

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Roth Tap Water Manifold, RED





The Norwegian EPD Foundation

Owner of the declaration:

Roth North Europe A/S

Product:

Roth Tap Water Manifold, RED

Declared unit:

1 kg

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR

NPCR Part A: Construction products and services

Program operator:

The Norwegian EPD Foundation

Declaration number:

NEPD-6179-5455-EN

Registration number:

NEPD-6179-5455-EN

Issue date: 29.02.2024

Valid to: 29.02.2029

EPD software:

LCAno EPD generator ID: 124792

General information

Product

Roth Tap Water Manifold, RED

Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
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Declaration number:

NEPD-6179-5455-EN

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR Part A: Construction products and services

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 kg Roth Tap Water Manifold, RED

Declared unit with option:

A1-A3,A4,A5,C1,C2,C3,C4,D

Functional unit:

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Owner of the declaration:

Roth North Europe A/S
Contact person: Stine Bøgh Petersen
Phone: +45 47 33 97 00
e-mail: sustainability@roth-northeurope.com

Manufacturer:

Roth North Europe A/S

Place of production:

Roth North Europe A/S
Centervej 5
3600 Frederikssund, Denmark

Management system:

EN ISO 9001:2015, EN ISO 14001:2015

Organisation no:

34012113

Issue date: 29.02.2024

Valid to: 29.02.2029

Year of study:

2022

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD: Kim Haugsted Neubert

Reviewer of company-specific input data and EPD: Stine Bøgh Petersen

Approved:



Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

Roth EURO-red manifolds are made of CC499K redware. They are all available with 3/4" EURO-cone threads and thus universal in terms of connected pipes dimensions.

The Roth EURO-red manifolds are available with 2, 3 or 4 branches. They can all be supplied with or without distributor couplings ensuring a fit with pex pipe of the dimensions 12mm, 15mm and 18mm or the Roth Alu-LaserPlus® pipes in the dimensions 16mm and 20mm.

Product specification

| Materials | kg | % |
|---------------|------|--------|
| Metal - Brass | 1,00 | 100,00 |
| Total | 1,00 | |

| Packaging | kg | % |
|-----------------------|------|-------|
| Packaging - Cardboard | 0,01 | 52,26 |
| Packaging - Plastic | 0,01 | 47,74 |
| Total incl. packaging | 1,01 | |

Technical data:

The manifolds have been tested and approved to meet the strict requirements of GDV, ETA Danmark, KIWA and Sintef for use in drinking water installations.

Market:

Denmark, Sweden, Norway, Finland & UK

Reference service life, product

60 years (Haugbølle, K., et.al, 2022)

Reference service life, building or construction works

50 years (Haugbølle, K., et.al, 2022)

LCA: Calculation rules

Declared unit:

1 kg Roth Tap Water Manifold, RED

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

| Materials | Source | Data quality | Year |
|-----------------------|------------------------|--------------|------|
| Metal - Brass | Modified ecoinvent 3.6 | Database | 2019 |
| Packaging - Cardboard | ecoinvent 3.6 | Database | 2019 |
| Packaging - Plastic | ecoinvent 3.6 | Database | 2019 |

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

| Product stage | | | Construction installation stage | | Use stage | | | | | | | End of life stage | | | | Beyond the system boundaries |
|---------------|-----------|---------------|---------------------------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|------------------------------------|
| Raw materials | Transport | Manufacturing | Transport | 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 |
| X | X | X | X | X | MND | MND | MND | MND | MND | MND | MND | X | X | X | X | X |

