

# ENVIRONMENTAL-PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

|                          |                                      |
|--------------------------|--------------------------------------|
| Owner of the Declaration | Ideal Standard International         |
| Publisher                | Institut Bauen und Umwelt e.V. (IBU) |
| Programme holder         | Institut Bauen und Umwelt e.V. (IBU) |
| Declaration number       | EPD-IDE-20220322-IBB1-EN             |
| Issue date               | 03.04.2023                           |
| Valid to                 | 02.04.2028                           |

## Single lever mixer Ideal Standard International

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## 1. General Information

### Ideal Standard International

#### Programme holder

IBU – Institut Bauen und Umwelt e.V.  
Hegelplatz 1  
10117 Berlin  
Germany

#### Declaration number

EPD-IDE-20220322-IBB1-EN

#### This declaration is based on the product category rules:

Fittings and showers, 08.03.2023  
(PCR checked and approved by the SVR)

#### Issue date

03.04.2023

#### Valid to

02.04.2028



Dipl.-Ing Hans Peters  
(chairman of Institut Bauen und Umwelt e.V.)



Dipl.-Ing. Hans Peters  
(Managing Director Institut Bauen und Umwelt e.V.)

### Single lever mixer

#### Owner of the declaration

Ideal Standard International NV  
Da Vincilaan 2  
1935 Zaventem  
Belgium

#### Declared product / declared unit

1 kg of Single lever mixer

#### Scope:

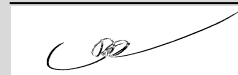
The EPD contains the results for 1 kg of a single lever mixer produced by Ideal Standard. The EPD is representative for all single lever mixer produced by Ideal Standard in the factories located in Vidima (Bulgaria) and Wittlich (Germany).

Foreground data has been provided directly by Ideal Standard and background LCA data is based on Ecoinvent 3.8 and Industry 2.0 data. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804 bezeichnet*.

#### Verification

|                                                                                  |            |
|----------------------------------------------------------------------------------|------------|
| The standard EN 15804 serves as the core PCR                                     |            |
| Independent verification of the declaration and data according to ISO 14025:2011 |            |
| <input type="checkbox"/>                                                         | internally |
| <input checked="" type="checkbox"/>                                              | externally |



Vito D'Incognito,  
(Independent verifier)

## 2. Product

### 2.1 Product description/Product definition

Single lever mixers. A single-hole mechanical mixer with a fixed or swivel spout includes the aerator, cap, cartridge, fixation set, flexhose, fixation screws, handle, manifold, lift-rod, pop-up waste. The range of mixer taps covers several models and two commercial brands: Ideal Standard and Porcher. The manufacturer can - within the framework of the *European Regulation N° 305/2011 (CPR)* - present the Declaration of Performance (DOP) of the product confirming that the product has a CE marking.

### 2.2 Application

A solution used in private and public bathrooms as a plumbing fixture used to mix hot and cold water.

### 2.3 Technical Data

#### Constructional data

The tests carried out on single lever mixers included in this EPD are the following:

- EN 248, Sanitary fittings - General specification for Ni-Cr electrolytic coating.
- EN 817, Sanitary fittings - Mechanical mixing valves (PN10) - General technical specifications.

| Name                                                  | Value     | Unit |
|-------------------------------------------------------|-----------|------|
| Maximum load temperature permanent operation          | 65        | °C   |
| Maximum load temperature temporary operation          | 90        | °C   |
| Flow rate (indications for pressure range of 1-3 bar) | 0.6 - 1.2 | m³/h |
| Sound emissions                                       | 20        | dB/A |

The manufacturer can - within the framework of the *European Regulation N° 305/2011 (CPR)* - present the Declaration of Performance (DOP) of the product confirming that the product has a CE marking.

### 2.4 Delivery status

The products are packed: pallet, PE plastic bag, coverage carton and are accompanied with an instruction and guarantee sheet.

The products can come in very different shapes and dimensions. An overview of all Single lever mixers can be found on Ideal Standard's website and filter on 'Single lever': <https://www.idealstandard.co.uk/products/catalog/taps-and-mixers/>

### 2.5 Base materials/Ancillary materials

The main components of the product are: aerator, body, cap, cartridge, flexhose, fixation screws, fixation set, handle, lift rod, manifold and pop-up waste.

The material composition of the product:

- 80-95% Brass
- 0-15% Zinc dye cast
- 5-15% Plastic

A variability study on differences in material composition is described in the LCA background report, and shows that the variance is acceptable. As a result the composition used in this EPD is representative for the full range of Single lever mixers produced by Ideal Standard in Europe.

