

GUIDE TO ENVIRONMENTAL PRODUCT DECLARATIONS (EPDs) AND HEALTH PRODUCT DECLARATIONS (HPDs)

EPDs AND HPDs — THE TRANSPARENCY TOOLS FOR SUSTAINABLE COMMERCIAL BUILDINGS

“Green building” has always been more than just resource-efficient buildings. The US GreenBuilding Council (USGBC) defines as green building as encompassing “planning, design, construction, operations, and ultimately end-of-life recycling or renewal of structures.”

Similarly, “green products” are more than just products that save water and energy. Sustainable product innovation (SPI) is the concept of life-cycle thinking that considers environmental impact from the time raw materials are harvested or collected, all the way through to disposal. With this approach, specifiers can think beyond the impacts we ‘see’ or ‘feel’ in a product, providing a deeper understanding of which products will have the smallest environmental footprint.

Environmental product declarations (EPDs) are a life-cycle assessment (LCA) reporting tool that provides transparency into this wide variety of data points. EPDs follow a standardized format, so specifiers can easily compare products in the same category from different manufacturers or even compare different products from the same company. Transparency in materials EPDs help specifiers select products that will contribute to the overall efficiency of the building, much like food labeling helps consumers contribute to their overall health.

HPDs are similar, but focus on product contents and each ingredient’s relationship to human and ecological health. A completed HPD includes manufacturer and product information, details of product testing and compliance, and product ingredients.

This guide provides an overview of EPD and HPD reporting, their importance to Leadership in Energy and Environmental Design (LEED) certification, and tips on how to read them.

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EPD BASICS

EPDs cover a wide range of interior and exterior products for the built environment, including furniture, wall coverings, surfaces, lighting, plumbing and more. The quantified environmental data available in an EPD considers five stages of a lifecycle assessment (LCA): 1) extraction and processing of raw materials, 2) manufacturing, 3) transportation and distribution, 4) use, reuse, and maintenance, and 5) recycling and final disposal.

Unlike a green product label or certification, EPDs do not rank or rate a product. Instead, they are more like a detailed, scientific nutrition label, with disclosures that “help purchasers better understand a product’s sustainable qualities and environmental repercussions so they can make more informed product selections,” according to Underwriters Laboratories (UL), one of the world’s most recognized certifying companies.

EPDs are based on established product category rules (PCRs) and an open development process whereby industry stakeholders provide input that is collected by UL and reviewed by a panel for consensus. To ensure that industry innovations are always captured and reflected, PCRs are subject to revision every three to five years.

EPD reporting complies with International Standard ISO 14025, providing the ultimate in rigor and objectivity and eliminating the possibility of greenwashing — which is when companies make unsubstantiated marketing claims about their products.

“An EPD tells the lifecycle story of a product in a single, written report, focusing on information about a product’s environmental impacts, such as global warming potential, smog creation, ozone depletion, and water pollution” - Underwriters Laboratories

LEED AND EPDs

Over the past 25 years, the LEED green building rating system has transformed the marketplace for buildings products globally. Now used in more than 165 countries, LEED “provides a framework to create healthy, highly efficient and cost-saving green buildings” that is also a

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competitive advantage because they “attract tenants, cost less to operate, and boost employee productivity and retention.” LEED v4 and LEED v4.1, the latest pilot version of the standard as of this writing in 2019, reflects a growing focus on how materials impact the environment and human health.

Materials & Resources (MR) credits in LEED v4 for New Construction and Commercial Interiors “push on manufacturers to have a greener supply chain and more eco-friendly materials,” notes LEED v4 MR Credits: EPDs vs HPDs. The category looks at the entire lifecycle of a product as opposed to rating a single attribute. Because they provide transparency into product ingredients and manufacturing, EPDs qualify for several points under the credit for Building Product Disclosure and Optimization – Environmental Product Declarations. (Note: As of Spring 2019, teams can choose credits from either LEED v4 or the v4.1 pilot, enabling the specifier to choose the most advantageous path to certification.)

A project can earn one point by using “at least 20 different permanently installed products sourced from at least five different manufacturers” with an ISO-conforming EPD. The purpose of prioritizing products with EPDs is to “minimize the embodied energy and other impacts associated with the extraction, processing, transport, maintenance, and disposal of building materials,” states the Material and Resources Overview.

