

Succinimide Dispersants



Introduction

At Chevron Oronite, we foster a culture grounded in operational excellence and are conscientiously committed to protecting people and the environment. This product summary is one example of that commitment.

For engines to perform their everyday functions as well as expected, all their moving parts must be powered and protected with fuels and lubricants enhanced by some of the most technologically advanced additives. The products we produce help fuels and lubricants push the boundaries of speed, strength, cleanliness, and durability.

Succinimides are ashless, polymeric chemicals used as additives in engine oils to keep sludge, soot, oxidation products, and other deposit precursors dispersed in engine oil so that these by-products of heat and combustion do not deposit onto and harm key engine parts. Because their function is to disperse these by-products of heat and combustion, succinimides are commonly referred to as succinimide dispersants.

Succinimide dispersants keep vital engine parts clean, prolonging engine life and helping to maintain proper emissions and good fuel economy. Figure 1 on the next page shows two photos of an engine's oil pan after a normal oil drain interval. In the top photo, the engine oil contained the correct level of succinimide dispersant needed to keep the pan clean, but in the lower photo, sludge has built up due to a lack of succinimide dispersant in the oil.

Succinimide dispersants are able to disperse impurities in engine oil due to their chemical structure.

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Making the things that go, **go better.**[™]



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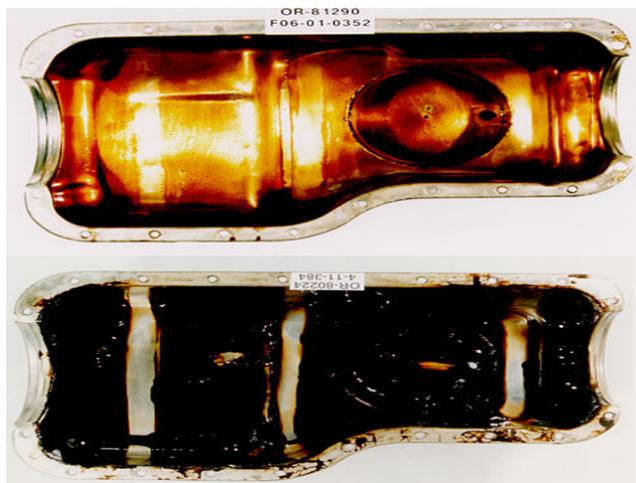


Figure 1. Comparison of oil pans with succinimide dispersant (top) and without succinimide dispersant (bottom)

Figure 2 below shows a conceptual diagram of a dispersant's structure. There is a polar head that attaches itself to a solid particle. Solid particles may be soot, sludge, or other impurities.

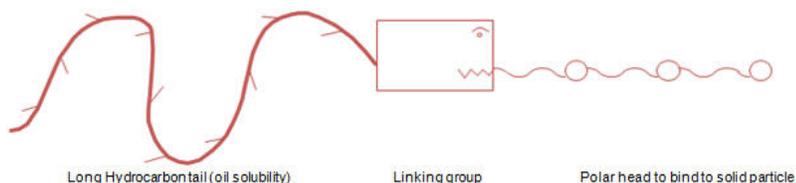


Figure 2. Conceptual diagram of a succinimide dispersant

The polar head is attached by a linking group to a very long hydrocarbon tail that keeps the dispersant suspended in oil. Once several dispersant polar heads have attached themselves to a solid particle, it can no longer combine with other impurities to form large particles that can deposit onto engine surfaces, but is rather removed from the engine when the oil is changed (see Figure 3). This allows for cleaner burning engines and, along with the other additives we discuss in other product summaries, helps to prolong engine life.

