordance with certified management systems that ensure structured process control, the reduction of operational risks, and compliance with regulatory and market requirements.
The company is certified according to:

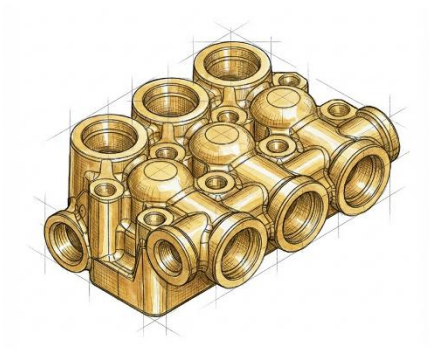
- **ISO 9001:2015** for quality management
- **ISO 14001:2015** for environmental management
- **ISO 50001:2018** for energy management
- **ISO 45001:2018** for the protection of health and safety at work
- **ISO 14067:2018 – Annex C** – systematic approach to product carbon footprint

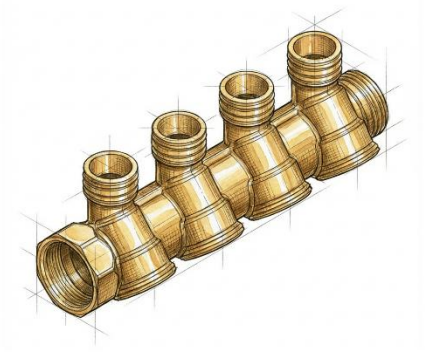
PRODUCT INFORMATION

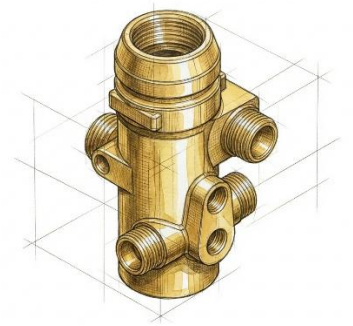
Product name:
Stamped and processed brass product

Product identification:
The declared product is a hot forged and machined brass component manufactured by Gnutti Cirillo S.p.A. at its production facilities in Odolo and Lumezzane.

Visual representation of the product:







UN CPC code:
UN CPC 416 'Other non-ferrous metals and articles thereof'

Product description:
The declared product comprises a range of OEM brass components manufactured according to technical drawings and in compliance with customer-defined technical specifications.
The components are intended for multiple application sectors, including plumbing and heating systems, hydraulic and mechanical installations, automotive, energy, medical applications, and general industrial uses. Key functionalities include fluid conveyance and regulation, mechanical connection and joining, structural support, and integration into complex assemblies requiring dimensional precision, mechanical strength, and long-term reliability.
Technical performance (mechanical strength, pressure tightness, corrosion resistance, dimensional tolerances) depends on the alloy used and on customer-specific design requirements.
The production cycle of the brass component is strategically distributed between the Odolo and Lumezzane plants.
The first part of the process takes place in Odolo and focuses on the primary transformation of the material: it begins with the receipt of the bars, which undergo dimensional and quality inspections, followed by cutting and hot forging. Subsequently, the semi-finished product is subjected to trimming (or deburring) to remove excess material and sandblasting for surface finishing. Every step at this facility includes 'Visual/Dimensional' control loops, with machine parameter verification in case of a negative outcome (KO).
The second part of the cycle moves to the Lumezzane plant, where the component undergoes high value-added processing. This stage involves precision machining using CNC machines, where dimensional controls become more stringent. The process always concludes in Lumezzane with packaging, where a final integrity check of the parts is performed, followed by the final shipping phase.

Name and location of production sites:
- Via Brescia, 7 – 25076 Odolo (BS), Italy
- Via Ruca, 96 – 25065 Lumezzane (BS), Italy

Website:
www.gnutticirillo.it

CONTENT DECLARATION

- Declared unit:
  1 tonne of stamped and machined brass product

- Information about the content of the product in the form of a list of materials and substances, and their mass:

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Brass bars	1.735	95%*	0%	0
TOTAL	1.735	95%*	0%	0

**The recycled material content of 95% is declared by the company based on self-declarations and communications provided by its raw material suppliers. For the purposes of this EPD, only data supported by documentary evidence compliant with the requirements of the EPD programme have been considered. Based on the evidence currently available, the verifiable recycled content amounts to 45%. The company is committed to progressively expanding the collection of qualified data within its supply chain in order to increase the share of recycled content documented according to the criteria required by the certification.*

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Corrugated board box	50,71	4,0%	22,31
Packaging film	1,05	0,1%	
Plastic Bag	0,83	0,1%	
Pallet	56,19	4,5%	28,10
Polystyrene	0,42	0,0%	
Label	0,75	0,1%	
TOTAL	109,95	8,7%	50,41

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product or declared unit
Lead	231-100-4	7439-92-1	Max 2%

