MasterShower® K-728-K-NA

3/4" 2- or 3-way transfer valve

Product Group

Commercial Products

Product Specifications

Packaged Product Weight (kg)	####
Product Recycled Content	####
Product Recyclable Content	####
Product Life time (years)	10
Product Application	Commercial

Use Phase Specifications

Flow rate (gal/min)	2
User Frequency (Events/year)	5840
Annual Cleaning Frequency (times)	365
Cleaner	10 ml, 1% sodium lauryl sulfate

Greenhouse Gas Emission (kg CO2- eq.)

Material & Manufacturing	90
Use & Maintenance	5932

Water Intensity (m3)

Material & Manufacturing	-0.49
Use & Maintenance	113.98

Manufacturing Locations

Kohler, WI

Believing in Better

We believe in a better world. We are passionate about protecting the environment and enhancing the quality of life for current and future generations. And that means designing products that look beautiful and deliver exceptional performance, while being as sustainable as possible.

Program Operator Name, Address, Logo, and Website	UL Environment
General Program Instructions and Version Number	Program Operator Rules V2.3 February 2018
Location of Explanatory Material	Kohler, WI
Declaration Holder and Address	Kohler Co. 444 Highland Drive, Kohler, WI
Declaration Number	4788111728.262.1
Declared Product and Functional Unit	Single Shower/ tub valve- Commercial
Product Definition	3/4" 2- or 3-way transfer valve
Reference PCR and Version Number	PCR for Building-Related Products and Services. Adapted for UL Environment from the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Part A (v.3): Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report. Part B: Kitchen and Bath Fixture Fittings and Accessory Products
Markets of Applicability	Asia-Pacific
Date of Issue	01-Oct-21
Period of Validity	5 Years
EPD Type	Product Specific
EPD Scope	Cradle-to-grave
Year of Reported Manufacturer Primary Data	2019-2020
LCA Software and Version Number	SimaPro v. 8.4.0.0
LCIA Database(s) and Version Numbers	Ecoinvent 3 DATASMART LCI Package (USEI 2.2)
LCIA Methodology and Version Number	TRACI 2.1 v1.04 CML-IA baseline v3.04 Cumulative Energy Demand (CED) v1.09
Applicable Green Building Certifications Schema	LEED v4/BD+C/Materials and Resources/Building Product Disclosure and Optimization-Environmental Product Declarations

The PCR review was conducted by:

This declaration was independently verified in accordance with ISO 14025:2006. The UL Environment "Part A: calculation Rules for the Life Cycle Assessment Reuirements on the Project Report" v3.0 (December 2017), 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).

☐ INTERNAL ☒ EXTERNAL

This life cycle assessment was conducted in accordance with ISO 14044 and reference PCR by:

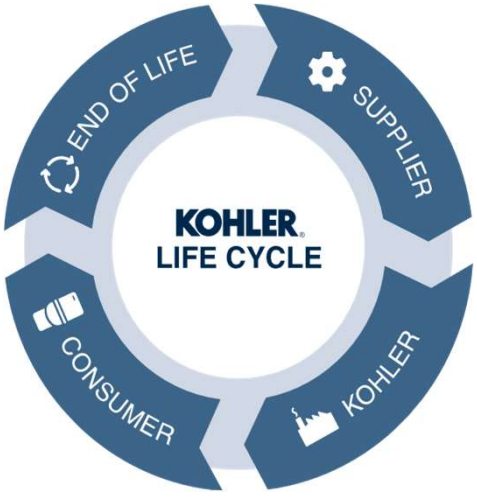
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:

Thomas Gloria, Life-Cycle Services, LLC

LIMITATIONS: 1) Environmental declarations from different programs (ISO 14025) may not be comparable; 2) Comparison of the environmental performance using EPD information shall be based on the prodcut'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; 3) Full conformance with the PCR allows EPD comparability 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 constrution work. 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.

This document is an environmental product declaration (EPD) in accordance with ISO 21930. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycles.

At Kohler Co., we believe in protecting the environment and enhancing the quality of life for current and future generations. When developing new products, we consider the environmental impact at each stage of a product’s existence - from the activities of our suppliers through the end of the product’s useful life. Designing for a better world means every choice counts.



Product Description

The MasterShower transfer valve brings a new level of innovation and flexibility as a custom shower solution. When paired with compatible trim, its three-way design allows control of up to three separate components to six different outputs, and can also easily be configured as a two-way transfer valve.

