ENVIRONMENTAL PRODUCT DECLARATION

HK-JA HAND DRYER

HOKWANG INDUSTRIES CO. LTD.

Hand dryers are electric devices used to provide a hygienic and sustainable method to dry hands in public washrooms.

Hokwang, an ISO certified (ISO9001 and ISO14001), professional manufacturer in Taiwan, specializes in hand dryers, automatic soap dispenser, auto faucet, auto flush valves and automatic aerosol dispensers. We offer a complete washroom package to make the management of your facilities as easy as possible with our top quality HANDS FREE hygiene products. The main aim of HOKWANG is long term customer retention via exceptional levels of quality and customer service.

HOKWANG also dedicated in innovation and sustainability of natural resources. Loving people have always been a starting point for Hokwang since established in 1996. We aim to bring people happiness by providing them with goods that are environmentally friendly and produced through green technology.

Around the world have used Hokwang's hand dryers to create clean, modern restrooms that set the standard for sustainability and efficiency.

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

ENVIRONMENTAL PRODUCT DECLARATION

HK-JA Hand Dryer
HOKWANG INDUSTRIES CO. LTD.

According to ISO 14025 and EN 15804

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	HOKWANG INDUSTRIES CO. LTD
DECLARATION NUMBER	4787616201.102.1
DECLARED PRODUCT	HK-JA Hand dryer from HOKWANG INDUSTRIES CO. LTD
REFERENCE PCR	UL PCR for Hand Dryers (2016)
REFERENCE PCR STANDARD	☒ EN 15804 (2012) ☐ ISO 21930 (2007) ☐ ISO 21930 (2017)
DATE OF ISSUE	January 12, 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 manufacture Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications

The PCR review was conducted by:	UL Environment Review Panel Chair: Jon Dettling
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories ☐ INTERNAL ☒ EXTERNAL	Grant R. Martin Grant R. Martin, UL Environment
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria Thomas P. Gloria, Industrial Ecology Consultants

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Product Definition and Information

Company Description

HOKWANG specializes in auto soap dispenser, high speed hand dryer and automatic aerosol dispensers. We offer a complete washroom package to make the management of your facilities as easy as possible with our top quality HANDS FREE hygiene products. The main aim of HOKWANG is long term customer retention via exceptional levels of quality and customer service. Manufacturing company location: No.131 Dingping Rd., Ruifang District, New Taipei City, 22452 Taiwan.

Product Definition

HK-JA, this high speed hand dryer has a novel design and an elegant appearance. Functionally, HK-JA hand dryer is very powerful and durable. Its air blows strong enough to dry hands in 10 seconds, and HK-JA is the first automatic high speed hand dryer equipped with our patented blue LED indicator light to optimize drying efficiency. Furthermore, you can adjust the air speed and turn the heater on or off based on your needs. A carbon filter assembly is also available for dusty installation environments. Enamel coated steel and stainless steel (satin/bright) are available for HK-JA hand dryer covers.

Application

The purpose of this product is to dry hands. While it is possible that the system has secondary functions, such as hygiene, reduction of cost, maintenance and waste, for purposes of the present study it is assumed that any other functions are equivalent among different systems and that the systems can be evenly compared on the basis of the hand--drying function alone.

Product Specification

Characteristics	Nominal Value	Unit
Product package	287x205x180	mm
Product Weight	8.558	kg
Drying Time	Less than 10-15 seconds	
Operating Voltage	110V-120Vac, 50/60 Hz, 1.3-1.6kW	
Operating Voltage	220V-240Vac, 50/60 Hz, 1.3-1.6kW	
Standby Power	0.3-0.4W	
Timing Protection	60-second auto shut off	
Sound Level	MIN 70 dB to 73.7 dB MAX @ 1m	
Air Speed	75-100 m/s, adjustable	

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Sensing range	170 mm ± 20 mm, adjustable
Drip Proof	IP21/IP23 (optional)
UL, CE, GS, CB, BSMI, EMC, LVD, WEEE, ROHS, GreenSpec certified	

Technical Information

- HK-JA have blue LED indicator light to optimize drying efficiency
- Adjust the air speed and turn the heater on or off
- Enamel coated steel and stainless steel are available for HK-JA hand dryer covers.

Raw material Supply and Manufacturing

Includes the processing and assembly of materials into finished hand-dryer products. Energy and ancillary materials required to manufacture dryers are included.

