

RECO-COOL

TECHNICAL BULLETIN 0005/12

TOXICOLOGY AND ENVIRONMENTAL ASSESSMENT OF RECO-COOL OAT-10XSC COOLANT SUPERCONCENTRATE

Test Data

Independent toxicological and biodegradability testing demonstrate the RECO-COOL OAT-10XSC coolant superconcentrate long-life OAT inhibitor has very low toxicity to aquatic fauna and mammals, and to be readily biodegradable.

AS BLENDED COOLANT (READY TO USE)

Biodegradability: Full pass in ready biodegradability; >95% water within seven days

LD₅₀ > 1960 mg/kg (OECD Guideline No.401: Toxicity to Mammals)
LC₅₀ > 980 mg/kg (OECD Guideline No.203: Toxicity to Fish)

Reco-Cool OAT-10XSC Superconcentrate inhibitor package can be classified as READILY BIODEGRADABLE. When blended according to Recochem's mixing instructions (10% maximum of OAT-10XSC in water), the resulting coolant fluid will decompose to >95% water in seven days. As a result, the product is classified as *readily biodegradable*.

Chemical Effects

Reco-Cool OAT-10XSC coolant superconcentrate contains no environmentally harmful or scheduled poisonous chemicals such as borates, phosphates, amines or nitrites typically found in conventional coolants.

NITRITES and AMINES

The absence of nitrites and amines in Reco-Cool OAT-10XSC coolant superconcentrate limits the potential formation of carcinogenic nitrosamines. The use of nitrite and amine inhibitors together has been banned in many countries since they can combine to form nitrosamines (ie n-nitrosodiethanolamine; N-DELA) which are known carcinogens. Reco-Cool OAT-10XSC contains neither nitrites nor amines, and therefore cannot contribute to the formation of N-DELA.

BORON

Boron (commonly used as a buffer in conventional coolants) has been implicated in the contamination of ground water systems used for agricultural irrigation purposes. Levels of Boron above 1.5ppm can severely affect agricultural yields (stunted plant growth).



Japan, end-user restrictions for <10ppm Boron are in place due to ISO 14000. Europe is also set to adopt Boron restrictions through the ECB of 5.5% max Boric Acid.

Reco-Cool OAT-10XSC superconcentrate is Boron free.

2-ETHYL HEXANOIC ACID

2-Ethyl Hexanoic Acid (2-EH) is a known common organic acid corrosion inhibitor and is used extensively in coolant inhibitors marketed by competitors. The HSE concerns of 2-EH formulated coolants are well documented and many OEMs are restricting the use of 2-EH containing coolants in their products

2-Ethylhexanoic acid (2-EH) causes an increase in liver size and enzyme levels when repeatedly administered to rats via the diet. When administered to pregnant rats by gavage or in drinking water, 2-EH caused teratogenicity (birth defects) and delayed postnatal development of the pups. Additionally, 2-EH impaired female fertility in rats. Birth defects were seen in the offspring of mice who were administered sodium 2-ethylhexanoate via intraperitoneal injection during pregnancy.

2-EH has been listed as a marine pollutant.

Reco-Cool OAT-10XSC superconcentrate is 2-EH free, and is free from any salt derivatives of 2-EH.

Water Endangering Potential

The term "Water Endangering Potential" (WGK: Wassergefährdungsklasse) comes from the Administrative Authority for the definition of water polluting substances (Germany). Based on an assessment from biological testing and other properties, fluids are classified as follows:

WGK 1 = weak water endangering

WGK 2 = water endangering

WGK 3 = high water endangering

The former WGK 0 = is discontinued. Instead, a category is introduced as "not water endangering substance".

Substances are listed in the annexure of the Administrative Authority's determination. The materials used in OAT-10XSC superconcentrate allow us to classify the material as "Not water endangering".

Soluble Metals in Used Coolant

Recochem conducts extensive used coolant metals testing as part of our ongoing global coolant research and development activity.

Coolants are tested in accordance with ASTM specifications.

Recochem advises that our coolants meet all of the standard ASTM corrosion test requirements for the minimization of dissolved metals in solution.



Recochem OAT-10XSC meets the following ASTM test specifications:

ASTM D 1384
ASTM D 2570
ASTM D 4340
ASTM D 2809
ASTM D 7583

Each of these tests prescribes a maximum level of corrosion permissible, which minimized the levels of soluble metal ions in solution in used coolants. Recochem fully meets the technical specifications of those requirements and thus reduces the level of soluble metal species in used coolant fluids.

Spills and Disposal

Reco-Cool OAT-10XSC Superconcentrate treatment of engine cooling systems offers improved occupational health and safety in coolant handling. In well maintained systems where the correct coolant change-out procedures have been followed, the used coolants are environmentally safer with a wide range of options for the effective management of coolant disposal and spillage control.

Traditional inorganic coolant fluids may require flushing and draining every 40,000km. Through good fluid maintenance, it is possible to extend the life of Reco-Cool OAT-10XSC technology to over six times that of conventional fluids. Therefore, using Reco-Cool OAT-10XSC coolant technologies will reduce the level of used coolant effluent (over traditional conventional coolants) to less than one-sixth of the total used coolant fluid generated.

Reco-Cool approved coolant diagnostic laboratories can conduct scheduled coolant analysis programs which will provide a ready check on relevant chemical characteristics of the coolant in the engine or coolant. This process will provide an ongoing check on any metals contamination of the coolant from the corrosion deposits and surface scale associated with poorly maintained cooling systems or impurities carryover from vehicle coolant systems previously operating on other coolants. From these laboratory tests, Recochem can recommend methods for the disposal of the used coolants.

Always dispose of used coolants in accordance with local, state and federal guidelines.

