



## Environmental Product Declaration for Tork<sup>®</sup> Hand Towels and Handee Paper Towels

Produced under EPD Australasia in accordance with ISO 14025.

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Geographical scope: Australia and New Zealand

*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at [www.environdec.com](http://www.environdec.com)*

## Essity Australasia

Essity Australasia is a leader in Personal Care and Hygiene across Australasia, offering products that provide care, comfort and confidence every day.

The Company manufactures, markets, distributes and sells essential, everyday consumer products including tampons, pads and liners, nappies, toilet and facial tissue, paper towels and napkins. Our popular products are recognised household brands like Libra, TENA, Sorbent and Purex, Handee Ultra, Viti and Orchid.

Our professional hygiene products, which include hand towels, napkins, toilet and facial tissue, soaps and other hygiene accessories, are sold under the Tork brand to the hospitality sector, offices, schools, hospitals, shopping centres and industrial companies. Our TENA Incontinence Healthcare products and support services are provided to healthcare professionals in residential and community care facilities, retirement villages and hospitals.

Essity Australasia has 14 manufacturing and distribution facilities across Australia, New Zealand and the Pacific Islands. For more information, visit [www.essity.com](http://www.essity.com).



## Brands in this Environmental Product Declaration



Tork is the leading global brand in professional hygiene. From toilet tissue in universities to sports stadiums and hospitals, Tork delivers a great experience for the user and a convenient experience for the buyer. Tork is dedicated to serving your needs in a sustainable way – saving you time, money and effort, so you can focus on what matters most to your business.

To learn more about Tork, please visit [www.tork.co.nz](http://www.tork.co.nz) or [www.tork.com.au](http://www.tork.com.au). Tork is a registered trademark of Essity for use in Australia, New Zealand and a number of other countries in the Pacific region.



In the late 1960s our Kawerau factory was making paper towels for hospitals when it was recognised that there was a need for a similar product in the home and Handee paper towel was born. Since production in the early 1970s it has become a household name and is market leader in grocery. Handee Ultra, made to cope with anything you can throw at it!



## Sustainability – a core part of how we do business

Sustainability is built into Tork and Handee paper towel products from the start:

We begin with 100% responsibly-sourced non-controversial pulp. In particular, we are committed to purchase pulp and paper reels consistent with No Deforestation, No Peat, No Exploitation (NDPE) policies adopted by the forestry and palm oil industries. All the wood fiber we source and use must come from suppliers that are certified according to the Forest Stewardship Council® (FSC®) or Program for the Endorsement of Forest Certification (PEFC™). Our demand is that the fiber at a minimum will always meet the FSC Controlled Wood standard, which means that the origin of the fiber has been verified by an independent third party. 100% of the pulp that enters our Kawerau paper machines is from suppliers that are certified to FSC standards, with a minimum of 70% FSC Mix sourced fiber and a maximum of 30% FSC Controlled Wood sources. To learn more about FSC standards and labels, please visit: [www.fsc.org](http://www.fsc.org)

We then manufacture paper locally, using a large share of renewable energy. We are proud to manufacture the products in this Environmental Product Declaration in Kawerau, New Zealand. Our Kawerau operation is certified to ISO 9001, ISO 14001, AS/NZS 4801 and FSC chain of custody. In 2010, we replaced most of our natural gas consumption with geothermal steam in an ongoing partnership with Ngāti Tūwharetoa Geothermal Assets. In addition, our site's electricity comes from the New Zealand grid, comprising 84% renewable energy in 2018 (MBIE 2018). Consequently, since 2009 we have more than halved the greenhouse gas emissions generated from our Kawerau plant.

We help our customers to reduce their environmental footprint through their use of our unique consumption-reducing dispensers and recyclable packaging, both of which help to reduce waste. Our upgrade from bulky cardboard cartons with the Tork Carry Pack led to a six-fold reduction in packaging waste and six times less packaging to transport.

We focus on continuous improvement at Kawerau and in the past decade we have reduced water consumption by over 30%, reduced waste to landfill by a third and almost doubled our waste recycling rate.

This EPD helps to demonstrate Essity's commitment to sustainability and complements our work with eco-label and sustainability organisations such as FSC, Environmental Choice New Zealand, Sedex and the Dow Jones Sustainability Index.



Essity Paper Mill  
Kawerau, New Zealand

## Environmental Product Declaration (EPD)

An Environmental Product Declaration, or EPD, is a standardised and verified way of quantifying the environmental impacts of a product based on a consistent set of rules known as a PCR (Product Category Rules). Environmental Product Declarations within the same product category from different EPD programmes may not be comparable.

## Products covered by this EPD

All products in this EPD are covered by the following industry classifications: ANZSIC v1.0 C152400 "Sanitary Paper Product Manufacturing" and UN CPC v2 32131 "Toilet or facial tissue stock, towel or napkin stock and similar paper, cellulose wadding and webs of cellulose fibres".

The Tork Xpress Multifold Hand Towel is the most popular format in the Tork range based on its unrivalled value. The Tork Ultraslim Multifold Hand Towel offers similar benefits in an even slimmer dispenser. These soft and absorbent towels are packed in the innovative Tork Carry Packs that make it easier to carry, use and dispose. Available in a wide range of quality, tailored for specific needs (Premium, Advanced and Universal).



### **Tork Xpress® Multifold Hand Towel / Slimline H2 Advanced**

- Single ply, white tissue paper
- FSC Mix 70% certified
- Unfolded sheet dimensions: 21.0 cm wide x 24.0 cm long
- Folded sheet dimensions: 21.0 cm wide x 8.0 cm long
- Net weight per pack of 185 sheets: 422 g
- Tork Carry Packs™ lightweight plastic packaging
- **Article number: 148430**



### **Tork Xpress® Multifold Hand Towel / Slimline H2 Universal**

- Single ply, white tissue paper
- FSC Mix 70% certified
- Unfolded sheet dimensions: 21.0 cm wide x 24.0 cm long
- Folded sheet dimensions: 21.0 cm wide x 8.0 cm long
- Net weight per pack of 230 sheets: 466 g
- Tork Carry Packs™ lightweight plastic packaging
- **Article number: 184987**



#### Tork Ultralim Multifold Hand Towel / H4 Advanced

- Single ply, white tissue paper
- FSC Mix 70% certified
- Unfolded sheet dimensions: 21.0 cm wide x 24.0 cm long
- Folded sheet dimensions: 21.0 cm wide x 6.0 cm long
- Net weight per pack of 150 sheets: 319 g
- Tork Carry Packs™ lightweight plastic packaging
- **Article number: 170370**



#### Tork H2 Xpress Low Lint Multifold Hand Towel

- Single ply, white tissue paper
- FSC Mix 70% certified
- Unfolded sheet dimensions: 21.0 cm wide x 24.0 cm long
- Folded sheet dimensions: 21.0 cm wide x 8.0 cm long
- Net weight per pack of 209 sheets: 476 g
- Tork Carry Packs™ lightweight plastic packaging
- **Article number: 306120**

**Tork Basic Paper, Tork Roll Towel and Tork Ultra Long Kitchen Towel** are designed for basic wiping tasks such as mopping up spills, soaking up liquids and picking up dust and dirt with paper.



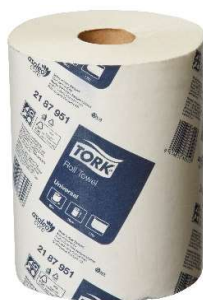
#### Tork Basic Paper 1ply Centerfeed Roll M2

- Single ply, white tissue paper
- FSC Mix 70% certified
- Dimensions: 20.0 cm wide x 300.0 m long
- Net weight: 1320 g
- **Article number: 120155 (H2),**



#### Tork Basic Paper 1ply Centerfeed Roll M2 Blue

- Single ply, white tissue paper
- FSC Mix 70% certified
- Dimensions: 20.0 cm wide x 300.0 m long
- Net weight: 1320 g
- **Article number: 219859 (Blue)**



#### Tork Roll Towel Universal

- Single ply, white tissue paper
- FSC Mix 70% certified
- Dimensions: 18.0 cm wide x 90.0 m long
- Net weight: 567 g
- **Article number: 2187951**



#### Tork Ultra Long Paper Towel

- Two ply, white tissue paper
- FSC Mix 70% certified
- Sheet dimensions: 27.0 cm wide x 26.0 cm long
- Net weight per pack of 2 x 156 sheets: 971 g
- **Article number: 2327073 (available in NZ only)**



#### Tork Ultra Long Paper Towel (short)

- Two ply, white tissue paper
- FSC Mix 70% certified
- Sheet dimensions: 27.0 cm wide x 20.4 cm long
- Net weight per pack of 2 x 156 sheets: 745 g
- **Article number: 2328833**

Handee paper towels are designed for home use and come in a range of formats:



#### Handee standard-length roll (available as 2s, 4s and 6s)

- Two-ply, white or printed tissue paper
- FSC Mix 70% certified
- Dimensions: 27cm x 13.5m long (60 sheets)
- Net weight per roll: 195 g
- **Article number: 2169509 White 2s**
- **Article number: 2323054 White 4s**
- **Article number: 2324454 White 6s**



#### Handee prints (2-pack)

- Two-ply, white or printed tissue paper
- FSC Mix 70% certified
- Dimensions: 27cm x 13.5m long (60 sheets)
- Net weight per roll: 195 g
- **Article number: 483**