This product does contain substances listed in the candidate list (date: 26.10.2022) exceeding 0.1 percentage by mass: 7439-92-1 (Pb)

This product does not contain other carcinogenic, mutagenic,

reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass,

Biocide products were not added to this construction product and it has not been treated with biocide products as defined by the (EU) Ordinance on Biocide Products No. 528/2012.

### 2.6 Manufacture

#### Production brass components:

During the brass production Ideal Standard remelts internal scrap with some purchased metals (eg. Al, Cu ...) to adjust for the recipe. Besides, Ideal Standard also purchases brass rods and tubes from their suppliers. The brass ingots from remelted scrap and the purchased brass rods and tubes are cutted, shaved and/or turned to produce the different brass components. Finally the brass components are plated with nickel and chrome. Also note that Ideal Standard sometimes purchases completely finalized brass components if the demand is higher than the produced quantity.

#### Production plastic components:

Some plastic components are produced at Ideal Standard. Plastic granulates are injection moulded into the correct shape. Afterwards they are plated with nickel and chrome.

#### Assembly

The final stage in the production process is the assembly of the different brass components, plastic components and purchased components (i.e screws, cartridges etc ...), and the packaging.

### 2.7 Environment and health during manufacturing

Environmental, occupational health, safety and quality management at the Ideal Standard plants are in accordance with the following standards:

- ISO 14001
- ISO 9001
- ISO 45001

### 2.8 Product processing/Installation

Usually the fitting is installed using an installation kit provided by Ideal Standard (i.e. EasyKit), but it can also be installed without.

### 2.9 Packaging

A wooden pallet, PE plastic bag and coverage carton are used to pack and transport the product to the supplier/customer. The product is also accompanied with an instruction and guarantee sheet.

### 2.10 Condition of use

The product will not change in material composition over the reference service life.

### 2.11 Environment and health during use

Under normal conditions of use, the products do not cause any adverse health effects or release of volatile organic compounds (VOCs) into indoor air.

No environmental impact on water, air or soil is expected.

### 2.12 Reference service life

Reference service life not relevant, as module B has not been declared.

Description of the influences on the ageing of the product when applied in accordance with the rules of technology.



## 2.13 Extraordinary effects

### Fire

Not subjected to fire classification

### Water

No risks are expected to occur in terms of the environment and human health.

### Mechanical destruction

In case of mechanical destruction, no risks are expected to occur in terms of environment and human health.

## 2.14 Re-use phase

Recycling of the brass components is possible, and considered in this LCA study using the average European end-of-life scenario described in Annexe C of the Product Environmental Footprint Pilots (PEFCR) 6.3 guidance, version March 2018.

Energy recovery of the incineration of the plastic components is also considered in this study.

## 2.15 Disposal

According to the average European end-of-life scenario described in Annexe C of the Product Environmental Footprint Pilots (PEFCR) 6.3 guidance (version March 2018), the following disposal scenarios have been considered: 5% of the brass and other metals parts are landfilled, 45% of the plastic parts are incinerated and 55% of the plastic parts are landfilled.

## 2.16 Further information

Additional information on Single lever mixers produced by Ideal Standard can be found at:  
<https://www.idealstandard.co.uk/products/catalog/taps-and-mixers/>

# 3. LCA: Calculation rules

## 3.1 Declared Unit

### Declared unit

| Name          | Value | Unit |
|---------------|-------|------|
| Declared unit | 1     | kg   |

This EPD reports the environmental impact of 1 kg of the weighted average single lever mixer produced at the Bulgarian factory plant.

The average has been selected as follows:

- The weighted average is calculated based on the weight and sold quantities of the product in 2021.
- The product that has a weight closest to the average weight is selected.
- The data for the selected single lever mixer is converted to 1 kg of that product

The environmental impact of a specific single lever can be calculated by multiplying the results of 1 kg of the average single lever mixer with the respective weight of the product.

In the background report a variability study has been performed to show the representativeness of the average single lever mixer for the full product range in Europe. This is further described in paragraph 3.6.

## 3.2 System boundary

Cradle-to-gate with options, including module D

## 3.3 Estimates and assumptions

The results are for 1 kg of representative single lever mixer. A variability study shows the variance between both factories, respectively in Bulgaria and Germany, and that the variance in the material composition is acceptable.

