

# LIFE CYCLE ASSESSMENT CAT LITTER PACKAGING CASE STUDY

## CAT LITTER PACKAGE COMPARISON

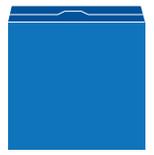
Cat litter is a necessity for all cat owners and is a heavy, moisture-sensitive product that requires a strong package with a moisture barrier. Three common packaging formats for cat litter were evaluated for this Life Cycle Assessment study: a flexible stand-up bag, a paperboard barrier carton and a rigid plastic pail with handle. All formats meet the criteria for strength and moisture protection.



FLEXIBLE  
STAND-UP BAG



RIGID PAIL



BARRIER  
CARTON



### WATER CONSUMPTION

Paper manufacturing requires significant amounts of water in the paper forming process. Similarly, water is used to cool the molds during the production of rigid plastic pails. This gives the flexible stand-up bag a significant advantage in water consumption compared to the barrier carton or rigid pail.

The barrier carton has a water consumption impact **3,573%** more than that of the flexible stand-up bag. The rigid pail has a water footprint **1,370%** higher than the flexible stand-up bag.



### GREENHOUSE GAS EMISSIONS

The flexible stand-up bag consists of considerably less material by weight than the rigid pail or barrier carton, which makes the stand-up bag preferable in terms of greenhouse gas emissions.

Additionally, the injection molding process required to make the rigid pail uses more energy than film lamination used for the flexible stand-up bag.

Compared to the flexible stand-up bag's greenhouse gas emissions, the barrier carton produces **331%** more while the rigid pail emits **996%** more emissions.



**8,941**

GRAMS per 1000 kg of cat litter



**125,404**

GRAMS per 1000 kg of cat litter



**82,015**

GRAMS per 1000 kg of cat litter



### FOSSIL FUEL CONSUMPTION

Because of its lightweight advantages, the flexible stand-up bag comes out ahead of the other packaging types in fossil fuel consumption.

The weight of the barrier carton and energy needed in the paper making process leads to **69.6%** more fossil fuel in manufacturing than the flexible stand-up bag.

The rigid pail requires **11X** as much material as the flexible stand-up bag and uses **1,429%** more fossil fuel in manufacturing than the flexible stand-up bag.



**2,248**

MJ-EQUIV



**34,371**

MJ-EQUIV



**3,812**

MJ-EQUIV

## END OF USE SUMMARY

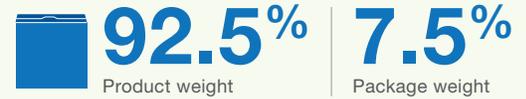
### SOURCE REDUCTION BENEFITS

The stand-up bag offers a higher product-to-package ratio compared to the barrier carton and rigid pail formats.

High product-to-package ratio:



Low product-to-package ratio:



### RECOVERY BENEFITS

FLEXIBLE STAND-UP BAG



**1x**  
amount of material ending up as municipal solid waste

None of the package formats are recycled in any significant amount today. The barrier carton is not typically recycled because of the film lamination to the paperboard, which is needed to provide the appropriate moisture barrier.

RIGID PAIL



**12x**  
amount of material ending up as municipal solid waste

Based on this, the flexible stand-up bag results in about **9x** less material ending up in municipal solid waste than the barrier carton, and about **12x** less material by weight ending up in municipal solid waste than the rigid pail, even considering the recycling rate of the pail.

BARRIER CARTON



**9x**  
amount of material ending up as municipal solid waste

The rigid pail and lid recycling rate would need to increase from **11.1%** to **90%** to have the same weight of material ending up in municipal solid waste as the flexible stand-up bag.

## IMPLICATIONS

The results of the data when comparing different cat litter packaging options shows that the flexible stand-up bag has a number of significant benefits (fossil fuel usage, carbon impact, water consumption, and municipal solid waste) over the rigid pail and barrier carton, even when taking the current recycling rate of the rigid pail into consideration.

FORMAT	FOSSIL FUEL CONSUMPTION (MJ-EQUIV)	GHG EMISSIONS (KG-CO <sup>2</sup> EQUIV)	WATER CONSUMPTION (L)	PRODUCT-TO-PACKAGE RATIO (%)	PKG LANDFILLED (G)/1000 KG CAT LITTER
FLEXIBLE STAND-UP BAG	2,248	125.40	182	99.1 : 0.9	8,941
RIGID PAIL	34,371 (+1,429%)	1,373.85 (+996%)	2,676 (+1,370%)	88.9 : 11.1	111,610 (+1,148%)
BARRIER CARTON	3,812 (+69.6%)	540.46 (+331%)	6,684 (+3,573%)	92.5 : 7.5	82,015 (+817%)