#### Handee double-length roll (2-pack)

- Two-ply, white tissue paper
- FSC Mix 70% certified
- Dimensions: 27cm x 27m long (120 sheets)
- Net weight per roll: 389 g
- **Article number: 2329558**

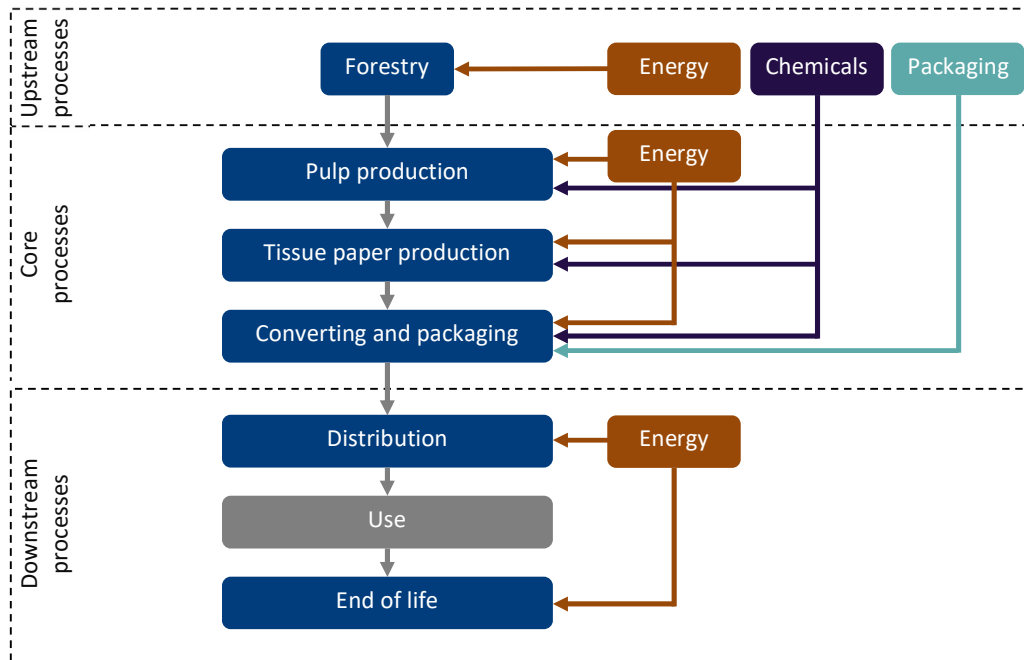


#### Handee max paper towels (2-pack)

- Two-ply, white tissue paper
- FSC Mix 70% certified
- Dimensions: 27cm x 13.5m long (60 sheets)
- Net weight per roll: 259 g
- **Article number: 2325522**



## Life cycle of Tork® and Handee paper products



This EPD covers the full life cycle of paper towel products from cradle-to-grave.

The life cycle starts with (1) forestry to grow wood fibre, (2) production of the chemicals needed to make paper from wood fibre, (3) production of packaging materials, and (4) production of energy for these process steps. These are the **upstream processes**.

Wood chips/residues, chemicals and fuels are transported to pulp mills, where wood pulp is made from wood fibre. This pulp is then transported to Essity Australasia's paper mill where it is formed into paper, cut to size ('converted'), packaged and then warehoused. These steps also require energy to be produced, and for both solid waste and wastewater to be treated. These are the **core processes**.

Finally, finished paper towel products are transported to customers. As the use of a paper towel has no direct environmental impacts, use is not included in this EPD. The final step is end-of-life, where the paper towel and its packaging are disposed. These are the **downstream processes**.

## Key parameters and assumptions for the LCA

- **Declared unit:** 1 tonne (1000 kg) of tissue paper , plus packaging.
- **Manufacturing site:** All products are manufactured in Kawerau, New Zealand.
- **Distribution to customer:** Distribution from the manufacturing plant to customer via Essity's warehouses is based on a sales-weighted average of the distances travelled in each transport mode (truck and container ship).
- **End of life:** Two options are provided for product end-of-life: landfill and composting. Results are declared separately for each option in the results tables that follow.  
 100% of polyethylene film packaging is assumed to go to landfill (conservative approach).  
 71% of paper packaging is assumed to be recovered for recycling, with the remainder landfilled (APCO 2019). Recovery and recycling rates in New Zealand are likely to be similar but are not available due to uncertainties in waste statistics (PCNZ 2015). No credits are applied for recycling paper in line with the PCR 2011:05 (IEPDS 2022).  
 All waste treatment assumes truck transport of 50 km outbound with an empty backhaul.
- **Biogenic carbon emissions from landfill:** From every kilogram of paper, 22% of the mass is biogenic carbon that is converted to landfill gas. From every kilogram of carbon converted to landfill gas, 71.2% is released as carbon dioxide and 28.8% is released as methane. These percentages represent Australian conditions where data quality is best.
  - 0.45 kg/kg = degradable organic carbon in paper at 10% water content (ECN 2012)
  - 0.49 kg/kg = fraction of carbon that degrades (Australian Government 2018)
  - Of the landfill gas formed, 50% is CO<sub>2</sub> and 50% is CH<sub>4</sub> (ibid)
  - 36% of the CH<sub>4</sub> is captured, of which 75% is used for energy recovery and 25% is flared (Carre 2011, based on Hyder Consulting 2007)
  - 64% of the CH<sub>4</sub> is not captured, of which 90% is released to the atmosphere as CH<sub>4</sub> and 10% is oxidised to CO<sub>2</sub> in the landfill's surface (Australian Government 2018)
- **Biogenic carbon emissions from composting:** Windrow composting is assumed using operational inputs from UNSW (2003). 92% of cellulose (Venelampi et al. 2003) and 23% of lignin (Tuomela et al. 2000) is assumed to break down, with 9 kg methane released per tonne of paper (IPCC 2006) and the remainder as carbon dioxide.
- **Data for core processes:** Primary (specific) data were collected from Essity Australasia and our pulp suppliers as per the PCR 2011:05 (IEPDS 2022). Data are an annual average for the 2021 calendar year. Mono-nitrogen oxides (NO<sub>x</sub>) have been modelled as nitrogen dioxide (NO<sub>2</sub>) and Total Reduced Sulfur (TRS) has been modelled as hydrogen sulfide (H<sub>2</sub>S).
- **Data for upstream and downstream processes:** Secondary (generic) data were used for forestry, chemical production, packaging materials and electricity, as allowed under the PCR 2011:05 (IEPDS 2022). All data are from the GaBi Life Cycle Inventory Database 2022 and are typically representative of the years 2018 to 2021, depending on the dataset (Sphera 2022).
- **Electricity mixes:** All electricity is based on New Zealand's national electricity production mix for 2018 from the GaBi Life Cycle Inventory Database 2022 (Sphera 2022).
- **Allocation:** Where required, co-product allocation using the most relevant physical quantity (mass, energy or exergy) was applied for core processes. Allocation rules for secondary data (upstream/downstream processes) are documented on the GaBi website (Sphera 2022). Recycling allocation follows the polluter pays principle in line with IEPDS (2017).
- **Cut-off criteria:** Environmental impacts relating to personnel, infrastructure, and production equipment not directly consumed in the process are excluded from the system boundary as per the PCR 2011:05 (IEPDS 2022). All other reported data were incorporated and modelled using the best available life cycle inventory data.

## Environmental indicators

Indicator	Description
<b>Climate change</b> Total (GWP-total) Fossil (GWP-fossil) Biogenic (GWP-biogenic) Land use and Land use change (GWP-luluc)	A measure of greenhouse gas emissions, such as CO <sub>2</sub> and methane. These emissions are causing an increase in the absorption of radiation emitted by the earth, increasing the natural greenhouse effect. This may in turn have adverse impacts on ecosystem health, human health and material welfare
<b>Ozone Depletion</b> (ODP)	A measure of air emissions that contribute to the depletion of the stratospheric ozone layer. Depletion of the ozone leads to higher levels of UVB ultraviolet rays reaching the earth's surface with detrimental effects on humans and plants
<b>Acidification Potential</b> (AP)	The potential of emissions to cause acidifying effects in the environment, typically due to acid rain. Potential downstream effects include fish mortality, forest decline and the deterioration of building materials.
<b>Eutrophication</b> Freshwater (EP-fw) Aquatic marine (EP-fm) Terrestrial (EP-tr)	Eutrophication covers all potential impacts of excessively high levels of macronutrients, the most important of which nitrogen (N) and phosphorus (P). Nutrient enrichment may cause an undesirable shift in species composition and elevated biomass production in both aquatic and terrestrial ecosystems. In aquatic ecosystems increased biomass production may lead to depressed oxygen levels, because of the additional consumption of oxygen in biomass decomposition.
<b>Photochemical Ozone Creation Potential</b> (POCP)	A measure of emissions of precursors that contribute to ground-level smog formation (mainly ozone, O <sub>3</sub> ). Ground-level ozone can be harmful to human and ecosystem health and can also damage crops.
<b>Depletion of abiotic resources – minerals and metals</b> (ADP-mm)	The consumption of non-renewable resources leads to a decrease in the future availability of the functions supplied by these resources. Depletion of mineral resources is assessed based on ultimate reserves
<b>Depletion of abiotic resources</b> (ADP-fossil)	The consumption of non-renewable resources leads to a decrease in the future availability of the functions supplied by these resources.
<b>Water use</b> (WDP)	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)

## Handee Standard Roll-2

**Article number(s): 2169509**

1,000 kg air-dry tissue + 72 kg paper packaging + 90 kg plastic packaging = 1,162 kg total.