Additional data can be found at:

https://www.us.kohler.com/us/Mastershower-3-4-in-wall-2-or-3-way-transfer-valve/productDetail/valves/428155.htm

Applications and Uses

- Transfers water flow to up to three separate components/outlets
- Components/outlets can be operated individually or in anycombination of two components at the same time.
- Supplied as a three-way transfer valve (360 degree handlerotation) but can be configured onsite for two-way operation(120 degree ha
- Single handle operation.
- Using 1 outlet: 18 gpm flow rate at 45 psi; using 2 outlets:20.8 gpm at 45 psi.
- One 3/4" female NPT inlet connection.

Product Standards, Approvals and Certifications

Specified model meets or exceeds the following:

- ASME A112.18.1/CSA B125.1

Technical Data

Name	Applicable Test Standard	Value	Unit
Flow/ Flush Rate	ASME A112.18.1-2018/CSA B125.1-18	1.98	gallon per minute/ flush
Operational Water Pressure	ASME A112.18.1-2018/CSA B125.1-18	-	N/m2 or PSI

SUPPLIER OPERATIONS

Base Material Content of the Product

Material	Function	Quantity (% By Weight)
Brass	Internal Body Component	55-65
Stainless Steel	Internal Body Component	30-20
Aluminium	Internal Body Component	1-5
Plastic	Internal Body Component	85-90
Balance	Miscellanous hardware and packaging	10-15

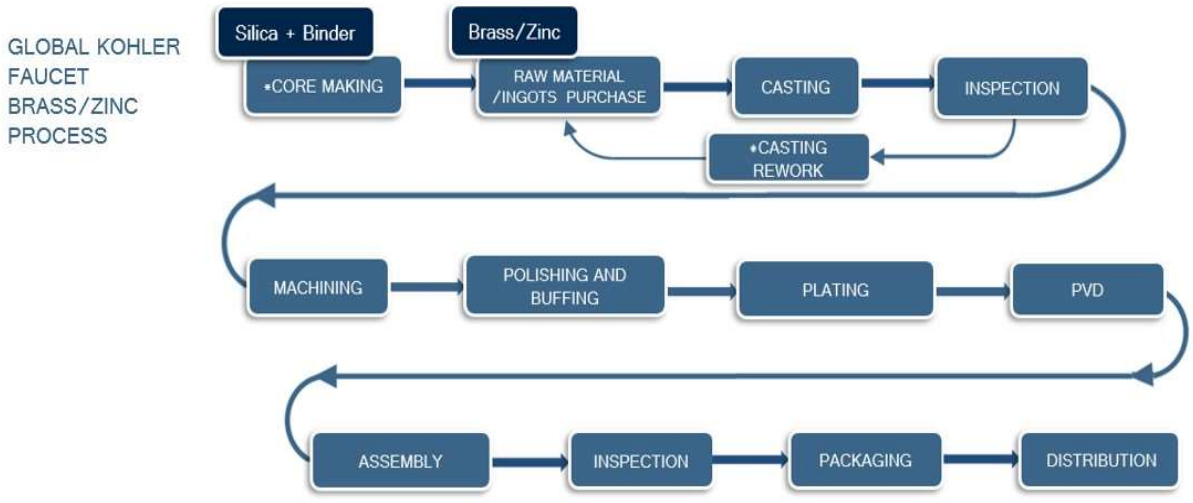
KOHLER OPERATIONS

Manufacturing Process Description

Raw Materials are casted into a mold with cavities. After casting, components go through several setps of machining, polishing and buffing before final coating. Depending on the intended color, parts may go through plating and/ or physical vapor deposition processes. Finished products are assembled, inspected and packaged for distirburion.

Manufacturing Locations

Manufacturing Process



Health, Safety and Environmental Aspects during Production

Kohler Co. has established program management guidelines for safety, accident prevention and environmental performance. These systems enable Kohler Co. operations to achieve world-class performance: Kohler Safety Management System (KSMS) and Kohler Environmental Management System (KEMS). The management systems are based on best management practices, and the application of these programs consistently delivers significant results.

Packaging

Faucets are packaged primarily in molded pulp trays and single-wall corrugated containerboard. Blue bags- made of poly propylene- are often used to protect the finish of the faucet and associated product components. Molded pulp and corrugated containerboard are 100% recyclable, and collection is available in most municipalities. Other materials can be recyclable; however, this is dependent on local availability of collection programs.