Product components are as follow:

Raw Material Content

Material	Amount	Total(kg)	Percentage
ABS	1	000.2	0.48%
PA66+30%GF	3	0.740	5.31%
PCB	3	0.375	2.69%
PVC	3	0.052	0.37%
Rubber	3	0.066	0.47%
Stainless steel	8	4.163	79.61%
Corrugated paper	2	1.300	6.21%
Paper	2	0.019	0.09%
Motor	1	1.570	3.75%
Stickers	5	0.005	0.06%
Wire	3	0.069	0.49%
Wire+ plug	1	0.160	0.38%
Nickel hotline	1	0.038	0.09%

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Health, Safety and Environmental Aspects during Production

This product according to ISO 14001 Environmental Management System, RoHS, WEEE.

RoHs: RoHS specifies maximum levels for the following 10 restricted substances.

- Lead (Pb): < 1000 ppm
- Mercury (Hg): < 100 ppm
- Cadmium (Cd): < 100 ppm
- Hexavalent Chromium: (Cr VI) < 1000 ppm
- Polybrominated Biphenyls (PBB): < 1000 ppm
- Polybrominated Diphenyl Ethers (PBDE): < 1000 ppm
- Bis(2-Ethylhexyl) phthalate (DEHP): < 1000 ppm
- Benzyl butyl phthalate (BBP): < 1000 ppm
- Dibutyl phthalate (DBP): < 1000 ppm
- Diisobutyl phthalate (DIBP): < 1000 ppm

WEEE: WEEE stands for Waste from Electrical and Electronic Equipment. WEEE Directive 2002/96/EC mandates the treatment, recovery and recycling of electric and electronic equipment (90% ends up in landfills). All applicable products in the EU market must pass WEEE compliance and carry the "Wheelie Bin" sticker.

Product Installation

Product installation is carried out by local dealer.

Use stage

Product life, the drive speed of the hand dryer is the most vulnerable to damage the core components, the case of its use for 15 seconds each time and stop 10 seconds for continuous testing, the results of the test for the HK-JA up to 280,000 times. Due to the PCR of hand dryer, the functional unit is based on 100,000 times. Thus, the use stage of calculation factor is 0.357 product. (100,000 (cycles) / 280,000 (cycles / product)) = 0.357 product.

Reference Service Life

Apply the service life for the scenario assumptions (200 hands per day). Final testing from October 2019-May 2020 confirms that the product life of HK-JA is 1680 days for 120V and 1544 days for 240V.

Further Information

HOKWANG INDUSTRIES CO. LTD.

https://www.hokwang.com

HK-JA Hand Dryer
HOKWANG INDUSTRIES CO. LTD.

According to ISO 14025 and EN 15804

End of life

Treatment are as follow:
- Mixed metal: abandoned (basic situation: buried)
- Mixed plastic: incineration
- Glass fiber: abandoned (basic situation: buried)
- PE and PVC plastic: incineration
- Other plastic, metal and electronic components: Recycling

Life Cycle Assessment

A full Life Cycle Assessment has been carried out according to ISO 14040 and ISO 14044.
The following Life Cycle Stages are assessed:
- Material acquisition phase (Material acquisition, transportation to Manufacturing)
- Manufacturing phase
- Marketing phase (transportation to User only)
- Use phase

System Boundaries

In this study, the system boundaries are assessed:

Product Stage 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 during the raw material stage (A1), transport (A2), manufacturing (A3). Installation phase was excludes. (The transport (A4) and installation (A5)).

Use Stage includes the use (B1). The maintenance transportation (B2) and replacement (B3) is not considered.

End of life Stage includes transport (C2), waste processing (C3) and disposal (C4). The removal (C1) was excluded.

