

## Environmental Product Declaration

# Cadet® PRO 3517 Series Bowls

Vitreous Sanitary Ceramic Ware Bowls with EverClean® less Seats



3517A Right Height Elongated Bowl  
3517B Right Height Round Front Bowl  
3517C Standard Height Elongated Bowl  
3517D Standard Height Round Front Bowl  
3517F Compact Right Height Elongated Bowl

**Making life healthier, safer, and more beautiful at home, at work, and throughout the world.**

*American  
Standard*

The Cadet® PRO series of toilets from American Standard are trade channel exclusive, high efficiency toilets, offering professionals great value, price, and performance.

The Cadet® flushing system offers exceptional flushing power and the PowerWash® rim ensures superior bowl cleaning. A flow rate of 1.28 gallons per flush (gpf) utilizes 20% less water than a standard 1.6 gpf toilet. The Right Height™ designs sit at 16-1/2 inches tall, and the elongated bowl provides additional comfort. The innovative EverClean® surface, which helps to inhibit the growth of mold, mildew, and bacteria, is a permanent surface included on the Cadet® PRO.



# Environmental Product Declaration

## Cadet® PRO 3517 Series Bowls

Vitreous Sanitary Ceramic Ware

*American  
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According  
to  
**ISO 14025 &  
21930**

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025 & 21930. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g., Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

|  |   |
|--|---|
| PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE  | UL Solutions<br>333 Pfingsten Rd, Northbrook IL 60062<br>www.ul.com<br>www.spot.com   |
| GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER  | Program Operator Rules v.2.7 2022   |
| MANUFACTURER NAME AND ADDRESS  | LIXIL Water Technology  |
| DECLARATION NUMBER   | 4790840147.111.1  |
| DECLARED PRODUCT & FUNCTIONAL UNIT   | Cadet® PRO 3517 Series Bowls<br>1 Piece   |
| DESCRIPTION OF PRODUCT APPLICATION/USE   | Vitreous Sanitary Ceramic Ware  |
| PRODUCT RSL DESCRIPTION  | This specific product has a RSL of 10 years.  |
| REFERENCE PCR AND VERSION NUMBER   | UL Environment: Product Category Rules for Building-Related Products and Services in North America, Part A: Life Cycle Assessment Calculation Rules and Report Requirements, v.3.2, December 2018.<br>UL Environment: PCR Guidance - Texts for Building-Related Products and Services, Part B: Requirements on the EPD for Sanitary Ceramics. V.2.1. June 2018. |
| MARKETS OF APPLICABILITY   | Global  |
| DATE OF ISSUE  | October 1, 2023   |
| PERIOD OF VALIDITY   | 5 Years   |
| EPD TYPE   | Product Specific  |
| EPD SCOPE  | Cradle-to-Grave   |
| YEAR(S) OF REPORTED MANUFACTURER PRIMARY DATA  | 2022  |
| LCA SOFTWARE & VERSION NUMBER  | SimaPro Analyst v9.4.0.2  |
| LCA DATABASE & VERSION NUMBER  | Ecoinvent v3.9  |
| LCIA METHODOLOGY & VERSION NUMBER  | TRACI 2.1; EN 15804:2012+A2:2019+AC:2021  |
| The PCR review was conducted by  | UL Solutions - PCR Review Panel - epd@ul.com  |
| This declaration was independently verified in accordance with ISO 14025: 2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v3.1 (March 2018), based on CEN Norm EN 15804 (2012) and ISO 21930:2017, serves as the core PCR, with additional considerations from the USGBC/UL Environment Part A Enhancement (2017)<br><br><input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL | <br>Cooper McCollum, UL Solutions   |
| This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by   | Sustainable Solutions Corporation   |
| This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by  | Thomas P. Gloria, Industrial Ecology Consultants  |

### LIMITATIONS

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of Sanitary Ceramic products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the building use phase as instructed under this PCR. Full conformance with the PCR for Sanitary Ceramics allows EPD comparability only when all stages of a life cycle have been considered, when they comply with all referenced standards, use the same sub-category PCR, and use equivalent scenarios with respect to construction works. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.



