



Coolant: Radiator antifreeze Frost and corrosion protection

General points

Coolant protects from frost, rust and overheating, and “lubricates” at the same time. Coolant is the generic term for the cooling fluid in the cooling system. Its task is to absorb the engine heat and discharge it via the radiator. The coolant is a mixture of tap water and anti-freeze (glycol/ethanol) plus various additives (bitter principles, silicate, anti-oxidants, anti-foaming agents etc.) and has been dyed. The bitter principles are to prevent anyone drinking the coolant by mistake. Silicates form a protective layer on metal surfaces and prevent limescale deposits, for example. Anti-oxidants prevent component corrosion. Anti-foaming agents prevent the coolant foaming. Glycol “lubricates” components, keeps hoses and seals supple and raises the coolant’s boiling point.



Mixing ability and mixing ratio

Coolants / anti-freeze can be dyed depending on the vehicle manufacturer and purpose of application.

The mixing ratio water/anti-freeze should be 60:40 to 50:50. This usually corresponds to anti-freeze protection from -25°C to -40°C . The minimum mixing ratio should be 70:30 and the maximum mixing ratio 40:60. A further increase in the share of anti-freeze (e.g. 30:70) will not lower the freezing point any further. On the contrary, anti-freeze used undiluted will freeze at around -13°C and no longer dissipates enough engine heat at temperature above 0°C , thus causing the engine to overheat. Since glycol has a very high boiling point, the right mixing ratio and respective excess pressure in the system can increase the coolant's boiling point to up to 135°C . This is





why a sufficient anti-freeze share is important in warm countries, too. Inhibited water (drinking water quality) should be used for refilling or preparing a coolant mixture. The mixed drinking water / tap water used may only have a water hardness of max. 20° dH. Otherwise demineralised or distilled water must be used. The specifications of the vehicle or coolant manufacturers must always be observed.

Additives / replacement intervals

The coolant or its additives are subject to a certain wear, i.e. a share of the additives is consumed over the years. If, for example, the corrosion protection additives have been degraded, the coolant can take on a brownish colour. For this reason, some vehicle manufacturers prescribe a fixed replacement interval for coolant (e.g. every 5 years for the Opel Sintra). However, the cooling systems of newer vehicles are being filled with "Long Life" coolants more and more often. Under normal circumstances, if no soiling occurs, no coolant replacement should be necessary (VW). In some Mercedes models, replacement is only prescribed after 15 years or 250,000 km. Different vehicle manufacturers have different specifications. Generally speaking, the coolant must be replaced if soiled (by oil, corrosion) and the coolant system must be flushed out (in this context, please refer to the Technical Information "Flushing the cooling system"). In the case of vehicles that are not filled with "Long Life" coolants, we recommend replacing the coolant every 3 years. The vehicle and coolant manufacturers' instructions must always be followed with regard to specifications, replacement interval, mixing ratio and mixing ability of anti-freeze / coolants.



Coolant is a health hazard and must not be allowed to get into the groundwater or must be discharged via the oil trap. It must be collected and disposed of separately according to valid conditions.