

## GEA charge air cooler

Innovations that put big things into motion

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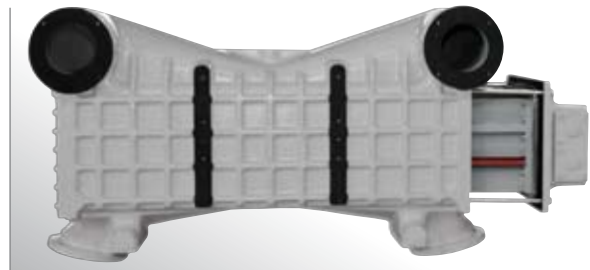
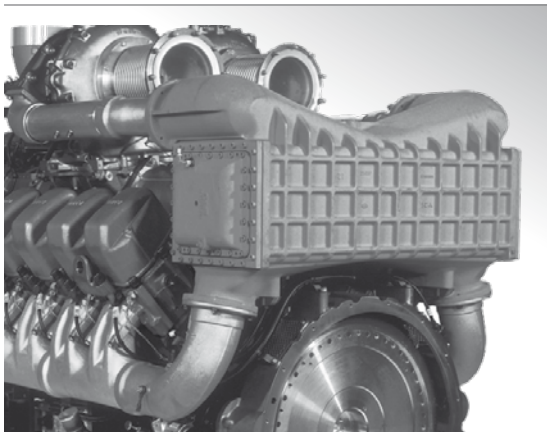
## Charge air cooler in general

GEA Maschinenkühltechnik – Established component developer

For many decades GEA Maschinenkühltechnik has been one of the world's leading specialists in the development and manufacture of charge air coolers for stationary and mobile onshore/offshore applications for engine outputs above 200 kW.

Our success is based on the continual and innovative further development of proven systems as well as on groundbreaking ideas and their successful implementation.

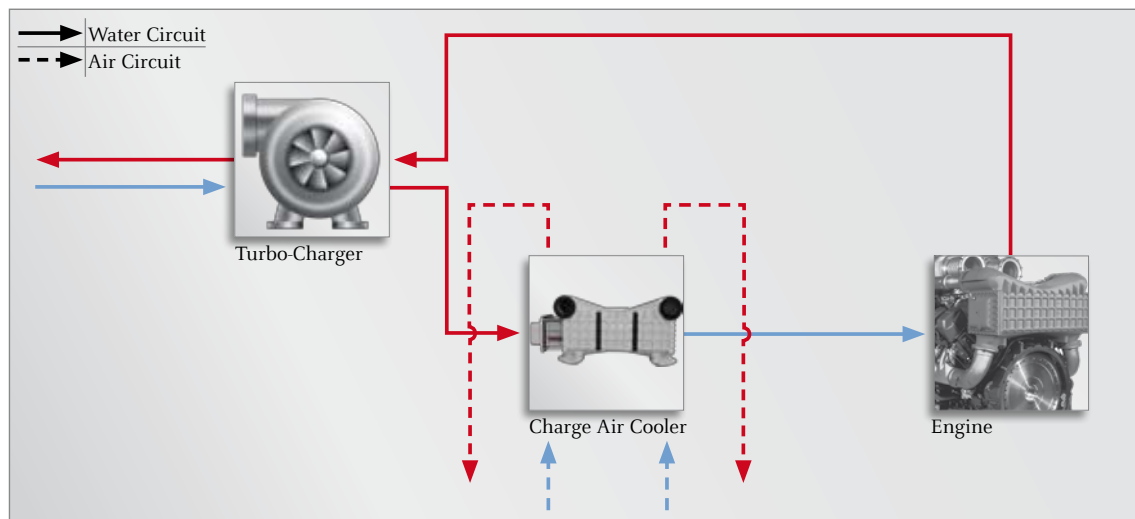
GEA cooling systems are matched to the different requirements, circumstances and environmental factors.



As a specialist, GEA Maschinenkühltechnik has a number of concepts for optimising the heat conduction according to the application.

Global cooperation with the approval and classification authorities (such as LRS, GL, BV, etc.) means we can also certify the charge air coolers to Inspection Certificate 3.1 based on EN 10204 on request.

The high degree of flexibility allows us to adapt to the principle ideas of the engine manufacturer and, hence, we are able to design individual charge air coolers as block, case or slide-in coolers as well as special models.



## Mixed gas coolers/stainless steel

Coolers for special gas engines

Compared to other fields the special gas sector is still very new. The challenges that the industry has to face in distributed energy generation include:

- relatively uninvestigated and difficult to regulate fuels
- extremely high stresses on the material (thermal, mechanical and chemical)

Thanks to the use of special materials, the latest coating technology and new finned tube systems GEA coolers can also be used in the field of special gases.