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## Product Definition and Information

### Product Description



The Cadet PRO series of toilets from American Standard are trade channel exclusive, high efficiency toilets, offering great value, price and performance. The Cadet flushing system offers exceptional flushing power and the PowerWash rim ensures superior bowl cleaning. The innovative EverClean surface which helps to inhibit the growth of mold, mildew and bacteria is a permanent surface included on the Cadet Pro.

Toilet shall be 26-1/4" to 30-1/4" in length, 17-1/4" to 18" in width, and 28-1/4" to 30-3/8" in height.

Toilet shall use the Cadet flushing system.

Toilet shall be 12", 10", or 14" rough-in.

### Application

- Elongated bowl offers added room and comfort.
- Right Height feature offers taller height seating that makes sitting down and standing up easier for most adults
- Combines with 4188A series of tanks to create 215AA, 215BA, 215CA, 215DA, or 215FC series complete toilets.
- Combines with 4188B series of tanks to create 215AB, 215BB, 215CB, 215DB, or 215FA series complete toilets.

### Environmental Activities and Certification

The LIXIL Group promotes conservation of water and raw materials and sustainable practices across the entire lifecycle of our products from inputs, procurement, through use and disposal. On September 17, 2017, LIXIL Group Corporation announced placement in the Dow Jones Sustainability Indices (DJSI) for sustainability performance. LIXIL Group was included in the DJSI Asia-Pacific Index as the highest scoring company in the Building Products Industry, and ranked third globally in this industry group.

### Technical Data

For the declared product, the following technical data in the delivery status must be provided with reference to the test standard:

#### Technical Data

| Category | Value         |
|----------|---------------|
| Width    | Up to 18"     |
| Length   | Up to 30.25"  |
| Height   | Up to 30.375" |

### Market Placement / Application Rules

Specified model meets or exceeds the following:

- ADA & ICC/ANSI A117.1 (when installed with Right Height bowl and appropriate Cadet PRO tank which has the trip lever on the accessible side)
- ASME A112.19.2/CSA B45.1
- EPA WaterSense (when using 1.28 gpf configured Cadet PRO tanks)
- OBC

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#### Properties of Declared Product as Delivered

The product arrives to the site of installation packaged in a cardboard box with similar dimensions to the product size stated above. Installation instructions are available online, and additional installation materials may be required.

#### Material Composition

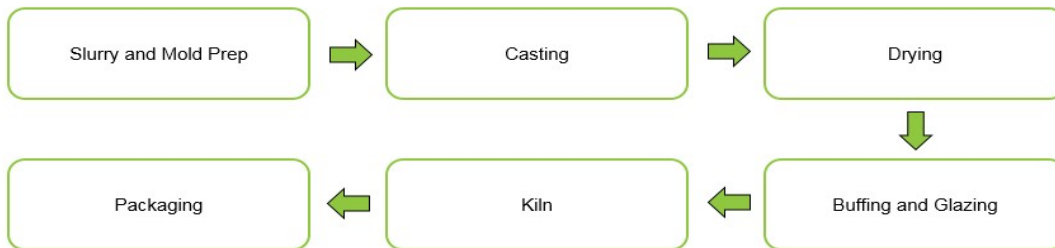
The composition of the Cadet® PRO 3517 Series Bowls is as follows:

| Component    | Percentage in mass (%) |
|--------------|------------------------|
| Clays        | 40-50%                 |
| Feldspar     | 35-45%                 |
| Silica       | 5-15%                  |
| Limestone    | 0-5%                   |
| Other        | 0-2%                   |
| <b>Total</b> | <b>100.00%</b>         |

#### Manufacturing

The manufacturing process of vitreous process begins with the casting of slip in a plaster mold. Slip is primarily comprised of clay, feldspar, and silica, along with various additives. The molded slip is dried, coated with a glaze material, and fired in a kiln. The product is then inspected, packaged, and shipped to the customer.