CONSUMER USE

Conditions of Use

The majority of product use phase environmental impacts are related to energy required to heat up the water. Water consumed in each use cycle is defined by product specifications- flow rate- while proportion of hot and cold water is defined by PCR.

Reference Service Life

Commercial Shower/ tub valve- Commercial are assumed to remain in service for 10 years.

Cleaning and Maintenance

Shower/ tub valve- Commercial are assumed to require 365 cleanings per year with 10 ml, 1% sodium lauryl sulfate. These impacts are included within the product use stage of the LCA.

END OF LIFE

Recycle or Reuse

Collection and processing for zinc and brass product beneficial reuse and recycle are possible, but availability of the technologies depend on disposal locations.

Disposal

Upon PCR default assumsptions, The KOHLER® LCA model assumes 100% of the brass portion of the product, accessories and packaging materials are landfilled.

LIFE CYCLE ASSESSMENT

Description of Declared or Functional Unit

The functional unit represented here refers to a single shower/ tub valve- commercial.

Name	Value	Unit
Functional Unit	1	One packaged product with refrenced RSL
Component Breakdown (if applicable)	-	components in 1 pckaged product
Mass	#VALUE!	kg
Thickness (if relevent)	-	cm
Surface Area (if relevant)	-	m2

Estimates and Assumptions

The LCI/ LCA assumptions are mentioned below:

- Product transport from DC to final customer and from customer to diposal site are modeled based on PCR specifications
- Product and packaging disposal scenarios are adopted from the PCR specifications
- Building estimated service life (ESL) is assumed to be 75 years
- Biogenic carbon content is estimated for three types of packaging materials: plywood, corrugate box and kraft paper

Cut-off Criteria

This LCA is in compliance with the cutoff criteria specified in the PCR, as no known processes were excluded from this assessment outside of the specific items listed within the “System Boundary” section below.

Allocation

Impacts are allocated to individual products with a unit process approach. Typically, product mass is used to build the impact allocation factors. Product-specific quality data is also employed to match impacts to products.

Data Sources

Primary manufacturing data is collected directly from Kohler Faucets Operations globally, including North America, Inida and China. Supply chain data is sourced from primary survey results and individual part modeling. Secondary data primarily references the DATASMART and eocinvent 3 LCI databases. Both databases are widely distributed and are referenced within the LCA community. All ecoinvent datasets have been critically reviewed.

Data Quality

Wherever secondary data is used, the study adopts critically reviewed data for consistency, precision and reproducibility to limit uncertainty. The data sources used are complete and representative of North America, India and China in terms of the geographic and technological coverage and are a recent vintage (i.e., less than ten years old). Any deviations from these initial data quality requirements for secondary data are documented in the critically reviewed LCA report. When a product is produced at more than one plant, impacts are weighted by unit volume to produce a single result.

LCA Modeling Scenarios

Transport from gate to the building site (A4)		
Name	**Value**	**Unit**
Fuel type	Diesel	
Liters of fuel	38	l/100 km
Vehicle Type	Single Unit Truck	
Transport distance	821.869	km
Capacity utilization (including empty runs)	89	%
Gross density of products transported	-	kg/m^3
Capacity utilization volume factor	89	-

Installation into the building (A5)		
Name	**Value**	**Unit**
Ancillary materials	-	kg
Net fresh water consumption	-	m^3
Other resources	-	km
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Product loss per functional unit	-	kg
Waste material at the construction site before waste processing	0.19	kg
Output materials resulting from on-site waste processing	-	kg
Mass of packaging waste- corrugate and paper	0.19	kg
Biogenic carbon contained in packaging	8.4E-02	kg CO2
Direct emissions to ambient air, soil and water	-	kg
VOC Emissions		µg/m3

Reference service life		
Name	**Value**	**Unit**
Reference service life (RSL)	10	years

Maintenance (B2)		
Name	**Value**	**Unit**
Maintenance process information	-	-
Maintenance cycle	3650	Number/RSL
Maintenance cycle	27375	Number/ESL
Net freshwater consumption	-	m^3
Ancillary materials by type- cleaning agent	16.5561	kg
Other resources	-	kg
Enrgy input by activity, type, amount	-	kWh
Other energy carriers by type	-	kWh
Power output of equipment	-	kW
Waste materials- cleaning agent	16.5561	kg
Direct emissions to ambient air, soil and water	-	kg

