



**SLOVENSKI STANDARD**  
**SIST-TP CEN/TR 18047:2025**

**01-januar-2025**

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**Mehanski izdelki - Vrstni red velikosti ključnih okoljskih podatkov**

Mechanical products — Order of magnitude of key environmental data

Mechanische Produkte - Größenordnung der wesentlichen Umweltdaten

Produits mécaniques - Ordre de grandeur de données environnementales clés

**Ta slovenski standard je istoveten z: CEN/TR 18047:2024**

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**ICS:**

13.020.10	Ravnanje z okoljem	Environmental management
21.020	Značilnosti in načrtovanje strojev, aparatov, opreme	Characteristics and design of machines, apparatus, equipment

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## Mechanical products - Order of magnitude of key environmental data

Produits mécaniques - Ordre de grandeur de données environnementales clés

Mechanische Produkte - Größenordnung der wesentlichen Umweltdaten

This Technical Report was approved by CEN on 9 March 2024. It has been drawn up by the Technical Committee CEN/TC 406.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (CEN/TR 18047:2024) has been prepared by Technical Committee CEN/TC 406 “*Mechanical products - Ecodesign methodology*”, the secretariat of which is held by AFNOR.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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## CEN/TR 18047:2024 (E)

### Introduction

As part of the initiatives to take the environmental aspects into account in product design and thus improve environmental performance, manufacturers need environmental data to guide their choices (e.g.: choice for a material, a process or an energy used).

Environmental data contained in this document are based on the feedback obtained from CETIM's (French Technical Centre for Mechanical Industry) research, and development actions and its involvement in several industrial projects <sup>[8]</sup>.

These data are based on calculations and experimentations made on cases in the mechanical industry, and calculated from general data available on the market. References used are the most common and understandable terms and might not be in accordance with standardised designations.

The proposed data can be updated given the state of knowledge acquired on this topic.

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## 1 Scope

This document provides general environmental data relevant to mechanical products. It can be applied to a mechanical product as well as to parts of a mechanical product.

The aim is to provide guidance values to entities, e.g. manufacturers, supporting

- design or re-design choices for products (e.g.: to compare technical solutions) by providing a complementary environmental criterion in a multicriteria approach;
- enhancement of knowledge on products from an environmental perspective (simplified environmental performance assessment).

These data cover the most relevant aspects for the mechanical sector: material, processes, energy, transportation and end of life of products. They provide an order of magnitude of impacts and cannot be considered as absolute values because many parameters can influence the obtained results (geographical and technical perimeters, use scenarios, hypothesis and method of calculation, etc.).

They are not intended to replace specific data obtained or used by entities as part of individual projects.

They are not intended to be used as such for:

- quantification of environmental impacts within a life cycle analysis (LCA) according to EN ISO 14040/EN ISO 14044,
- environmental communication as defined in EN ISO 14025 (Type III environmental declaration),
- evidence of regulatory compliance.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15804:2012+A2:2019 apply.

NOTE Additional definitions can be found in the PEP Ecopassport program.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

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<sup>1</sup> Impacted by EN 15804:2012+A2:2019/AC:2021.

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## 4 Symbols and abbreviations

Units used in the data sheets contained in Annex A are defined in Table 1.

**Table 1 — Definition of units**

Units	Meaning
kg CO <sub>2</sub> eq.	Kilograms of carbon dioxide equivalent
kg Sb eq.	Kilograms of antimony equivalent
kg SO <sub>2</sub> eq.	Kilograms of sulfur dioxide equivalent
m <sup>3</sup>	Cubic meter
kg CFC-11 eq.	Kilograms of trichlorofluoromethane equivalent
kg C <sub>2</sub> H <sub>4</sub> eq.	Kilograms of ethene equivalent
kg PO <sub>4</sub> <sup>3-</sup> eq.	Kilograms of phosphate equivalent
CTUe	Comparative Toxic Unit
CTUh	Comparative Toxic Unit
l	Litre
MJ	Megajoule
kg	Kilogram

Abbreviations used in this document are defined in Table 2.