Content declaration: Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-2,880	2,730	-153	3,820	3,660	1,980	1,830	-50%
Climate change, fossil	kg CO <sub>2</sub> -eq.	441	999	1,440	130	1,570	85.2	1,530	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-3,330	1,730	-1,600	3,690	2,090	1,900	301	-86%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.195	3.41	3.60	0.0149	3.62	7.96E-04	3.60	-1%
Ozone depletion	kg CFC11-eq.	4.37E-09	5.34E-10	4.91E-09	9.92E-11	5.01E-09	7.53E-12	4.92E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.95	8.47	10.4	1.23	11.6	0.735	11.1	-4%
Eutrophication, freshwater	kg P eq.	0.00778	0.0389	0.0467	0.00119	0.0479	1.29E-05	0.0467	-3%
Eutrophication, marine	kg N eq.	0.676	2.60	3.28	0.561	3.84	0.261	3.54	-8%
Eutrophication, terrestrial	Mole of N eq.	7.29	29.4	36.7	5.03	41.7	2.87	39.6	-5%
Photochemical ozone formation, human health	kg NMVOC eq.	1.98	7.05	9.03	1.97	11.0	0.693	9.72	-12%
Resource use, mineral and metals	kg Sb-eq.	1.41E-04	6.27E-05	2.04E-04	4.93E-06	2.09E-04	1.33E-06	2.05E-04	-2%
Resource use, fossils	MJ	9,230	10,700	20,000	1,670	21,600	1,020	21,000	-3%
Water use	m <sup>3</sup> world equiv.	76.7	349	425	14.1	439	0.523	426	-3%



# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	39,500	17,500	99.1	99.1	57,000	5.63	57,000	0%
Primary energy resources used as raw materials	MJ	14.2	0	0	0	14.2	0	14.2	0%
Total use of renewable primary energy resources	MJ	39,500	17,500	99.1	99.1	57,000	5.63	57,000	0%
Use of non-renewable primary energy	MJ	9,330	10,800	1,670	1,670	20,100	1,020	21,100	-3%
Non-renewable primary energy resources used as raw materials	MJ	3.40	0	0	0	3.40	0	3.40	0%
Total use of non-renewable primary energy resources	MJ	9,330	10,800	1,670	1,670	20,100	1,020	21,100	-3%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	7.23	31.5	0.414	0.414	38.8	0.0118	38.8	-1%
Total use of non-renewable & renewable primary energy resources	MJ	48,800	28,300	77,100	1,770	78,900	1,770	78,100	-1%
% Total use of renewable primary energy resources	MJ	80.9%	62.0%	73.9%	5.6%	72.4%	5.6%	73.0%	

Waste indicators		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste disposed	kg	1.66E-05	1.20E-06	6.13E-08	6.13E-08	1.77E-05	1.60E-09	1.77E-05	-1%
Non-hazardous waste disposed	kg	13.5	36.6	304	304	50.0	0.0235	50.1	-86%
Radioactive waste disposed	kg	0.178	0.0548	0.00565	0.00565	0.233	1.75E-04	0.233	-3%
Components for re-use	kg	0	0	0	0	0	0	0	0%
Materials for recycling	kg	0	0	0	0	0	0	0	0%
Material for energy recovery	kg	0	0	0	0	0	0	0	0%
Exported electrical energy	MJ	0	0	0	0	0	0	0	0%
Exported thermal energy	MJ	0	0	0	0	0	0	0	0%

## Handee Standard Roll-4

**Article number(s): 2323054**

1,000 kg air-dry tissue + 72 kg paper packaging + 41 kg plastic packaging = 1,113 kg total.

Content declaration: Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-2,990	2,730	-256	7,750	7,500	3,910	3,650	-51%
Climate change, fossil	kg CO <sub>2</sub> -eq.	338	998	1,340	195	1,530	110	1,450	-5%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-3,320	1,730	-1,600	7,560	5,960	3,790	2,200	-63%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.183	3.41	3.59	0.0258	3.61	9.92E-04	3.59	-1%
Ozone depletion	kg CFC11-eq.	4.23E-09	5.34E-10	4.77E-09	2.00E-10	4.97E-09	9.80E-12	4.78E-09	-4%
Acidification	Mole of H <sup>+</sup> eq.	1.75	8.46	10.2	1.62	11.8	0.669	10.9	-8%
Eutrophication, freshwater	kg P eq.	0.00765	0.0389	0.0465	0.00107	0.0476	1.57E-05	0.0466	-2%
Eutrophication, marine	kg N eq.	0.609	2.60	3.21	0.833	4.04	0.251	3.46	-14%
Eutrophication, terrestrial	Mole of N eq.	6.56	29.4	35.9	6.90	42.8	2.75	38.7	-10%
Photochemical ozone formation, human health	kg NMVOC eq.	1.78	7.05	8.83	3.31	12.1	0.746	9.57	-21%
Resource use, mineral and metals	kg Sb-eq.	7.97E-05	6.26E-05	1.42E-04	1.04E-05	1.53E-04	1.66E-06	1.44E-04	-6%
Resource use, fossils	MJ	6,350	10,700	17,100	2,520	19,600	1,250	18,300	-7%
Water use	m <sup>3</sup> world equiv.	56.4	349	405	27.1	432	0.674	406	-6%

Primary Energy Demand (PED)		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	39,400	17,500	166	166	56,900	7.05	56,900	0%
Primary energy resources used as raw materials	MJ	14.8	0	0	0	14.8	0	14.8	0%
Total use of renewable primary energy resources	MJ	39,400	17,500	166	166	56,900	7.05	56,900	0%
Use of non-renewable primary energy	MJ	6,400	10,700	2,520	2,520	17,100	1,250	18,400	-7%
Non-renewable primary energy resources used as raw materials	MJ	1.78	0	0	0	1.78	0	1.78	0%
Total use of non-renewable primary energy resources	MJ	6,400	10,700	2,520	2,520	17,100	1,250	18,400	-7%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	6.65	31.5	0.731	0.731	38.2	0.0146	38.2	-2%
Total use of non-renewable & renewable primary energy resources	MJ	45,800	28,300	74,000	2,690	76,700	0	0	-2%
% Total use of renewable primary energy resources	MJ	86.0%	62.0%	76.8%	6.2%	74.4%	0	0	



Waste indicators		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste disposed	kg	1.64E-05	1.20E-06	1.09E-07	1.09E-07	1.76E-05	2.02E-09	1.76E-05	-1%
Non-hazardous waste disposed	kg	8.63	36.6	510	510	45.2	0.0297	45.2	-92%
Radioactive waste disposed	kg	0.138	0.0548	0.00997	0.00997	0.193	2.26E-04	0.193	-5%
Components for re-use	kg	0	0	0	0	0	0	0	0%
Materials for recycling	kg	0	0	0	0	0	0	0	0%
Material for energy recovery	kg	0	0	0	0	0	0	0	0%
Exported electrical energy	MJ	0	0	0	0	0	0	0	0%
Exported thermal energy	MJ	0	0	0	0	0	0	0	0%

## Handee Standard Roll-6

**Article number(s): 2324454**

1,000 kg air-dry tissue + 72 kg paper packaging + 36 kg plastic packaging = 1,108 kg total.

Content declaration: Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-3,000	2,730	-266	3,800	3,540	1,970	1,710	-52%
Climate change, fossil	kg CO <sub>2</sub> -eq.	328	998	1,330	118	1,440	77.1	1,400	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-3,320	1,730	-1,600	3,690	2,090	1,900	301	-86%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.181	3.41	3.59	0.0130	3.60	7.12E-04	3.59	0%
Ozone depletion	kg CFC11-eq.	4.22E-09	5.34E-10	4.75E-09	9.33E-11	4.85E-09	6.74E-12	4.76E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.73	8.46	10.2	1.12	11.3	0.644	10.8	-4%
Eutrophication, freshwater	kg P eq.	0.00764	0.0389	0.0465	4.77E-04	0.0470	1.15E-05	0.0465	-1%
Eutrophication, marine	kg N eq.	0.603	2.60	3.20	0.524	3.73	0.228	3.43	-8%
Eutrophication, terrestrial	Mole of N eq.	6.48	29.4	35.9	4.63	40.5	2.50	38.4	-5%
Photochemical ozone formation, human health	kg NMVOC eq.	1.76	7.05	8.80	1.88	10.7	0.618	9.42	-12%
Resource use, mineral and metals	kg Sb-eq.	7.36E-05	6.26E-05	1.36E-04	4.52E-06	1.41E-04	1.19E-06	1.37E-04	-3%
Resource use, fossils	MJ	6,070	10,700	16,800	1,500	18,300	910	17,700	-3%
Water use	m <sup>3</sup> world equiv.	54.4	349	403	14.1	417	0.471	403	-3%

# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	39,400	17,500	94.2	94.2	56,900	5.12	56,900	0%
Primary energy resources used as raw materials	MJ	14.8	0	0	0	14.8	0	14.8	0%
Total use of renewable primary energy resources	MJ	39,400	17,500	94.2	94.2	56,900	5.12	56,900	0%
Use of non-renewable primary energy	MJ	6,110	10,700	1,500	1,500	16,800	910	17,800	-3%
Non-renewable primary energy resources used as raw materials	MJ	1.61	0	0	0	1.61	0	1.61	0%
Total use of non-renewable primary energy resources	MJ	6,110	10,700	1,500	1,500	16,800	910	17,800	-3%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	6.59	31.5	0.412	0.412	38.1	0.0108	38.1	-1%
Total use of non-renewable & renewable primary energy resources	MJ	45,500	28,300	73,700	1,600	75,300	0	0	-1%
% Total use of renewable primary energy resources	MJ	86.6%	62.0%	77.1%	5.9%	75.6%	0	0	

# Waste indicators

Indicator	Unit
Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed	kg
Components for re-use	kg
Materials for recycling	kg
Material for energy recovery	kg
Exported electrical energy	MJ
Exported thermal energy	MJ

# Manufacture

Upstream	Core	To Gate
1.64E-05	1.20E-06	5.28E-08
8.16	36.6	250
0.134	0.0548	0.00497
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

# Transport + Landfill

Downstream	Total
5.28E-08	1.76E-05
250	44.7
0.00497	0.189
0	0
0	0
0	0
0	0
0	0

# Transport + Compost

Downstream	Total	Reduction
1.43E-09	1.76E-05	0%
0.0211	44.8	-85%
1.57E-04	0.189	-3%
0	0	0%
0	0	0%
0	0	0%
0	0	0%
0	0	0%



## Handee Prints-2

### Article number(s): 483

1,000 kg air-dry tissue + 71 kg paper packaging + 89 kg plastic packaging = 1,160 kg total.

Content declaration: Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-2,890	2,730	-154	3,820	3,670	1,990	1,840	-50%
Climate change, fossil	kg CO <sub>2</sub> -eq.	439	999	1,440	139	1,580	94.9	1,530	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-3,320	1,730	-1,600	3,680	2,090	1,900	301	-86%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.194	3.41	3.60	0.0149	3.62	8.82E-04	3.60	-1%
Ozone depletion	kg CFC11-eq.	4.36E-09	5.34E-10	4.89E-09	9.99E-11	4.99E-09	8.38E-12	4.90E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.94	8.47	10.4	1.44	11.9	0.953	11.4	-4%
Eutrophication, freshwater	kg P eq.	0.00775	0.0389	0.0466	0.00117	0.0478	1.45E-05	0.0467	-2%
Eutrophication, marine	kg N eq.	0.673	2.60	3.28	0.626	3.90	0.326	3.60	-8%
Eutrophication, terrestrial	Mole of N eq.	7.26	29.4	36.7	5.74	42.4	3.58	40.3	-5%
Photochemical ozone formation, human health	kg NMVOC eq.	1.97	7.05	9.02	2.13	11.2	0.857	9.88	-12%
Resource use, mineral and metals	kg Sb-eq.	1.67E-04	6.27E-05	2.30E-04	5.06E-06	2.35E-04	1.47E-06	2.31E-04	-2%
Resource use, fossils	MJ	9,160	10,700	19,900	1,790	21,700	1,140	21,100	-3%
Water use	m <sup>3</sup> world equiv.	76.1	349	425	14.2	439	0.588	425	-3%

# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	39,400	17,500	99.5	99.5	57,000	6.15	57,000	0%
Primary energy resources used as raw materials	MJ	14.2	0	0	0	14.2	0	14.2	0%
Total use of renewable primary energy resources	MJ	39,400	17,500	99.5	99.5	57,000	6.15	57,000	0%
Use of non-renewable primary energy	MJ	9,260	10,800	1,790	1,790	20,000	1,140	21,200	-3%
Non-renewable primary energy resources used as raw materials	MJ	3.29	0	0	0	3.29	0	3.29	0%
Total use of non-renewable primary energy resources	MJ	9,260	10,800	1,790	1,790	20,000	1,140	21,200	-3%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	7.22	31.5	0.415	0.415	38.8	0.0129	38.8	-1%
Total use of non-renewable & renewable primary energy resources	MJ	48,700	28,300	77,000	1,890	78,900	0	0	-1%
% Total use of renewable primary energy resources	MJ	81.0%	62.0%	74.0%	5.3%	72.4%	0	0	

Waste indicators		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste disposed	kg	1.63E-05	1.20E-06	6.12E-08	6.12E-08	1.75E-05	1.77E-09	1.75E-05	-1%
Non-hazardous waste disposed	kg	13.4	36.6	302	302	49.9	0.0260	50.0	-86%
Radioactive waste disposed	kg	0.177	0.0548	0.00564	0.00564	0.232	1.90E-04	0.232	-2%
Components for re-use	kg	0	0	0	0	0	0	0	0%
Materials for recycling	kg	0	0	0	0	0	0	0	0%
Material for energy recovery	kg	0	0	0	0	0	0	0	0%
Exported electrical energy	MJ	0	0	0	0	0	0	0	0%
Exported thermal energy	MJ	0	0	0	0	0	0	0	0%

## Handee Max Paper Towels-2

**Article number(s): 2325522**

1,000 kg air-dry tissue + 51 kg paper packaging + 29 kg plastic packaging = 1,081 kg total.

Content declaration: Paper >99% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-3,010	2,730	-278	3,750	3,470	1,940	1,670	-52%
Climate change, fossil	kg CO <sub>2</sub> -eq.	293	987	1,280	111	1,390	71.8	1,350	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-3,300	1,740	-1,560	3,640	2,080	1,870	311	-85%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.157	3.42	3.58	0.0126	3.59	6.57E-04	3.58	0%
Ozone depletion	kg CFC11-eq.	3.91E-09	5.43E-10	4.45E-09	9.16E-11	4.54E-09	6.21E-12	4.46E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.59	8.45	10.0	1.07	11.1	0.599	10.6	-5%
Eutrophication, freshwater	kg P eq.	0.00715	0.0391	0.0462	3.97E-04	0.0466	1.06E-05	0.0462	-1%
Eutrophication, marine	kg N eq.	0.555	2.58	3.13	0.503	3.64	0.209	3.34	-8%
Eutrophication, terrestrial	Mole of N eq.	6.00	29.3	35.3	4.40	39.7	2.29	37.6	-5%
Photochemical ozone formation, human health	kg NMVOC eq.	1.61	6.99	8.60	1.84	10.4	0.578	9.18	-12%
Resource use, mineral and metals	kg Sb-eq.	6.10E-05	6.34E-05	1.24E-04	4.38E-06	1.29E-04	1.10E-06	1.25E-04	-3%
Resource use, fossils	MJ	5,270	10,500	15,800	1,420	17,200	840	16,600	-3%
Water use	m <sup>3</sup> world equiv.	49.3	356	405	14.0	419	0.437	405	-3%

# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	38,500	18,200	92.8	92.8	56,800	4.79	56,800	0%
Primary energy resources used as raw materials	MJ	15.0	0	0	0	15.0	0	15.0	0%
Total use of renewable primary energy resources	MJ	38,500	18,200	92.8	92.8	56,800	4.79	56,800	0%
Use of non-renewable primary energy	MJ	5,300	10,500	1,420	1,420	15,800	840	16,700	-3%
Non-renewable primary energy resources used as raw materials	MJ	1.29	0	0	0	1.29	0	1.29	0%
Total use of non-renewable primary energy resources	MJ	5,300	10,500	1,420	1,420	15,800	840	16,700	-3%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	6.29	32.1	0.409	0.409	38.4	0.0101	38.4	-1%
Total use of non-renewable & renewable primary energy resources	MJ	43,900	28,700	72,600	1,520	74,100	0	0	-1%
% Total use of renewable primary energy resources	MJ	87.9%	63.4%	78.2%	6.1%	76.7%	0	0	

Waste indicators		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste disposed	kg	1.18E-05	1.19E-06	5.15E-08	5.15E-08	1.30E-05	1.32E-09	1.30E-05	-1%
Non-hazardous waste disposed	kg	6.27	36.7	243	243	42.9	0.0194	43.0	-85%
Radioactive waste disposed	kg	0.121	0.0551	0.00485	0.00485	0.176	1.44E-04	0.176	-3%
Components for re-use	kg	0	0	0	0	0	0	0	0%
Materials for recycling	kg	0	0	0	0	0	0	0	0%
Material for energy recovery	kg	0	0	0	0	0	0	0	0%
Exported electrical energy	MJ	0	0	0	0	0	0	0	0%
Exported thermal energy	MJ	0	0	0	0	0	0	0	0%



## Handee Double Roll-2

**Article number(s): 2329558**

1,000 kg air-dry tissue + 34 kg paper packaging + 45 kg plastic packaging = 1,078 kg total.