Manufacturing Location: Tlaxcala, MX & Aguascalientes, MX



#### Environmental and Health During Manufacturing

LIXIL is committed to producing and distributing sanitary ceramics and tub products with minimal environmental impact, where health and safety is the primary focus for all employees and associates.

- Environmental operations, GHG, energy, water, waste, VOC, surface treatment and Health & Safety are being routinely monitored. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met and environment management program effectiveness is evaluated.
- No regulated substances of very high concern are present.
- Code of Conduct covers human rights, labor practices, and decent work. Management of Lixil is aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability, and recognizing outstanding performance.
- Any waste metals during machining are separated and recycled. Process water is treated internally before being discharged to municipal wastewater treatment.

#### Transportation

The product is transported an average of 2696 km to the site of installation via a diesel-powered truck, consuming 32 MJ of diesel fuel.

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### Installation

The product is installed through a manual installation process, and as such, no noise reduction measures are required. Caulk is used to create a waterproof seal around the edges of the installed product. In some instances, a wax ring may be used to create a secure connection between the product and the existing infrastructure. The installation phase also considers the disposal of packaging materials. For more instructions on how to install the product, go to [https://www.youtube.com/watch?v=xYcZ\\_TZWFuA](https://www.youtube.com/watch?v=xYcZ_TZWFuA)

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### Packaging

These products are packaged with cardboard, paper, and plastic wrap. All of these materials are considered to be recyclable.

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### Use Conditions

For vitreous and tub products, the majority of use phase impacts are the result of cleaning required to maintain the product over its stated reference service life. Operational water and energy use is only included for products that control the flow of water. The majority of vitreous and tub products do not control the flow of water, and therefore have no operational water or energy use impacts. The exception is for one-piece toilets with an integrated flushing system, which do have water and energy use impacts.

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### Environmental and Health During Use

There is no harmful emissive potential. No damage to health or impairment is expected under normal use of the product.

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### Reference Service Life

The Reference Service Life is determined by the guidance from the Product Category Rules and varies by product type. This specific product has a RSL of 10 years. The building Estimated Service Life is 75 years.

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### Extraordinary Effects

#### Fire

No danger to the environment is anticipated during exposure to fire.

#### Water

No substances are used which have a negative impact on ecological water quality on contact by the product with water.

#### Mechanical Destruction

No danger to the environment is anticipated during mechanical destruction.

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### Re-use Phase

Although it is possible to recycle these products at the end of life, it is not the typical disposal pathway.

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### Disposal

Final product disposal is modeled as 100% to inert material landfill.

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### Further Information

LIXIL Water Technologies  
One Centennial Avenue  
Piscataway, NJ, 08854

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## Life Cycle Assessment

### Functional Unit

The declaration refers to the functional unit of 1 unit (or piece) of Cadet® PRO 3517 Series Bowls.

| Name                      | Value | Unit                 |
|---------------------------|-------|----------------------|
| Functional unit           | 1     | Piece                |
| Mass                      | 27.59 | kg                   |
| Conversion factor to 1 kg | 0.04  | -                    |
| Flush rate                | n/a   | m <sup>3</sup> / sec |
| Flow rate                 | n/a   | m <sup>3</sup> / sec |

### System Boundary

This is a cradle-to-grave Environmental Product Declaration. The following life cycle phases were considered:

| 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 gate to the site | Construction/ installation process | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction /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                                  | X         | X           | X      | X           | X             | X                      | X                     | X                          | X         | X                | X        | MND   |

Description of the System Boundary Stages Corresponding to the PCR

(X = Included; MND = Module Not Declared)

\*This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of waste state or disposal of final residues.

### Estimates and Assumptions

Transport:

For materials and pre-products, the actual means of transport and distances, provided by the suppliers, were considered.

