

Cooling System: Fluid Type Specifications

PREFERRED MIXTURE

The required ethylene-glycol (antifreeze) and water mixture depends upon the climate and vehicle operating conditions. The recommended mixture of 50/50 ethylene-glycol and water will provide protection against freezing to **-37°C (-35°F)**. The antifreeze concentration must always be a minimum of 44 percent, year-round in all climates. If percentage is lower than 44 percent, engine parts may be eroded by cavitation, and cooling system components may be severely damaged by corrosion. Maximum protection against freezing is provided with a 68 percent antifreeze concentration, which prevents freezing down to **-67.7°C (-90°F)**. A higher percentage will freeze at a warmer temperature. Also, a higher percentage of antifreeze can cause the engine to overheat because the specific heat of antifreeze is lower than that of water.

UNACCEPTABLE MIXTURES

100 Percent Ethylene-Glycol

Use of 100 percent ethylene-glycol will cause formation of additive deposits in the system, as the corrosion inhibitive additives in ethylene-glycol require the presence of water to dissolve. The deposits act as insulation, causing temperatures to rise to as high as **149°C (300°F)**. This temperature is hot enough to melt plastic and soften solder. The increased temperature can result in engine detonation. In addition, 100 percent ethylene-glycol freezes at **22°C (-8°F)**.

Propylene-glycol Formulations

Propylene-glycol formulations do not meet Chrysler coolant specifications. Its overall effective temperature range is smaller than that of ethylene-glycol. The freeze point of 50/50 propylene-glycol and water is **-32°C (-26°F)**, 5°C higher than ethylene-glycol's freeze point. The boiling point (protection against summer boil-over) of propylene-glycol is **125°C (257°F) at 96.5 kPa (14 psi)**, compared to **128°C (263°F)** for ethylene-glycol. Use of propylene-glycol can result in boil-over or freeze-up in Chrysler vehicles, which are designed for ethylene-glycol. Propylene glycol also has poorer heat transfer characteristics than ethylene glycol. This can increase cylinder head temperatures under certain conditions.

Propylene-glycol/Ethylene-glycol Mixtures

Propylene-glycol/ethylene-glycol Mixtures can cause the destabilization of various corrosion inhibitors, causing damage to the various cooling system components. Also, once ethylene-glycol and propylene-glycol based coolants are mixed in the vehicle, conventional methods of determining freeze point will not be accurate. Both the refractive index and specific gravity differ between ethylene glycol and propylene glycol.

CAUTION: Richer antifreeze mixtures cannot be measured with normal field equipment and can cause problems associated with 100 percent ethylene-glycol.