Content declaration: Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-2,940	2,730	-215	3,720	3,500	1,930	1,720	-51%
Climate change, fossil	kg CO <sub>2</sub> -eq.	319	996	1,310	121	1,440	80.1	1,390	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-3,260	1,730	-1,530	3,600	2,060	1,850	316	-85%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.142	3.41	3.55	0.0132	3.56	7.38E-04	3.55	0%
Ozone depletion	kg CFC11-eq.	3.72E-09	5.34E-10	4.25E-09	9.35E-11	4.35E-09	6.99E-12	4.26E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.59	8.42	10.0	1.20	11.2	0.722	10.7	-4%
Eutrophication, freshwater	kg P eq.	0.00677	0.0389	0.0457	6.10E-04	0.0463	1.20E-05	0.0457	-1%
Eutrophication, marine	kg N eq.	0.547	2.59	3.13	0.543	3.67	0.250	3.38	-8%
Eutrophication, terrestrial	Mole of N eq.	5.92	29.2	35.1	4.85	40.0	2.74	37.9	-5%
Photochemical ozone formation, human health	kg NMVOC eq.	1.60	7.01	8.60	1.93	10.5	0.676	9.28	-12%
Resource use, mineral and metals	kg Sb-eq.	7.91E-05	6.26E-05	1.42E-04	4.57E-06	1.46E-04	1.23E-06	1.43E-04	-2%
Resource use, fossils	MJ	6,150	10,700	16,900	1,540	18,400	948	17,800	-3%
Water use	m <sup>3</sup> world equiv.	54.0	349	403	14.0	417	0.491	403	-3%

# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	37,600	17,500	94.1	94.1	55,100	5.28	55,100	0%
Primary energy resources used as raw materials	MJ	0	0	0	0	0	0	0	0%
Total use of renewable primary energy resources	MJ	37,600	17,500	94.1	94.1	55,100	5.28	55,100	0%
Use of non-renewable primary energy	MJ	6,200	10,700	1,540	1,540	16,900	949	17,900	-3%
Non-renewable primary energy resources used as raw materials	MJ	0	0	0	0	0	0	0	0%
Total use of non-renewable primary energy resources	MJ	6,200	10,700	1,540	1,540	16,900	949	17,900	-3%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	6.38	31.5	0.408	0.408	37.9	0.0111	37.9	-1%
Total use of non-renewable & renewable primary energy resources	MJ	43,800	28,200	72,100	1,640	73,700	0	0	-1%
% Total use of renewable primary energy resources	MJ	85.8%	62.1%	76.5%	5.7%	74.9%	0	0	

Waste indicators		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste disposed	kg	8.13E-06	1.20E-06	5.39E-08	5.39E-08	9.33E-06	1.48E-09	9.33E-06	-1%
Non-hazardous waste disposed	kg	7.45	36.6	258	258	44.0	0.0218	44.1	-85%
Radioactive waste disposed	kg	0.130	0.0548	0.00504	0.00504	0.185	1.61E-04	0.185	-3%
Components for re-use	kg	0	0	0	0	0	0	0	0%
Materials for recycling	kg	0	0	0	0	0	0	0	0%
Material for energy recovery	kg	0	0	0	0	0	0	0	0%
Exported electrical energy	MJ	0	0	0	0	0	0	0	0%
Exported thermal energy	MJ	0	0	0	0	0	0	0	0%

## Tork Ultra Long Paper Towel-2

**Article number(s): 2327073**

1,000 kg air-dry tissue + 29 kg paper packaging + 12 kg plastic packaging = 1,041 kg total.

Content declaration: Paper >99% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-3,020	2,730	-295	3,690	3,400	1,910	1,620	-52%
Climate change, fossil	kg CO <sub>2</sub> -eq.	241	985	1,230	106	1,330	68.2	1,290	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-3,260	1,740	-1,520	3,590	2,060	1,840	320	-84%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.129	3.43	3.55	0.0120	3.57	6.17E-04	3.55	-1%
Ozone depletion	kg CFC11-eq.	3.56E-09	5.43E-10	4.10E-09	8.92E-11	4.19E-09	5.84E-12	4.11E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.43	8.43	9.86	1.05	10.9	0.579	10.4	-5%
Eutrophication, freshwater	kg P eq.	0.00659	0.0391	0.0457	1.81E-04	0.0459	1.00E-05	0.0457	0%
Eutrophication, marine	kg N eq.	0.493	2.57	3.06	0.489	3.55	0.198	3.26	-8%
Eutrophication, terrestrial	Mole of N eq.	5.34	29.2	34.5	4.26	38.8	2.17	36.7	-5%
Photochemical ozone formation, human health	kg NMVOC eq.	1.43	6.96	8.39	1.80	10.2	0.559	8.95	-12%
Resource use, mineral and metals	kg Sb-eq.	3.63E-05	6.34E-05	9.97E-05	4.21E-06	1.04E-04	1.03E-06	1.01E-04	-3%
Resource use, fossils	MJ	4,010	10,500	14,500	1,350	15,900	791	15,300	-4%
Water use	m <sup>3</sup> world equiv.	39.9	356	396	13.9	409	0.414	396	-3%

Primary Energy Demand (PED)		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	37,500	18,200	90.6	90.6	55,700	4.55	55,700	0%
Primary energy resources used as raw materials	MJ	15.2	0	0	0	15.2	0	15.2	0%
Total use of renewable primary energy resources	MJ	37,500	18,200	90.6	90.6	55,700	4.55	55,700	0%
Use of non-renewable primary energy	MJ	4,030	10,500	1,350	1,350	14,500	791	15,300	-4%
Non-renewable primary energy resources used as raw materials	MJ	0.681	0	0	0	0.681	0	0.681	0%
Total use of non-renewable primary energy resources	MJ	4,030	10,500	1,350	1,350	14,500	791	15,300	-4%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	5.91	32.1	0.406	0.406	38.0	0.00964	38.1	-1%
Total use of non-renewable & renewable primary energy resources	MJ	41,500	28,700	70,300	1,440	71,700	0	0	-1%
% Total use of renewable primary energy resources	MJ	90.3%	63.4%	79.3%	6.3%	77.8%	0	0	

# Waste indicators

Indicator	Unit
Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed	kg
Components for re-use	kg
Materials for recycling	kg
Material for energy recovery	kg
Exported electrical energy	MJ
Exported thermal energy	MJ

# Manufacture

Upstream	Core	To Gate
7.08E-06	1.19E-06	4.86E-08
3.68	36.7	225
0.100	0.0551	0.00461
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

# Transport + Landfill

Downstream	Total
4.86E-08	8.26E-06
225	40.4
0.00461	0.155
0	0
0	0
0	0
0	0
0	0

# Transport + Compost

Downstream	Total	Reduction
1.24E-09	8.26E-06	-1%
0.0182	40.4	-85%
1.34E-04	0.155	-3%
0	0	0%
0	0	0%
0	0	0%
0	0	0%
0	0	0%



## Tork Ultra Long Paper Towel (Short)-2

**Article number(s): 2328833**

1,000 kg air-dry tissue + 30 kg paper packaging + 26 kg plastic packaging = 1,056 kg total.

Content declaration: Paper >99% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-2,940	2,730	-209	3,700	3,490	1,910	1,710	-51%
Climate change, fossil	kg CO <sub>2</sub> -eq.	271	985	1,260	108	1,360	68.7	1,320	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-3,210	1,740	-1,470	3,590	2,120	1,850	378	-82%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.133	3.43	3.56	0.0125	3.57	6.22E-04	3.56	0%
Ozone depletion	kg CFC11-eq.	3.61E-09	5.43E-10	4.15E-09	9.06E-11	4.24E-09	5.89E-12	4.15E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.48	8.43	9.92	1.06	11.0	0.587	10.5	-5%
Eutrophication, freshwater	kg P eq.	0.00663	0.0391	0.0457	3.64E-04	0.0461	1.01E-05	0.0457	-1%
Eutrophication, marine	kg N eq.	0.513	2.57	3.08	0.492	3.58	0.201	3.28	-8%
Eutrophication, terrestrial	Mole of N eq.	5.56	29.2	34.7	4.29	39.0	2.20	36.9	-5%
Photochemical ozone formation, human health	kg NMVOC eq.	1.49	6.97	8.46	1.81	10.3	0.564	9.02	-12%
Resource use, mineral and metals	kg Sb-eq.	5.39E-05	6.34E-05	1.17E-04	4.28E-06	1.22E-04	1.04E-06	1.18E-04	-3%
Resource use, fossils	MJ	4,840	10,500	15,300	1,370	16,700	798	16,100	-4%
Water use	m <sup>3</sup> world equiv.	45.7	356	401	13.9	415	0.418	402	-3%

# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	37,500	18,200	91.8	91.8	55,800	4.58	55,800	0%
Primary energy resources used as raw materials	MJ	0	0	0	0	0	0	0	0%
Total use of renewable primary energy resources	MJ	37,500	18,200	91.8	91.8	55,800	4.58	55,800	0%
Use of non-renewable primary energy	MJ	4,870	10,500	1,370	1,370	15,400	798	16,200	-3%
Non-renewable primary energy resources used as raw materials	MJ	0	0	0	0	0	0	0	0%
Total use of non-renewable primary energy resources	MJ	4,870	10,500	1,370	1,370	15,400	798	16,200	-3%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	6.08	32.1	0.406	0.406	38.2	0.00970	38.2	-1%
Total use of non-renewable & renewable primary energy resources	MJ	42,400	28,700	71,200	1,470	72,600	0	0	-1%
% Total use of renewable primary energy resources	MJ	88.5%	63.4%	78.4%	6.3%	76.9%	0	0	

# Waste indicators

Indicator	Unit
Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed	kg
Components for re-use	kg
Materials for recycling	kg
Material for energy recovery	kg
Exported electrical energy	MJ
Exported thermal energy	MJ

# Manufacture

Upstream	Core	To Gate
7.16E-06	1.19E-06	5.08E-08
5.07	36.7	239
0.112	0.0551	0.00479
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

# Transport + Landfill

Downstream	Total
5.08E-08	8.35E-06
239	41.7
0.00479	0.167
0	0
0	0
0	0
0	0
0	0

# Transport + Compost

Downstream	Total	Reduction
1.25E-09	8.35E-06	-1%
0.0184	41.8	-85%
1.36E-04	0.167	-3%
0	0	0%
0	0	0%
0	0	0%
0	0	0%
0	0	0%

## Tork Basic Paper Centerfeed Roll M2-1

### Article number(s): 120155

1,000 kg air-dry tissue + 29 kg paper packaging + 13 kg plastic packaging = 1,042 kg total.

