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Standard Terminology for Engine Coolants[1]

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antifoam, *n*—a substance added to engine coolant concentrate, corrosion inhibitor packages, or supplemental coolant additives to prevent or suppress foam.

DISCUSSION—Eliminating foam improves heat transfer.

antifreeze, *n*—a term frequently used in the marketplace for engine coolant concentrate. (See **engine coolant concentrate**.)

ash content, *n*—the residue from an engine coolant concentrate, antirust, or engine coolant that remains after evaporation, charring, and ignition at strong heat.

boiling point, *n*—the temperature at which the vapor pressure of an engine coolant reaches atmospheric pressure under equilibrium boiling conditions.

cavitation corrosion, *n*—a form of localized, accelerated corrosion characterized by deep pitting and caused by high mechanical forces resulting from coolant vapor bubble collapse at the surface of the metal.

cavitation erosion corrosion, *n*—the mechanical removal of protective films on metal by the formation and collapse of vapor bubbles in a liquid,and the abrasive action of a liquid, which may contain suspended solids, moving at high velocity.

DISCUSSION—The mechanical removal of the protective films exposes fresh metal to corrosive attack.

coolant additive package, *n*—the combination of inhibitors added to an engine coolant to mitigate cooling system degradation, corrosion, scaling, and foaming, or to provide other desirable properties.

corrosion inhibitor package, *n*—the combination of inhibitors added to an engine coolant to mitigate cooling system corrosion.

corrosive water, *n*—a standard solution containing 100 ppm each of sulfate, chloride, and bicarbonate ions introduced as the sodium salts to distilled water.

dye, *n*—a colorant added to an engine coolant to give it a distinctive color.

engine coolant, *n*—a heat exchange fluid designed to transfer heat from the engine block and accessories to the air through the radiator, consisting of water plus a corrosion inhibitor package, or a blend of water and glycol engine coolant concentrate.

DISCUSSION—Engine coolants may also contain supplemental coolant additives.

engine coolant concentrate, *n*—a formulated liquid product intended to be diluted with water for use in engine cooling systems.

DISCUSSION—Functionally, the product provides a lower freeze point and mitigates corrosion and foaming.

engine dynamometer test, *n*—a laboratory full-scale engine test designed to evaluate corrosion protection and inhibitor stability of engine coolants under simulated operational conditions.

erosion corrosion, *n*—nonuniform, accelerated corrosion characterized by a smooth appearance and caused by high-velocity coolant.

DISCUSSION—The corrosive attack may be aggravated by suspended solids.

extended life coolant, *n*—an engine coolant for light-duty service vehicles with recommended change-out of the coolant after 160 000 km (100 000 miles), 5 years, or 4000 operating hours.

foaming tendencies, *n*—a laboratory test conducted in glassware to evaluate the tendency of an engine coolant to foam under standard conditions of aeration and temperature.

freezing point, *n*—the temperature at which ice crystals begin to form in an engine coolant when tested in accordance with Test Method D 1177 for Freezing Point of Aqueous Engine Coolant Solution.[2]

glassware corrosion test, *n*—a laboratory screening test for evaluating the corrosion protection properties of engine coolants on metal test specimens under controlled conditions of aeration and temperature.

glycol engine coolant concentrate, *n*—an engine coolant concentrate in which the freeze point depressant is ethylene or propylene glycol, with inhibitors to minimize foaming and corrosion.

DISCUSSION—Small amounts of other glycols may be present.

heavy-duty, *adj—in internal combustion engine operation*, characterized by average speeds, power output, and internal

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[2] *Annual Book of ASTM Standards*, Vol 15.05.

temperatures that are generally close to the potential maximums.

heavy-duty engine, *n—in internal combustion engine types*, one that is designed to allow operation continuously at or close to its peak output.

DISCUSSION—This type of engine is typically used in (*a*) Class 5 to 8 over-the-road trucks and buses, (*b*) off-highway machinery for agricultural, earthmoving, construction, and mining, (*c*) high-output stationary engine applications, and (*d*) locomotive and marine applications.

hydrometer-thermometer field tester, *n*—a device designed to indicate the freezing point of an engine coolant by measurement of the relative density of the coolant at a specific temperature.

inhibitor, *n*—a chemical compound added to engine coolant to mitigate cooling system degradation.

