

Not all coolants are the same!

We explain the different standards

Many vehicle manufacturers have formulated their own requirements for a coolant, which have been laid down in various standards. A very important point, however, is that these agents cannot all be mixed with each other! In the worst case, mixing different coolants can cause engine damage. The most important technologies are therefore explained below.

OAT „Organic Acid Technology“

The OAT agents are free of silicates. These products are radiator antifreeze agents that are usually coloured red. This agent is mainly used in aluminium radiators. An organic acid is used to produce the agent.

Si-OAT or IAT „Inorganic Acid Technology“

This coolant is an inorganic acid. It is based on a silicate, which means it is a silicate-containing coolant and can be recognised by its blue or bluish-violet colour.

HOAT „Hybrid Organic Acid Technology“

HOAT, i.e. a hybrid radiator antifreeze, is an agent that is coloured orange or yellow. The hybrid radiator antifreeze contains silicates. The advantages of the two other coolant technologies are combined in this product.



Development of standards

The Volkswagen Group has been particularly involved in the development of coolants and their standards (in cooperation with Haertol Chemie from Magdeburg), which is why they have named them. VW standards are: G11, G12, G12+, G12++, G13 and G12evo. Another group that has been involved in development is BASF (Glysantin), whose standards are: G05, G30, G33, G34, G40, GG40, G48, G64 and G65.

In the past, the typical coolant contained just these silicates (G11 or G48). Although the silicate prevents aluminium corrosion (build-up of an Al-silicate protective layer on aluminium parts), it degrades quickly and must therefore be renewed regularly. At some point, however, VW and others came up with the idea of using organic compounds for corrosion protection instead of silicate, as these last longer.

Dangerous mixture

Since these two standards are not compatible, however, problems have increasingly arisen due to confusion and ignorance. When G11 and G12 are mixed, aggressive acids are formed on the one hand, and on the other hand the coolant can clump and clog channels. Therefore, G12+ (equivalent to G30) was developed, which is silicate-free but miscible with the others.



Original VW G12++ bottle

Range of febi coolants

| febi | Colour | to fit VW | to fit Glysantin | to fit others | Silicate share [mg/l] | Glycerol share [%] | Comment |
|--------|--------|-----------|------------------|---------------|-----------------------|--------------------|-------------------|
| 01089 | Blue | G11 | G48 | — | 500-680 | 0 | — |
| 02374 | Yellow | — | G48 | Type D | 500-680 | 0 | Only Renault |
| 01381 | Red | G12 | — | — | 0 | 0 | — |
| 19400 | Violet | G12+ | G30 | — | 0 | 0 | Replaced in G12++ |
| 37400 | Violet | G12++ | G40 | — | 400-500 | 0 | Replaced in G13 |
| 38200 | Violet | G13 | GG40 | — | 400-500 | 20 | — |
| 183366 | Violet | G12evo | G65 | — | 430-530 | > 90 | Latest version |
| 183409 | Green | — | G64 | 18 LC | 430-530 | > 90 | Latest version |

Then came G12++ (equivalent to Glysantin G40), which was filled in all VW/Audi vehicles and was said to have the following advantages over G12+: better corrosion protection, higher boiling point (135°C), better heat dissipation, lifetime filling for grey cast iron and aluminium engines.

In the meantime, VW has replaced G12++ with G13, which is no longer based on glycol (obtained from crude oil) but on glycerine (from biological waste products), which is cheaper for VW (production) and more environmentally friendly, also because approx. 11% CO₂ is saved during production. The latest version G12evo has replaced G13 in 2018. It is more efficient than G13, especially with regard to the freezing point. VW thus releases the G12evo coolant ready-mix for undiluted use down to a temperature of -35°C. The 18 LC standard is similar to the G12evo. It was developed according to the special demands of some vehicle manufacturers and is also suitable for modern hybrid and electric vehicles.

When refilling is necessary

The coolant required by a vehicle can usually be found in the vehicle's documentation. Even the colours of coolants from different manufacturers are not a clear indication of the ingredients. In case of doubt, however, a workshop should be consulted.

If the right coolant is not available, filling up with pure water (at least at temperatures above freezing) is the better choice. The coolant should then be replenished or replaced with the appropriate coolant in the short term. Operation exclusively with coolant is not recommended, as the freezing point of the pure coolant is reached too early and the boiling temperature and heat dissipation are reduced. Likewise, coolant should not be dispensed with even in summer, as it also prevents corrosion and silting of the cooling system. The water/coolant mixture ratio should therefore be between 40/60 and 60/40 for most coolants.

Change intervals

The coolant has a certain amount of wear. Some of the inhibitors are consumed over time. Therefore, the coolant loses frost and corrosion protection as well as lubricating effect and thermal conductivity. Foaming and deposits may also occur. The durability of a coolant depends on its quality and the cleanliness of the entire cooling system. Wear is particularly intense if a leak occurs or exhaust gases enter the cooling system (e.g. due to a defective cylinder head gasket). For this reason, the coolant should be checked regularly and replaced if necessary.

Tip: It is essential to observe the vehicle manufacturer's specifications, change intervals, miscibility and mixing ratio! Do not forget: An existing coolant filter must also be changed according to the manufacturer's specifications.



The entire range of fluids can be found at: [partsfinder.bilsteingroup.com](https://www.partsfinder.bilsteingroup.com)

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