Content declaration: Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-3,040	2,740	-302	3,900	3,600	1,940	1,640	-54%
Climate change, fossil	kg CO <sub>2</sub> -eq.	230	987	1,220	137	1,350	95.9	1,310	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-3,270	1,750	-1,520	3,760	2,240	1,840	321	-86%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.128	3.45	3.57	0.0121	3.59	7.52E-04	3.58	0%
Ozone depletion	kg CFC11-eq.	3.55E-09	5.45E-10	4.10E-09	1.07E-10	4.20E-09	8.00E-12	4.10E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.43	8.46	9.88	2.51	12.4	2.05	11.9	-4%
Eutrophication, freshwater	kg P eq.	0.00659	0.0393	0.0459	2.02E-04	0.0461	1.47E-05	0.0459	0%
Eutrophication, marine	kg N eq.	0.492	2.58	3.07	0.837	3.91	0.557	3.62	-7%
Eutrophication, terrestrial	Mole of N eq.	5.33	29.2	34.6	8.07	42.6	6.10	40.7	-4%
Photochemical ozone formation, human health	kg NMVOC eq.	1.41	6.98	8.39	2.86	11.3	1.59	9.99	-12%
Resource use, mineral and metals	kg Sb-eq.	3.58E-05	6.35E-05	9.93E-05	6.33E-06	1.06E-04	1.26E-06	1.01E-04	-5%
Resource use, fossils	MJ	3,690	10,500	14,200	1,750	16,000	1,120	15,300	-4%
Water use	m <sup>3</sup> world equiv.	40.4	356	397	13.3	410	0.627	397	-3%

# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	37,700	18,200	71.7	71.7	55,900	4.78	56,000	0%
Primary energy resources used as raw materials	MJ	15.3	0	0	0	15.3	0	15.3	0%
Total use of renewable primary energy resources	MJ	37,700	18,200	71.7	71.7	55,900	4.78	56,000	0%
Use of non-renewable primary energy	MJ	3,700	10,500	1,760	1,760	14,200	1,120	15,400	-4%
Non-renewable primary energy resources used as raw materials	MJ	0.462	0	0	0	0.462	0	0.462	0%
Total use of non-renewable primary energy resources	MJ	3,700	10,500	1,760	1,760	14,200	1,120	15,400	-4%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	5.76	32.2	0.324	0.324	38.0	0.0107	38.0	-1%
Total use of non-renewable & renewable primary energy resources	MJ	41,400	28,800	70,200	1,830	72,000	0	0	-1%
% Total use of renewable primary energy resources	MJ	91.1%	63.4%	79.7%	3.9%	77.8%	0	0	

Waste indicators		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste disposed	kg	7.04E-06	1.19E-06	5.17E-08	5.17E-08	8.23E-06	1.55E-09	8.23E-06	-1%
Non-hazardous waste disposed	kg	3.90	36.8	227	227	40.7	0.0215	40.7	-85%
Radioactive waste disposed	kg	0.101	0.0554	0.00461	0.00461	0.156	1.11E-04	0.156	-3%
Components for re-use	kg	0	0	0	0	0	0	0	0%
Materials for recycling	kg	0	0	0	0	0	0	0	0%
Material for energy recovery	kg	0	0	0	0	0	0	0	0%
Exported electrical energy	MJ	0	0	0	0	0	0	0	0%
Exported thermal energy	MJ	0	0	0	0	0	0	0	0%

## Tork Basic Paper Centerfeed Roll Blue-1

**Article number(s): 2198859**

1,000 kg air-dry tissue + 26 kg paper packaging + 12 kg plastic packaging = 1,038 kg total.

Content declaration: Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-3,040	2,740	-302	3,750	3,450	1,910	1,610	-53%
Climate change, fossil	kg CO <sub>2</sub> -eq.	226	987	1,210	109	1,320	69.5	1,280	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-3,270	1,750	-1,520	3,640	2,130	1,840	322	-85%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.125	3.45	3.57	0.0119	3.58	5.81E-04	3.57	0%
Ozone depletion	kg CFC11-eq.	3.52E-09	5.45E-10	4.06E-09	9.47E-11	4.16E-09	5.81E-12	4.07E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.41	8.45	9.87	1.44	11.3	0.981	10.8	-4%
Eutrophication, freshwater	kg P eq.	0.00653	0.0393	0.0458	1.84E-04	0.0460	1.03E-05	0.0458	0%
Eutrophication, marine	kg N eq.	0.486	2.58	3.06	0.571	3.63	0.284	3.35	-8%
Eutrophication, terrestrial	Mole of N eq.	5.27	29.2	34.5	5.15	39.6	3.11	37.6	-5%
Photochemical ozone formation, human health	kg NMVOC eq.	1.39	6.98	8.37	2.08	10.5	0.828	9.20	-12%
Resource use, mineral and metals	kg Sb-eq.	3.41E-05	6.36E-05	9.77E-05	4.83E-06	1.03E-04	9.72E-07	9.87E-05	-4%
Resource use, fossils	MJ	3,600	10,500	14,100	1,380	15,500	795	14,900	-4%
Water use	m <sup>3</sup> world equiv.	39.7	356	396	13.6	410	0.434	397	-3%



# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	37,600	18,200	83.2	83.2	55,800	4.12	55,800	0%
Primary energy resources used as raw materials	MJ	15.3	0	0	0	15.3	0	15.3	0%
Total use of renewable primary energy resources	MJ	37,600	18,200	83.2	83.2	55,800	4.12	55,800	0%
Use of non-renewable primary energy	MJ	3,620	10,500	1,380	1,380	14,200	795	14,900	-4%
Non-renewable primary energy resources used as raw materials	MJ	0.501	0	0	0	0.501	0	0.501	0%
Total use of non-renewable primary energy resources	MJ	3,620	10,500	1,380	1,380	14,200	795	14,900	-4%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	5.73	32.2	0.375	0.375	37.9	0.00896	37.9	-1%
Total use of non-renewable & renewable primary energy resources	MJ	41,200	28,800	70,000	1,470	71,500	0	0	-1%
% Total use of renewable primary energy resources	MJ	91.2%	63.4%	79.8%	5.7%	78.3%	0	0	

# Waste indicators

Indicator	Unit
Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed	kg
Components for re-use	kg
Materials for recycling	kg
Material for energy recovery	kg
Exported electrical energy	MJ
Exported thermal energy	MJ

# Manufacture

Upstream	Core	To Gate
6.51E-06	1.19E-06	4.95E-08
3.70	36.8	225
0.0990	0.0554	0.00459
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

# Transport + Landfill

Downstream	Total
4.95E-08	7.70E-06
225	40.5
0.00459	0.154
0	0
0	0
0	0
0	0
0	0

# Transport + Compost

Downstream	Total	Reduction
1.18E-09	7.70E-06	-1%
0.0169	40.5	-85%
1.09E-04	0.155	-3%
0	0	0%
0	0	0%
0	0	0%
0	0	0%
0	0	0%

## Tork Roll Towel Universal-1

### Article number(s): 2187951

1,000 kg air-dry tissue + 23 kg paper packaging + 9 kg plastic packaging = 1,032 kg total.

Content declaration: Paper >98% virgin CTMP pulp. Bleaching agent: hydrogen peroxide (totally chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-2,500	1,940	-552	3,910	3,360	1,810	1,250	-63%
Climate change, fossil	kg CO <sub>2</sub> -eq.	169	881	1,050	158	1,210	117	1,170	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-2,660	1,060	-1,600	3,750	2,150	1,690	85.6	-96%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.904	0.237	1.14	0.0121	1.15	9.19E-04	1.14	-1%
Ozone depletion	kg CFC11-eq.	3.77E-09	8.25E-10	4.59E-09	1.09E-10	4.70E-09	9.74E-12	4.60E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.26	4.51	5.77	3.16	8.93	2.71	8.47	-5%
Eutrophication, freshwater	kg P eq.	0.0123	0.0187	0.0310	1.57E-04	0.0312	1.83E-05	0.0310	-1%
Eutrophication, marine	kg N eq.	0.430	1.56	1.99	1.01	3.00	0.731	2.72	-9%
Eutrophication, terrestrial	Mole of N eq.	4.48	18.6	23.1	9.97	33.1	8.01	31.1	-6%
Photochemical ozone formation, human health	kg NMVOC eq.	1.20	4.11	5.31	3.33	8.64	2.07	7.37	-15%
Resource use, mineral and metals	kg Sb-eq.	2.04E-05	6.96E-05	9.00E-05	6.65E-06	9.67E-05	1.55E-06	9.15E-05	-5%
Resource use, fossils	MJ	2,670	9,460	12,100	2,020	14,100	1,380	13,500	-4%
Water use	m <sup>3</sup> world equiv.	32.3	458	491	13.4	504	0.771	491	-3%

# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	29,400	20,600	71.6	71.6	49,900	5.76	49,900	0%
Primary energy resources used as raw materials	MJ	15.4	0	0	0	15.4	0	15.4	0%
Total use of renewable primary energy resources	MJ	29,400	20,600	71.6	71.6	49,900	5.76	49,900	0%
Use of non-renewable primary energy	MJ	2,680	9,460	2,020	2,020	12,100	1,380	13,500	-4%
Non-renewable primary energy resources used as raw materials	MJ	0.356	0	0	0	0.356	0	0.356	0%
Total use of non-renewable primary energy resources	MJ	2,680	9,460	2,020	2,020	12,100	1,380	13,500	-4%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	2.75	37.5	0.322	0.322	40.3	0.0130	40.3	-1%
Total use of non-renewable & renewable primary energy resources	MJ	32,000	30,100	62,100	2,090	64,200	0	0	-1%
% Total use of renewable primary energy resources	MJ	91.6%	68.5%	80.4%	3.4%	77.9%	0	0	

Waste indicators		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste disposed	kg	5.60E-06	1.08E-06	5.15E-08	5.15E-08	6.69E-06	1.88E-09	6.69E-06	-1%
Non-hazardous waste disposed	kg	2.65	32.8	223	223	35.4	0.0261	35.5	-86%
Radioactive waste disposed	kg	0.0316	0.0407	0.00458	0.00458	0.0723	1.28E-04	0.0724	-6%
Components for re-use	kg	0	0	0	0	0	0	0	0%
Materials for recycling	kg	0	0	0	0	0	0	0	0%
Material for energy recovery	kg	0	0	0	0	0	0	0	0%
Exported electrical energy	MJ	0	0	0	0	0	0	0	0%
Exported thermal energy	MJ	0	0	0	0	0	0	0	0%

## Tork Xpress® Multifold Hand Towel / Slimline H2 Advanced-21

### Article number(s): 148430

1,000 kg air-dry tissue + 0 kg paper packaging + 24 kg plastic packaging = 1,024 kg total.

Content declaration: Paper >97% virgin CTMP pulp. Bleaching agent: hydrogen peroxide (totally chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-1,450	1,160	-290	3,760	3,470	1,640	1,350	-61%
Climate change, fossil	kg CO <sub>2</sub> -eq.	270	1,000	1,270	121	1,400	80.4	1,360	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-1,720	151	-1,570	3,640	2,070	1,560	-4.16	-100%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.888	0.238	1.13	0.0123	1.14	6.52E-04	1.13	-1%
Ozone depletion	kg CFC11-eq.	3.94E-09	1.22E-09	5.17E-09	1.01E-10	5.27E-09	6.72E-12	5.17E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.81	5.58	7.39	1.88	9.26	1.42	8.81	-5%
Eutrophication, freshwater	kg P eq.	0.00708	0.0493	0.0564	3.40E-04	0.0568	1.21E-05	0.0564	-1%
Eutrophication, marine	kg N eq.	0.544	1.74	2.28	0.678	2.96	0.396	2.68	-9%
Eutrophication, terrestrial	Mole of N eq.	5.77	19.7	25.4	6.33	31.8	4.33	29.8	-6%
Photochemical ozone formation, human health	kg NMVOC eq.	1.56	4.26	5.82	2.39	8.21	1.14	6.96	-15%
Resource use, mineral and metals	kg Sb-eq.	4.30E-05	1.36E-04	1.79E-04	5.53E-06	1.84E-04	1.09E-06	1.80E-04	-2%
Resource use, fossils	MJ	5,020	12,900	18,000	1,540	19,500	927	18,900	-3%
Water use	m <sup>3</sup> world equiv.	37.5	400	437	13.3	451	0.514	438	-3%

# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	18,100	19,100	78.2	78.2	37,100	4.37	37,200	0%
Primary energy resources used as raw materials	MJ	15.2	0	0	0	15.2	0	15.2	0%
Total use of renewable primary energy resources	MJ	18,100	19,100	78.2	78.2	37,100	4.37	37,200	0%
Use of non-renewable primary energy	MJ	5,040	13,000	1,540	1,540	18,000	927	19,000	-3%
Non-renewable primary energy resources used as raw materials	MJ	0.928	0	0	0	0.928	0	0.928	0%
Total use of non-renewable primary energy resources	MJ	5,040	13,000	1,540	1,540	18,000	927	19,000	-3%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	3.24	35.5	0.348	0.348	38.8	0.00962	38.8	-1%
Total use of non-renewable & renewable primary energy resources	MJ	23,100	32,100	55,200	1,620	56,800	0	0	-1%
% Total use of renewable primary energy resources	MJ	78.2%	59.5%	67.3%	4.8%	65.5%	0	0	



Waste indicators		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste disposed	kg	3.15E-07	1.02E-06	5.18E-08	5.18E-08	1.34E-06	1.33E-09	1.34E-06	-4%
Non-hazardous waste disposed	kg	3.91	24.2	235	235	28.1	0.0188	28.2	-89%
Radioactive waste disposed	kg	0.0701	0.565	0.00470	0.00470	0.635	1.10E-04	0.635	-1%
Components for re-use	kg	0	0	0	0	0	0	0	0%
Materials for recycling	kg	0	0	0	0	0	0	0	0%
Material for energy recovery	kg	0	0	0	0	0	0	0	0%
Exported electrical energy	MJ	0	0	0	0	0	0	0	0%
Exported thermal energy	MJ	0	0	0	0	0	0	0	0%

## Tork Xpress® Multifold Hand Towel / Slimline H2 Universal-21

**Article number(s): 184987**

1,000 kg air-dry tissue + 0 kg paper packaging + 21 kg plastic packaging = 1,021 kg total.

Content declaration: Paper >97% virgin CTMP pulp. Bleaching agent: hydrogen peroxide (totally chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-1,450	1,160	-289	3,750	3,460	1,640	1,350	-61%
Climate change, fossil	kg CO <sub>2</sub> -eq.	262	1,010	1,280	115	1,390	74.4	1,350	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-1,720	151	-1,570	3,640	2,070	1,560	-4.30	-100%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.886	0.240	1.13	0.0122	1.14	6.05E-04	1.13	-1%
Ozone depletion	kg CFC11-eq.	3.92E-09	1.24E-09	5.16E-09	1.00E-10	5.26E-09	6.25E-12	5.17E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.80	5.62	7.42	1.70	9.12	1.24	8.66	-5%
Eutrophication, freshwater	kg P eq.	0.00706	0.0493	0.0564	3.07E-04	0.0567	1.11E-05	0.0564	-1%
Eutrophication, marine	kg N eq.	0.539	1.74	2.28	0.630	2.91	0.348	2.63	-10%
Eutrophication, terrestrial	Mole of N eq.	5.72	19.9	25.6	5.80	31.4	3.81	29.4	-6%
Photochemical ozone formation, human health	kg NMVOC eq.	1.55	4.27	5.82	2.26	8.08	1.01	6.83	-15%
Resource use, mineral and metals	kg Sb-eq.	3.96E-05	1.37E-04	1.77E-04	5.47E-06	1.83E-04	1.02E-06	1.78E-04	-3%
Resource use, fossils	MJ	4,830	13,000	17,800	1,470	19,300	853	18,700	-3%
Water use	m <sup>3</sup> world equiv.	36.4	414	451	13.3	464	0.474	451	-3%

# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	18,100	20,000	77.4	77.4	38,000	4.09	38,000	0%
Primary energy resources used as raw materials	MJ	15.2	0	0	0	15.2	0	15.2	0%
Total use of renewable primary energy resources	MJ	18,100	20,000	77.4	77.4	38,000	4.09	38,000	0%
Use of non-renewable primary energy	MJ	4,850	13,000	1,470	1,470	17,900	853	18,700	-3%
Non-renewable primary energy resources used as raw materials	MJ	0.827	0	0	0	0.827	0	0.827	0%
Total use of non-renewable primary energy resources	MJ	4,850	13,000	1,470	1,470	17,900	853	18,700	-3%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	3.20	36.7	0.346	0.346	39.9	0.00894	39.9	-1%
Total use of non-renewable & renewable primary energy resources	MJ	22,900	33,000	55,900	1,550	57,500	0	0	-1%
% Total use of renewable primary energy resources	MJ	78.8%	60.5%	68.0%	5.0%	66.3%	0	0	

Waste indicators		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste disposed	kg	3.02E-07	1.03E-06	5.14E-08	5.14E-08	1.33E-06	1.24E-09	1.33E-06	-4%
Non-hazardous waste disposed	kg	3.93	24.3	233	233	28.2	0.0176	28.2	-89%
Radioactive waste disposed	kg	0.0673	0.564	0.00467	0.00467	0.632	1.05E-04	0.632	-1%
Components for re-use	kg	0	0	0	0	0	0	0	0%
Materials for recycling	kg	0	0	0	0	0	0	0	0%
Material for energy recovery	kg	0	0	0	0	0	0	0	0%
Exported electrical energy	MJ	0	0	0	0	0	0	0	0%
Exported thermal energy	MJ	0	0	0	0	0	0	0	0%

## Tork Ultraslim Multifold Hand Towel / H4 Advanced-20

### Article number(s): 170370

1,000 kg air-dry tissue + 16 kg paper packaging + 18 kg plastic packaging = 1,033 kg total.

