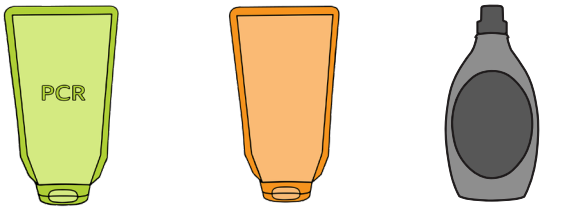
STREAMLINED LIFE CYCLE ASSESSMENT* CHOCOLATE SYRUP PACKAGING CASE STUDY

CHOCOLATE SYRUP PACKAGE COMPARISON

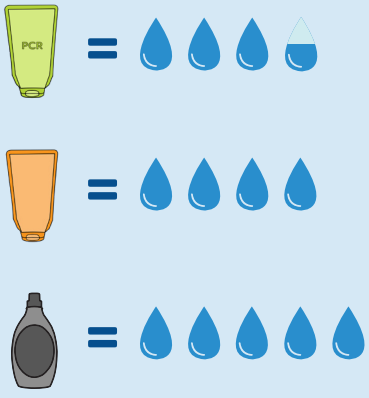
Most chocolate syrup available today is packaged in an HDPE bottle or glass jar. For this Life Cycle Assessment study with a cradle-to-grave boundary, a comparison was made between a popular syrup in an HDPE bottle versus the premade STANDCAP Pouch, an eco-friendly inverted flexible pouch.



PCR STANDCAP | STANDCAP | HDPE BOTTLE

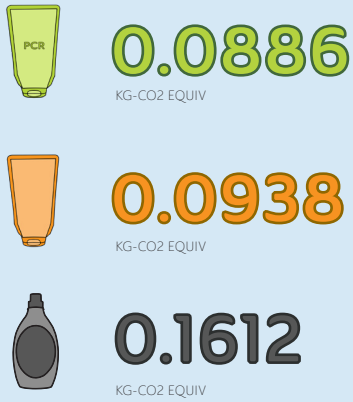
Water Consumption

The premade STANDCAP Pouch format with PCR is formed by laminating multiple thin layers of film together, uses much less water (-30.4%) 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 lower GHG emissions (-41.8%), with an additional (-45.0%) reduction through the incorporation of PCR. 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 (-45.9%) when compared to the rigid HDPE bottle, while use of PCR results in an additional reduction (-51.5%). This is because the rigid bottle employs nearly double the amount of packaging material to hold almost the same amount of chocolate syrup.

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*All environmental impact metrics were developed using the streamlined life cycle assessment tool, EcoImpact-COMPASS®

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.

RECOVERY BENEFITS

PCR STANDCAP

1x
amount of material ending up as municipal solid waste

STANDCAP

1x
amount of material ending up as municipal solid waste

HDPE BOTTLE

1.4x
amount of material ending up as municipal solid waste

High product-to-package ratio:

95.1% Product weight | **4.9%** Package weight

95.1% Product weight | **4.9%** Package weight

Low product-to-package ratio:ratio:

91.6% Product weight | **8.4%** Package weight

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

Even when accounting for the HDPE bottle recycling rate of **29.3%**, 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 results show that 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, greenhouse gas emissions, better product: package ratio (efficiency of materials), 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)/1,000 KG SYRUP)
PCR STANDCAP POUCH 	1.81 (-51.5%)	.08861 (-45.0%)	25.02 (-30.4%)	19.6:1 (95.1% : 4.9%)	50,996 (-26.3%)
STANDARD STANDCAP POUCH 	2.01 (-45.9%)	.09379 (-41.8%)	28.85 (-19.7%)	19.6:1 (95.1% : 4.9%)	50,996 (-26.3%)
HDPE BOTTLE 	3.72	.1612	35.95	10.9:1 (91.6% : 8.4%)	69,170

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*For more information and methodologies of assessments, please visit **www.flexpack.org** or **www.glenroy.com** to download Glenroy's "A Streamlined 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 27-30.*