LCA INFORMATION

Declared unit:
1 tonne (1000 kg) of stamped and machined brass product

Time representativeness:
2024

Geographical scope:
European

Database and LCA software used:
SimaPro v.10.3.0.1. Ecoinvent 3.11

System boundaries:
"Cradle to grave with options", covering stages A1-A3 and C1 to C4 (But not stages A4, A5 and B1 to B7)
Transportation, installation and use stage is excluded under this approach because the broad scope of the PCR (any metal product for any application) does not allow to define specific criteria for the use phase scenarios. This will require detailed information and parameters to define the function of the finished product and scenarios for handling the installation and use stages, in order to meet comparability within the specific products. Finished metal products could have any application (automotive, construction, naval, pipes, boilers, containers, scientific sector, electronics etc.) and the environmental impact of those in use stages should be defined, calculated and allocated by the manufacturers of those finished products (using these intermediate LCA and EPD data as part of their own Upstream processes). That's why the cradle-to-grave with options option is given.

- **A1 – Material extraction and processing**: the primary raw materials consist of brass bars, which are sourced and processed prior to entering the production line. The production of packaging materials has also been taken into account.
- **A2 – Transport to the manufacturer:** This module includes the transport of raw, auxiliary, and packaging materials to the production site.
- **A3 - Manufacturing of the product:** This module includes the processing of auxiliary materials used in the production process, manufacturing waste, energy consumption (electricity and natural gas), F-gases, atmospheric emissions resulting from the process, and water consumption. The energy mix characterizing each production plant has been modeled by considering contributions from the public electricity grid, certified renewable energy (Guarantees of Origin), and on-site photovoltaic self-consumption. The Global Warming Potential (GWP – GHG) associated with electricity was calculated using a GWP-GHG emission factor of 0.53 kg CO_2-eq per kilowatt-hour (kWh) for electricity produced in Odolo, and 0.46 kg CO_2-eq per kilowatt-hour (kWh) for electricity produced in Lumezzane.
- **C1 - Deinstallation of the metal product:** Deconstruction and demolition processes are not relevant, since the product is manually dismantled for reuse or assembly in other products.
- **C2 - Transport to sorting/recycling or to end-of-life disposal site:** the transport of 1 ton of processed and machined brass products to sorting/recycling or to end-of-life disposal site, has been assumed over a distance of 100 km by truck.

- **C3 - Sorting, collection, processing of waste product for the different routes (reuse, recycling, energy recovery, final disposal) at a waste processing facility:** the collection, sorting, and processing of the waste product at waste management facilities is considered. All brass material is directed to recycling, with no waste sent to final disposal or energy recovery.
- **C4 - Final disposal at disposal site, including any required pre-treatment and the management of the disposal facility:** no waste is sent to final disposal, as the entire brass product is recovered and recycled. No disposal treatment is required.

Cut-offs and exclusions:
In the present study, a cut-off rule of 5% was applied, ensuring that at least 95% of the relevant data were included. The following were excluded:

- Infrastructure, buildings, machinery, and tools (capital goods) that are not directly consumed in the production process and retain their function for more than three years
- Business travel of personnel and commuting to and from work
- Research and development activities

as required by Section A.3.1.1 and Section A.3.1.2 of the GPI.

Allocation:
Data allocation for raw materials, electricity, heat, F-gases, water consumption, atmospheric emissions, manufacturing waste, packaging materials, and auxiliary materials was performed on a per-unit-of-mass basis.

A summary of the data quality assessment, Declaration of data sources, reference years, and share of primary data, in line with requirements in Section A.5.4 of GPI V5.0.1.

Data representativeness, quality, and selection:
For the Product stage (modules A1–A3), site-specific data were used, collected directly at the Odolo and Lumezzane plants. In the absence of site-specific data, generic data from internationally recognized databases, in particular Ecoinvent v. 3.11, were employed.
Since all products pass through both plants, the information used is considered fully representative.
The end-of-life stage (C) of the Environmental Product Declaration (EPD) accurately reflects the geographical area considered (European).
In terms of data quality, temporal, geographical, and technological representativeness have been classified as predominantly good.

Process	Source type	Source	Reference Year	Data category	Share of primary data, of GWPGHG results for A1-A3
Raw Materials	Collected data	Ecoinvent v3.11 EPD owner Sustainability report	2024	Dati primary, dati secondari	30,0%
Packaging	Collected data	Ecoinvent v3.11	2024	Dati primary, dati secondari	0%
Inbound logistics	Collected data	Ecoinvent v3.11	2024	Dati primary	0,5%
Energy consumption	Collected data	Ecoinvent v3.11	2024	Dati primary	15,3%
Auxiliary Material	Collected data	Ecoinvent v3.10	2024	Dati primary, dati secondari	0%
Waste	Collected data	Ecoinvent v3.11	2024	Dati primary, dati secondari	0%
Atmospheric Emissions	Collected data	Ecoinvent v3.11	2024	Dati primary, dati secondari	0%
Total share of primary data, of GWP-GHG results for A1-A3					45,8%

The share of primary data is calculated based on the results of the Global Warming Potential (GWP-GHG). This is a simplified indicator of data quality that encourages the use of a greater amount of primary data to increase representativeness and comparability among Environmental Product Declarations (EPDs).
It should be noted that this indicator does not capture all relevant aspects of data quality and is not comparable across different product categories.