Content declaration: Paper >98% virgin CTMP pulp. Bleaching agent: hydrogen peroxide (totally chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-1,470	1,220	-248	3,870	3,620	1,700	1,450	-60%
Climate change, fossil	kg CO <sub>2</sub> -eq.	254	1,010	1,260	139	1,400	98.0	1,360	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-1,720	212	-1,510	3,730	2,220	1,600	91.4	-96%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.108	0.384	0.492	0.0123	0.504	7.70E-04	0.493	-2%
Ozone depletion	kg CFC11-eq.	3.94E-09	1.18E-09	5.11E-09	1.07E-10	5.22E-09	8.18E-12	5.12E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.77	5.70	7.47	2.56	10.0	2.10	9.57	-4%
Eutrophication, freshwater	kg P eq.	0.00539	0.0479	0.0532	2.60E-04	0.0535	1.51E-05	0.0533	0%
Eutrophication, marine	kg N eq.	0.522	1.76	2.28	0.850	3.13	0.570	2.85	-9%
Eutrophication, terrestrial	Mole of N eq.	5.69	20.2	25.9	8.21	34.1	6.24	32.1	-6%
Photochemical ozone formation, human health	kg NMVOC eq.	1.55	4.34	5.88	2.89	8.78	1.63	7.51	-14%
Resource use, mineral and metals	kg Sb-eq.	3.62E-05	1.32E-04	1.68E-04	6.36E-06	1.74E-04	1.30E-06	1.69E-04	-3%
Resource use, fossils	MJ	4,590	12,700	17,300	1,780	19,100	1,140	18,400	-4%
Water use	m <sup>3</sup> world equiv.	32.4	415	448	13.3	461	0.640	448	-3%

# Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	18,700	20,200	72.1	72.1	38,900	4.89	38,900	0%
Primary energy resources used as raw materials	MJ	15.3	0	0	0	15.3	0	15.3	0%
Total use of renewable primary energy resources	MJ	18,700	20,200	72.1	72.1	38,900	4.89	38,900	0%
Use of non-renewable primary energy	MJ	4,610	12,700	1,780	1,780	17,400	1,140	18,500	-3%
Non-renewable primary energy resources used as raw materials	MJ	0.656	0	0	0	0.656	0	0.656	0%
Total use of non-renewable primary energy resources	MJ	4,610	12,700	1,780	1,780	17,400	1,140	18,500	-3%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	2.79	36.5	0.323	0.323	39.3	0.0109	39.3	-1%
Total use of non-renewable & renewable primary energy resources	MJ	23,300	32,900	56,200	1,850	58,100	0	0	-1%
% Total use of renewable primary energy resources	MJ	80.2%	61.3%	69.1%	3.9%	67.1%	0	0	

# Waste indicators

Indicator	Unit
Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed	kg
Components for re-use	kg
Materials for recycling	kg
Material for energy recovery	kg
Exported electrical energy	MJ
Exported thermal energy	MJ

# Manufacture

Upstream	Core	To Gate
3.82E-06	1.01E-06	5.22E-08
4.06	24.9	230
0.0686	0.527	0.00465
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

# Transport + Landfill

Downstream	Total
5.22E-08	4.83E-06
230	28.9
0.00465	0.595
0	0
0	0
0	0
0	0
0	0

# Transport + Compost

Downstream	Total	Reduction
1.58E-09	4.83E-06	-1%
0.0221	29.0	-89%
1.13E-04	0.595	-1%
0	0	0%
0	0	0%
0	0	0%
0	0	0%
0	0	0%

## Tork H2 Xpress Low Lint Multifold Hand Towel-21

### Article number(s): 306120

1,000 kg air-dry tissue + 0 kg paper packaging + 20 kg plastic packaging = 1,020 kg total.

Content declaration: Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

### Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Climate change, total	kg CO <sub>2</sub> -eq.	-1,450	1,220	-228	3,820	3,600	1,660	1,430	-60%
Climate change, fossil	kg CO <sub>2</sub> -eq.	250	1,010	1,260	122	1,380	80.2	1,340	-3%
Climate change, biogenic	kg CO <sub>2</sub> -eq.	-1,700	212	-1,480	3,700	2,220	1,580	98.2	-96%
Climate change, land use and land use change	kg CO <sub>2</sub> -eq.	0.0915	0.384	0.475	0.0122	0.487	6.50E-04	0.476	-2%
Ozone depletion	kg CFC11-eq.	3.72E-09	1.18E-09	4.90E-09	1.06E-10	5.01E-09	6.89E-12	4.91E-09	-2%
Acidification	Mole of H <sup>+</sup> eq.	1.71	5.68	7.39	1.87	9.26	1.42	8.81	-5%
Eutrophication, freshwater	kg P eq.	0.00502	0.0479	0.0529	2.98E-04	0.0532	1.21E-05	0.0529	-1%
Eutrophication, marine	kg N eq.	0.497	1.75	2.25	0.673	2.92	0.394	2.65	-9%
Eutrophication, terrestrial	Mole of N eq.	5.44	20.1	25.5	6.28	31.8	4.32	29.9	-6%
Photochemical ozone formation, human health	kg NMVOC eq.	1.48	4.32	5.80	2.40	8.20	1.14	6.94	-15%
Resource use, mineral and metals	kg Sb-eq.	3.74E-05	1.32E-04	1.69E-04	6.22E-06	1.75E-04	1.09E-06	1.70E-04	-3%
Resource use, fossils	MJ	4,610	12,700	17,300	1,570	18,900	926	18,200	-4%
Water use	m <sup>3</sup> world equiv.	31.8	415	447	13.0	460	0.519	448	-3%



Primary Energy Demand (PED)		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Use of renewable primary energy	MJ	17,900	20,200	70.5	70.5	38,100	4.15	38,100	0%
Primary energy resources used as raw materials	MJ	15.2	0	0	0	15.2	0	15.2	0%
Total use of renewable primary energy resources	MJ	17,900	20,200	70.5	70.5	38,100	4.15	38,100	0%
Use of non-renewable primary energy	MJ	4,640	12,700	1,570	1,570	17,400	926	18,300	-3%
Non-renewable primary energy resources used as raw materials	MJ	0.801	0	0	0	0.801	0	0.801	0%
Total use of non-renewable primary energy resources	MJ	4,640	12,700	1,570	1,570	17,400	926	18,300	-3%
Input of secondary material	kg	0	0	0	0	0	0	0	0%
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of non renewable secondary fuels	MJ	0	0	0	0	0	0	0	0%
Use of net fresh water	m <sup>3</sup>	2.72	36.5	0.316	0.316	39.2	0.00902	39.2	-1%
Total use of non-renewable & renewable primary energy resources	MJ	22,600	32,900	55,500	1,640	57,100	0	0	-1%
% Total use of renewable primary energy resources	MJ	79.5%	61.3%	68.7%	4.3%	66.8%	0	0	

Waste indicators		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	Unit	Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste disposed	kg	3.04E-07	1.01E-06	5.24E-08	5.24E-08	1.31E-06	1.34E-09	1.31E-06	-4%
Non-hazardous waste disposed	kg	3.67	24.9	232	232	28.5	0.0189	28.6	-89%
Radioactive waste disposed	kg	0.0662	0.527	0.00467	0.00467	0.593	1.09E-04	0.593	-1%
Components for re-use	kg	0	0	0	0	0	0	0	0%
Materials for recycling	kg	0	0	0	0	0	0	0	0%
Material for energy recovery	kg	0	0	0	0	0	0	0	0%
Exported electrical energy	MJ	0	0	0	0	0	0	0	0%
Exported thermal energy	MJ	0	0	0	0	0	0	0	0%

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## EPD registration and verification

### Declaration owner:



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### Product Category Rules (PCR):

ANZSIC v1.0 classification:

UN CPC v2 classification:

PCR review was conducted by:

Independent verification of the declaration and data, according to ISO 14025:2006:

### PCR 2011:05 Tissue Products, Version 3.0.1, 2022-04-20

C152400: "Sanitary Paper Product Manufacturing"

32131: "Toilet or facial tissue stock, towel or napkin stock and similar paper, cellulose wadding and webs of cellulose fibres"

The Technical Committee of the International EPD® System.  
Chair: Massimo Marino. Contact via [info@environdec.com](mailto:info@environdec.com).

☐ EPD process certification (Internal)

☒ EPD verification (External)

### Third party verifier:



Life Cycle Logic

Approved by:

### Andrew D Moore, Life Cycle Logic

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EPD Australasia Ltd

Procedure for follow-up of data during EPD validity involves third party verifier:

☒ Yes ☐ No

## Version history

v1.0 Initial release

v1.1 Correction to POCP results

v1.2 Addition of articles 170370 and 2187951

v2.0 Revision of all data. Addition of Handee brand and new products.

V3.0 Revision of all data from 2018 to 2022. Revision of impact indicators in line with EN15804+ A2.

Addition of the following products to EPD:

- Tork Ultra Long Paper Towel (Short)-2
- Tork Basic Paper 1ply Centerfeed Roll Blue-1
- Tork H2 Xpress Low Lint Multifold Hand Towel-21

Removal of the following from EPD:

- HANDEE,TWL;TALL,WHT,3Sx6
- HANDEE,TWL;WHT,LONGROLL,2Sx6

The EPD owner has the sole ownership, liability and responsibility for the EPD.