DISCUSSION—Examples of inhibitors are corrosion inhibitors, foam inhibitors, and scale inhibitors

light-duty, *adj—in internal combustion engine operation*, characterized by average speeds, power output, and internal temperatures that are generally much lower than the potential maximums.

light duty engine, *n—in internal combustion engine types*, one that is designed to be normally operated at substantially less than its peak output.

DISCUSSION—This type of engine is typically installed in (*a*) automobiles, (*b*) pickup trucks, vans, and sport utility vehicles, (*c*) small farm tractors, and (*d*) lawn maintenance equipment.

liner pitting, *n*—cavities that develop on the coolant side of cast iron cylinder liners as a result of cavitation corrosion.

DISCUSSION—This predominantly occurs on the thrust side of heavy-duty diesel cylinder walls.

low-silicate coolant concentrate, *n*—an engine coolant concentrate containing not more than 250 ppm silicon.

metal test specimens, *n*—standard samples of metals commonly used in engine cooling systems.

DISCUSSION—The metals are used to evaluate the corrosion properties of engine coolants in laboratory, engine dynamometer, and fleet tests.

methoxy propanol, *n*—a glycol ether used as an engine coolant concentrate.

multiphase coolant, *n*—an engine coolant composed of immiscible liquids or undissolved solids, or both.

prediluted aqueous ethylene glycol coolant, *n*—a commercially prepared uniform solution (50 % by volume minimum) of ethylene-glycol-based engine coolant concentrate and deionized water (described in Specification D 1193, Type IV).[3]

DISCUSSION—The prediluted coolant is intended for direct addition to an engine cooling system.

recycled engine coolant, *n*—engine coolant formulated using other than virgin materials.

reference test fluid, *n*—a standard glycol-base test fluid, described in Specification D 3585 Reference Fluid for Coolant Tests,[2] used by laboratories to evaluate test methods and procedures.

refractometer, *n*—an instrument used to indicate the freezing point of engine coolants by refractive index.

reserve alkalinity, *adj*—a term applied to engine coolant concentrates and antirusts to indicate the amount of alkaline inhibitors present in the product.

round-robin test, *n*—the practice of planning, conducting, analyzing, and interpreting the results of interlaboratory tests on the chemical and physical properties of engine coolants.

scale suppressant, *n*—a substance added to engine coolant concentrates, corrosion inhibitor packages, or supplemental coolant additives that helps prevent the formation of hard water mineral scale.

DISCUSSION—Scale will insulate and reduce heat transfer.

silicate gel, *n*—a jelly-like substance consisting of polymerized silicate and entrapped coolant.

simulated service corrosion test, *n*—evaluation of the effects of a circulating engine coolant on metal test specimens and automotive cooling system components under controlled, essentially isothermal laboratory conditions.

soluble oil, *n*—a combination of mineral oil base and one or more polar organic materials, such as petroleum sulfonates, sulfated vegetable oils, and fatty acids or their salts.

specific gravity, *n*—the ratio of the mass of a given volume of liquid at 60°F (16°C) to the mass of an equal volume of pure water at the same temperature.

DISCUSSION—When reporting results, explicitly state the standard reference temperature (for example, specific gravity 60/60°F (16/16°C)).

stop-leak additives, *n*—a compound containing particulates that is added to the cooling system for the purpose of stopping or minimizing leaks.

supplemental coolant additive (SCA) maintenance dose, *n*—smaller periodic additions of SCA, subsequent to the precharge dose of SCA, required to maintain protection against general corrosion, cylinder liner pitting, and scaling in heavy-duty engines.

supplemental coolant additive (SCA) precharge dose, *n*—initial concentration of SCA in engine coolant required to enable the coolant to provide adequate protection against cylinder liner pitting and scaling in heavy-duty engines plus general corrosion protection when water only is used as a coolant.

supercooling, *n*—an unstable state in which an engine coolant exists as a liquid below its normal freezing point.

virgin glycol, *n*—glycol that has not been used previously.

[3] *Annual Book of ASTM Standards*, Vol 11.01.