



## DSM offers solutions to challenges of tightened small-engine emissions regulations

Born out of the need for a more eco-friendly product after stricter emissions regulations, Akulon® Fuel Lock emerged as a functional replacement for the HDPE materials commonly used for small-engine fuel tanks.

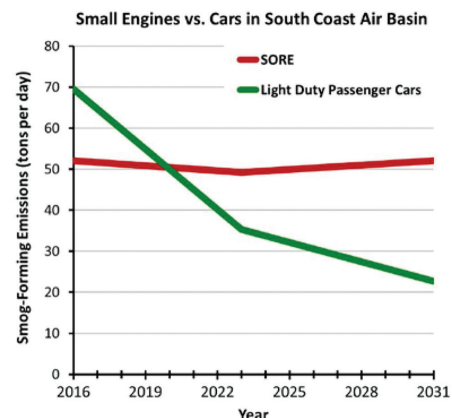
DSM Engineering Plastics continues to offer many cutting-edge products that meet the needs of the ever-changing global community. Akulon® Fuel Lock is just one of those products, emerging as the perfect material for use in small-engine fuel tanks.

Akulon Fuel Lock is a revolutionary material born from the core values of DSM, an eco-conscious company leading the way to a cleaner Earth.

In the 1990s, stricter guidelines for reducing the evaporative emissions of small off-road equipment were instituted by the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA). With other countries preparing to follow suit, DSM saw an opportunity to make an environmental impact in the Outdoor Power Equipment (OPE) industry, leading to the 2008 launch of our Fuel Lock products.

With small-engine emissions projected to reach more than twice those of light-duty passenger cars by 2031, DSM seized the opportunity to develop a novel material that decreases emissions while

maintaining its durability. Fuel tanks made with Akulon Fuel Lock, a low-permeation material, significantly lower hydrocarbon emissions while also meeting mechanical requirements, such as high-impact performance at temperatures as low as  $-40^{\circ}\text{C}$ .

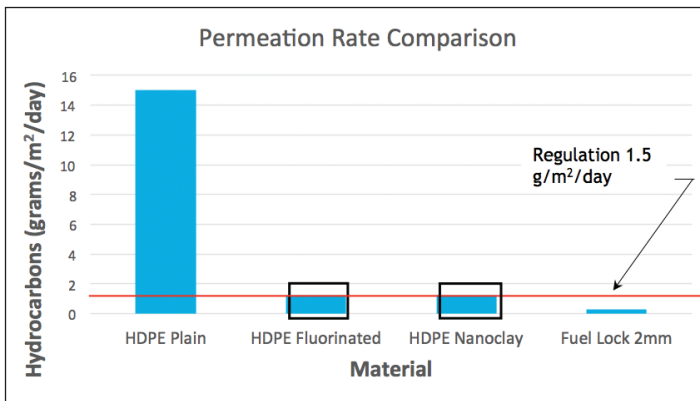
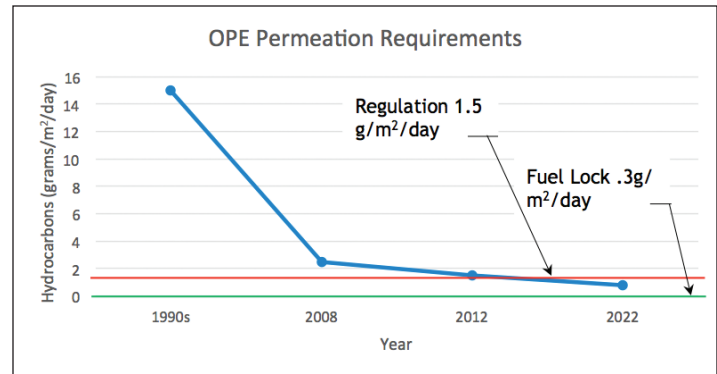


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Although some OPE manufacturers already met the new standards, those that didn't needed to upgrade their fuel tanks to meet requirements. After visiting the CARB and EPA offices, DSM engineers were confident that they understood the regulations and could manufacture a product that would significantly lower emission rates without sacrificing durability.

By listening to the needs of current OPE customers, DSM was able to develop a cost-competitive product that not only met, but far exceeded emissions regulations.

Prior to the implementation of the 2008 regulations, small-engine fuel tanks were predominantly made with high-density polyethylene. HDPE tanks emitted 15 to 20 grams of hydrocarbons per square meter per day, which is over 10 times the updated EPA standards, while Akulon Fuel Lock reduces emissions to only 20% of the maximum allowable target number.



Akulon Fuel Lock offers very low permeation versus both the regulation standards and HDPE plus fluorination. Fuel Lock's permeation rates are five times below CARB and EPA standards, and over 50 times below HDPE tanks.

Akulon Fuel Lock's low permeation rates remain consistent and the plastic maintains its durability throughout product life, making it resistant to failure during the molding and assembly stages and extending its expected-use life.

A polyamide-6 monolayer, Akulon Fuel Lock requires no masterbatch or fluorination treatment. Injection molding, blow molding and rotomolding grades are available and existing molding equipment can still be utilized.

In 2022, CARB will further tighten restrictions on emissions, allowing DSM to have an even stronger foothold in the market. By working with customers to ensure compliance and prepare for the future, DSM is sure to remain a leader in the plastics industry.

### Contact us:

Want to learn about other OPE applications offered by DSM? Or want to share your challenge with us? Contact your local DSM office.

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