EoL:

In the End-of-Life phase, all materials are assumed to be disposed of in a 100% inert material landfill.

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### Cut-off Criteria

In the assessment, all available data from the production process are considered, i.e., all raw materials used, auxiliary materials (e.g., lubricants), thermal energy consumption, and electric power consumption - including material and energy flows contributing less than 1% of mass or energy (if available). In case a specific flow contributing less than 1% in mass or energy is not available, worst case assumption proxies are selected to represent the respective environmental impacts. Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment. No known flows are deliberately excluded from this EPD.

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### Background data

For life cycle modeling of the considered products, the SimaPro v9.4.0.2 software is used. Primary data was collected from the LIXIL owned facilities. Secondary data was used for upstream raw material production and downstream inventory flows. This secondary data was sourced from either the Ecoinvent v3.9 or USLCI databases.

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### Data Quality

The data sources used are complete and representative of North America in terms of the geographic and technological coverage and are a recent vintage (i.e., less than ten years old). The data used for primary data are based on direct information sources of the manufacturer. Secondary data sets were used for raw materials extraction and processing, end of life, transportation, and energy production flows. Wherever secondary data is used, the study adopts critically reviewed data for consistency, precision, and reproducibility to limit uncertainty.

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### Period Under Review

The period under review is the 2022 Fiscal Year.

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### Allocation

Allocation was determined on a mass basis and then converted to unit/piece.

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### Comparability

A comparison or an evaluation of EPD data is only possible if all data sets to be compared were created according to ISO 21930 and the building context, respectively the product-specific characteristics of performance, are taken into account. Environmental declarations from different programs may not be comparable. Full conformance with the selected PCR allows EPD comparability only when all stages of a product's life cycle have been considered. However, variations and deviations are possible.

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## LCA: Modeling Scenarios and Additional Technical Information

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared. Any information omitted from the following scenario tables was done so intentionally as it was unrelated and had no presentable values.

| Transport to Building Site (A4)             |       |                   |
|---|-------|-------------------|
| Name  | Value | Unit              |
| Liters of fuel                              | 38    | l/100km           |
| Transport distance                          | 2696  | km                |
| Capacity utilization (including empty runs) | 90    | %                 |
| Gross density of products transported       | -     | kg/m <sup>3</sup> |
| Capacity utilization volume factor          | 0.68  | -                 |

| Installation into the Building (A5)               |       |                    |
|---|-------|--------------------|
| Name  | Value | Unit               |
| Auxiliary materials                               | 0.22  | kg                 |
| Water consumption                                 | -     | m <sup>3</sup>     |
| Other resources                                   | -     | kg                 |
| Electricity consumption                           | -     | kWh                |
| Other energy carriers                             | -     | MJ                 |
| Waster materials at construction site             | 3.78  | kg                 |
| Output substance (landfill)                       | 3.02  | kg                 |
| Output substance (incineration)                   | 0.76  | kg                 |
| Direct emissions to ambient air*, soil, and water | 0.80  | kg CO <sub>2</sub> |

\* CO<sub>2</sub> emissions to air from disposal of packaging

| Maintenance (B2)                       |         |                |
|--|---------|----------------|
| Name                                   | Value   | Unit           |
| Information on maintenance             | *       | -              |
| Maintenance cycle                      | 3650    | Number / RSL   |
| Maintenance cycle                      | 23725   | Number / ESL   |
| Water consumption (from tap, to sewer) | 0.00045 | m <sup>3</sup> |
| Auxiliary materials (cleaning agent)   | 18.25   | kg             |
| Other resources                        | -       | kg             |
| Electricity consumption                | -       | kWh            |
| Other energy carriers                  | -       | MJ             |
| Material loss                          | -       | kg             |

