

STREAMLINED LIFE CYCLE ASSESSMENT* KETCHUP PACKAGING CASE STUDY

KETCHUP PACKAGE COMPARISON

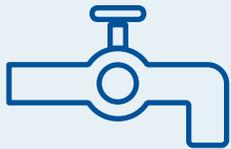
Ketchup is a universally loved condiment that is often packaged in a PET or glass bottle. For this Life Cycle Assessment study with a cradle-to-grave boundary, a popular inverted PET bottle and the premade STANDCAP Pouch, an award-winning inverted flexible pouch, were evaluated.



STANDCAP POUCH



INVERTED PET BOTTLE



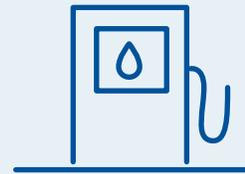
WATER CONSUMPTION

The premade STANDCAP Pouch uses about three quarters less water **(-75.3%)** than the rigid container, a result of the more water-intensive stretch blow molding process as compared to the laminating and extrusion process for multilayer pouches.



GREENHOUSE GAS EMISSIONS

The premade STANDCAP Pouch results in lower GHG emissions **(-58.8%)** than the PET bottle, which can be attributed to the additional energy and heat needed during the stretch blow molding process for the bottle.



FOSSIL FUEL CONSUMPTION

The premade STANDCAP Pouch results in **52.7%** lower fossil fuel use because it takes less material to make than the PET bottle. Additionally, the stretch blow molding for the bottle manufacturing process uses more fossil fuel than the pouch's laminating and extruding process.



END OF USE SUMMARY

SOURCE REDUCTION BENEFITS

According to the U.S. EPA Waste Hierarchy, the most preferred method for waste management is source reduction and reuse.

A major benefit of flexible packaging is the high product-to-package ratio that it offers.

High product-to-package ratio:



Low product-to-package ratio:



RECOVERY BENEFITS

STANDCAP POUCH



1x

amount of material ending up as municipal solid waste

While many multi-material flexible packages are not yet recovered and recycled in any significant amount, they still result in a substantial reduction in the amount of material sent to landfill versus other types of packaging.

PET BOTTLE



1.7x

amount of material ending up as municipal solid waste

The PET bottle results in about **40%** more material landfilled, which is notable considering its **29.2%** recycling rate and the lack of credit for the flexible pouch recovery.

IMPLICATIONS

The premade STANDCAP Pouch results in lower impacts across a wide range of environmental metrics, including fossil fuel and water use, GHG emissions and discarded material. This is driven by the efficient material usage of the flexible pouch, which uses less than half the amount of material needed to package the same amount of ketchup.

FORMAT	FOSSIL FUEL CONSUMPTION (MJ-EQUIV)	GHG EMISSIONS (KG-CO ² EQUIV)	WATER CONSUMPTION (L)	PRODUCT-TO-PACKAGE RATIO (%)	PKG LANDFILLED ((G)/1000 KG KETCHUP)
STANDCAP POUCH 	1.86 (-52.7%)	.08726 (-58.8%)	26.83 (-75.3%)	20.3:1 (95.3%:4.7%)	49,233 (-40.7%)
PET BOTTLE 	3.93	.2116	108.46	9.5:1	82,991



For more information and methodologies of assessments, please visit www.flexpack.org or www.glenroy.com to download Glenroy's "A Life Cycle Assessment Comparison for the Glenroy Premade STANDCAP Pouch in the Sauces and Personal Care Market versus Rigid Packaging Options" report and refer to pages 22-25.