There are three types of EPDs – “Industry-Wide”, “Product Specific”, and “Manufacturer Specific.” The most rigorous and valued product specific EPD is 3rd-Party Certified, meaning its claims have been tested to a third-party standard.

Restroom plumbing is an ideal opportunity to specify products with EPDs, including toilets, urinals, faucets, sinks, showerheads, and even bathtubs – of which contribute LEED points toward building certification.

HOW TO INTERPRET EPDs

EPD documents follow the standardized design for EPDs to ensure they are easy to read. Each section contains a detailed breakdown of the product’s environmental impacts. These span from manufacturing and material composition, transportation and packaging, and installation and disposal. Use these key pieces of information to understand a product’s EPD and compare it against others:

The logo for American Standard, featuring the words "American Standard" in a stylized, cursive script font.

1. PRODUCT OVERVIEW

The specific name of the product or product family and a photo. Specification details for the product may be included, such as a WaterSense label, gallons per minute (gpm) or gallons per flush (gpf).

2. THIRD-PARTY VERIFICATION

Like a table of contents, this section documents the date of issue, program operator, and which PCRs were satisfied.

Environmental Product Declaration
VorMax® 4385 Series Tanks
 Vitreous Sanitary Ceramic Ware Tanks with EverClean



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The transitional designed VorMax delivers the cleanest flush ever engineered and is available as either an 1.28 gallon per flush (gpf) High Efficiency Toilet or an eco-minded 1.0 gpf Ultra High Efficiency Toilet. These Right Height toilets include our CleanCurve® Rim Design that eliminates hard to reach surfaces, to make cleaning virtually effortless. Our EverClean® Surface inhibits the growth of stain and odor-causing bacteria, mold and mildew on the toilet surface.


4385A VorMax 12" Rough Tank

THIRD-PARTY CERTIFIED BY A PROGRAM OPERATOR



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


Environmental Product Declaration
 VorMax® 4385 Series Tanks
 Vitreous Sanitary Ceramic Ware

American Standard  According to ISO 14025

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. 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	UL Environment	
DECLARATION HOLDER	LIXIL Water Technology	
DECLARATION NUMBER		
DECLARED PRODUCT	VorMax® 4385 Series Tanks	
REFERENCE PCR	Sanitary Ceramics	REFERENCE TO A PRODUCT CATEGORY RULE (PCR)
REFERENCE PCR STANDARD	<input type="checkbox"/> EN 15804 (2012) <input type="checkbox"/> ISO 21930 (2007) <input type="checkbox"/> ISO 21930 (2017)	
DATE OF ISSUE	January 30, 2018	
PERIOD OF VALIDITY	5 Years	
CONTENTS OF THE DECLARATION	Product definition and information about building physics Information about basic material and the material's origin Description of the product's manufacturing Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications	
The PCR review was conducted by		
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories	<input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL	UL Environment
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by		UL Environment

1 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.

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3. PRODUCT INFORMATION

This section provides a deeper look at the product profile, including manufacturing location, applications, and standard compliance. A chart highlights the material composition as measured in percentage of mass.

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Environmental Product Declaration

VorMax® 4385 Series Tanks
Vitreous Sanitary Ceramic Ware



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.

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.

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.

Re-use Phase

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

Disposal

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

Further Information

LIXIL Water Technologies
One Centennial Avenue
Piscataway, NJ, 08854

**DECLARED UNIT: HOW
IMPACT IS MEASURED
THROUGHOUT THE EPD**

Life Cycle Assessment

Declared Unit

The declaration refers to the functional unit of 1 unit (or piece) of VorMax® 4385 Series Tanks

Name	Value	Unit
Functional unit	1	Piece
Mass	16.50	kg
Conversion factor to 1 kg	0.06	-
Flush rate	4.9E-03	m ³ / flush
Flow rate	n/a	m ³ / sec

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Environmental Product Declaration

VorMax® 4385 Series Tanks
Vitreous Sanitary Ceramic Ware



**LIFE CYCLE STAGES OF THE
PRODUCT: FROM RAW MATERIALS
TO DISPOSAL/RECOVERY**

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 Losses Beyond the System Boundaries
	Raw material supply	Transport	Manufacturing	Transport from gate to the site	Construction/Installation process	Use	Maintenance	Repair	Replacement	Rehabilitation	Operational energy use	Operational water use	Discontinuation/Removal	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	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.

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.

Background data

For life cycle modeling of the considered products, the SimaPro 8.2.0.0 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 3.1 or USLCI databases.