\* Daily with 50ml of 10% HCL solution

| Replacement (B4) / Refurbishment (B5) |       |              |
|---------------------------------------|-------|--------------|
| Name                                  | Value | Unit         |
| Replacement cycle                     | -     | Number / RSL |
| Replacement cycle                     | 6.5   | Number / ESL |

| Operational Energy Use (B6) and Water Use (B7)   |       |                |
|--|-------|----------------|
| Name   | Value | Unit           |
| Water consumption (from tap, to sewer)           | -     | m <sup>3</sup> |
| Electricity consumption                          | -     | kWh            |
| Other energy carriers                            | -     | MJ             |
| Equipment output                                 | -     | kW             |
| Direct emissions to ambient air, soil, and water | -     | kg             |
| Further assumptions                              | *     | -              |

\* No associated operational energy or water use

| End of Life (C1 - C4)                 |       |      |
|---------------------------------------|-------|------|
| Name                                  | Value | Unit |
| Collected separately                  | -     | kg   |
| Collected as mixed construction waste | 27.59 | kg   |
| Reuse                                 | -     | kg   |
| Recycling                             | -     | kg   |
| Energy recovery                       | -     | kg   |
| Landfilling                           | 27.59 | kg   |

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## LCA Results

Results shown below were calculated using TRACI 2.1 Methodology.

### TRACI 2.1 Impact Assessment

| Parameter | Parameter  | Unit                    | A1-A3    | A4       | A5       | B2*      | B4*      | C1       | C2       | C3       | C4       |
|-----------|--|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| GWP       | Global warming potential                             | kg CO <sub>2</sub> -Eq. | 3.32E+01 | 6.56E+00 | 4.37E+00 | 1.61E+01 | 3.96E+02 | 0.00E+00 | 3.68E-01 | 0.00E+00 | 2.85E-01 |
| ODP       | Depletion potential of the stratospheric ozone layer | kg CFC-11 Eq.           | 1.22E-06 | 2.50E-10 | 1.17E-07 | 6.56E-06 | 5.25E-05 | 0.00E+00 | 8.26E-08 | 0.00E+00 | 9.33E-08 |
| AP Air    | Acidification potential for air emissions            | kg SO <sub>2</sub> -Eq. | 2.29E-01 | 3.91E-02 | 2.68E-03 | 1.04E-01 | 2.46E+00 | 0.00E+00 | 1.82E-03 | 0.00E+00 | 2.18E-03 |
| EP        | Eutrophication potential                             | kg N-Eq.                | 5.39E-02 | 2.18E-03 | 2.27E-02 | 8.99E-02 | 1.11E+00 | 0.00E+00 | 4.38E-04 | 0.00E+00 | 9.17E-04 |
| SP        | Smog formation potential                             | kg O <sub>3</sub> -Eq.  | 1.67E+00 | 1.07E+00 | 3.55E-02 | 1.37E+00 | 2.76E+01 | 0.00E+00 | 4.52E-02 | 0.00E+00 | 5.30E-02 |
| FFD       | Fossil fuel depletion                                | MJ-surplus              | 6.52E+01 | 1.18E+01 | 1.61E+00 | 1.42E+01 | 6.14E+02 | 0.00E+00 | 7.34E-01 | 0.00E+00 | 8.85E-01 |

\*All use phase stages have been considered, and any stages that contain non-zero values are reported above. The remainder of use phase stages have values of zero.

Results shown below were calculated using EN 15804+A2 Methodology.