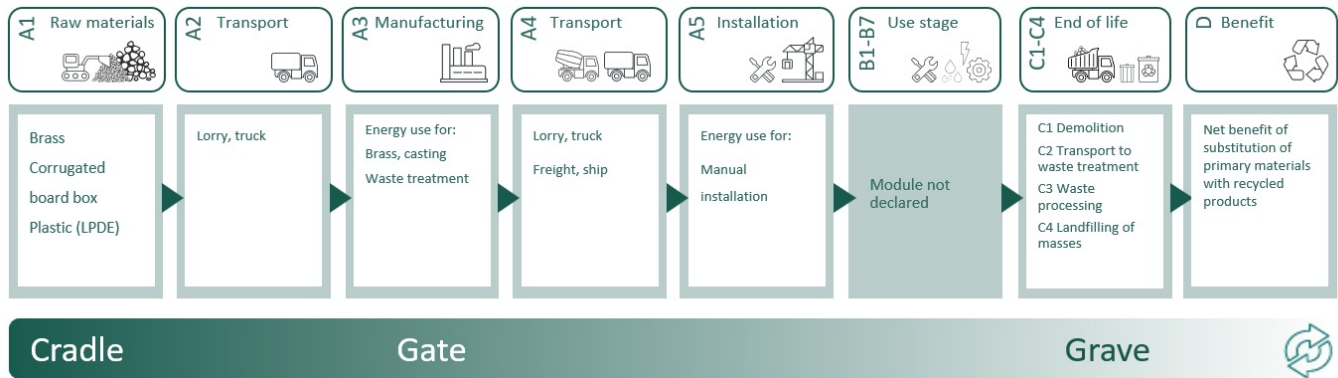
System boundary:

Module A1: Packaging has been included by average use of packaging pr. 1 kg of product.

Module A4: The transportation distances provided in this EPD are derived from precise data concerning the distances between production facility and various sales departments in different countries. Subsequently, it is assumed that the distribution from each of these sales departments to the end customers an approximate distance of 300 km*.

Transportation by truck is assumed on a distributon of 80% EURO 6 and 20% EURO 5, based on data from the companys own logistics provider.

Module C2: The estimated transportation distance to the waste handling facility in this EPD is 100 km, assuming the use of a truck as the transport method.



Additional technical information:

No technical information declared.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

The Roth Tap Water Manifold are distributed to sales units in Denmark, Sweden, Norway, Finland & UK respectively. The transportation method is a combination of lorry and containership, depending on the country.














It is assumed that the distribution from each of these sales departments to the end customers an approximate distance of 300 km.

The transportation from building site to waste facility is assumed to be 100 km by lorry in all scenarios.

| Transport from production place to user (A4) | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit | Value (Liter/tonne) |
|---|---------------------------------------|---------------|-------------------------|-------|---------------------|
| Ship, Coastal Barge (km) | 71,0 % | 165 | 0,011 | l/tkm | 1,82 |
| Truck, 16-32 tonnes, EURO 5 (km) - Europe | 36,7 % | 88 | 0,044 | l/tkm | 3,86 |
| Truck, 16-32 tonnes, EURO 5 (km) - Europe | 36,7 % | 60 | 0,044 | l/tkm | 2,64 |
| Truck, 16-32 tonnes, EURO 6 (km) - Europe | 36,7 % | 351 | 0,043 | l/tkm | 15,10 |
| Truck, 16-32 tonnes, EURO 6 (km) - Europe | 36,7 % | 240 | 0,043 | l/tkm | 10,32 |
| Assembly (A5) | | Unit | Value | | |
| Waste, packaging, corrugated board box, to average treatment (kg) | kg | 0,01 | | | |
| Waste, packaging, plastic film (LDPE), to average treatment (kg) | kg | 0,01 | | | |
| Transport to waste processing (C2) | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy Consumption | Unit | Value (Liter/tonne) |
| Truck, 16-32 tonnes, EURO 5 (km) - Europe | 36,7 % | 100 | 0,044 | l/tkm | 4,40 |
| Waste processing (C3) | | Unit | Value | | |
| Waste, Materials to recycling (kg) | kg | 0,90 | | | |
| Disposal (C4) | | Unit | Value | | |
| Waste, scrap brass, to landfill (kg) | kg | 0,10 | | | |
| Benefits and loads beyond the system boundaries (D) | | Unit | Value | | |
| Substitution of primary Brass with net scrap (kg) | kg | -0,10 | | | |