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.

Period Under Review

The period under review is the 2017 Fiscal Year.

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4. MANUFACTURING

This section describes how the product is fabricated. A flow chart outlines the different manufacturing stages, such as smelting ore to casting or enamel application to kiln firing.

5. SYSTEM BOUNDARY

This section addresses the product lifecycle. **Cradle-to-grave** assesses a product from raw material supply to disposal. It spans the production stage, construction process, use stage, and end of life. These typically apply to products that have reuse or recycle options. **Cradle-to-gate** follows a product from the production stage only through the construction process. It does not cover transportation, use, or end of life.

6. METHODOLOGY

Both cradle-to-gate and cradle-to-grave EPDs include modeling scenarios with technical information showing how environmental impact calculations. These include a range of measurements, such as transport to a building site, maintenance, and operational energy use.

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7. LCA RESULTS

Environmental Product Declaration
VorMax® 4385 Series Tanks
Vitreous Sanitary Ceramic Ware

LIFE CYCLE ASSESSMENT (LCA) DEFINES IMPACTS BY IMPACT CATEGORY

According to ISO 14025

LCA Results

Results shown below were calculated using TRACI 2.1 Methodology.

TRACI 2.1 Impact Assessment		Unit	A1-A3	A4	A5	B2*	C1	C2	C3	C4
GWPP	Global warming potential	kg CO ₂ -Eq.	4.41E+01	1.90E+00	1.90E+00	0.00E+00	0.00E+00	1.02E-01	0.00E+00	1.73E-01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.62E-04	7.23E-11	1.14E-07	0.00E+00	0.00E+00	4.23E-13	0.00E+00	8.96E-08
AP Au	Acidification potential for air emissions	kg SO ₂ -Eq.	2.72E-01	1.12E-02	2.44E-03	0.00E+00	0.00E+00	7.14E-04	0.00E+00	1.38E-03
EP	Eutrophication potential	kg N-Eq.	1.84E-01	8.31E-04	1.39E-02	0.00E+00	0.00E+00	4.07E-05	0.00E+00	5.47E-04
SP	Smog formation potential	kg O ₃ -Eq.	1.62E+00	3.10E-01	2.89E-02	0.00E+00	0.00E+00	1.96E-03	0.00E+00	3.15E-02
FFD	Fossil Fuel Depletion	Mt surplus	7.43E+01	3.42E+00	1.59E+00	0.00E+00	0.00E+00	2.00E-01	0.00E+00	5.45E-01

*All use phase stages have been considered, and only maintenance (B2) contains non-zero values, which are reported above. The remainder of use phase stages have values of zero.

Results shown below were calculated using CML 2001 - April 2013 Methodology.

CML 2.1 Impact Assessment		Unit	A1-A3	A4	A5	B2*	C1	C2	C3	C4
GWPP	Global warming potential	kg CO ₂ -Eq.	4.41E+01	1.90E+00	2.79E+00	0.00E+00	0.00E+00	1.02E-01	0.00E+00	1.73E-01
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	1.25E-04	7.16E-11	1.09E-07	0.00E+00	0.00E+00	4.16E-13	0.00E+00	4.49E-08
AP Au	Acidification potential for air emissions	kg SO ₂ -Eq.	3.03E-01	9.34E-03	2.31E-03	0.00E+00	0.00E+00	5.79E-04	0.00E+00	1.19E-03
EP	Eutrophication potential	kg PO ₄ -Eq.	1.78E-02	1.69E-03	5.39E-03	0.00E+00	0.00E+00	1.07E-04	0.00E+00	3.06E-04
POCP	Photochemical oxidant formation potential	kg ethene-Eq.	1.48E-02	4.31E-04	6.94E-04	0.00E+00	0.00E+00	2.72E-05	0.00E+00	5.64E-05
ADPE	Abiotic depletion potential for non-fossil resources	kg Sb-Eq.	1.80E-05	0.00E+00	1.16E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-07
ADPF	Abiotic depletion potential for fossil resources	MJ	5.92E+02	2.59E+01	1.29E+01	0.00E+00	0.00E+00	1.82E+00	0.00E+00	4.30E+00

*All use phase stages have been considered, and only maintenance (B2) contains non-zero values, which are reported above. The remainder of use phase stages have values of zero.

