

# Manufacturing superior plastic gas tanks with Akulon® Fuel Lock



Manufacturers of outdoor power equipment (OPE), tractors, all-terrain vehicles and golf cars are increasingly under pressure to reduce evaporative emissions that permeate through plastic fuel tanks.

To help minimize the impact of greenhouse gases on the environment, regulatory bodies – including the Environmental Protection Agency (EPA) and California Air Resource Board (CARB) – mandate strict evaporative emissions limits. Gas tank manufacturers are required to use materials that guarantee compliance with ever-shifting regulations to avoid costly fines and equipment recalls.

Although high-density polyethylene (HDPE) is most commonly used to mold plastic fuel tanks, it's highly permeable on its own. To be able to meet the 1.5 g/m<sup>2</sup>/day emissions limit set by the EPA and CARB, tanks created from HDPE must be fluorinated to create a barrier layer. In addition to being environmentally hazardous, fluorination is expensive and time-consuming. Typically, tanks must be shipped to another location to undergo multiple rounds of treatment and quality testing. Once complete, fuel sloshing inside the tank has been shown to wear down the fluorinated coating over time – decreasing barrier performance.

DSM's Akulon® Fuel Lock is a cost-competitive family of mono-materials designed to combine enhanced low permeation capabilities with excellent processing characteristics. With no secondary treatment or complex manufacturing required, the material significantly outperforms HDPE with a permeation rate less than 20% of the current EPA limit.

## **AKULON® FUEL LOCK:**

- Provides lifetime barrier durability superior to HDPE
- Eliminates the need for fluorination
- Meets and exceeds all current EPA and CARB regulations
- Delivers high flowability and processability for tank walls as thin as 2 mm
- Features 200% higher tensile strength and 60% higher flexural modulus than HDPE
- Enables reduced cycle times due to inherently faster recrystallization rate from melt
- Provides excellent low temperature toughness down to -40°C
- Includes laser marking and colorable options
- Has a proven track record of success



# Akulon® Fuel Lock

## Key benefits

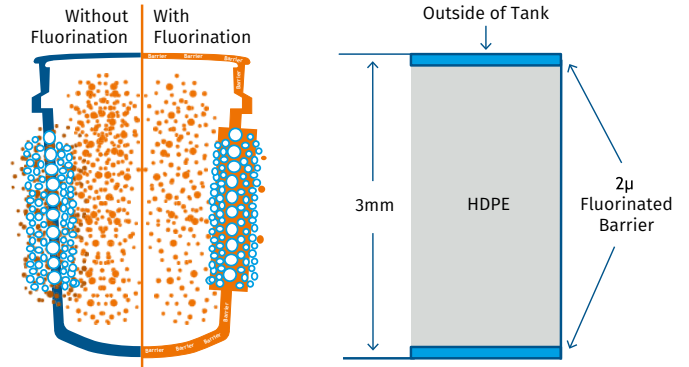
### The mono-material advantage

Since Fuel Lock's barrier capabilities are inherent rather than batch dependent, fuel tanks only need to be certified once to ensure high performance throughout the lifetime of final parts. The material surpasses current EPA and CARB regulations by more than 80% – providing manufacturers a large buffer to avoid the risk of non-compliance.

## THE STATUS QUO

### HDPE Fuel Tanks

To reduce costs, most plastic fuel tanks are made of high-density polyethylene (HDPE), however this material is permeable. HDPE needs to undergo fluorination to create a barrier layer – a process which is environmentally hazardous gas.

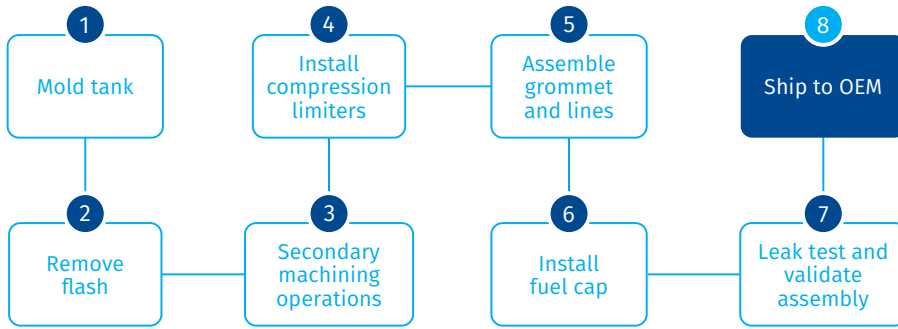


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surpasses current EPA  
and CARB regulations  
by **more than 80%**



## SIMPLIFIED WORKFLOW

### AKULON FUEL LOCK FUEL TANKS



#### Simplified manufacturing process

Fuel Lock gas tanks don't require any additional treatments – they're ready to use out of the box. The material is compatible with injection molds, blow molding and roto-molding equipment and hot plate and vibration welding equipment originally used for HDPE – eliminating the time and costs associated with re-tooling operations.

## KEY FUEL TANK APPLICATIONS



All-Terrain & Specialty Vehicles



Automotive



Tractors



Outdoor Power Equipment

Akulon Fuel Lock can be molded as thin as 2mm – reducing tank weight, increasing fuel capacity and saving material costs

## DSM MATERIAL SOLUTIONS – AKULON FUEL LOCK

Akulon Grade	Process	Permeation	Impact	Welding	Parison Strength
FLE-LP	Injection molding	✓✓	✓✓✓	✓	
FLE40-HP	Blow molding, extrusion	✓✓	✓✓✓	✓	✓✓
K-X08846	Roto-molding	✓✓	✓✓	✓	

At DSM, we understand that switching materials in your production plant can be a risk-laden process. That's why we back all of our materials with extensive research and development, and work directly with you to solve any technical issues. With 25,000 Fuel Lock plastic tanks already in market, we also work closely with the EPA and CARB to ensure our materials continuously align to emission regulations.

Contact us at [dsm.com/contactdem](https://dsm.com/contactdem) to learn more about how Akulon® Fuel Lock helps you manufacture superior small engine gas tanks.