### EN 15804+A2 Impact Assessment

| Parameter           | Parameter   | Unit                    | A1-A3    | A4       | A5       | B2*      | B4*      | C1       | C2       | C3       | C4       |
|---------------------|---|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| GWP - total         | Global warming potential total  | kg CO <sub>2</sub> Eq.  | 3.50E+01 | 6.71E+00 | 8.43E+00 | 1.67E+01 | 4.39E+02 | 0.00E+00 | 3.73E-01 | 0.00E+00 | 2.94E-01 |
| GWP - fossil        | Global warming potential fossil fuels   | kg CO <sub>2</sub> Eq.  | 3.38E+01 | 6.71E+00 | 7.42E-01 | 1.66E+01 | 3.80E+02 | 0.00E+00 | 3.69E-01 | 0.00E+00 | 2.90E-01 |
| GWP - biogenic      | Global warming potential biogenic   | kg CO <sub>2</sub> Eq.  | 1.19E+00 | 0.00E+00 | 7.69E+00 | 4.12E-02 | 5.80E+01 | 0.00E+00 | 1.03E-03 | 0.00E+00 | 3.69E-03 |
| GWP - luluc         | Global warming potential land use and land use change                               | kg CO <sub>2</sub> Eq.  | 1.48E-02 | 0.00E+00 | 2.64E-04 | 2.65E-02 | 2.88E-01 | 0.00E+00 | 2.61E-03 | 0.00E+00 | 1.40E-04 |
| ODP                 | Depletion potential of the stratospheric ozone layer                                | kg CFC-11 Eq.           | 1.14E-06 | 1.71E-10 | 9.10E-08 | 6.25E-06 | 4.97E-05 | 0.00E+00 | 7.83E-08 | 0.00E+00 | 8.83E-08 |
| AP                  | Acidification potential, Accumulated Exceedance                                     | mol H <sup>+</sup> Eq.  | 2.85E-01 | 3.58E-02 | 2.90E-03 | 1.26E-01 | 2.95E+00 | 0.00E+00 | 2.04E-03 | 0.00E+00 | 2.45E-03 |
| EP - freshwater     | Eutrophication potential, fraction of nutrients reaching freshwater end compartment | kg P Eq.                | 4.55E-03 | 0.00E+00 | 1.10E-04 | 7.95E-03 | 8.27E-02 | 0.00E+00 | 3.05E-05 | 0.00E+00 | 8.37E-05 |
| EP - marine         | Eutrophication potential, fraction of nutrients reaching marine end compartment     | kg N Eq.                | 3.29E-02 | 1.68E-02 | 6.03E-03 | 1.88E-02 | 4.95E-01 | 0.00E+00 | 7.28E-04 | 0.00E+00 | 8.44E-04 |
| EP - terrestrial    | Eutrophication potential, Accumulated Exceedance                                    | mol N Eq.               | 2.94E-01 | 1.83E-01 | 6.29E-03 | 1.92E-01 | 4.50E+00 | 0.00E+00 | 7.84E-03 | 0.00E+00 | 9.19E-03 |
| POCP                | Formation potential of tropospheric ozone photochemical oxidants                    | kg NMVOC Eq.            | 9.07E-02 | 4.89E-02 | 3.55E-03 | 5.38E-02 | 1.31E+00 | 0.00E+00 | 2.26E-03 | 0.00E+00 | 2.65E-03 |
| ADP-minerals&metals | Abiotic depletion potential for non-fossil resources                                | kg Sb Eq.               | 8.19E-05 | 0.00E+00 | 3.85E-06 | 6.91E-04 | 5.06E-03 | 0.00E+00 | 1.26E-06 | 0.00E+00 | 9.29E-07 |
| ADP - fossil        | Abiotic depletion potential for fossil resources                                    | MJ, net calorific value | 4.90E+02 | 8.43E+01 | 1.26E+01 | 2.13E+02 | 5.28E+03 | 0.00E+00 | 5.56E+00 | 0.00E+00 | 6.81E+00 |

\*All use phase stages have been considered, and any stages that contain non-zero values are reported above. The remainder of use phase stages have values of zero.