GLOBAL WARMING POTENTIAL (GWPP): THE RELATIVE MEASURE OF HOW MUCH HEAT A GREENHOUSE GAS TRAPS IN THE ATMOSPHERE

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One of the most important sections for comparison purposes, the LCA Results detail environmental parameters. A product is measured for its impact on ecological factors that affect global warming and resource depletion. The EPDs conclude with a bar chart for the TRACI (Tool for Reduction and Assessment of Chemicals and Other Environmental Impacts) Impacts by Lifecycle Stage.

EPDs include the environmental impacts across each life cycle stage of a product. For example, A1-A3 represent raw material extraction, transport, and manufacturing while C4 represents end of life disposal.

This particular LCA was modeled using the Environmental Protection Agency (EPA) Tool for Reduction and Assessment of Chemicals and Other Environmental Impacts (TRACI) impact assessment methodology. Environmental impacts considered include global warming potential, ozone depletion, acidification potential, eutrophication potential, smog formation, and fossil fuel depletion. This information can be used by an architect to understand the environmental impact of the products they are specifying for buildings.

By examining this table, we can see that for this specific product, the greatest impact for global warming potential occurs during the use phase.

This shows that the greatest impact has to do with running water through the tank throughout its lifetime. Now that we know this, we know that the best way for this type of product to reduce its impact is by making its use phase more efficient, such as by designing tanks to use less water.

Environmental Product Declaration
VorMax® 4385 Series Tanks
Vitreous Sanitary Ceramic Ware

LIFE CYCLE ASSESSMENT (LCA) DEFINES IMPACTS BY IMPACT CATEGORY

According to ISO 14025

Resource Use

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

Resource Use		Unit	A1-A3	A4	A5	B2*	C1	C2	C3	C4
PERE	Renewable primary energy as lower calorific value	MJ lower calorific value	1.15E+01	0.00E+00	1.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.91E-02
PENR	Renewable primary energy resources as material utilization	MJ lower calorific value	9.55E+00	0.00E+00	2.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.80E-02
PERT	Total use of renewable primary energy resources	MJ lower calorific value	2.00E+01	0.00E+00	3.75E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-01
PENE	Nonrenewable primary energy as energy carrier	MJ lower calorific value	8.05E+02	2.99E+01	1.32E+01	0.00E+00	0.00E+00	1.52E+00	0.00E+00	4.48E+00
PENR	Nonrenewable primary energy as material utilization	MJ lower calorific value	9.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENR	Total use of nonrenewable primary energy resources	MJ lower calorific value	8.05E+02	2.99E+01	1.32E+01	0.00E+00	0.00E+00	1.52E+00	0.00E+00	4.48E+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
RSF	Use of nonrenewable secondary	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
NRSP	Use of nonrenewable secondary	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
FW	Use of net fresh water	m ³	2.65E-01	0.00E+00	8.92E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.35E-03

*All use phase stages have been considered, and only maintenance (B2) contains non-zero values, which 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		Unit	A1-A3	A4	A5	B2*	C1	C2	C3	C4
RWD	Hazardous waste disposed	kg	2.88E-04	0.00E+00	4.97E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.32E-04
NHWD	Non-hazardous waste disposed	kg	1.87E-01	0.00E+00	1.89E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.68E+01
RWD	Radioactive waste disposed	kg	9.79E-04	0.00E+00	9.45E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.09E-03
CRU	Components for re-use	kg	9.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MPN	Materials for recycling	kg	2.30E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MEK	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
REE	Reparted 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
REE	Reparted 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

*All use phase stages have been considered, and only maintenance (B2) contains non-zero values, which are reported above. The remainder of use phase stages have values of zero.

ADDITIONAL LIFE CYCLE INVENTORY VALUES BY LIFE CYCLE STAGE

NON-HAZARDOUS WASTE DISPOSED (NHWD); WASTE THAT IS DISPOSED OF DURING EACH LIFE CYCLE STAGE OF THE PRODUCT

Environment

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HPD BASICS — WHAT IS MATERIAL INGREDIENT REPORTING?

Material ingredient reporting (MIR) is a tool used by product manufacturers to disclose the materials and/or the hazards associated with their products in order for architects and designers to make the best decisions for their building.

Material ingredient reporting enables project design teams to select building products with disclosed chemical ingredients and/or select products with verified reductions in the use and generation of harmful substances. This reporting encourages manufacturers to innovate around their product design, provide transparency information, and reduce the use of harmful substances. Material ingredient reporting details the chemical inventory of a product, including its components.

