LCA
Life Cycle Assessment

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Compared to the traditional bed bath with water and soap

The traditional bed bath with water and soap incurs a higher GWP (Global Warming Potential which is used as a single summary impact measure) when compared to the washing without water bed bath (Swash).

GWP traditional bed bath with water and soap = 2,152776kg CO2eq

GWP Swash® = 0.5539404kg CO2eq (74% less than the traditional bed bath!)

Functional unit

The functional unit is a single bed bath for a single individual patient.

Based on a quantity of 100.000 bed baths, the impact savings from moving the traditional bed bath approach to the Swash washing without water approach is:

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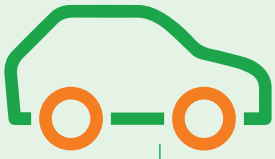

Carbon reduction =
1.614.987 kilometers in a Ford Fiesta 1.0

SAVED 25.455.890 liters of water =
50 Mio 500 ml bottles

Energy saved =
36 Average Households = energy used by 36 households in 1 year

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Scope

The scope covers the raw materials, conversion processes, associated transports, use stage and end-of-life scenario.

Components included in the comparison:

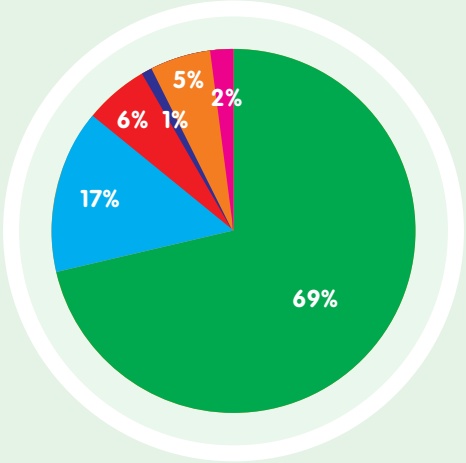
Swash® (8-pack gloves)	Traditional bed bath water and soap
NON-WOVEN	WATER AND HEATING OF WATER
LOTION	SOAP
PACKAGING FILM	TEXTILES (TOWELS AND CLOTH)*
CLOSING LABEL	LAUNDRY OF TOWELS AND CLOTHS*
PRODUCTION PROCESS	DETERGENT FOR TEXTILE WASHING
SWASH® HEATING ENERGY	PLASTIC BASIN
END-OF-LIFE SCENARIO: MUNICIPAL INCINERATION	END-OF-LIFE SCENARIO: MUNICIPAL INCINERATION

* Bedlinen (and laundering bedlinen) is not included in the comparison. In general, bedlinen needs to be changed more often when the traditional bed bath approach with water and soap is adopted

Results GWP calculation for the traditional bed bath with water and soap

GWP IMPACT ASSOCIATED WITH THE TRADITIONAL WASHING SYSTEM

- Textile/Cotton production
- Soap
- Electricity
- Gas use for laundry/heating water
- Transport (sea and truck)
- Others



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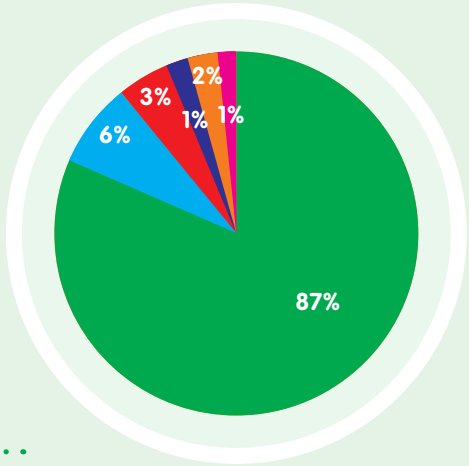
RESULTS GWP CALCULATION FOR SWASH®
GWP IMPACT ASSOCIATED WITH THE SWASH® WASHING SYSTEM

- Swash® gloves
- Swash® closing label
- Swash® lotion
- Packaging process energy
- Swash® packaging foil
- Swash® heating energy