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Results below contain the resource use throughout the life cycle of the product.

| Resource Use |  |                           |          |          |          |          |          |          |           |          |          |
|--------------|--|---------------------------|----------|----------|----------|----------|----------|----------|-----------|----------|----------|
| Parameter    | Parameter  | Unit                      | A1-A3    | A4       | A5       | B2*      | B4*      | C1       | C2        | C3       | C4       |
| PERE         | Renewable primary energy as energy carrier                 | MJ, lower calorific value | 1.33E+01 | 0.00E+00 | 2.05E-01 | 1.64E+01 | 1.95E+02 | 0.00E+00 | 5.07E-02  | 0.00E+00 | 8.73E-02 |
| PERM         | Renewable primary energy resources as material utilization | MJ, lower calorific value | 1.41E+01 | 0.00E+00 | 1.70E-01 | 6.11E+00 | 1.33E+02 | 0.00E+00 | 6.24E-02  | 0.00E+00 | 3.02E-02 |
| PERT         | Total use of renewable primary energy resources            | MJ, lower calorific value | 2.73E+01 | 0.00E+00 | 3.75E-01 | 2.25E+01 | 3.28E+02 | 0.00E+00 | 1.13E-01  | 0.00E+00 | 1.17E-01 |
| PENRE        | Nonrenewable primary energy as energy carrier              | MJ, lower calorific value | 5.38E+02 | 8.94E+01 | 1.34E+01 | 2.27E+02 | 5.72E+03 | 0.00E+00 | 5.92E+00  | 0.00E+00 | 7.24E+00 |
| PENRM        | Nonrenewable primary energy as material utilization        | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00 | 0.00E+00 |
| PENRT        | Total use of nonrenewable primary energy resources         | MJ, lower calorific value | 5.38E+02 | 8.94E+01 | 1.34E+01 | 2.27E+02 | 5.72E+03 | 0.00E+00 | 5.92E+00  | 0.00E+00 | 7.24E+00 |
| SM           | Use of secondary material                                  | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00 | 0.00E+00 |
| RSF          | Use of renewable secondary fuels                           | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00 | 0.00E+00 |
| NRSF         | Use of nonrenewable secondary fuels                        | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00 | 0.00E+00 |
| FW           | Use of net fresh water                                     | m <sup>3</sup>            | 4.65E-01 | 0.00E+00 | 6.50E-03 | 3.35E-01 | 5.27E+00 | 0.00E+00 | -4.02E-04 | 0.00E+00 | 5.07E-03 |

\*All use phase stages have been considered, and any stages that contain non-zero values are reported above. The remainder of use phase stages have values of zero.

Results below contain the output flows and wastes throughout the life cycle of the product.

| Output Flows and Waste Categories |                               |      |          |          |          |          |          |          |          |          |          |
|-----------------------------------|-------------------------------|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Parameter                         | Parameter                     | Unit | A1-A3    | A4       | A5       | B2*      | B4*      | C1       | C2       | C3       | C4       |
| HWD                               | Hazardous waste disposed      | kg   | 1.82E-04 | 0.00E+00 | 4.69E-06 | 4.39E-04 | 4.23E-03 | 0.00E+00 | 1.45E-05 | 0.00E+00 | 1.05E-05 |
| NHWD                              | Non-hazardous waste disposed  | kg   | 4.42E+00 | 0.00E+00 | 3.27E+00 | 2.87E+00 | 2.51E+02 | 0.00E+00 | 3.86E-01 | 0.00E+00 | 2.77E+01 |
| RWD                               | Radioactive waste disposed    | kg   | 4.82E-04 | 0.00E+00 | 1.12E-05 | 6.00E-04 | 7.61E-03 | 0.00E+00 | 3.66E-05 | 0.00E+00 | 4.09E-05 |
| CRU                               | Components for re-use         | kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MFR                               | Materials for recycling       | kg   | 8.01E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.21E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MER                               | Materials for energy recovery | kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EEE                               | Exported electrical energy    | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EEE                               | Exported thermal energy       | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

\*All use phase stages have been considered, and any stages that contain non-zero values are reported above. The remainder of use phase stages have values of zero.



