



## COOLANT

The triple protection against corrosion, overheating and frost

### ADDITIVES

As the name suggests, additives are admixtures that create certain properties. Our coolants give the coolant additional properties, such as protection against corrosion, suppression of foam formation and much more. Additives give coolant products a special hue so that they can be better distinguished by the customer.

### HARD WATER

Water hardness is a chemical term that refers to the concentration of ions, anions and metals that are in the water when dissolved. Calcium and magnesium ions, for example, are counted among the „hardness builders“. In household appliances, hard water may cause, among other things, calcification. When changing the coolant, we recommend using water that is not harder than 3.566 mmol / l to dilute coolant.

If the available tap water is unsuitable in terms of hardness or cleanliness, coolant products can be diluted with distilled or fully desalinated water without any problems.

### INHIBITORS

The name inhibitor refers to the Latin verb for stop or to prevent. These substances can prevent or slow down chemical reactions. So-called corrosion inhibitors are particularly important at coolants. They combine with the metals of the cooling system and form a very thin, but extremely durable, protective layer on the surface. This protects the various components of the cooler from corrosion.

### CAVITATION

Cavitation cannot be prevented in complex cooling systems and always occurs during operation. The reason for this is the different pressure conditions in the cooling system during operation: When the pressure drops, vapor bubbles are created which collapse as soon as the pressure rises again. This can lead to deep impacts in the metal surface. Cavitation can occur in coolant channels, in the water pump, in the cylinder block, in the cylinder liners or in the cylinder head. Without the right additives, corrosion and heavy wear and tear can quickly occur here.



## CORROSION

Without radiator protection, ideal conditions for corrosion exist in a vehicle's cooling system. This is due to the high temperatures and the water used for cooling. To put it simply, corrosion means that substances react with their environment and are changed in the process. In the cooling system, this means that, for example, oxygen is formed which reacts with the various materials in the cooler. This can lead to a common form of corrosion - rusting. The metal changes color and becomes unstable and full of holes.

## COOLANT

A cooling system is necessary to dissipate the heat generated in engines by burning fuel. For this purpose, the so-called coolant is usually used in cars. Usually this is a mixture of water and an engine coolant concentrate. The misleading term cooling water is unfortunately also widespread.

Because of its properties as a coolant, water is ideal. It can both absorb and transport heat well. However, water without coolants should not be used as a coolant because it could damage the vehicle! At low temperatures the water expands by up to 10% and can therefore blow up the radiator and engine block. In this case there is a risk of major engine damage. At high temperatures, water as a coolant will not cool the engine sufficiently and therefore increases the risk of overheating. In addition, the risk of corrosion is very high because the high temperatures in the cooling system, together with water, offer ideal conditions for rust. High-quality coolants such as coolants ensure that the coolant cools the engine evenly in either heat or frosty conditions and protects the materials of the cooling system from corrosion with the help of an extremely durable protective layer. You should change the Radiator protection on your vehicle every three to four years.

# COOLANT – APPLICATION TIPS

- Incorrect coolant filling will damage the cooling system!
- Always completely replace the coolant during repairs, flush and clean the cooling system beforehand!
- For vehicles that are more than six years old, we recommend replacing the radiator protection every three to four years!
- Radiator protection is year-round protection!
- Never mix coolants of different types !
- Use clean water!
- Always follow the instructions of the vehicle manufacturer!
- Always observe the correct mixing ratio!



# COOLANT – QUESTIONS AND ANSWERS

## WHY DO COOLANTS NEED TO BE CHANGED?

Corrosive molecules are generated from the breakdown of the ethylene glycol contained in the engine coolant and the gradual breakdown of the additives and inhibitors it contains. The degradation is caused by the high thermal loads in the engine's cooling circuit. The engine coolant must be changed regularly after three to four years.

## CAN COOLANTS BE DISPOSED OF VIA THE SEWAGE SYSTEM (OIL SEPARATOR)?

NO. This would break the law, which leads to penalties.

## CAN COOLANT CONCENTRATES BE USED UNDILUTED?

NO, all radiator protection concentrates must be mixed with water. This is the only way to guarantee the desired cooler protection. An undiluted radiator protection product would not dissipate the engine heat sufficiently, which would result in the engine overheating. Undiluted concentrates can also freeze in winter.

## IN WHICH RATIO MUST IT BE MIXED WITH WATER ?

When using coolant products (concentrate), we recommend a mixing ratio of 50:50 (coolant / water) (- 40 degrees Celsius) or 40:60 (coolant / water) (- 25 degrees Celsius) to ensure optimal frost and corrosion protection. A maximum of 60% coolants can be used.

## CAN „NORMAL“ TAP WATER BE USED FOR DILUTION?

Distilled, demineralized or fully demineralized (deionized) water should preferably be used to mix the coolant. In many cases, drinking water is also suitable for this.

## WHAT DO THE RECOMMENDATIONS OF CAR MANUFACTURERS MEAN?

The automobile manufacturers do not make „recommendations“ for coolants, but only issue approvals or official approvals. Therefore, when buying, pay attention to the actually available approvals.

## HOW LONG DO COOLANTS LAST ?

In the originally sealed containers at least three years from the date of manufacture. In the vehicle - i.e. mixed with water - you should observe the information provided by the vehicle manufacturer.

## IS COOLANT HARMFUL TO HEALTH?

Coolants contain glycol / ethanediol and are harmful if swallowed. Avoid contact with skin and eyes. Keep out of the reach of children. If swallowed, seek medical advice immediately and show the packaging or label.