Besides, some other assumptions have been made:

- For production waste only the most relevant production waste streams have been considered (waste of ancillary materials and smaller waste flows have been excluded).
- Only the most relevant ancillary materials have been selected based on the consumption rate and importance in the production process.
- No data was available on the specific packaging per raw material/component. Therefore the packaging of the raw materials have been calculated based on the packaging waste reported in the factory.

## 3.4 Cut-off criteria

The following processes are excluded because data was not available:

- Transport of some raw materials
- Transport of packaging raw materials
- Packaging and transport of ancillary materials used during the production process
- Packaging and transport of ancillary materials used during installation

No further approximations have been made to replace the missing data, as they were considered to be not relevant based on the first iterations of the results.

The following processes are considered below cut-off:

- For production waste only most relevant production waste streams have been considered (waste of ancillary materials and smaller waste flows have been excluded).
- Only most relevant ancillary materials have been selected based on consumption rate and importance in the production process.
- Environmental impacts caused by the personnel of the production plants are not included in the LCA, e.g. waste from the cafeteria and sanitary installations, accidental pollution caused by human mistakes, or environmental effects caused by commuter traffic. Heating or cooling of the plants in order to ensure a comfortable indoor climate for the personnel for example is also neglected.

## 3.5 Background data

Ecoinvent 3.8 and Industry 2.0

## 3.6 Data quality

Foreground data is specific to Ideal Standard and is collected for the reference year 2021. Background data is based on Ecoinvent 3.8 which is released in September 2021, and Industry 2.0.

In the background report a variability study has been performed to show the representativeness of the average single lever mixer for the full product range in Europe.

First, the variance with the German plant is investigated and shows a variance of less than 4% over modules A1-C4, and less than 20 % if only module A3 is taken into account.

Secondly the variance in composition of the different single lever mixers is investigated. The study shows that the variance is less than 25 %, and is mainly influenced by a different brass



### 3.7 Period under review

The data collected by Ideal Standard is based on data from the production year 2021 for Single Lever mixer.

### 3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product's lifespan: Europe

### 3.9 Allocation

- Amounts of the raw materials/components (modules A1 and A2) and the packaging of the final product have been extracted from the bill of material. No allocation was necessary.

- The data for the production process (module A3) i.e input and outputs such as energy consumption, water consumption, production waste, ancillary materials and emissions are based on factory averages (total amount in the factory converted to 1 kg based on the total production volume in kg).
- No data was available on the specific packaging per raw material/component (module A1). Therefore the packaging of the raw materials have been calculated based on the packaging waste reported in the factory, and allocated to 1 kg of product based on the total production volume.

### 3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. Ecoinvent 3.8 and Industry 2.0

## 4. LCA: Scenarios and additional technical information

### Characteristic product properties

#### Information on biogenic carbon

The product does not contain biogenic carbon, but its accompanying packaging contains 0.222 kg C per kg of product in the form of paper, cardboard and wooden pallets.

#### Information on describing the biogenic Carbon Content at factory gate

| Name                                              | Value | Unit |
|---------------------------------------------------|-------|------|
| Biogenic carbon content in product                | -     | kg C |
| Biogenic carbon content in accompanying packaging | 0.222 | kg C |

### Transport to the building site (A4)

| Name                                        | Value                   | Unit              |
|---------------------------------------------|-------------------------|-------------------|
| Litres of fuel                              | 260                     | l/100km           |
| Transport distance                          | 2000                    | km                |
| Capacity utilisation (including empty runs) | Default value Ecoinvent | %                 |
| Gross density of products transported       | Not calculated          | kg/m <sup>3</sup> |
| Capacity utilisation volume factor          | Default value Ecoinvent | -                 |

### Installation into the building (A5)

It is considered that there is no assembly waste, based on the fact that the product is prefabricated and installed by hand.

Only the impact of packaging waste has been considered.

| Name                                                                                                                                          | Value  | Unit |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--------|------|
| Packaging waste (paper and cardboard) PEF EOL scenario Europe for coverage carton packaging: 11 % incineration; 75 % recycling; 14 % landfill | 0.708  | kg   |
| Packaging waste (PE) PEF EOL scenario Europe for PE packaging: 32 % incineration; 29 % recycling; 39 % landfill                               | 0.0073 | kg   |

### End of life (C1-C4)

According to the European average PEF scenario, 95% of the brass, steel and zamak are recycled and 5% is landfilled. The European average PEF scenario for plastics describes 45%

incineration and 55% landfill.

| Name                                  | Value | Unit |
|---------------------------------------|-------|------|
| Collected as mixed construction waste | 1     | kg   |
| Reuse                                 | -     | kg   |
| Recycling Brass, steel and zamak      | 0.89  | kg   |
| Energy recovery Plastics              | 0.029 | kg   |
| Landfilling Brass steel and zamak     | 0.045 | kg   |
| Landfilling Plastics                  | 0.036 | kg   |

### Reuse, recovery and/or recycling potentials (D), relevant scenario information

Module D contains the benefits and loads of recycling Brass, steel and zamak, and the benefits of energy recovery during the incineration of the plastics.