**Table 2 — Meaning of abbreviations**

Acronym	Meaning
ADEME	French organisation for the Environment and Energy Management ( <i>Agence de l'Environnement et de la Maîtrise de l'Energie</i> )
BOM	Bill of material
DEP	Declaration of Environmental Product
FDES	Environmental and health declaration form
HVAC-R	Heating, ventilation, air conditioning and refrigeration
LCA	Life cycle analysis
PCR	Product Category Rules
PEP	Product Environmental Profile
NOTE The FDES is a French statement document made under the responsibility of the product manufacturer which presents the results of the life cycle analysis of a construction product.	



## 5 Preparation of data and data sheet presentation

Impact data were obtained from environmental studies based on field experiments (flow measurements, environmental assessments, etc.), scientific and technical publications (bibliography, eco-profiles, etc.) and calculations based on existing data.

This required the establishment of rules and hypotheses for the calculation of impact data and the use of existing calculation methods. Some explanations are given in Annex A.

For each data sheet, the following information is provided:

- name of the data (cast iron, stainless steel milling, etc.);
- amount (e.g. 1 kg);
- reference number to the sheet for data management and traceability;
- type (material, energy, processes, etc.);
- subtype (metal, polymer, processes by removal of material, transportation, etc.);
- comment(s), if needed (geographic scope, additional information, etc.);
- name of environmental indicator, its value and unit.

NOTE Annex B describes the methodology to achieve impact data sheets. Annex C gives an example on how to use the data sheets for a product.

## 6 List of data sheets

The data sheets are grouped per type and subtype, as shown in Table 3.

**Table 3 — List of data sheets**

Type	Subtype	Name	Reference #
Material	Ferrous material	Cast iron	Aa002
Material	Ferrous material	Mild steel - Flat	Aa003
Material	Ferrous material	Mild steel - Profile	Aa004
Material	Ferrous material	Mild steel - Tube	Aa005
Material	Ferrous material	Mild steel - Coil	Aa010
Material	Ferrous material	Mild steel - Wire	Aa011
Material	Ferrous material	Mild steel - Concrete reinforcing	Aa012
Material	Ferrous material	Mild steel - Hot dip galvanised	Aa013
Material	Ferrous material	Mild steel - Electro zinc coated	Aa014
Material	Ferrous material	Mild steel - Chromium	Aa015
Material	Ferrous material	Mild steel - Tinned	Aa016
Material	Ferrous material	Mild steel - Polymer coating	Aa017
Material	Ferrous material	Low-alloy steel - Sheet metal	Aa018
Material	Ferrous material	Low-alloy steel - Bar	Aa019
Material	Ferrous material	Stainless steel said chromium-nickel steel (Type 304) - Sheet metal	Aa020
Material	Ferrous material	Stainless steel said chromium-nickel steel (Type 304) - Bar	Aa021
Material	Ferrous material	Stainless steel said chromium-nickel steel (Type 316) - Sheet metal	Aa024
Material	Ferrous material	Stainless steel said chromium-nickel steel (Type 316) - Bar	Aa025
Material	Ferrous material	Stainless steel said chromium steel (Type 420, 430, 440, 441) - Sheet metal	Aa030
Material	Ferrous material	Stainless steel said chromium steel (Type 420, 430, 440, 441) - Bar	Aa031
Material	Non-ferrous material	Primary aluminium - Ingot	Ab001
Material	Non-ferrous material	Primary aluminium - Sheet metal	Ab002
Material	Non-ferrous material	Primary aluminium - Profile	Ab003