Comparison environmental impact between the traditional bed bath and Swash®

ENVIRONMENTAL IMPACT PER FUNCTIONAL UNIT OF 1 BED BATH	SWASH® BATH	TRADITIONAL BATH
Climate change (kg CO_2Eq)	0,55393873	2,152776085
Total energy use (MJ-Eq))	10,435002	20,12983911
Water use (ltr)	17,9111	272,470
Land use (m2a)	0,37900132	1,079762887
Depletion of Abiotic Resources (kg antimony-Eq)	0,004938594	0,009922769
Acidification (kg SO_2-Eq)	0,003270211	0,008805322
Nitrate eutrophication (kg NO_x-Eq)	0,001482617	0,008189878
Ozone layer depletion (kg CFC-11-Eq)	6,79072E-08	4,87092E-06
City smog (kg etileno-Eq)	0,00017023	0,000405652
Land smog (kg ethylene-Eq)	7,57704E-05	0,000220658
Human Toxicity (kg 1,4 -DCB-Eq)	0,228298385	1,034595675
Terrestrial Toxicity (kg 1,4 -DCB-Eq)	0,001895063	0,25023166
Freshwater Toxicity (kg 1,4 -DCB-Eq)	2,538407273	3,673506791
Marine water Toxicity (kg 1,4 -DCB-Eq)	9,141268708	2,556708362
Freshwater sediment toxicity (kg 1,4 -DCB-Eq)	3,252590409	4,269551367
Marine sediment toxicity (kg 1,4 -DCB-Eq)	5,384378725	2,91812705
Ionising radiation (DALYs)	9,02493E-10	4,05057E-09
Total nuclear energy use (MJ-Eq)	0,855496453	2,942954492

See appendix I for an explanation of the impact categories.

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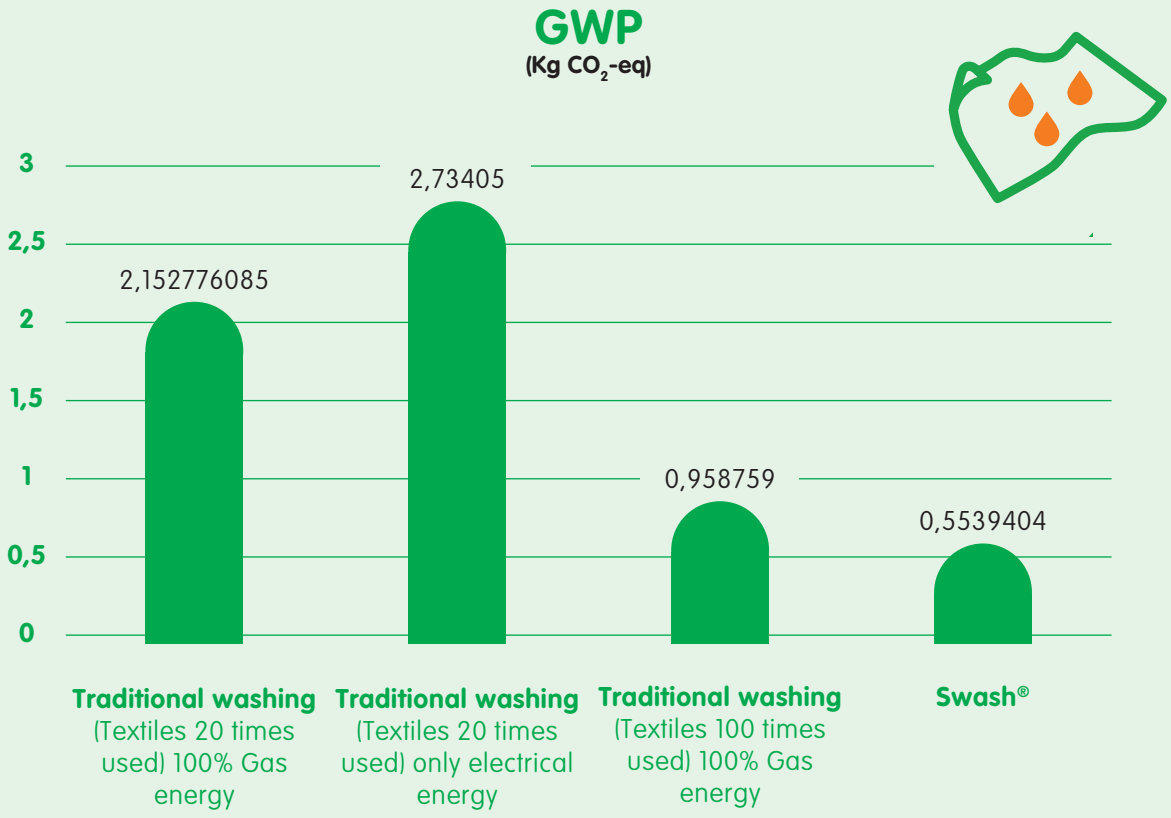
Uncertainty analysis

The graph below shows the impact of the traditional bed bath with water and soap compared to Swash® if assumptions about energy use and/or assumptions about the number of usages of towels and cloths change. In all scenarios Swash® is better for the environment.