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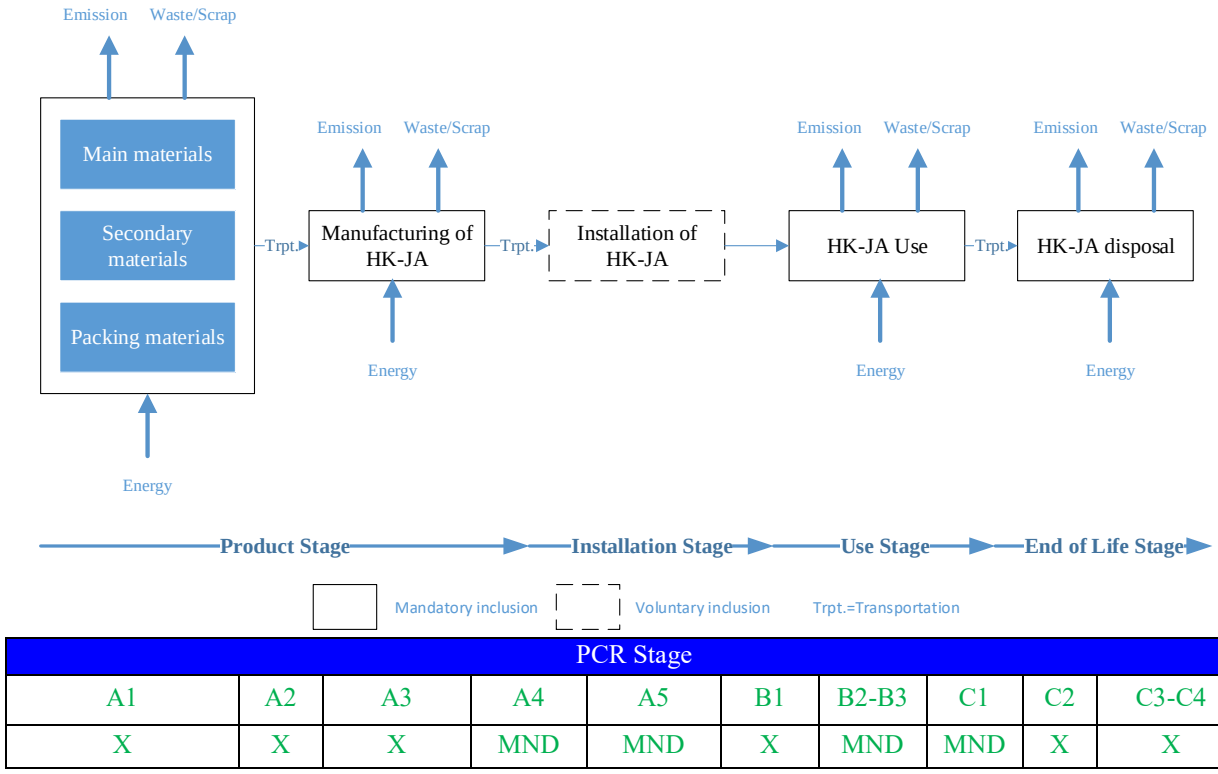

PCR Stage									
A1	A2	A3	A4	A5	B1	B2-B3	C1	C2	C3-C4
X	X	X	MND	MND	X	MND	MND	X	X

Functional Unit/ Description of the Declared Unit

In accordance with the requirements of the referenced PCR, the declared unit is selected as one HK-JA product for 100,000 instances of hand drying to dryness equaling 0.25 grams of residual water or less.

Study Information

As a general rule, specific data derived from specific production processes or average data derived from specific production processes have been used as the first choice as a basis for calculating an EPD. The inventory data was collected during 2016/1-2016/12. All of inventory data were investigated the on-site factory. The primary data were collected through supplier and bill. In the product stage, we surveyed the information of supplier background and the input weight of materials, and then locations were searched and the transport distance was estimated using Google Maps; the concept of ton–kilometer was used. Material transport was assumed to be a 7.5-16 ton truck. In the use stage, the dry time testing and RSL was collected from laboratory testing, provided the energy resources input data, and information of the HK-JA was used to collect the operating power, standby power for the equipment (40/46, 86.9%)

The inventory data for waste disposal and transportation were collected by reasonable scenario assumption, such as disposal treatment, including landfilled, incineration and recycled. (6/46, 13.1%)

For life cycle modeling of the considered products, the SimaPro 8.0.2 Software System for Life Cycle Engineering. All

relevant LCA datasets are taken from the SimaPro 8.0.2 software database.. The datasets from the database Ecoinvent 3.0 are documented in the documentation. To ensure comparability of results in the LCA, the basic data of SimaPro8.0.2 database were used for energy, transportation, main, secondary, package, and auxiliary materials.

Exclusions and Cut-off Criteria

The cut-off criteria shall be 1% of renewable and non-renewable primary energy usage and 1% of the total mass of the unit process. The total neglected input flows per module shall be a maximum of 5% of energy usage and mass.