GROHE SustainAbility 

REACH

June 2018

REACH – the new EU chemical regulation

As of 1 June 2007 a new EU ordinance (EU 1907/2006) for the Registration, Evaluation, Authorisation and Restriction of Chemicals - called REACH - has come into effect, with elementary changes on the existing regulations on chemicals in Europe. Solely for the implementation of the new requirements the European Chemicals Agency (ECHA) was established in Helsinki and started operations as of 1 June 2008.

The declared aim of REACH is to improve the level of knowledge about the dangers and risks that chemicals may pose, to achieve a higher protection level for man and environment. REACH affects all chemicals, as well those which are in use for a long time. Moreover, REACH will shift the responsibility for the risk assessment of chemicals in large part from the authorities to the producers and importers.

In the centre of the new ordinance is the registration and evaluation process, in which communication within the supply chain is playing an essential role. Nearly all companies in the supply chain, like producers, importers, downstream users, are affected by REACH and have to fulfil particular obligations.

The entire implementation of REACH will last more than 10 years. The timetable set by REACH included a pre-registration phase running from 1st June 2008 to 1st December 2008. The schedule for the following registration was depending on the production volume and risk potential of the particular substances. Until 1 July 2018 all substances were supposed to be registered.

Substances of Very High Concern (SVHC) according to Annex XIV of the REACH ordinance are required to be approved separately and may be subject to restrictions on use. A first list of substances with such properties ("candidate list") was already issued by ECHA on 28.10.2008 followed by additional listings since then.

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REACH AND RoHs

REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) is a European Union (EU) regulation. Compliance requires full accordance with the REACH Regulation and any amendments. Updates are ongoing, and additional chemicals were recently added to the list. REACH addresses the production and use of chemical substances, and their potential impacts on both human health and the environment.

RoHs is another EU directive focused on reducing impacts related to consumer electronics waste. Many manufacturers will provide summary statements that describe whether their products comply with these two standards.

A Health Product Declaration (HPD) reports product contents and each ingredient's relationship to human and ecological health. A completed HPD includes: Manufacturer and product information, details of product testing and compliance, and product ingredients.

This is a Health Product Declaration (HPD), a document that is used by manufacturers to clearly disclose the health impacts of each material ingredient in a product.

Afwall Millennium by Lixil Americas

Health Product Declaration v2.1.1

created via: HPDC Online Builder

CLASSIFICATION: 22 42 13
PRODUCT DESCRIPTION: Afwall® Millennium™ FloWise® wall-hung toilet line from American Standard. This reliable and dependable wall-hung toilet is now even better and more powerful with a premier flushing performance at lower flush volume, increased static weight load capacity, and streamlined design.

Section 1: Summary **Nested Method / Product Threshold**

CONTENT INVENTORY

Inventory Reporting Format <input checked="" type="radio"/> Nested Materials Method <input type="radio"/> Basic Method	Threshold level <input checked="" type="radio"/> 100 ppm <input type="radio"/> 1,000 ppm <input type="radio"/> Per GHS SDS <input type="radio"/> Per OSHA MSDS <input type="radio"/> Other	Residuals/Impurities Residuals/Impurities Considered in 6 of 6 Materials Explanation(s) provided for Residuals/Impurities? <input checked="" type="radio"/> Yes <input type="radio"/> No	<i>All Substances Above the Threshold Indicated Are:</i> Characterized <input type="radio"/> Yes Ex/SC <input checked="" type="radio"/> Yes <input type="radio"/> No <i>% weight and role provided for all substances.</i> Screened <input type="radio"/> Yes Ex/SC <input checked="" type="radio"/> Yes <input type="radio"/> No <i>All substances screened using Priority Hazard Lists with results disclosed.</i> Identified <input type="radio"/> Yes Ex/SC <input checked="" type="radio"/> Yes <input type="radio"/> No <i>All substances disclosed by Name (Specific or Generic) and Identifier.</i>
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Completed HPDs include manufacturer and product information, details of product testing and compliance and product ingredients.

For an HPD to qualify to meet the LEED v4 standard, it must:

- Disclose materials' health hazards for all intentional substances to the 1,000 parts per-million (ppm) (.1%)
- Consider residuals and their hazards for each material

Within the HPD is information required of a product to meet LEED v4's Building product disclosure and optimization credit. HPDs include the substance threshold, the substances contained in a product, the associated hazards of each and the VOC content. HPDs can either be self-published or third-party verified. Under LEED v4.1, the newest and most stringent version of LEED, third-party verified HPDs are now worth 1.5 products for credit achievement calculations, rather than just one.