# Environmental Product Declaration

Cadet® PRO 3517 Series Bowls

Vitreous Sanitary Ceramic Ware

American  
Standard



According  
to  
ISO 14025 &  
21930

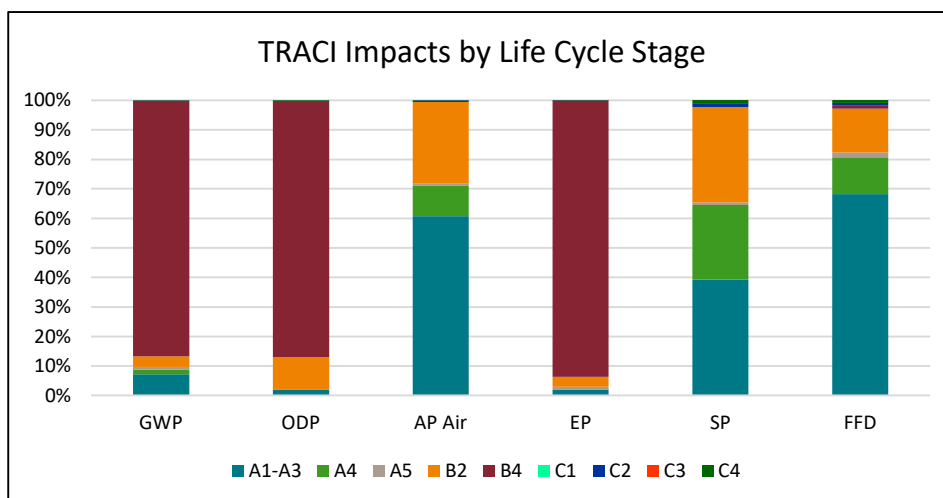
Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

| Resource Use |  |                           |          |          |          |          |          |          |          |          |          |
|--------------|--|---------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Parameter    | Parameter  | Unit                      | A1-A3    | A4       | A5       | B2*      | B4*      | C1       | C2       | C3       | C4       |
| BCRP         | Biogenic Carbon Removal from Product   | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEP         | Biogenic Carbon Emissions from Product   | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCRK         | Biogenic Carbon Removal from Packaging   | MJ, lower calorific value | 7.97E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.18E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEK         | Biogenic Carbon Emissions from Packaging   | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 7.97E-01 | 0.00E+00 | 5.18E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| BCEW         | Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCE          | Calcination Carbon Emissions   | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CCR          | Carbonation Carbon Removal   | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| CWNR         | Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process      | MJ, lower calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

\*All use phase stages have been considered, and any stages that contain non-zero values are reported above. The remainder of use phase stages have values of zero.

## Interpretation

The use (B2 and B4) life cycle stages drive the results in all impact categories, with the exception of the fossil fuel depletion, smog, and acidification categories, which are driven primarily by stages A1-A3. Within these A1-A3 stages, raw materials and energy used in the production process drive the impacts. B2 impacts are driven by the cleaning chemicals used for maintenance.



# Environmental Product Declaration

Cadet® PRO 3517 Series Bowls

Vitreous Sanitary Ceramic Ware

*American  
Standard*



According  
to  
ISO 14025 &  
21930

## References

- PCR Part A UL Environment: Product Category Rules for Building-Related Products and Services in North America, Part A: Life Cycle Assessment Calculation Rules and Report Requirements, v.3.2, December 2018.
- PCR Part B UL Environment: PCR Guidance - Texts for Building-Related Products and Services, Part B: Requirements on the EPD for Sanitary Ceramics. V.2.1. June 2018.
- ISO 14025 ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.
- ISO 14040 ISO 14040:2009-11, Environmental management — Life cycle assessment — Principles and framework.
- ISO 14044 ISO 14044:2006-10, Environmental management — Life cycle assessment — Requirements and guidelines.
- ISO 21930 ISO 21930:2017, Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services.
- EN 15804:2012+A2:2019+AC:2021 Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction product
- ULE 2020 UL Environment, General Program Instructions, v2.7, March 2022.
- TRACI 2.1 US EPA, Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI).
- CML 2001 Center of Environmental Science of Leiden University impact categories and characterization methods for impact assessment (CML).

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