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Peer review

The approach taken follows the ISO: 14040&14044 standards for LCA and can, upon agreement, be used to support the ISO: 14025 standard for 3rd Party Claims.

The LCA has been peer reviewed. The peer review was carried out by Dr. L.Holloway who has extensive experience in environmental impact assessment and LCA reports. Dr. Holloway's PhD was in the subject of product life cycle assessment and was judged by the foremost UK material scientist Prof. M.Ashby of Cambridge University.

Appendix I
Explanation of impact categories

CLIMATE CHANGE (KG CO2EQ)
Global warming is being caused by emission of gases that create the greenhouse effect. CO2 is the most commonly known greenhouse gas. This impact factor represents the quantity of those gases released during the life cycle of the product.

TOTAL ENERGY USE (MJ-Eq)
Total energy consumed during the life cycle of the product.

WATER USE (LTR)
Total water consumed during the life cycle of the product.

LAND USE (M^2a)
Total land used per year in the life cycle of the product, mostly related to agricultural activities.

DEPLETION OF ABIOTIC RESOURCES (KG antimony-Eq)
The total amount of non-biotic (fossil, mineral) resources consumed during the life cycle of the product.

ACIDIFICACIÓN (KG SO_2-Eq)
The total amount of acid inputs and wastes entering the ecosystem during the life cycle of the product.

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PHOSPHATE EUTROPHICATION (KG PO_4-Eq)
Life cycle contribution to the destruction of aquatic environments based on phosphate equivalents. Sources of phosphates and nitrates to surface waters invlude agriculture (fertilisers, animal manures, run-off), human sewage, food wastes, urban run-off, vegetable matter, industry and detergents.

NITRATE EUTROPHICATION (KG NO_x -Eq)
Life cycle contribution to the destruction of aquatic environments based on nitrate equivalents.
The largest source of nitrate eutrophication is the use of fertilisers in agriculture. Other sources include farm animal waste, domestic sewage, industrial wastes and stom drainage.

OZONE LAYER DEPLETION (KG CFC - 11 -Eq)
Release of Chlorofluorocarbons and other halogenated ozone depleting substances that contribute to stratospheric ozone layer depletion which leads to increased surface UV. It is related almost completely to man-made chemicals.

CITY SMOG (KG ETHYLENE Eq)
Contribution to smog from the product life cycle mostly from air pollutants caused by coal burning, traffic emissions and volatile organic compounds from coatings, paints, adhesives removers, cleaning agents, solvents etc.

LAND SMOG (KG ETHYLENE Eq)
Contribution to smog from the product life cycle mostly from NOx, as is typical in the rural environment due to fertilization and the use of nitrogen fixing plants.

HUMAN TOXICITY (KG 1,4 - DCB -Eq)
Contribution to negative impacts on human health by substances (such as heavy metals) emitted during the life cycle of the product.

TERRESTRIAL TOXICITY (KG 1,4 - DCB -Eq)
Contribution to pollution of the land by compounds from the product life cycle.

FRESHWATER TOXICITY (KG 1,4 - DCB -Eq)
Contribution to pollution of freshwater by compounds fro the product life cycle. This negative effect has a potential of causing water pollution and rendering the water unfit for aquatic life.

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MARINE WATER TOXICITY (KG 1,4 - DCB -Eq)
Contribution to sea water pollution by compounds from the products life cycle. This negative effect has a potential of causing water pollution and rendering the water unfit for aquatic life.

FRESHWATER SEDIMENT TOXICITY (KG 1,4 - DCB -Eq)
Contribution to freshwater-body bed sediment toxicity by compounds from the product life cycle.

MARINE SEDIMENT TOXICITY (KG 1,4 - DCB -Eq)
Contribution to the sea bed sediment toxicity by compounds from the product life cycle. In sufficiently high concentrations, these contaminan-laden sediments may pose serious threats to coastal eco-systems, the sustainability of natural resources and human health.

IONISING RADIATION (DALYs)
Contribution to radiation arising during the product life cycle (e.g. as a result of decay of radioactive materials at the nuclear power plants supplying the energy used during the product life cycle).

TOTAL NUCLEAR ENERGY USE (MJ-Eq)
Total nuclear energy within the above Total Energy Use figure, consumed during the product life cycle.

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