Repair (B3)		
Name	**Value**	**Unit**
Repair process information	-	
Inspection process information	-	
Repair cycle	-	Number/RSL
Repair cycle	-	Number/ ESL
Net fresh water consumption	-	m3
Ancillary materials by type	-	kg
Enrgy input by activity, type, amount	-	kWh
Waste materials from repair	-	kg
Direct emissions to air, soil and water	-	kg
Further assumptions for scenario development		

Replacement (B4)		
Name	**Value**	**Unit**
Reference service life	10	years
Replacment cycle	7.5	(ESL/RSL)-1
Energy input by activity, type, amount	-	kWh
Net fresh water consumption	-	m3
Ancillary materials by type	-	kg
Replacement of worn parts	-	kg
Direct emissions to air, soil and water	-	kg
Further assumptions for scenario development		

Refurbishment (B5)		
Name	**Value**	**Unit**
Refurbishment process description		
Replacement cycle	1	Cycle/RSL
Replacement cycle	7.5	Number/ESL
Energy input by activity, type, amount	-	kWh
Net fresh water consumption	-	m^3
Material input for refurbishment	-	kg
Waste materials	-	kg
Direct emissions to air, soil and water	-	kg
Futher assumptions for scenario development	-	

Operational energy (B6) and water (B7) use		
Name	**Value**	**Unit**
Net fresh water consumption	438	m3/p/RSL
Ancillary materials	-	kg
Energy input by activity, type, amount	-	kWh
Equipment power output	-	kW
Characteristic performance	-	kg
Direct emissions to air, water and soil	-	kg
Further assumptions for scenario development	-	

End of life (C1-C4)		
Name	**Value**	**Unit**
Assumptions for scenario development		
Collected separately	0	kg
Collected as mixed construction waste	0	kg
Reuse	-	kg
Recycling	-	kg
Landfill	0	kg
Incineration	-	kg
Incineration with energy recovery	-	kg
Energy conversion	-	
Product or material for final disposition	0	kg
Removal of biogenic carbon	-	kg CO2

System Boundaries

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Benefits and Loads Beyond the System Boundaries	
Cradle to grave with options	Raw material supply	Transport	Manufacturing	Transport from gate to the site	Assembly/ Install	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling potential	Reference Service Life
	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)

Results of the Assessment

TRACI 2.1 Impact Assessment						
Module	GWP	ODP	AP	EP	POCP	ADP
	(kg CO2 Eq.)	(kg CFC-11 Eq.)	(kg SO2- Eq.)	(kg N-Eq.)	(kg O3-Eq.)	(MJ surplus)
Total	5.12E+04	3.70E-03	2.36E+02	2.80E+02	2.94E+03	3.88E+04
A1- A3	8.98E+01	1.90E-05	1.05E+00	7.36E-01	1.55E+01	1.74E+02
A4	3.94E-01	1.88E-08	2.31E-03	2.69E-04	6.59E-02	7.57E-01
A5	3.18E-03	1.30E-09	2.81E-05	1.23E-05	7.17E-04	1.23E-02
B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B2	6.21E+01	2.42E-06	2.80E-01	2.46E-01	3.61E+00	5.57E+01
B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B4	4.52E+04	3.26E-03	2.09E+02	2.47E+02	2.60E+03	3.42E+04
B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B6	2.84E+03	1.99E-04	1.25E+01	1.13E+01	1.55E+02	2.08E+03
B7	3.03E+03	2.14E-04	1.40E+01	2.07E+01	1.72E+02	2.26E+03
C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C2	8.08E-02	3.41E-12	8.25E-04	4.89E-05	2.04E-02	1.71E-01
C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C4	1.31E-02	5.85E-09	1.13E-04	2.32E-05	2.79E-03	5.44E-02