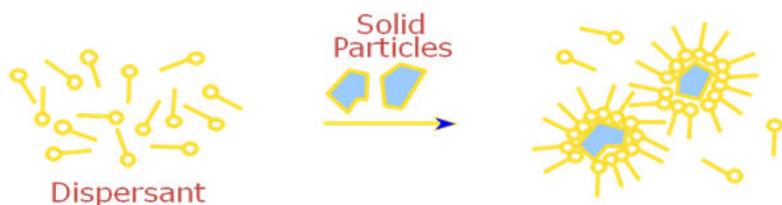


Figure 3. Conceptual diagram of a succinimide dispersant preventing particle clumping

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Description and Properties

Succinimide dispersants appear as dark or brown-colored liquids with a thickness or viscosity similar to heavy syrup. They have little or no solubility in water, and because they are denser than water, will sink in a water environment. They are readily soluble in oil and lighter weight hydrocarbons, such as gasoline. Succinimide dispersants have very low vapor pressure and little noticeable odor at ambient temperatures.

Health Information

Studies provide evidence that succinimide dispersants are low in toxicity following acute exposure. Subchronic exposures to these substances via dermal or oral exposure demonstrate low toxicity.

Dermal exposures to succinimide dispersants can cause dermatitis and swelling, and oral exposures can cause diarrhea. These minor effects are only observed at very high doses that are much greater than likely human exposures related to typical uses.

Studies demonstrate that these substances have low potential to be toxic to genetic material in cells and do not present a significant risk for mutagenicity or carcinogenicity in humans. Studies provide no evidence of direct effects of repeated doses on reproductive systems or indices.

Environmental Information

Succinimide dispersants are not expected to undergo hydrolysis, photolysis, or microbial degradation based on their chemistry, available test data, or predictive modeling. Additionally, due to their low vapor pressure and low water solubility, modeling has indicated that succinimide dispersants are more likely to partition into soil and sediment rather than air and water. Based on current data, succinimide dispersants are unlikely to bioaccumulate in the environment.

Succinimide dispersants exhibit little or no toxicity in aquatic species, but spills should be prevented and managed. In the event of a spill of a product containing succinimide dispersants, stop the source of the release if you can do so without risk. The Material Safety Data Sheets (MSDS) provided with these products contain suggested spill response and clean-up procedures. As appropriate (or required), report spills to local authorities. In the USA, the US Coast Guard can be reached at 1-800-424-8802 and Chemtrec at 1-800-424-9300.

Regulatory Information

Requirements may exist that govern the manufacture, importation, sale, transportation, use, and/or disposal of succinimide dispersants or products containing them. These requirements may vary by jurisdiction. For more information, consult the relevant Material Safety Data Sheet (MSDS) or contact us.



The low volatility and low water solubility of succinimide dispersants limits the potential for exposure, and therefore risk, to people in the workplace, as well as consumers.



For engines to perform their everyday functions as well as expected, all their moving parts must be powered and protected with fuels and lubricants.

Exposure Potential

The low volatility and low water solubility of succinimide dispersants limits the potential for exposure, and therefore risk, to people in the workplace, as well as consumers. Indirect exposure to these chemicals via the environment is likely to be negligible. Also, exposure to these substances during normal lubricant use is low because they comprise only a fraction of the final lubricant oil product.

Manufacturing of succinimide dispersants generally occurs in dedicated closed systems with proper engineering controls, thereby minimizing exposure. Solid waste is incinerated, recycled, or otherwise properly disposed.

Waste water from the manufacture of succinimide dispersants is treated before release to a sewer or other appropriate system. Workers in manufacturing plants, including those in sample analysis, blending, maintenance, and cleaning and those involved in transportation are well trained in their particular operations and wear appropriate personal protective equipment, e.g. safety glasses and chemical resistant gloves.

Professional mechanics, service station attendants, and other skilled workers that are frequently involved with oil changes use personal protective equipment and hygiene practices that reduce exposure to lubricant oils. Consumers have potential for exposure to small amounts of these substances due to the possibility of skin contact with fresh lubricant oils that can occur during crankcase oil changes or periodic oil "top-off". There may also be infrequent, trivial inhalation exposure to aerosols/vapor if "top-off" is conducted before the engine has cooled. However, "do-it-yourself" consumer exposure is likely to be relatively infrequent. In summary, there is minimal potential for exposure of the consumer to succinimide dispersants.



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