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

| Environmental impact | | | | | | | | | | |
|--|------------------------|-----------|----------|----------|----|----------|----------|----------|----------|--|
| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D | |
|  GWP-total | kg CO ₂ -eq | 5,21E+00 | 1,31E-01 | 1,32E-02 | 0 | 1,69E-02 | 0,00E+00 | 8,20E-04 | 4,35E-01 | |
|  GWP-fossil | kg CO ₂ -eq | 5,21E+00 | 1,31E-01 | 6,54E-04 | 0 | 1,69E-02 | 0,00E+00 | 8,19E-04 | 4,32E-01 | |
|  GWP-biogenic | kg CO ₂ -eq | -6,25E-03 | 5,69E-05 | 1,25E-02 | 0 | 6,89E-06 | 0,00E+00 | 9,44E-07 | 2,40E-03 | |
|  GWP-luluc | kg CO ₂ -eq | 2,31E-03 | 5,81E-05 | 8,06E-08 | 0 | 5,91E-06 | 0,00E+00 | 2,72E-07 | 6,89E-04 | |
|  ODP | kg CFC11 -eq | 5,77E-07 | 2,92E-08 | 5,70E-11 | 0 | 3,85E-09 | 0,00E+00 | 3,63E-10 | 2,76E-08 | |
|  AP | mol H+ -eq | 4,36E-02 | 4,62E-04 | 1,23E-06 | 0 | 6,91E-05 | 0,00E+00 | 7,28E-06 | 4,01E-02 | |
|  EP-FreshWater | kg P -eq | 7,20E-04 | 1,08E-06 | 2,08E-09 | 0 | 1,33E-07 | 0,00E+00 | 1,22E-08 | 3,22E-04 | |
|  EP-Marine | kg N -eq | 7,89E-03 | 1,20E-04 | 7,90E-07 | 0 | 2,05E-05 | 0,00E+00 | 2,19E-06 | 2,00E-03 | |
|  EP-Terrestrial | mol N -eq | 9,38E-02 | 1,33E-03 | 4,39E-06 | 0 | 2,27E-04 | 0,00E+00 | 2,42E-05 | 2,96E-02 | |
|  POCP | kg NMVOC -eq | 2,52E-02 | 4,37E-04 | 1,36E-06 | 0 | 6,94E-05 | 0,00E+00 | 7,35E-06 | 7,86E-03 | |
|  ADP-minerals&metals ¹ | kg Sb-eq | 1,90E-04 | 3,45E-06 | 5,76E-09 | 0 | 4,58E-07 | 0,00E+00 | 8,92E-09 | 2,57E-03 | |
|  ADP-fossil ¹ | MJ | 6,04E+01 | 1,96E+00 | 3,88E-03 | 0 | 2,55E-01 | 0,00E+00 | 2,56E-02 | 4,96E+00 | |
|  WDP ¹ | m ³ | 2,14E+01 | 1,96E+00 | 9,91E-03 | 0 | 2,43E-01 | 0,00E+00 | 8,73E-03 | 3,50E+00 | |







GWP-total = Global Warming Potential total; 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

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

1. 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 experienced with the indicator

Remarks to environmental impacts




| Additional environmental impact indicators | | | | | | | | | | |
|---|-------------------|----------|----------|----------|----|----------|----------|----------|----------|--|
| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D | |
|  PM | Disease incidence | 3,36E-07 | 7,96E-09 | 2,00E-11 | 0 | 1,22E-09 | 0,00E+00 | 1,21E-10 | 8,76E-08 | |
|  IRP ² | kgBq U235 -eq | 1,88E-01 | 8,58E-03 | 1,71E-05 | 0 | 1,11E-03 | 0,00E+00 | 1,02E-04 | 2,06E-02 | |
|  ETP-fw ¹ | CTUe | 5,17E+02 | 1,45E+00 | 4,34E-03 | 0 | 1,88E-01 | 0,00E+00 | 8,17E-01 | 3,87E+02 | |
|  HTP-c ¹ | CTUh | 6,52E-09 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 2,32E-09 | 5,84E-09 | |
|  HTP-nc ¹ | CTUh | 4,52E-07 | 1,50E-09 | 5,00E-12 | 0 | 2,03E-10 | 0,00E+00 | 1,59E-07 | 4,66E-07 | |
|  SQP ¹ | dimensionless | 1,81E+01 | 1,37E+00 | 4,97E-03 | 0 | 1,76E-01 | 0,00E+00 | 9,57E-02 | 4,68E+00 | |