CML 4.1 Impact Assessment							
Module	GWP	ODP	AP Air	EP	POCP	ADP element	ADP fossil fuels
	(kg CO2-Eq.)	(kg CFC-11 Eq.)	(kg SO2-Eq.)	(kg (PO4)3- Eq.)	(kg C2H4 Eq.)	(kg Sb-Eq.)	(MJ, LHV)
Total	5.16E+04	2.98E-03	2.31E+02	1.32E+02	1.01E+01	1.09E+00	5.60E+05
A1- A3	9.00E+01	1.43E-05	1.03E+00	3.78E-01	3.62E-02	1.05E-01	1.28E+03
A4	3.96E-01	1.41E-08	1.86E-03	4.06E-04	7.26E-05	2.08E-06	5.10E+00
A5	3.18E-03	9.82E-10	2.37E-05	7.59E-06	9.72E-07	3.11E-08	8.40E-02
B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B2	6.20E+01	1.80E-06	2.55E-01	1.37E-01	9.87E-02	1.96E-04	4.51E+02
B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B4	4.55E+04	2.63E-03	2.03E+02	1.17E+02	8.94E+00	9.65E-01	4.95E+05
B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B6	2.86E+03	1.61E-04	1.22E+01	5.50E+00	4.97E-01	9.45E-03	3.11E+04
B7	3.05E+03	1.73E-04	1.36E+01	9.52E+00	5.59E-01	1.41E-02	3.31E+04
C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C2	8.11E-02	3.37E-12	6.44E-04	1.33E-04	-1.16E-04	0.00E+00	1.16E+00
C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C4	1.32E-02	4.39E-09	9.65E-05	2.10E-05	4.04E-06	1.23E-07	3.72E-01

Rest of the World Impact Assessment					
Module	GWP	ODP	AP	EP	POCP
	(kg CO2-Eq.)	(kg CFC-11 Eq.)	(kg SO2-Eq.)	(kg N-Eq.)	(kg O3- Eq.)
Total	5.16E+04	2.98E-03	2.29E+02	2.80E+02	2.94E+03
A1- A3	9.00E+01	1.43E-05	1.03E+00	7.36E-01	1.55E+01
A4	3.96E-01	1.41E-08	1.86E-03	2.69E-04	6.59E-02
A5	3.18E-03	9.82E-10	2.37E-05	1.23E-05	7.17E-04
B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B2	6.20E+01	1.80E-06	2.55E-01	2.46E-01	3.61E+00
B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B4	4.55E+04	2.63E-03	2.03E+02	2.47E+02	2.60E+03
B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B6	2.86E+03	1.61E-04	1.22E+01	1.13E+01	1.55E+02
B7	3.05E+03	1.73E-04	1.36E+01	2.07E+01	1.72E+02
C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C2	8.11E-02	3.37E-12	6.44E-04	4.89E-05	2.04E-02
C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C4	1.32E-02	4.39E-09	9.65E-05	2.32E-05	2.79E-03

Resource Use											
Module	RPRe	RPRm	RPRt	NRPRe	NRPRm	NRPRt	SM	RSF	NRSF	RE	FW
	(MJ)	(MJ)	(MJ)	(MJ)	(MJ)	(MJ)	(kg)	(MJ)	(MJ)	(MJ)	(m3)
Total	8.50E+04	0.00E+00	8.50E+04	7.22E+05	0.00E+00	7.20E+05	1.70E-01	0.00E+00	0.00E+00	0.00E+00	9.6E+02
A1- A3	4.45E+01	0.00E+00	4.45E+01	1.40E+03	0.00E+00	1.40E+03	2.00E-02	0.00E+00	0.00E+00	0.00E+00	-4.9E-01
A4	2.20E-02	0.00E+00	2.20E-02	5.49E+00	0.00E+00	5.49E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2E-02
A5	7.29E-04	0.00E+00	7.29E-04	9.02E-02	0.00E+00	9.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9E-06
B1	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	0.00E+00	0E+00
B2	1.44E+03	0.00E+00	1.44E+03	6.92E+02	0.00E+00	6.92E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3E+01
B3	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	0.00E+00	0E+00
B4	7.50E+04	0.00E+00	7.50E+04	6.37E+05	0.00E+00	6.37E+05	1.50E-01	0.00E+00	0.00E+00	0.00E+00	9E+02
B5	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	0.00E+00	0E+00
B6	4.17E+03	0.00E+00	4.17E+03	4.02E+04	0.00E+00	4.02E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2E+01
B7	4.35E+03	0.00E+00	4.35E+03	4.26E+04	0.00E+00	4.26E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6E+01
C1	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	0.00E+00	0E+00
C2	0.00E+00	0.00E+00	0.00E+00	1.23E+00	0.00E+00	1.23E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0E+00
C3	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	0.00E+00	0E+00
C4	3.04E-03	0.00E+00	3.04E-03	3.99E-01	0.00E+00	3.99E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5E-05

