

## Importance of the pH Value in Engine's Coolant

All types of internal combustion engines requires the use of antifreeze, anti-boil or simply a coolant to remove heat from the combustion area.

Whether it is called antifreeze in the colder parts of the world or anti-boil in the tropical regions, the coolant's function is to lower the freezing point for winter operation or raise the boiling point in warm climate.

The most popular choice of coolant worldwide has always been a mixture of ethylene glycol and water, with the ethylene glycol containing selected and specific inhibitors. While coolant is needed to remove heat in all internal combustion engines regardless of the type of fuel used, a regular control of the coolant solution is required to prevent the engine from severe damage.

Frequent engine repair and failure can be traced to improper or non existent engine cooling water treatment. Rust, scale, mineral deposit and deterioration of seals are the result of improper or no treatment in the cooling system.

From the time the coolant is introduced into any type of engine it starts a gradual degradation process into corrosive acids. This degradation is a function of time, temperature and the types of metals used in the engine and components construction. Once the coolant turns acidic all engine metals start to dissolve. The results are leaking water pumps, heater cores and radiators.

With the increasing number of aluminum engines and components the corrosive process is accelerated since the coolant degrades much faster in contact with aluminum than in typical cast iron engines. During the preventive maintenance of any engine, in addition to the freezing point, the pH value of the cooling system should be checked.

Most automotive manufacturers provide in the vehicle manual information about the suggested mileage or time to change the coolant. However it is important, because of the different climate and operative conditions, to measure the pH of the coolant every time the vehicle is at a scheduled service.

Extensive testing has shown that a coolant **pH below 8.3 pH is not acceptable** for use in engines due to its corrosive nature. The **correct pH value should be maintained between 9.5 - 10.0 pH**. Below 9.0 pH it is advisable to flush the cooling system and refill with a new coolant solution.

**WARNING:** Take proper precautions when removing radiator cap and DO NOT remove when the engine is hot. Accurate pH measurement is achieved when the coolant temperature is below 50 °C.

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