



A Better Class of Oil

ENGINE COOLANTS

Engines can be air cooled or water cooled.

Water cooled engines use water to assist the heat transfer process from the engine as it operates. However, engines are made from metal - usually of more than one type - and are likely to rust over time. Hence an engine coolant is required.

What must engine coolant do?

Be an effective heat exchange fluid

Protect against rust and corrosion in alloy, mixed metal and cast iron engines

Provide freezing and boiling protection

Be compatible with plastics and rubbers

Be chemically stable (ie no "drop out")

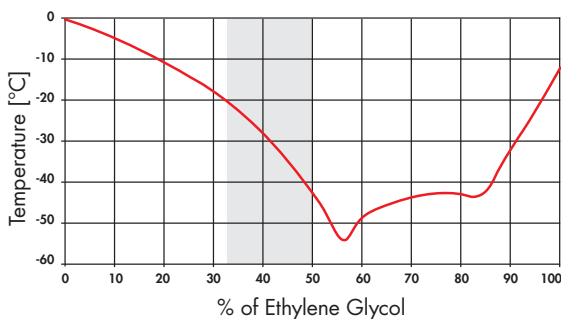
Mix readily with water!

There are two types of Coolants.

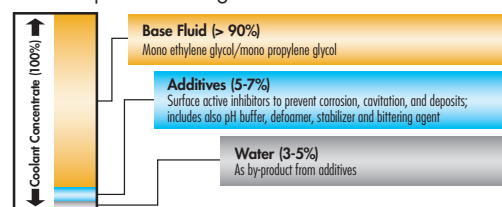
Water based products are just water and inhibitors. However some engines run very hot and hence require the use of ethylene or propylene glycol to raise the boiling point water, ie Anti Freeze Anti Boil. Some engines also may operate at less than the freezing point of water and to lower the freezing point, ethylene or propylene glycol are also used.

However, ethylene or propylene glycol mixed with water is corrosive, so fully formulated anti-freeze, anti-boil products contain corrosion inhibitors to protect the engine.

Typical, anti freeze anti boil coolants are used at between 33% and 50%, although in some cases, 60% has been used. They should never be used at higher than these rates as coolant performance is decreased and in the case of conventional coolants, additive deposition may occur which blocks the radiators.



Chemical Composition of Engine Coolants



Additives may include: Organic acids, Silicates and phosphates, Nitrites, De-foamers, Bittering agents



A Better Class of Oil

Borates

These all fulfil different functions within the coolant

There are three basic "types" of coolants.

CONVENTIONAL Uses conventional technology - in other words, does not use any of the newer style, organic inhibitors.

ORGANIC Uses 100% organic acid salts

HYBRID These products use mainly organic acids but with up to two or three conventional inhibitors.

Automotive manufacturers will generally specify silicates and phosphates.

Heavy Duty engine manufacturers will generally specify nitrites and molybdates.

Common Specifications

AS 2108-2004 Type A (Anti-Freeze Anti Boil)

AS 2108-2004 Type B (Water Based product)

JASO M325 (Japan)

JIS K2234 (Japan)

KSM 2142 (Korea)

ASTM D3306

German Army TL 6850-0038/1

SAE J1034

BMW N 600 69.0

Caterpillar EC-1

Cummins 85T8-2

Ford ESE M97-B44A/C/D

GM 1825M/1899M/6277M

Holden HN 2217/HN2043

JI Case JIC 501

MAN 324NF/324SNF

MB 325.0/325.3

MTU MTL 5048

Opel B 040 1065

VW/Audi/Skoda TL 774C/D/F (G12)

STORAGE LIFE OF COOLANTS

Concentrated coolants have a shelf life of about 2 years when stored correctly.

