

# ENVIRONMENTAL FOOTPRINT REDUCTION STUDY RESULTS

## EDUCATION / RETAIL & HEALTHCARE



ENERGY  
93% / 96%



CO<sub>2</sub> EMISSIONS  
92% / 93%



OZONE  
89% / 94%



SMOG  
96% / 97%



ACIDIFICATION  
87% / 91%



EUTROPHICATION  
41% / 58%



PARTICULATE  
88% / 90%

## ec-H2O NanoClean™ Technology

Compared to conventional packaged daily-use cleaning chemicals, utilizing ec-H2O NanoClean™ reduces the impact of cleaning operations on the environment in seven key categories according to a third-party study by Ecoform TM, LLC.

### REDUCTION OF ENVIRONMENTAL IMPACT VERSUS CONVENTIONAL DAILY CLEANING CHEMICALS

LCA CATEGORY	EDUCATION	RETAIL/HEALTHCARE
ENERGY	93%	96%
CO <sub>2</sub> EMISSIONS	92%	93%
OZONE	89%	94%
SMOG	96%	97%
ACIDIFICATION	87%	91%
EUTROPHICATION	41%	58%
PARTICULATE	88%	90%

### LIFE-CYCLE EVALUATION SCENARIOS

PARAMETER	EDUCATION	RETAIL/HEALTHCARE
CHEMICAL DILUTION RATE – OZ/GAL	1	1
LIQUID FLOW RATE – GAL/MIN	0.4 Chemical-based 0.12 ec-H2O NanoClean	0.4 Chemical-based 0.12 ec-H2O NanoClean
FLOOR SCRUB RATE – SQ FT/HR	9,274 <sup>a</sup>	9,274 <sup>a</sup>
FLOOR AREA CLEANED – SQ FT/DAY	25,000	25,000
FREQUENCY OF CLEANING – CYCLES/YR	200 Education (5 days/wk, 40 wks/year)	365 Retail/Health Care (daily)

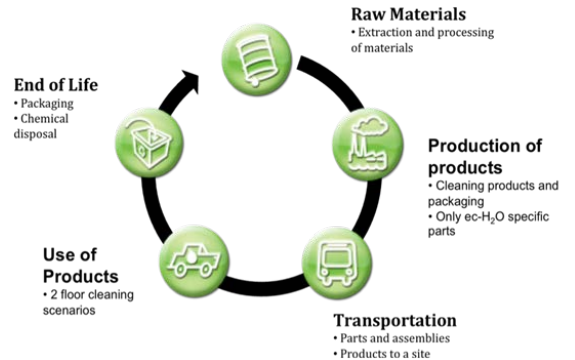
<sup>a</sup>The official ISSA 612 Cleaning Times Book, 2014.

A T300 scrubber was used for this analysis. The life-cycle analysis was performed using version 6 of the GaBi Life-Cycle Software. Secondary data from GaBi and Ecoinvent datasets, supplemented by proprietary Ecoform data sets, comprised the entirety of the life-cycle inventory data.

# ENVIRONMENTAL FOOTPRINT REDUCTION QUESTIONS & ANSWERS

## WHAT IS A LIFE-CYCLE ANALYSIS?

Life-cycle analysis is a methodology used to identify and quantify the environmental impacts of a product, service, or activity, across its life-cycle. The scope of the study included the items listed in the diagram to the right:



## WHO PERFORMED THE LIFE-CYCLE ANALYSIS?

Jack Geibig, president of Ecoform, LLC, an independent company that focuses on the environmental performance of companies and their products and processes.

## WHERE CAN I READ THE ENTIRE LIFE-CYCLE ANALYSIS REPORT FOR ec-H2O NanoClean?

Go to [www.tennantco.com](http://www.tennantco.com) to download the full Life-Cycle Analysis for the ec-H2O NanoClean technology.

IMPACT CATEGORY	REDUCTION OF	CREATED BY	HARMFUL TO
ACIDIFICATION	kg SO <sub>2</sub>	Combustion processes in electricity and heating production and transportation	Fish and forests, by lowering the pH of water and soil
CO <sub>2</sub> EMISSIONS	kg CO <sub>2</sub>	Combustion of fossil fuels	Atmosphere (global climate change)
ENERGY	MJ	Total energy required to manufacture and use product	Atmosphere (global climate change)
EUTROPHICATION	kg PO <sub>4</sub>	Nutrients from discharged waste water and fertilized farmland	Fish and other life in the aquatic ecosystem, due to oxygen deficiency
OZONE DEPLETION	g CFC	Emission of halocarbons	Humans, causing increased frequency of skin cancer and damage to plants
PARTICULATE	kg PM <sub>2.5</sub>	Combustion of materials	Human respiratory systems, resulting in chronic respiratory illness
SMOG	kg NO <sub>x</sub>	Reduction of VOCs and nitrogen oxides in the presence of heat and sunlight	Human respiratory systems, resulting in respiratory illness including chronic bronchitis and emphysema

Learn more about ec-H2O NanoClean and other innovations in cleaning. Contact Tennant today or visit our website at [www.tennantco.com](http://www.tennantco.com).

©2016 The Tennant Company logo and other trademarks designated with the symbol "®" are trademarks of Tennant Company registered in the United States and/or other countries. Tennant Company's products are sold and serviced through subsidiaries of Tennant Company and distributors. All rights reserved.

Tennant  
701 North Lilac Drive  
Minneapolis, MN 55422 USA  
USA/Canada: +1.800.553.8033  
Quebec: +1.800.361.9050  
Overseas: +1.763.540.1315  
[www.tennantco.com](http://www.tennantco.com) | [info@tennantco.com](mailto:info@tennantco.com)