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Type	Subtype	Name	Reference #
Material	Non-ferrous material	Medium aluminium - Profile	Ab004
Material	Non-ferrous material	Medium aluminium - Sheet metal	Ab005
Material	Non-ferrous material	Secondary aluminium extracted from production waste - Sheet metal	Ab006
Material	Non-ferrous material	Secondary aluminium extracted from production waste - Profile	Ab007
Material	Non-ferrous material	Secondary aluminium extracted from domestic waste - Sheet metal	Ab008
Material	Non-ferrous material	Secondary aluminium extracted from domestic waste - Profile	Ab009
Material	Non-ferrous material	Foundry aluminium (Si alloy, series 4) - Ingot	Ab010
Material	Non-ferrous material	Primary aluminium EN AW 2017A AlCu4MgSi - Sheet metal	Ab012
Material	Non-ferrous material	Primary aluminium EN AW 2017A AlCu4MgSi - Profile	Ab013
Material	Non-ferrous material	Secondary aluminium EN AW 2017A AlCu4MgSi - Sheet metal	Ab014
Material	Non-ferrous material	Secondary aluminium EN AW 2017A AlCu4MgSi - Profile	Ab015
Material	Non-ferrous material	Medium aluminium EN AW 2017A AlCu4MgSi - Sheet metal	Ab016
Material	Non-ferrous material	Medium aluminium EN AW 2017A AlCu4MgSi - Profile	Ab017
Material	Non-ferrous material	Primary aluminium EN AW 5083 AlMg4,5Mn0,7 - Sheet metal	Ab018
Material	Non-ferrous material	Primary aluminium EN AW 5083 AlMg4,5Mn0,7 - Profile	Ab019
Material	Non-ferrous material	Secondary aluminium EN AW 5083 AlMg4,5Mn0,7 - Sheet metal	Ab020
Material	Non-ferrous material	Secondary aluminium EN AW 5083 AlMg4,5Mn0,7 - Profile	Ab021
Material	Non-ferrous material	Medium aluminium EN AW 5083 AlMg4,5Mn0,7 - Sheet metal	Ab022
Material	Non-ferrous material	Medium aluminium EN AW 5083 AlMg4,5Mn0,7 - Profile	Ab023
Material	Non-ferrous material	Copper Cu - Ingot	Ab026
Material	Non-ferrous material	Cupro - aluminium CuAl10Fe5Ni5 - Ingot	Ab027
Material	Non-ferrous material	Bronze CuSn5 - Ingot	Ab028
Material	Non-ferrous material	Brass CuZn30 - Ingot	Ab030
Material	Non-ferrous material	Brass CuZn36 - Ingot	Ab031
Material	Non-ferrous material	Primary Zinc, Zn - Ingot	Ab032
Material	Non-ferrous material	Zamac - Ingot	Ab034
Material	Non-ferrous material	Magnesium, Mg	Ab035
Material	Non-ferrous material	Magnesium alloy	Ab036
Material	Non-ferrous material	Titanium, Ti	Ab037
Material	Polymer	ABS, Acrylonitrile Butadiene Styrene - Copolymer - Granules	Ac001
Material	Polymer	POM, polyoxymethylene - Copolymer	Ac002
Material	Polymer	PA6, polyamide 6	Ac003
Material	Polymer	PA6.6, polyamide 6.6	Ac004
Material	Polymer	PC, polycarbonate	Ac005
Material	Polymer	PVC, polyvinyl chloride - Film	Ac006
Material	Polymer	PVC, polyvinyl chloride - Pipe	Ac007
Material	Polymer	PVC, polyvinyl chloride - Moulded by injection	Ac008
Material	Polymer	LDPE, low-density polyethylene - Granules	Ac009
Material	Polymer	HDPE, high-density polyethylene - Granules	Ac010
Material	Polymer	PET, polyethylene terephthalate - Granules	Ac011
Material	Polymer	PMMA, polymethyl methacrylate - Beads	Ac012
Material	Polymer	PP, polypropylene - Granules	Ac013
Material	Polymer	PS, polystyrene - Granules	Ac014
Material	Polymer	PS, polystyrene - Expanded	Ac015
Material	Polymer	Rigid PUR, polyurethane	Ac016
Material	Polymer	Flexible PUR, polyurethane	Ac017
Material	Polymer	EP, liquid epoxy resin, epoxy	Ac019
Material	Polymer	UP, non-saturated polyester resin	Ac020
Material	Polymer	PF, phenolic resin	Ac021
Material	Elastomer	PTFE, polytetrafluoroethylene - Film	Ac022
Material	Elastomer	EPDM, synthetic rubber	Ad001
Material	Composite	PA6 FV30, type 6 glass fiber reinforced polyamide	Ae001

