

TECHNICAL BULLETIN

COOLANT DISPOSAL

GENERAL REMARKS AND WARNINGS

Used coolants should not be introduced directly into sanitary or storm sewers because of oil contamination effects. Since all used coolants contain petroleum oils, either by virtue of their composition or because of tramp oil contamination, they must not be emptied into sanitary or storm sewers without treatment. Petroleum oils are not easily degraded and strict limitations apply to the amount of oil permissible in industrial effluents. Hydraulic, lubricating or other oils in the spent coolant will interfere with sewage treatment and may contaminate streams and lakes. Before proceeding, check with your local Public Health Service, sewage treatment plant or state authorities regarding trade waste disposal standards in your area.

In general, an acid-alum "split" is suggested as the disposal procedure for spent STA-KOOL. When handling the chemicals used in this procedure, keep in mind that they are strong acids and alkalis and as such should be treated with the proper respect. Alum, sulfuric acid and sodium hydroxide (caustic soda) are extremely irritating and damaging to the skin and mucous membranes (eyes, nose and throat). Protective equipment that should be worn includes: chemical goggles, rubber gloves, rubber apron, rubber boots, hat and maximum coverage type clothing. In case of contact, flush the area with large amounts of cool clean water for 15 minutes. Contact a physician as soon as possible. Also, be sure to clean up spills of these materials as soon as possible to avoid slippery conditions.

ACID-ALUM SPLIT: Suggested Procedure

IMPORTANT: The trade waste treatment process described below is for spent solutions of STA-KOOL. However, EVERY BATCH OF WASTE IS DIFFERENT and consequently it is impossible to predict exactly how much of each chemical will be required for treatment of a particular batch of waste. THE PRESENCE OF OTHER TRADE WASTES IN THE STA-KOOL SOLUBLE WILL UNDOUBTEDLY REQUIRE MODIFICATION OF THIS PROCEDURE. For this reason we suggest that a professional trade waste treatment consultant be contacted for recommendations as to equipment and specific processes in view of the total trade waste out-put of your plant.

For 1000 gallons of spent STA-KOOL we suggest the following treatment:

- 1) Separation of unemulsified tramp oil:
 - a) Allow the trade waste to stand undisturbed for 24 hours. At the end of this period centrifuge, skim or by some other means remove the tramp oil which floats to the top of the tank.
 - b) This oil can be hauled away, burned or re-refined.
- 2) Separation of organic materials and emulsified tramp oil from the coolant solution:
 - a) Add enough concentrated sulfuric acid to the trade waste to lower the pH to 3.5. Two to three gallons of concentrated sulfuric acid will be required per 1000 gallons of spent coolant. Mix the solution continually while these additions are being made.
- 3) Allow the mixture to stand undisturbed until a good separation of the insoluble materials is achieved (usually 24 to 48 hrs).
- 4) Remove any solid materials and residual oil which floats to the top of the tank.

- 5) While mixing at low speed, add 50% caustic soda to the solution until a pH between 6.5 and 7.0 is reached. Two to three gallons of 50% caustic soda (sodium hydroxide) will be require.
- 6) Allow the aqueous mixture to stand undisturbed for 24 hours to permit the aluminum hydroxide floc to settle to the bottom of the tank. This will remove any residual organic matter remaining from the previous treatment.
- 7) The clear water layer should now be suitable for disposal as plant effluent. At this point, the water layer must be separated from the aluminum hydroxide slurry which has settled to the bottom of the tank. The water can be drawn off by valves located at various levels on the tank. Alternatively, the aluminum hydroxide floc can be floated by bubbling air from the bottom of this tank. As the floc reaches the top of the tank, it may be skimmed off and disposed with other solid waste. Alternatively, the aluminum hydroxide floc may be removed to a clean container and treated as described in (8) and (9).
- 8) Acidify the aluminum hydroxide slurry with concentrated sulfuric acid to regenerate aluminum sulfate.
- 9) Recycle the aluminum sulfate solution resulting from step 8 to the next batch of trade waste. 10% makeup of fresh alum is suggested to replace loss of this chemical.

COMMENTS

- 1) Alum flocculation is superior to that of calcium chloride. The trivalent ion is, in general, far more effective in this function than divalent ions. In turn, the aluminum trivalent ion is more effective than other common trivalent ions.
- 2) Maintenance to reduce oil leakage in machine tools is strongly recommended. The savings in oil resulting from an effective program could equal or exceed the cost for the trade waste program. Elimination of oil contamination will prolong coolant life.
- 3) A review of coolant practices is suggested for prolonged coolant life. Prevention of contamination, concentration control and improved water quality are simple and effective ways to reduce costs and minimize trade waste disposal.