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed




1. 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 experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

| Resource use | | | | | | | | | | |
|---|----------------|----------|----------|-----------|----|----------|----------|----------|----------|--|
| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D | |
|  PERE | MJ | 3,29E+00 | 2,91E-02 | 8,32E-05 | 0 | 3,60E-03 | 0,00E+00 | 2,36E-04 | 1,28E+00 | |
|  PERM | MJ | 6,06E-02 | 0,00E+00 | -6,06E-02 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | |
|  PERT | MJ | 3,36E+00 | 2,91E-02 | -6,05E-02 | 0 | 3,60E-03 | 0,00E+00 | 2,36E-04 | 1,28E+00 | |
|  PENRE | MJ | 6,01E+01 | 1,96E+00 | 3,88E-03 | 0 | 2,55E-01 | 0,00E+00 | 2,56E-02 | 4,96E+00 | |
|  PENRM | MJ | 2,87E-01 | 0,00E+00 | -2,87E-01 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | |
|  PENRT | MJ | 6,04E+01 | 1,96E+00 | -2,83E-01 | 0 | 2,55E-01 | 0,00E+00 | 2,56E-02 | 4,96E+00 | |
|  SM | kg | 1,13E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 6,17E-06 | 3,25E-02 | |
|  RSF | MJ | 2,53E-02 | 1,11E-03 | 2,37E-06 | 0 | 1,29E-04 | 0,00E+00 | 1,68E-05 | 9,52E-03 | |
|  NRSF | MJ | 8,18E-02 | 3,77E-03 | 7,59E-06 | 0 | 4,60E-04 | 0,00E+00 | 2,02E-05 | 4,84E-03 | |
|  FW | m ³ | 2,04E-02 | 2,17E-04 | 1,96E-06 | 0 | 2,68E-05 | 0,00E+00 | 2,97E-05 | 1,00E-02 | |

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 materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"






*INA Indicator Not Assessed

| End of life - Waste | | | | | | | | | | |
|--|------|----------|----------|----------|----|----------|----------|----------|----------|--|
| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D | |
|  HWD | kg | 3,98E-02 | 1,02E-04 | 0,00E+00 | 0 | 1,30E-05 | 0,00E+00 | 2,66E-06 | 4,24E-03 | |
|  NHWD | kg | 6,37E-01 | 9,05E-02 | 1,41E-02 | 0 | 1,22E-02 | 0,00E+00 | 1,00E-01 | 1,48E-01 | |
|  RWD | kg | 2,63E-04 | 1,33E-05 | 0,00E+00 | 0 | 1,74E-06 | 0,00E+00 | 1,62E-07 | 1,70E-05 | |

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

*Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

| End of life - Output flow | | | | | | | | | | |
|---|------|----------|----------|----------|----|----------|----------|----------|----------|--|
| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D | |
|  CRU | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | |
|  MFR | kg | 1,26E-01 | 0,00E+00 | 1,03E-02 | 0 | 0,00E+00 | 9,00E-01 | 5,50E-06 | 4,37E-03 | |
|  MER | kg | 1,03E-03 | 0,00E+00 | 5,17E-04 | 0 | 0,00E+00 | 0,00E+00 | 1,70E-07 | 5,28E-04 | |
|  EEE | MJ | 7,33E-04 | 0,00E+00 | 4,23E-04 | 0 | 0,00E+00 | 0,00E+00 | 5,23E-07 | 3,32E-03 | |
|  EET | MJ | 1,11E-02 | 0,00E+00 | 6,40E-03 | 0 | 0,00E+00 | 0,00E+00 | 7,91E-06 | 5,02E-02 | |

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

*Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

| Biogenic Carbon Content | | |
|---|------|---------------------|
| Indicator | Unit | At the factory gate |
| Biogenic carbon content in product | kg C | 0,00E+00 |
| Biogenic carbon content in accompanying packaging | kg C | 3,42E-03 |

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

| Electricity mix | Data source | Amount | Unit |
|----------------------------|---------------|---------|---------------------------|
| Electricity, China (kWh) | ecoinvent 3.6 | 1102,91 | g CO ₂ -eq/kWh |
| Electricity, Denmark (kWh) | ecoinvent 3.6 | 338,20 | g CO ₂ -eq/kWh |

Dangerous substances

The product contains dangerous substances, more than 0,1% by weight, given by the REACH Candidate List, see table:

| Name | CASNo | Amount |
|------|-----------|----------|
| Lead | 7439-92-1 | 1,5-3,0% |

Indoor environment

Not relevant. No tests have been carried out on the product concerning indoor environment.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products

| Indicator | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|-----------|------------------------|----------|----------|----------|----|----------|----------|----------|----------|
| GWPIOBC | kg CO ₂ -eq | 5,18E+00 | 1,31E-01 | 6,54E-04 | 0 | 1,69E-02 | 0,00E+00 | 8,20E-04 | 4,35E-01 |

GWPIOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Bibliography

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ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.






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