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Type	Subtype	Name	Reference #
Material	Composite	PA66 FVF30, type 66 glass fiber reinforced polyamide	Ae002
Material	Packaging	Virgin fibre paperboard	Af001
Material	Packaging	Recycled fibre paperboard	Af002
Material	Packaging	Packaging film - LDPE	Af006
Material	Packaging	Bubble wrap for packaging - LDPE	Af007
Material	Packaging	Bleached kraft paper	Af008
Material	Packaging	Non-bleached kraft paper	Af009
Material	Packaging	White container glass	Af010
Material	Packaging	Wooden pallet	Af011
Material	Other	Sawn and planed timber - Conifer	Az001
Material	Other	Sawn and planed timber - Hardwood	Az002
Material	Other	Plywood - Outdoor use	Az003
Material	Other	Plywood - Indoor use	Az004
Material	Other	Fibre board	Az005
Material	Other	Particle board - Outdoor use	Az006
Material	Other	Particle board - Indoor use	Az007
Material	Other	Single-glazed glass - Uncoated	Az008
Material	Other	Single-glazed glass - Coated	Az009
Material	Other	Double-glazed glass	Az010
Material	Other	Drinking water - Supply system	Az012
Material	Other	Water-based alkyd paint	Az014
Material	Other	Solvent-based alkyd paint	Az015
Material	Other	Hydraulic oil	Az016
Process	Material removal	Milling - Cast iron	Ba043
Process	Material removal	Milling - Steel	Ba044
Process	Material removal	Milling - Aluminium	Ba045
Process	Material removal	Milling - Stainless steel	Ba046
Process	Material removal	Drilling - Cast iron	Ba047
Process	Material removal	Drilling - Steel	Ba048
Process	Material removal	Drilling - Aluminium	Ba049
Process	Material removal	Drilling - Stainless steel	Ba050
Process	Material removal	Drilling - Brass	Ba051
Process	Material removal	Turning - Cast iron	Ba052
Process	Material removal	Milling - Cast iron	Ba043
Process	Material removal	Milling - Steel	Ba044
Process	Material removal	Milling - Aluminium	Ba045
Process	Material removal	Milling - Stainless steel	Ba046
Process	Material removal	Drilling - Cast iron	Ba047
Process	Material removal	Drilling - Steel	Ba048
Process	Material removal	Drilling - Aluminium	Ba049
Process	Material removal	Drilling - Stainless steel	Ba050
Process	Material removal	Drilling - Brass	Ba051
Process	Material removal	Turning - Cast iron	Ba052
Process	Material removal	Turning - Steel	Ba053
Process	Material removal	Turning - Aluminium	Ba054
Process	Material removal	Turning - Stainless steel	Ba055
Process	Material removal	Turning - Brass	Ba056
Process	Forming	Press drawing - Steel	Bb001
Process	Forming	Extrusion of seamless pipes - Steel	Bb006
Process	Forming	Profile extrusion - Aluminium	Bb027
Process	Forming	Cold rolling - Steel	Bb028
Process	Forming	Hot rolling - Steel	Bb029

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Type	Subtype	Name	Reference #
Process	Forming	Cold rolling - Stainless steel	Bb030
Process	Forming	Rolling - Aluminium	Bb031
Process	Forming	Rolling - Bronze	Bb032
Process	Forming	Rolling - Copper	Bb033
Process	Forming	Rolling - Brass	Bb034
Process	Forming	Wire drawing - Steel	Bb035
Process	Forming	Wire drawing - Copper	Bb036
Process	Surface treatment	Hot dip galvanising	Bd006
Process	Surface treatment	Continuous galvanising	Bd007
Process	Assembly	Arc welding - Steel	Be002
Process	Assembly	Gas welding - Steel	Be003
Process	Plastics processing	Calendering rolling - Plastics	Bf001
Process	Plastics processing	Extrusion - Plastic pipe	Bf003
Process	Plastics processing	Injection blowing - Plastics	Bf004
Process	Plastics processing	Blowing - Plastics	Bf005
Process	Other	Metal laser cutting - Laser CO2 2700W	Bz002
Process	Other	Metal laser cutting - Laser CO2 5000W	Bz005
Process	Other	Metal laser cutting - Laser YAG 330 to 500W	Bz012
Energy	Electricity	Low-voltage electricity - France	Ca001
Energy	Electricity	Medium voltage electricity - Europe	Ca004
Energy	Heat	Heat, average production - France	Cb001
Transportation	Air	Medium-haul aircraft, transportation - Europe	Da002
Transportation	Ship	Ship, ocean freight transportation - Worldwide	Db001
Transportation	Ship	Barge, freight transportation - Europe	Db002
Transportation	Road	Truck 16 to 32t - Europe	Dc001
Transportation	Train	Train, freight transportation - Europe	Dd001
Transportation	Average scenario	Air transportation scenario - Supply from China to France	Dz001
Transportation	Average scenario	Marine transportation scenario - Supply from China to France	Dz002
Transportation	Average scenario	Air transportation scenario - Supply from India to France	Dz003
Transportation	Average scenario	Marine transportation scenario - Supply from India to France	Dz004
End-of-life	Average scenario	End-of-life scenario - Hazardous waste	Ez001
End-of-life	Average scenario	End-of-life scenario - Inert waste	Ez002
End-of-life	Average scenario	End-of-life scenario - Non-hazardous waste	Ez003
End-of-life	Average scenario	End-of-life scenario - Steel	Ez004
End-of-life	Average scenario	End-of-life scenario - Aluminium	Ez005
End-of-life	Average scenario	End-of-life scenario - Paper and board	Ez006
End-of-life	Average scenario	End-of-life scenario - Plastics	Ez007

## 7 Data sheets

Name: <b>Cast iron</b>	Amount: <b>1kg</b>	Ref: Aa002
Comment:		Type: Material
		Subtype Ferrous metal
Environmental indicators	Value	Unit
Climate change	1,40E+00	kg CO <sub>2</sub> eq.
Resource depletion	1,38E-02	kg Sb eq.
Air acidification	4,84E-03	kg SO <sub>2</sub> eq.
Water pollution	9,48E-01	m <sup>3</sup>
Air pollution	5,87E+02	m <sup>3</sup>
Ozone depletion	5,04E-08	kg CFC-11 eq.
Photochemical ozone formation	8,71E-04	kg C <sub>2</sub> H <sub>4</sub> eq.
Eutrophication	7,85E-04	kg PO <sub>4</sub> <sup>3-</sup> eq.
Eco-toxicity (fresh water)	7,59E-04	CTUe
Human toxicity (cancer-causing)	3,06E-10	CTUh
Human toxicity (non cancer-causing)	3,90E-11	CTUh
Water use	1,14E+01	l
Total primary energy use	1,89E+01	MJ
Renewable energy use	5,69E-01	MJ
Non-renewable energy use	1,78E+01	MJ
Inert waste production	7,50E-01	kg
Non-hazardous waste production	1,15E-01	kg
Hazardous waste production	4,62E-04	kg
Radioactive waste production	7,54E-05	kg
Unique score indicator	1,79E-01	Points

## FprCEN/TR 18047:2023 (E)

Name: <b>Mild steel - Flat</b>	Amount: <b>1kg</b>	Ref: Aa003
Comment:		Type: Material
		Subtype: Ferrous metal
<b>Environmental indicators</b>	<b>Value</b>	<b>Unit</b>
Climate change	2,42E+00	kg CO <sub>2</sub> eq.
Resource depletion	1,31E-02	kg Sb eq.
Air acidification	6,46E-03	kg SO <sub>2</sub> eq.
Water pollution	3,66E-02	m <sup>3</sup>
Air pollution	4,09E+02	m <sup>3</sup>
Ozone depletion	9,11E-09	kg CFC-11 eq.
Photochemical ozone formation	1,17E-03	kg C <sub>2</sub> H <sub>4</sub> eq.
Eutrophication	4,79E-04	kg PO <sub>4</sub> <sup>3-</sup> eq.
Eco-toxicity (fresh water)	8,78E-03	CTUe
Human toxicity (cancer-causing)	0,00E+00	CTUh
Human toxicity (non cancer-causing)	0,00E+00	CTUh
Water use	1,37E+01	l
Total primary energy use	2,23E+01	MJ
Renewable energy use	2,99E-01	MJ
Non-renewable energy use	2,22E+01	MJ
Inert waste production	5,12E+00	kg
Non-hazardous waste production	3,18E-02	kg
Hazardous waste production	5,27E-02	kg
Radioactive waste production	1,18E-04	kg
Unique score indicator	1,71E-01	Points