

STREAMLINED LIFE CYCLE ASSESSMENT* CHOCOLATE SYRUP PACKAGING CASE STUDY

CHOCOLATE SYRUP PACKAGE COMPARISON

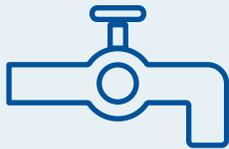
Most chocolate syrup available today is packaged in an HDPE bottle or glass jar. For this Life Cycle Assessment study with a cradle-to-grave boundary, a comparison was made between a popular syrup in an HDPE bottle versus the premade STANDCAP Pouch, an award-winning inverted flexible pouch.



STANDCAP POUCH



HDPE BOTTLE



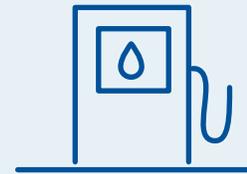
WATER CONSUMPTION

The premade STANDCAP Pouch format, which is formed by laminating multiple thin layers of film together, uses much less water (-19.6%) in its manufacturing process than the blow molding process for a rigid bottle, which uses water for cooling the molds.



GREENHOUSE GAS EMISSIONS

The premade STANDCAP Pouch results in about **41.7%** lower emissions since it's made with about half the amount of material as the bottle. Additionally, the HDPE bottle manufacturing process of blow molding requires heating, resulting in additional emissions when compared to the less energy-intensive extrusion and laminating process of multilayer pouches.



FOSSIL FUEL CONSUMPTION

The fossil fuel needed to make the premade STANDCAP Pouch is cut by nearly half (-46.5%) in comparison to the rigid HDPE bottle. This is because the rigid bottle employs nearly double the amount of packaging material to hold almost the same amount of chocolate syrup.



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.

HDPE BOTTLE



1.37x

amount of material ending up as municipal solid waste

Even when accounting for the HDPE bottle recycling rate of **31.1%**, the rigid bottle still results in over **25%** more material ending up landfilled vs. the premade STANDCAP Pouch. The bottle would need to increase to a recovery rate of over **54%** to have the same amount of material discarded as the inverted pouch.

IMPLICATIONS

The premade STANDCAP Pouch has a number of sustainability benefits when compared to an HDPE bottle for packing and shipping chocolate syrup. These include lower fossil fuel and water use, GHG emissions, better product-to-package ratio and considerably less material discarded at end-of-life.

FORMAT	FOSSIL FUEL CONSUMPTION (MJ-EQUIV)	GHG EMISSIONS (KG-CO ² EQUIV)	WATER CONSUMPTION (L)	PRODUCT-TO-PACKAGE RATIO (%)	PKG LANDFILLED ((G)/1000 KG SYRUP)
STANDCAP POUCH 	27.9 (-46.5%)	1.31 (-41.7%)	402.51 (-19.6%)	20.3:1 (95.3%:4.7%)	49,233 (-27.3%)
HDPE BOTTLE 	52.11	2.24	500.92	10.9:1	67,756



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 26-29.