In practice, in this assessment, all data from the production data acquisition are considered, i.e. all raw materials used as per formulation, electricity and other fuels, the required packaging materials, and all direct production emission, waste and scrap. Transport data on all considered inputs and output material are also considered.

Allocations

In the present study some allocations have been made. Detailed explanations can be found in the chapters below.

Transportation allocation

The transport allocation rule is based on the product weight of HK-JA.

Co-product allocation

No co-product allocation occurs in the product system.

Allocation of multi-Input processes

No allocation of multi-Input processes occurs in the product system.

Allocation procedure of reuse, recycling and recovery

No allocation of procedure of reuse, recycling and recovery occurs in the product system.

Description of the allocation processes in the LCA report

The description of allocation rules in of this LCA report meets the requirements of the PCR.

Description of the unit processes in the LCA report

The modeling of the unit processes reported for the LCA are documented in a transparent way, respecting the confidentiality of the data present in the LCA report.

Life Cycle Flow

The study included all life cycle stages of HK-JA dryers, from cradle to grave (extraction and processing of all raw materials through the end--of--life of all components).

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LCA Results

The environmental impacts for one lifecycle are presented for HK-JA. The environmental impacts are presented for the assessed lifecycle stages. The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

The LCA calculate results will difference by different region. If the EPD is to be distributed in North America, TRACI 2.1 impact methods must be used. For European markets the ILCD methods must be used. Additional environmental impacts recommended by ILCD may be reported as additional environmental information. For all other regions, the CML methodology shall be used.

Results of the LCA – Environmental impacts one lifecycle –HK-JA 120V (TRACI 2.1)

Impact Category: TRACI 2.1	Unit	A1-A3	B1	C2	C3	C4
Ozone Layer Depletion Potential (ODP)	kg CFC-11-Equiv.	4.27E-06	1.28E-05	6.33E-08	9.56E-09	8.92E-09
Global Warming Potential (GWP 100 years)	kg CO_2-Equiv.	5.46E+01	2.67E+02	7.07E-01	8.64E-01	1.13E+00
Smog Creation Potential	kg O_3-Equiv.	4.99E+00	8.58E+00	5.79E-02	1.40E-02	1.87E-02
Acidification Potential (AP)	kg SO_2-Equiv.	5.23E-01	9.95E-01	2.52E-03	8.06E-04	1.24E-03
Eutrophication Potential (EP)	kg N-Equiv.	9.25E-01	9.40E-01	5.63E-04	6.38E-04	2.28E-03
Fossil Depletion Potential	MJ surplus	6.50E+01	1.73E+02	1.51E+00	1.37E-01	1.22E-01

Results of the LCA – Environmental impacts one lifecycle –HK-JA 240V (ILCD)

Impact Category: ILCD	Unit	A1-A3	B1	C2	C3	C4
Global Warming Potential (GWP 100 years)	kg CO_2-Equiv.	5.53E+01	2.71E+02	7.11E-01	8.65E-01	1.14E+00
Acidification Potential (AP)	kg SO_2-Equiv.	5.23E-01	9.96E-01	2.52E-03	8.10E-04	1.26E-03
Eutrophication Potential (EP)	kg PO_4^3-Equiv.	4.14E-01	4.34E-01	4.96E-04	3.18E-04	9.50E-04
Smog Creation Potential	kg O_3-Equiv.	4.99E+00	8.58E+00	5.79E-02	1.40E-02	1.87E-02
Ozone Layer Depletion Potential (ODP)	kg CFC-11-Equiv.	3.85E-06	1.04E-05	4.85E-08	8.23E-09	7.60E-09
Abiotic depletion potential for mineral, fossil, and renewable	kg Sb-Equiv.	2.21E-02	1.78E-04	1.44E-06	2.85E-06	7.37E-07
Abiotic depletion potential for fossil resources	MJ	6.74E+02	2.96E+03	1.09E+01	1.19E+00	1.57E+00

Results of the LCA – Environmental impacts one lifecycle –HK-JA 120V (CML)

Impact Category: CML v3,1	Unit	A1-A3	B1	C2	C3	C4
Global Warming Potential (GWP 100 years)	kg CO_2-Equiv.	5.46E+01	2.67E+02	7.07E-01	8.64E-01	1.13E+00
Ozone Layer Depletion Potential (ODP. steady state)	kg CFC-11-Equiv.	3.85E-06	1.04E-05	4.85E-08	8.23E-09	7.60E-09