Note that according to EN15804+A2 the recycled content amount of the brass (i.e. 54 %) has been taken into account in module D by subtracting this from the amount of scrap that will be recycled at the end-of-life.

| Name                                                                                                                  | Value          | Unit |
|-----------------------------------------------------------------------------------------------------------------------|----------------|------|
| Loads recycling of brass: Impact of the production process of brass excluding the production of raw materials         | 0.77-0.43=0.34 | kg   |
| Loads recycling of steel: Impact of the electric arc furnace production excluding the production of the raw materials | 0.01           | kg   |
| Loads recycling of zamak: impact of the electric arc furnace production excluding the production of the raw materials | 0.11           | kg   |
| Benefits recycling of brass: Avoided production of brass using 100 % primary materials                                | 0.77-0.43=0.34 | kg   |
| Benefits recycling of steel: Avoided production of steel using 100 % primary materials                                | 0.01           | kg   |
| Benefits recycling of zamak: Avoided production of Zinc using 100 % primary materials                                 | 0.11           | kg   |
| Benefits energy recovery during incineration of plastics: 20 % avoided production of Heat from natural gas            | 0.18           | MJ   |
| Benefits energy recovery during incineration of plastics: 10 % avoided production of European average grid mix        | 0.09           | MJ   |

## 5. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

| PRODUCT STAGE       |           |               | CONSTRUCTION PROCESS STAGE          |          | USE STAGE |             |        |             |               |                        |                       | END OF LIFE STAGE          |           |                  |          | BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES |
|---------------------|-----------|---------------|-------------------------------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|-------------------------------------------------|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | 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         | MNR    | MNR         | MNR           | MND                    | MND                   | X                          | X         | X                | X        | X                                               |

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 kg single lever mixer

| Parameter      | Unit                             | A1        | A2       | A3        | A4       | A5       | C1 | C2       | C3       | C4       | D         |
|----------------|----------------------------------|-----------|----------|-----------|----------|----------|----|----------|----------|----------|-----------|
| GWP-total      | kg CO <sub>2</sub> eq            | 3.2E+00   | 6.85E-02 | 5.84E+00  | 4.89E-01 | 7.82E-01 | 0  | 3.13E-02 | 1.35E-03 | 7.39E-02 | -3.16E+00 |
| GWP-fossil     | kg CO <sub>2</sub> eq            | 3.28E+00  | 6.85E-02 | 6.46E+00  | 4.88E-01 | 2.21E-02 | 0  | 3.13E-02 | 1.33E-03 | 7.39E-02 | -2.5E+00  |
| GWP-biogenic   | kg CO <sub>2</sub> eq            | -8.39E-02 | 2.45E-05 | -6.29E-01 | 1.75E-04 | 7.6E-01  | 0  | 1.12E-05 | 7.22E-06 | 3.91E-06 | -6.52E-01 |
| GWP-luluc      | kg CO <sub>2</sub> eq            | 7.48E-03  | 2.74E-05 | 3.9E-03   | 1.95E-04 | 8.67E-06 | 0  | 1.25E-05 | 3.08E-06 | 2.06E-06 | -6.1E-03  |
| ODP            | kg CFC11 eq                      | 2.03E-07  | 1.59E-08 | 5.29E-07  | 1.13E-07 | 3.93E-09 | 0  | 7.25E-09 | 6.91E-11 | 6.92E-10 | -1.5E-07  |
| AP             | mol H <sup>+</sup> eq            | 2.11E-01  | 1.97E-04 | 3.53E-02  | 1.39E-03 | 7.49E-05 | 0  | 8.89E-05 | 7.64E-06 | 2.41E-05 | -1.83E-01 |
| EP-freshwater  | kg P eq                          | 6.59E-04  | 4.88E-07 | 9.34E-04  | 3.48E-06 | 2.21E-07 | 0  | 2.23E-07 | 1.4E-07  | 6.56E-08 | -5.54E-04 |
| EP-marine      | kg N eq                          | 8.96E-03  | 3.92E-05 | 5.12E-03  | 2.75E-04 | 2.17E-05 | 0  | 1.77E-05 | 1.02E-06 | 1.38E-05 | -7.56E-03 |
| EP-terrestrial | mol N eq                         | 1.23E-01  | 4.37E-04 | 5.22E-02  | 3.07E-03 | 2.41E-04 | 0  | 1.97E-04 | 1.17E-05 | 1.04E-04 | -1.05E-01 |
| POCP           | kg NMVOC eq                      | 3.7E-02   | 1.67E-04 | 1.54E-02  | 1.18E-03 | 7.42E-05 | 0  | 7.56E-05 | 3.27E-06 | 2.8E-05  | -3.16E-02 |
| ADPE           | kg Sb eq                         | 3.25E-03  | 1.85E-07 | 9.99E-06  | 1.32E-06 | 4.96E-08 | 0  | 8.47E-08 | 7.56E-09 | 9.39E-09 | -2.9E-03  |
| ADPF           | MJ                               | 4.37E+01  | 1.04E+00 | 1.17E+02  | 7.4E+00  | 2.57E-01 | 0  | 4.74E-01 | 2.79E-02 | 3.24E-02 | -3.22E+01 |
| WDP            | m <sup>3</sup> world eq deprived | 4.26E+00  | 3.16E-03 | 2.82E+00  | 2.25E-02 | 1.61E-03 | 0  | 1.44E-03 | 3.27E-04 | 1.2E-03  | -3.79E+00 |

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

### RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 kg single lever mixer

| Parameter | Unit           | A1       | A2       | A3       | A4       | A5        | C1 | C2       | C3       | C4        | D         |
|-----------|----------------|----------|----------|----------|----------|-----------|----|----------|----------|-----------|-----------|
| PERE      | MJ             | 1.01E+01 | 1.46E-02 | 3.53E+00 | 1.04E-01 | 9.18E-01  | 0  | 6.67E-03 | 5.49E-03 | 2.39E-03  | 0         |
| PERM      | MJ             | 1.01E+00 | 0        | 7.18E+00 | 0        | -6.85E+00 | 0  | 0        | 0        | 0         | 6.67E+00  |
| PERT      | MJ             | 1.11E+01 | 1.46E-02 | 1.07E+01 | 1.04E-01 | -5.93E+00 | 0  | 6.67E-03 | 5.49E-03 | 2.39E-03  | 6.67E+00  |
| PENRE     | MJ             | 5.19E+01 | 1.04E+00 | 1.4E+02  | 7.44E+00 | 3.35E-01  | 0  | 4.77E-01 | 3.32E-02 | 9.41E-01  | 0         |
| PENRM     | MJ             | 2.08E+00 | 0        | 2E-01    | 0        | -1.34E-01 | 0  | 0        | 0        | -9.05E-01 | 8.33E-02  |
| PENRT     | MJ             | 5.4E+01  | 1.04E+00 | 1.4E+02  | 7.44E+00 | 2.01E-01  | 0  | 4.77E-01 | 3.32E-02 | 3.62E-02  | 8.33E-02  |
| SM        | kg             | 4.07E-01 | 0        | 0        | 0        | 0         | 0  | 0        | 0        | 0         | 9.06E-01  |
| RSF       | MJ             | 0        | 0        | 0        | 0        | 0         | 0  | 0        | 0        | 0         | 0         |
| NRSF      | MJ             | 0        | 0        | 0        | 0        | 0         | 0  | 0        | 0        | 0         | 0         |
| FW        | m <sup>3</sup> | 1.02E-01 | 7.63E-05 | 5.17E-02 | 5.44E-04 | 8.01E-05  | 0  | 3.49E-05 | 2.08E-05 | 5.07E-05  | -8.18E-02 |

PERE = Use of renewable primary energy excluding renewable 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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

### RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 kg single lever mixer

| Parameter | Unit | A1       | A2       | A3       | A4       | A5       | C1 | C2       | C3       | C4       | D         |
|-----------|------|----------|----------|----------|----------|----------|----|----------|----------|----------|-----------|
| HWD       | kg   | 2.2E-03  | 2.71E-06 | 9.58E-03 | 1.93E-05 | 6.27E-07 | 0  | 1.24E-06 | 2.29E-08 | 7.48E-08 | -1.78E-03 |
| NHWD      | kg   | 1.29E+00 | 5.43E-02 | 1.17E+00 | 3.88E-01 | 8.35E-02 | 0  | 2.48E-02 | 1.09E-04 | 8.33E-02 | -9.56E-01 |
| RWD       | kg   | 1.66E-04 | 7.01E-06 | 6.13E-04 | 5E-05    | 1.7E-06  | 0  | 3.2E-06  | 2.03E-07 | 1.72E-07 | -1.22E-04 |
| CRU       | kg   | 0        | 0        | 0        | 0        | 0        | 0  | 0        | 0        | 0        | 0         |
| MFR       | kg   | 0        | 0        | 5.05E-02 | 0        | 3.75E-01 | 0  | 0        | 8.88E-01 | 0        | -1.31E+00 |
| MER       | kg   | 0        | 0        | 0        | 0        | 0        | 0  | 0        | 0        | 0        | 0         |



## Ideal Standard

|     |    |   |   |          |   |          |   |   |   |          |           |
|-----|----|---|---|----------|---|----------|---|---|---|----------|-----------|
| EEE | MJ | 0 | 0 | 6.51E-04 | 0 | 9.81E-02 | 0 | 0 | 0 | 9.05E-02 | -1.89E-01 |
| EET | MJ | 0 | 0 | 1.3E-03  | 0 | 1.96E-01 | 0 | 0 | 0 | 1.81E-01 | -3.78E-01 |

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; EEE = Exported electrical energy; EET = Exported thermal energy

### RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:

#### 1 kg single lever mixer

| Parameter | Unit              | A1       | A2       | A3       | A4       | A5       | C1 | C2       | C3       | C4       | D         |
|-----------|-------------------|----------|----------|----------|----------|----------|----|----------|----------|----------|-----------|
| PM        | Disease incidence | 4.36E-07 | 5.5E-09  | 1.95E-07 | 3.92E-08 | 1.48E-09 | 0  | 2.51E-09 | 2.54E-11 | 2.39E-10 | -3.77E-07 |
| IR        | kBq U235 eq       | 2.29E-01 | 4.51E-03 | 6.91E-01 | 3.21E-02 | 1.17E-03 | 0  | 2.06E-03 | 2.45E-04 | 1.48E-04 | -1.64E-01 |
| ETP-fw    | CTUe              | 1.35E+03 | 8.14E-01 | 4.24E+01 | 5.81E+00 | 3.3E-01  | 0  | 3.72E-01 | 1.85E-02 | 2.11E-01 | -1.16E+03 |
| HTP-c     | CTUh              | 4.56E-08 | 2.62E-11 | 2.03E-09 | 1.87E-10 | 2.65E-11 | 0  | 1.2E-11  | 9.32E-13 | 1.43E-11 | -3.54E-08 |
| HTP-nc    | CTUh              | 3.12E-06 | 8.23E-10 | 8.76E-08 | 5.87E-09 | 3.19E-10 | 0  | 3.76E-10 | 1.82E-11 | 1.41E-10 | -2.79E-06 |
| SQP       | SQP               | 7.81E+01 | 7.23E-01 | 5.19E+01 | 5.16E+00 | 1.86E-01 | 0  | 3.31E-01 | 1.83E-02 | 4.15E-02 | -1.25E+02 |

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. 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 experience with the indicator.

## 6. LCA: Interpretation

The results show that for the single lever mixer, the raw materials used in the formulation mix have a very significant impact on all impact categories, due to the use of brass. Brass has a dominant impact on 'Resource use – minerals and metals' in particular. Besides the production of the raw materials, also module A3 (mainly energy consumption during the manufacturing) has a significant contribution. For indicators such as 'Global warming potential' and 'Resource use – fossils'

the contribution of module A3 is more than 50 %.

Outside the system's boundaries, module D shows the benefits from recycling of the brass components and to a lesser extent the energy recovery from incineration of the plastic components. In module D the use of recycled content at the beginning of life has been taken into account in the calculations, as required by EN15804+A2.

## 7. Requisite evidence

## 8. References

### Standards

#### EN15804

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#### ISO 9001

ISO 9001:2015: Quality management systems — Requirements

#### ISO 14001

ISO 14001:2015: Environmental management systems — Requirements with guidance for use

#### ISO 14025

EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

#### ISO 14040

ISO 14040:2006: Environmental management – Life cycle assessment – Principles and framework.

#### ISO 14044

ISO 14044:2006: Environmental management – Life cycle assessment – Requirements and guidelines.

#### ISO 45001

ISO 45001:2018: Occupational health and safety management systems Requirements with guidance for use



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