ENVIRONMENTAL PERFORMANCE

Impact category indicators

PARAMETER		UNIT	Upstream-Corestream	Downstream				TOTAL
			A1-A3	C1	C2	C3	C4	
Global warming potential (GWP)	Fossil	kg CO_2 eq.	9,49E+03	0,00E+00	1,90E+01	1,01E+01	0,00E+00	9,52E+03
	Biogenic	kg CO_2 eq.	5,36E+01	0,00E+00	1,33E-01	2,65E+01	0,00E+00	8,02E+01
	Land use and land transformation	kg CO_2 eq.	2,02E+01	0,00E+00	6,36E-03	3,99E-03	0,00E+00	2,02E+01
	TOTAL	kg CO_2 eq.	9,57E+03	0,00E+00	1,92E+01	3,67E+01	0,00E+00	9,62E+03
Ozone layer depletion (ODP)		kg CFC 11 eq.	1,35E-04	0,00E+00	4,15E-07	2,20E-07	0,00E+00	1,35E-04
Acidification potential (AP)		mol H^+ eq.	4,21E+02	0,00E+00	6,11E-02	4,86E-02	0,00E+00	4,21E+02
Eutrophication potential (EP)	Aquatic freshwater	kg P eq.	3,34E+01	0,00E+00	1,30E-03	8,12E-04	0,00E+00	3,34E+01
	Aquatic marine	kg N eq.	2,55E+01	0,00E+00	2,06E-02	1,92E-02	0,00E+00	2,55E+01
	Aquatic terrestrial	mol N eq.	3,28E+02	0,00E+00	2,24E-01	2,09E-01	0,00E+00	3,29E+02
Photochemical oxidant creation potential (POCP)		kg NMVOC eq.	9,54E+01	0,00E+00	9,26E-02	7,20E-02	0,00E+00	9,56E+01
Abiotic depletion potential (ADP)*	Metals and minerals	kg Sb eq.	5,73E+00	0,00E+00	6,41E-05	3,25E-05	0,00E+00	5,73E+00
	Fossil resources	MJ, net calorific value	1,30E+05	0,00E+00	0,00E+00	1,46E+02	0,00E+00	1,30E+05
Water deprivation potential (WDP)*		m^3 world eq. deprived	9,59E+03	0,00E+00	2,74E-01	8,44E-01	0,00E+00	9,59E+03

** 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.*

Resource use indicators

PARAMETER		UNIT	Upstream-Corestream	Downstream				TOTAL
			A1-A3	C1	C2	C3	C4	
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	2,63E+04	0,00E+00	4,39E+00	2,96E+00	0,00E+00	2,63E+04
	Used as raw materials	MJ, net calorific value	1,90E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,90E+03
	TOTAL	MJ, net calorific value	2,82E+04	0,00E+00	4,39E+00	2,96E+00	0,00E+00	2,82E+04
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	8,95E+04	0,00E+00	1,87E-02	1,46E+02	0,00E+00	8,96E+04
	Used as raw materials	MJ, net calorific value	4,05E+04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,05E+04
	TOTAL	MJ, net calorific value	1,30E+05	0,00E+00	1,87E-02	1,46E+02	0,00E+00	1,30E+05

The environmental performance results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

The results of the end-of-life stage should be considered when using the results of the production stage.

Transportation, installation and use stages are excluded from this study due to the broad scope of the applicable PCR, which covers metal products for multiple and diverse applications and does not allow the definition of representative use-phase scenarios. The definition of these stages requires detailed information on the specific function of the finished product, as well as installation, operating conditions and maintenance parameters, in order to ensure comparability among products. Therefore, the environmental impacts related to transportation, installation and use shall be defined, calculated and allocated by the manufacturers of the finished products, who may use the results of this EPD as upstream data within their own life cycle assessments.

VERSION HISTORY

Original Version of the EPD, 2026-03-05

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central product classification
GHS	Globally harmonized system of classification and labelling of chemicals
ND	Not Declared

REFERENCES

- International EPDR System - General Programme Instructions, versione 5.0.1
- PCR 2023:01 FABRICATED METAL PRODUCTS, EXCEPT CONSTRUCTION PRODUCTS (version 2.0.0)
- ISO 14020:2000 Environmental labels and declarations-General principles
- ISO 14025:2010 Environmental labels and declarations-Type III Environmental Declarations-Principles and procedures
- ISO 14040:2006 Environmental management-Life Cycle Assessment-Principles and framework
- ISO 14044:2018 Environmental management-Life Cycle Assessment Requirements and guidelines
- LCA Report “LCA REPORT GNUTTI CIRILLO”, Rev.0, February 2026

EPD
INTERNATIONAL EPD SYSTEM
www.environdec.com