Acidification Potential (AP)	kg SO_2-Equiv.	5.46E-01	1.02E+00	2.20E-03	7.10E-04	1.18E-03
Eutrophication Potential (EP)	kg PO_4^3-Equiv.	4.14E-01	4.34E-01	4.96E-04	3.18E-04	1.02E-03
Photochem. Ozone Creation Potential (POCP)	kg C_2H_4-Equiv.	5.96E-02	4.32E-02	9.04E-05	3.36E-05	6.26E-05
Abiotic Depletion Potential Elements (ADPE)	kg Sb-Equiv.	2.21E-02	1.78E-04	1.44E-06	2.85E-06	7.37E-07
Abiotic Depletion Potential Fossil (ADPF)	[MJ]	7.00E+02	3.73E+03	1.03E+01	1.23E+00	1.87E+00

Results of the LCA –Resource use for HK-JA 120V/240V

		Product Stage	Installation stage		Use Stage	End of Life		
Paramet	**Unit**	**A1-3**	**A4**	**A5**	**B1**	**C2**	**C3**	**C4**
PERE	[MJ]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PERM	[MJ]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PERT	[MJ]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PENRE	[MJ]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PENRM	[MJ]	692	n/a	n/a	3730	n/a	n/a	13.4
PENRT	[MJ]	692	n/a	n/a	3730	n/a	n/a	13.4
SM	[kg]	8.5581	n/a	n/a	n/a	n/a	n/a	8.5581
RSF	[MJ]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NRSF	[MJ]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FW	[m^3]	0.003	n/a	n/a	n/a	n/a	n/a	n/a

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of nonrenewable primary energy excluding nonrenewable primary energy resources used as raw materials; PENRM = Use of nonrenewable primary energy resources used as raw materials; PENRT = Total use of nonrenewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of nonrenewable secondary fuels; FW = Use of net fresh water

Results of the LCA – Output flows and Waste categories for HK-JA 120V/240V

		Product Stage	Installation stage		Use Stage	End of Life		
Parameter	**Unit**	**A1-3**	**A4**	**A5**	**B1**	**C2**	**C3**	**C4**
HWD	[kg]	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NHWD	[kg]	n/a	n/a	n/a	n/a	n/a	n/a	1.23958
RWD	[kg]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CRU	[kg]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MFR	[kg]	n/a	n/a	n/a	n/a	n/a	n/a	7.31852
MER	[kg]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
EE Power	[MJ]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
EE Thermal energy	[MJ]	n/a	n/a	n/a	n/a	n/a	n/a	n/a

HWD = Hazardous waste disposed; NHWD = Nonhazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR= Materials for recycling; MER = Materials for energy recovery; EE = Exported energy per energy carrier

Interpretation

The interpretation of the results has been carried out considering the assumptions and limitations declared in the EPD, both methodologies. In all impact categories the use stage has the main contribution to the overall impact, with a share of 47.95%-86.14% of total impacts from the lifecycle. The main contributor in the use stage is the electricity consumption, the second contributor is product stage, and the main contributor is the electronic component. Although HK-JA declares in the EPD a longest distribution by truck (336 km), the transport stage has a very small (0-5.3% of total impacts from the lifecycle) effect on the total impacts.

References

- EPD PCR for Hand Dryers 2016:1.0: Product Category Rule for Environmental Product Declarations Hand Dryers
- UL ENVIRONMENT: UL Environment's Program Operator Rules
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- PE 2012 ILCD Handbook: General guide for Life Cycle Assessment - Detailed guidance:
  Description of Selected Impact Categories, PE International AG, 2012/
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STANDARDS AND LAWS

- DIN EN ISO 14044: Environmental management - Life cycle assessment - Requirements and guidelines(ISO 14044:2006); German and English version EN ISO 14044
- ISO 14025 2006: DIN EN ISO 14025: Environmental labels and declarations — Type III Environmental declarations — Principles and procedures
- ISO 14040 2006: Environmental management - Life cycle assessment - Principles and framework (ISO 14040); German and English version EN ISO 14040
- CEN/TR 15941: Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data; German version CEN/TR 15941
- EN 15804: EN 15804: Sustainability of construction works — Environmental Product REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF