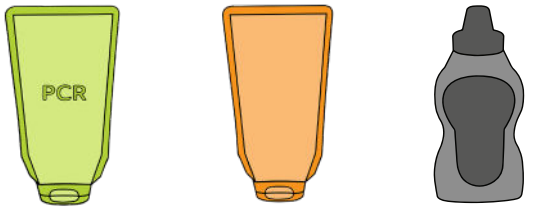
STREAMLINED LIFE CYCLE ASSESSMENT* MUSTARD PACKAGING CASE STUDY

MUSTARD PACKAGE COMPARISON

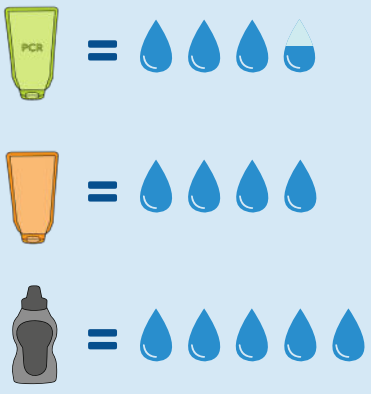
Mustard is one of the world's oldest condiments and has traditionally been packaged in HDPE bottles or glass jars. This Life Cycle Assessment study with a cradle-to-grave boundary compared the environmental impact of mustard packed in an HDPE bottle to that of a premade STANDCAP Pouch, an eco-friendly inverted flexible pouch.



PCR STANDCAP | STANDCAP | HDPE BOTTLE

Water Consumption

The premade STANDCAP Pouch has lower water use **(-17.8%)** than the HDPE bottle, likely driven by the manufacturing (converting) difference between the two packs as water needed to cool the molds for the rigid HDPE bottle, which drives its higher water use in the manufacturing process. The use of PCR further reduces water uasge by **(-28.7%)** over the standard STANDCAP option.



Greenhouse Gas Emissions

The premade STANDCAP Pouch with PCR has a much lower GHG emission impact **(-44.1%)** than the HDPE bottle because the pouch uses much less material. And since more material from HDPE bottles end up as municipal solid waste, they have a greater end-of-life impact than the pouch, even though HDPE bottles are recycled at a rate of **29.1%**.

Fossil Fuel Consumption

The premade STANDCAP Pouch uses less fossil fuel **(-44.9%)** compared to the HDPE bottle, which is largely due to the bottle's extra weight — nearly 2x as much as the pouch — and the additional energy required in the blow molding process. The use of PCR results in an additional fuel savings **(50.6%)**.

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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

1.3x
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:

91.7% Product weight | **8.3%** Package weight

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.

The premade STANDCAP Pouch results in less material landfilled, even though the current pouch is not considered recyclable and the HDPE bottle has a recycling rate of **29.3%**.

IMPLICATIONS

When the premade STANDCAP Pouch and traditional HDPE bottle are used for mustard, the flexible structure will generally have a favorable outcome for fossil fuel and water usage, GHG emissions and material discarded. This is largely driven by the flexible pouch using less material than the rigid bottle, which results in less energy used in manufacturing and transporting of the package materials, among other environmental impacts.

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 MUSTARD)
PCR STANDCAP POUCH	1.69 (-50.6%)	.0827 (-44.1%)	23.36 (-28.7%)	19.6:1 (95.1% : 4.9%)	50,996 (-24.8%)
STANDARD STANDCAP POUCH	1.88 (-44.9%)	.08754 (-40.8%)	26.93 (-17.8%)	19.6:1 (95.1% : 4.9%)	50,996 (-24.8%)
HDPE BOTTLE	3.41	.148	32.77	11.1:1 (91.7% : 8.3%)	67,789

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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 15-18.*