

■ GEBERIT

Life cycle assessment
Geberit AquaClean 8000*plus*





Starting point of the life cycle assessment

The Geberit AquaClean 8000*plus* is a WC which enables comfortable and hygienic cleaning with water in the anal and vaginal area. The life cycle assessment can help answer the question of how this device should be judged from an environmental perspective.

Subject of the assessment

The AquaClean 8000*plus* is a WC which enables comfortable and hygienic cleaning with water in the anal and vaginal area. Its main functions include cleaning with a spray of water after using the WC, drying with a warm-air dryer and automatic cleaning of the spray arm.

The use of a conventional WC (including the use of toilet paper and wet wipes) was examined for the purpose of comparison. The use of a bidet was also assessed as an additional variant.

Functional unit

The use of the AquaClean 8000*plus* by a family of four people over the course of one year was chosen as the functional unit.

System boundaries

The assessment spans all life cycle phases of the product, from the provision of the raw materials and energy carriers through to the manufacture of the AquaClean 8000*plus*, its use and eventually

its disposal. As with a conventional WC, the installation and dismantling are not taken into consideration.

Production-related assumptions

The energy consumed during the manufacture of the individual components and the final assembly was taken into account.

Use-related assumptions

The assessment was based on the assumption of use by a family of four, whereby each person defecates once and urinates four times per day.

The use of water, electricity and other consumables was taken into consideration.

Extensive measurements were taken in order to determine the amount of water and electricity used, based on the factory settings. The following main scenarios were examined:

- Boiler ON (water spray constantly at 37°C)
- Boiler UI (user identification, heating as required)
- Boiler OFF (water spray unheated)

For the WC, the use of toilet paper (three layers, made from virgin fibres) and wet wipes was also taken into account. For this it was assumed that 15 sheets are necessary during each use of the WC for defecation.

For cleaning with the bidet, the additional warm water (2 litres) and toilet paper (8 sheets) used were taken into account.

Disposal-related assumptions

It was assumed that the ceramic elements are disposed of at a landfill for inert materials, the metal parts are recycled, the electronic components are salvaged separately and the remaining components (esp. plastics) are incinerated.

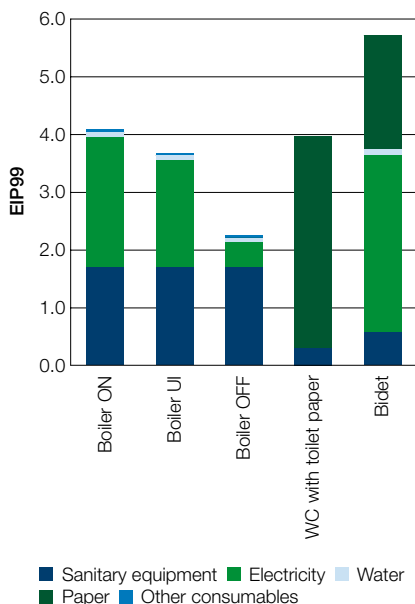


Results of the life cycle assessment

The conventional WCs (including the use of ordinary toilet paper) and the Geberit AquaClean 8000*plus* produced comparable life cycle assessment results. The manufacture of the toilet paper and the electricity used for heating the water play a central role in this.

Analysis of the results

The graph shows the environmental impact of the AquaClean 8000*plus* in comparison with the WC and bidet in Eco-indicator points (EIP99), evaluated using the Dutch life cycle assessment method.



In terms of environmental friendliness, the AquaClean 8000*plus* is comparable with the use of a conventional WC including the use of ordinary toilet paper.

The additional use of wet wipes produces approximately the same result as the use of dry toilet paper. However, the dermatological effects and composition of the wet wipes were not investigated.

With the AquaClean 8000*plus*, it is the utilisation phase – particularly the use of electricity for heating the water – that has the greatest impact on the environment. The impact caused by use is twice as high as the impact produced by the manufacture and disposal of the sanitary equipment. The additional water used for anal cleaning plays a secondary role.

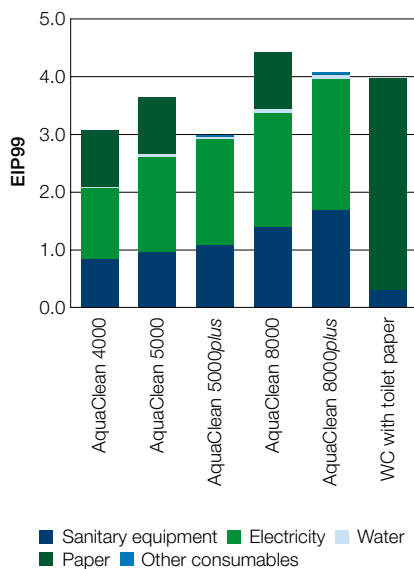
With the conventional WC and cleaning with toilet paper, the quality of the toilet paper used plays a substantial role. There is a factor of two to four, depending on the assessment method, between toilet paper made from 100% recycled fibres and toilet paper made from 100% virgin fibres.

From an environmental perspective, the use of a bidet for anal cleaning produces a significantly poorer performance than the AquaClean 8000*plus*. With the bidet, the toilet paper used for initial cleaning and the electricity used for heating the water to 37°C play a significant role. Here, too, the utilisation phase is key.

Recommendations

- Switch the boiler to user identification mode (Boiler UI), i.e. to heat only when required – this reduces the environmental impact by at least 10%.
- Turn off the boiler (Boiler OFF) – this reduces the environmental impact by around 50%.
- Reduce the temperature of the water spray, e.g. from 37°C to 33°C – this reduces the environmental impact by 20%.
- Use green electricity sources (hydroelectric, wind, photovoltaic power) – this reduces the environmental impact by more than 50%. The AquaClean 8000*plus* will then perform better than a WC with the use of ordinary toilet paper.

Analysis of the Geberit AquaClean range



Analysis of other Geberit AquaClean models

- The WC enhancement solutions analysed, Geberit AquaClean 4000 (with warm water cleaning), Geberit AquaClean 5000 (with warm water cleaning and odour extraction) and Geberit AquaClean 5000*plus* (with warm water cleaning, odour extraction, dryer and remote control), perform approximately 10% to 25% better than WCs with ordinary toilet paper.
- The Geberit AquaClean 8000 (with warm water cleaning) produces somewhat poorer results than the AquaClean 8000*plus* despite having fewer comfort features, as drying with paper has a greater impact on the environment than the warm-air dryer.
- Electricity consumption plays a significant role in all models and varies between 70 kWh and 130 kWh per year depending on the model.
- The additional water used for anal cleaning plays an insignificant role and amounts to between 0.5 and 1.5 litres per cleaning depending on the model.

Full report

The present life cycle assessment was produced in collaboration with the EMPA (The Swiss Federal Laboratories for Materials Testing and Research). We would be happy to send you the full report on the product life cycle assessment (as of December 2008) upon request. Please note that it is only available in German. Please contact the relevant distributor in your country or the Environment/ Sustainability department of the Geberit Group.

Geberit AG
Schachenstrasse 77
CH-8645 Jona

T +41 55 221 63 00
F +41 55 221 67 47
sustainability@geberit.com
www.geberit.com