DECLARE LABELS

Declare labels are transparency documents created by the International Living Future Institute. Declare labels detail where a product come from, what is it made of and where does it go at the end of its life.

In Declare, ingredients are reported by component. Ingredients with no associated hazard appear in grey, EPA Contaminants of Concern and REACH chemicals appear in light orange, and Red List chemicals appear in dark orange. Declare labels also include whether a product is in compliance with the California Department of Public Health's (CDHP) VOC requirements. Manufacturers can withhold one proprietary or second-tier supplied ingredient in any percentage, or multiple ingredients that make up less than 1% of the product by weight and volume. Low levels of lead are allowed in plumbing fittings and fixtures provided they meet the federal definition of "Lead-Free."

Declare labels meet LEED v4 material ingredient requirements if 99.9% of all of the ingredients have been evaluated and disclosed. Similar to third party certified HPDs, under LEED v4.1 third-party verified Declare Labels are now worth 1.5 products for credit achievement calculations, rather than just one.

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PLATINUM

Faucet: Eurostyle "Upcycled" (Prototype)

ISSUED TO Grohe AG

STANDARD 3.1

EXPIRES 12 September 2019

LEAD ASSESSMENT BODY

EPEA GmbH - Part of Drees & Sommer

ASSESSED APPLICATIONS

manufacturing, use, take back system (start phase), reuse of defined faucet chemical ingredients for an upcycling lead by GROHE

PRODUCTS COVERED

Faucet: Eurostyle "Upcycled"

PRODUCT OPTIMIZATION SUMMARY

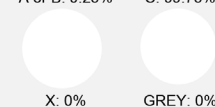
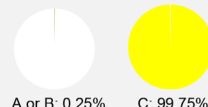
- Cradle to Cradle Certified*™ Banned List compliant
- Material Health optimization strategy not required
- No exposure from carcinogens, mutagens, or reproductive toxicants
- VOC emissions testing not required for this product type
- Product is fully optimized - does not contain any GREY or x-assessed chemicals
- Process chemicals have been identified and none are GREY or x-assessed

PERCENTAGE OF
 HOMOGENEOUS MATERIALS
 ASSESSED BY WEIGHT

100%

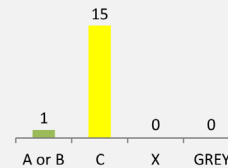
Inventory threshold for chemicals in each
 material = 100 ppm

ASSESSMENT RATINGS
 BY WEIGHT



% HOMOGENEOUS MATERIALS

PRODUCT
 OPTIMIZATION



16 HOMOGENEOUS MATERIALS

MHC3111

Another product transparency documentation method is Cradle to Cradle (C2C) Whenever possible provide products that are certified C2C v2 Basic, v3 Bronze, or higher. Or have a C2C Material Health Certificate certified Bronze or higher. To comply for LEED credit, the documentation must include one of the aforementioned labels.

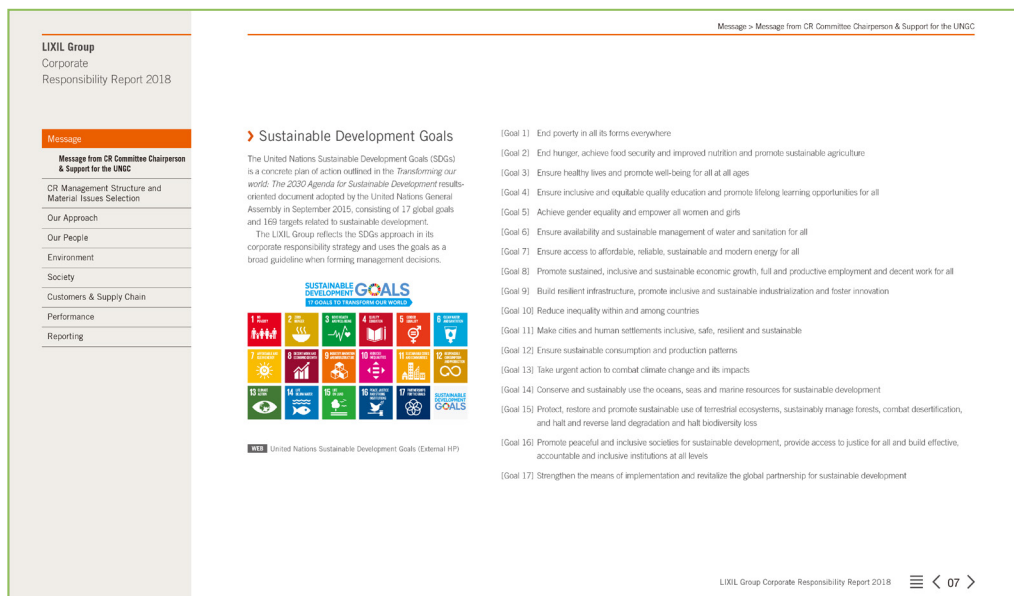
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LEED CREDIT WITH EPDs AND HPDs