Output Flows and Waste Categories								
Module	HWD	NHWD	HLRW	ILLRW	CRU	MFR	MER	EE
	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(MJ)
Total	0.00E+00	5.61E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
A1- A3	0.00E+00	5.86E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
A4	0.00E+00	5.87E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
A5	0.00E+00	5.80E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B2	0.00E+00	7.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B4	0.00E+00	4.95E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B6	0.00E+00	2.10E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B7	0.00E+00	3.80E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C4	0.00E+00	2.55E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Greenhouse Gas Emissions and Removals								
Module	BCRP	BCEP	BCRK	BCEK	BCEW	CCE	CCR	CWNR
	(kg CO2e)	(kg CO2e)	(kg CO2e)	(kgCO2e)	(kg CO2e)	(kg CO2e)	(kg CO2e)	(kg CO2e)
Total	0.00E+00	0.00E+00	8.41E-02	8.41E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
A1- A3	0.00E+00	0.00E+00	8.41E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
A5	0.00E+00	0.00E+00	0.00E+00	8.41E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Interpretation

Due to the high degree of value add within the faucet product manufacturing process, the Kohler Operations life cycle stage drives most of the environmental impact categories for maximum faucet products. Exceptions are products that are battery operated such as Metering Lavatory Faucet, where operational energy contributes to consumer use phase impacts dominate the product life cycle. Manufacturing impacts are primarily driven by energy (natural gas and electricity) use. Therefore, projects that improve energy efficiency have been and will continue to be a primary area of focus. Hardware accessories, especially those that contain metals such as brass and steel, also carry a greater contribution toward overall product environmental impact. Mass reduction and material substitution are areas of focus within the supplier operations portion of the product life cycle. Raw material and the product maintenance stages also tend to have significant impacts across certain impact categories.

Further increase in energy efficiency, decrease in process losses, and implementation of supplier sustainability requirements would be the best method to reduce overall environmental impacts. Kohler has direct control over the modes of transportation for raw materials and final products. Finding, vetting, and selecting more local suppliers and incorporating recycled content will further improve the environmental performance of these products. Where applicable, water use reduction efforts will see the greatest return on investment due primarily to the associated reduction in energy required to pump and treat this water. These efforts must be balanced against the product and product system’s capacity to operate effectively when less water is available as a motive force.

REFERENCES

- PCR Part A — UL Environment and Institut Bauen und Umwelt e.V., Königswinter (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. December 2017, version 3. General InformationThe UNSPSC code and the appropriate Construction Specifications Institute (CSI) / Constructions Specifications Canadian (CSC) classification shall be identified for the product category covered by the Part B PCR
- PCR Part B — UL Environment and Institut Bauen und Umwelt e.V. (IBU). Product Category Rules Part B: Applicable Products The Construction Specification Institute (CSI) Masterformat codes that cover the scope of this Part B include:
  - 15400 Plumbing Fixtures and EquipmentCorresponding applicable UNSPSC codes include:
    301817 - Faucets or taps
  - 301818 - Faucet and shower heads, jets and parts and accessories
  - 311626 - Hooks
  - 471317 - Restroom supplies
  - 401416 - Valves
- 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 — Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services
- EN 15804 — EN 15804:2012-04: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction product
- WaterSense® — US EPA, Office of Wastewater Management http://www.epa.gov/watersense
- ULE 2013 — UL Environment, General Program Instructions, 2013.
- OHSAS 18001 — Occupational Health and Safety Management Systems - Requirements
- ISO 14001 — Environmental Management Systems - Requirements with guidance for use
- ASME A112.19.2/CSA B45.1 — Ceramic Plumbing Fixtures
- ADA — Americans with Disabilities Act - Standards for Accessible Design
- ICC/ANSI A117.1 — International Code Council - Accessible and Usable Buildings and Facilities
- CSA B651 — Accessible Design for Built Environment
- OBC — Ontario Building Code Section 3.8 - Barrier-Free Design
- ICES-003 — Industry Canada, Interference Causing Equipment Standard 003 - Information Technology Equipment (ITE) - Limits and methods of measurement
- FCC part 15 — Federal Communications Commission, Title 47, Part 15 - Radio Frequency Devices
- DOE-Energy Policy Act 1992 — Department of Energy - Energy Policy Act 1992
- ASME A112.19.14 — Six Liter Closets Equipped with a Dual Flushing Device
- ADA-Children's Environment — ADA Standards for Accessible Design - Clause 604.9
- ASME A112.19.19-06 — Vitreous China Nonwater Urinals
- GREENGUARD — UL Environment, http://greenguard.org/en/index.aspx