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Color isn't everything: topping up with the correct coolant

Topping up with coolant might seem straightforward, but choosing the wrong radiator concentrate can have serious consequences.

Engine coolant requirements

In addition to providing effective cooling, engine coolants must meet a range of other requirements:

- Good protection against freezing, cavitation, and corrosion
- Compatibility with metals, plastics, and rubber seals
- Prevention of foaming
- Prevention of deposits
- Increasing the boiling point

Coolant types

Modern coolants fall into three main categories:

- **IAT** (inorganic acid technology) coolants: these use inorganic acids, such as silicates.
- **OAT** (organic acid technology) coolants: these use organic acids and are therefore silicate-free.

- **HOAT** (hybrid organic acid technology) coolants: combining the benefits of IAT and OAT coolants, these use silicates, for example, for corrosion protection, but are enhanced by organic additives. This means that HOAT coolants can basically be mixed with coolants of all three types.

Preventable damage

Since there are no universal standards in place, coolant color is an unreliable guide for selecting the correct type. To prevent damage, we recommend using only coolants that meet the specific requirements set by the vehicle manufacturer. Mixing coolants with other additives can lead to the formation of corrosive acids or clumps. These acids may corrode engine components in contact with the coolant, while clumps can clog the narrow cooling galleries within the engine block. This can drastically reduce cooling performance, causing localized overheating and potentially leading to engine damage.

		Initial filling/series application/currently in the coolant circuit					
		G11 from 1994	G12 from 1996	G1+ from 2000	G12++ from 2005	G13 from 2012	G12evo from 2019
Coolant for topping off	G11						
	G12						
	G12+						
	G12++						
	G13						
	G12evo						

Figure 1: Coolant table of coolant variants that can be mixed

- can be mixed in any ratio
- can be mixed, but corrosion protection will deteriorate (no guarantee of service life)
- cannot be mixed



Figure 2: Coolant variants from left to right IAT, OAT, HOAT



Figure 3: Barely distinguishable in color: OAT (left) and HOAT (right).

Important!

Color alone cannot reliably indicate the type of coolant in a vehicle. In emergencies, only distilled water should therefore be used for refilling. To avoid damage, use only coolants that meet the manufacturer's specifications.