In LEED, the EPD and HPD credits can be earned for both LEED v3 and LEED v4 projects. To earn these credits, the project must use at least 20 different permanently installed products sourced from at least five different manufacturers.

It is important to note that a product-specific EPD developed by a manufacturer counts as one full product, whereas an industry association EPD will only count as ½ of a product. Specific EPDs have more value. But note, self-declared reports are valued as one half (1/2) of a product.

In addition to EPDs and HPDs, LEED will accept corporate sustainability reports that meet certain criteria to contribute to the Materials and Resources Building product disclosure and optimization - sourcing of raw materials credit. Corporate sustainability reports (CSR) are valued as one whole product, including: Global Reporting Initiative (GRI) Sustainability Report and the U.N. Global Compact: Communication of Progress. Coordinate with manufacturers to obtain these reports for credit.



LIXIL Corporate Responsibility Report 2018

There are many popular material reporting methodologies, and each has its differences. All mentioned are accepted by LEED v4 for contribution to healthy building credits.

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CONCLUSION

Material transparency isn't a trend or a fad — sustainable manufacturing is an important commitment in the building products industry. At LIXIL, we believe that our living spaces — the environment where we live, work and play — are critical to our daily lives and wellbeing. As a result, we are committed to ensuring that the growth of our businesses contributes to improving the quality of people's lives, by delivering safe and comfortable products and services through responsible and sustainable innovations. LIXIL is proud to invest time and resources into providing our customers with environmental stewardship and product transparency through our EPDs.

To learn more about LIXIL's commitment to sustainable manufacturing:

- Download our EPDs at <https://spot.ul.com/>
- Review LIXIL Corporate Responsibility Report on Water Conservation, Sanitation and Sustainability at <https://www.lixil.com/en/sustainability/approach/responsibility.html>

LIXIL has 21 EPDs certified by UL available on commercial toilet bowls and tanks, urinals, flush valves, sinks, bathtubs, and faucets sold under the American Standard, DXV and GROHE brand names:

American Standard Toilet Bowls

Cadet
Madera
Champion
VorMax
Afwall

American Standard Toilet Tanks

Cadet
Champion
VorMax

DXV Toilet Bowls

Wyatt VorMax

DXV Toilet Tanks

Wyatt VorMax

American Standard Urinals

Pintbrook

American Standard Electronic Flush Valves

Selectronic Toilet
Selectronic Urinal

*American
Standard*

American Standard Bathtubs

Cambridge

Princeton

Stratford

DXV Bathtubs

Hawkins

Byrdcliffe

American Standard Sinks

Decorum

Lucerne

Ovalyn

Studio

American Standard Faucets

NextGen

Serin

GROHE Faucets

Concetto bath and shower faucets

RESEARCH

ABCs of EPDs

<https://www.usgbc.org/education/sessions/abcs-epds-7410330>

UL

<https://industries.ul.com/environment/certificationvalidation-marks/environmental-product-declarations>

ISO PRC

<https://industries.ul.com/environment/transparency/product-category-rules-pcrs>

LEED

<https://new.usgbc.org/leed>

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EPDs vs HPDs

<https://www.usgbc.org/education/sessions/leed-v4-mr-credits-epds-vs-hpds-%E2%80%93-what-you-need-know-11012063>

LEED EPD for New Construction

<https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthca-22>

LEED CI

<https://www.usgbc.org/node/2616377?return=/credits/commercial-interiors/v4>

LEED MR

https://www.usgbc.org/guide/bdc#mr_overview

Declare Labels:

<https://living-future.org/declare/declare-about/#overview>

Cradle to Cradle

<http://www.c2ccertified.org/products/registry>

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