Coating of the finned tubes

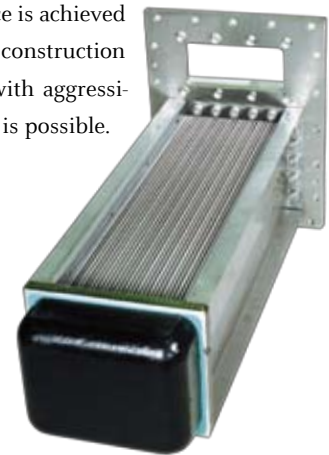
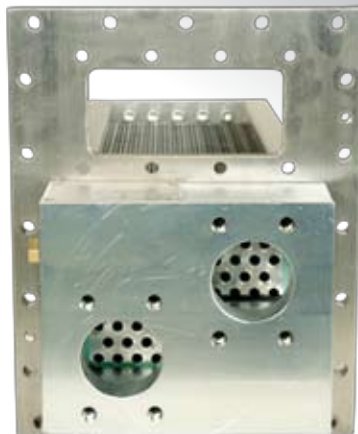
The following coating materials are available for improving corrosion resistance in special applications:

- Delta Seal · KTL · Tinning

Stainless steel finned tube

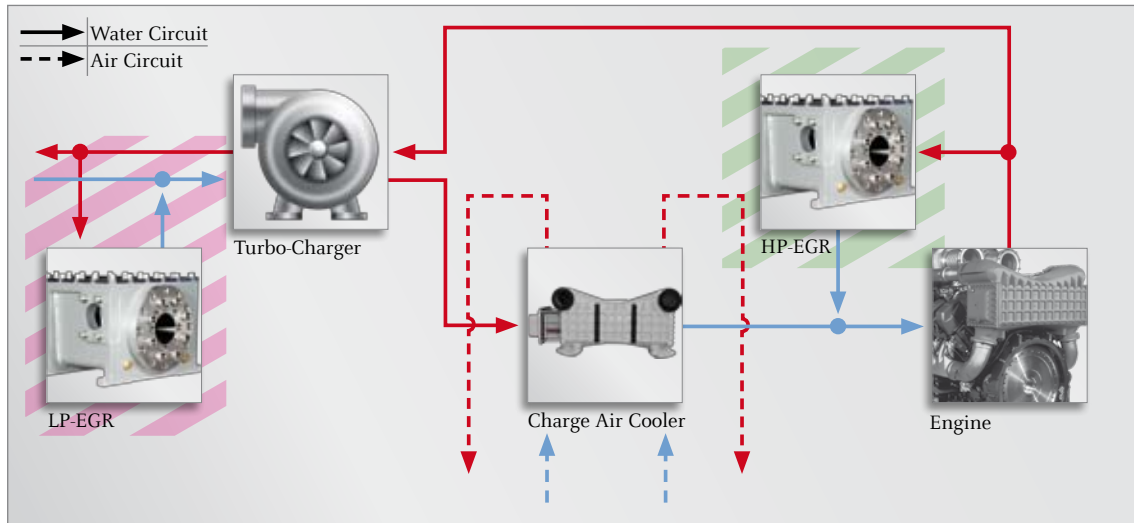
By choosing stainless steel as the basic material of the finned tube system, corrosion resistance is significantly increased compared to any material used to date. The mixed gas cooler based on stainless steel is eminently predestined for aggressive accompanying substances of the mixture to be cooled. The rate of contamination is minimized which, through innovative optimisation of the fin geometry (fins with turbulators), generates a balanced distribution of laminar and turbulent flows and which is associated with minimum pressure loss.

High material resistance is achieved thanks to the special construction where even cleaning with aggressive cleaning substances is possible.



## EGR – Exhaust gas recirculation cooler

The development for the future





The exhaust gas recirculation cooler (EGR cooler) is the latest development in the field of emission reduction. It complements the existing exhaust gas recirculation with the aim of reducing NO<sub>x</sub> emissions (within the engine) and, hence, complies with the emission directives according to IMO, TIER, EURO, etc.

By recirculating the cooled exhaust gas in the combustion chamber, the combustion temperature is further reduced and the formation of NO<sub>x</sub> emissions is effectively minimized in comparison to the conventional EGR system. No operating materials are necessary and the design can fully comply with customer specifications.

Stringent requirements are placed on the exhaust gas recirculation cooler such as extreme temperatures (up to 700 degrees Celsius), sulphurous exhaust gas as well as contamination by soot particles.

The cooler is available in the following two versions:

-  Low-pressure: removal of the exhaust gas after the turbocharger
-  High-pressure: removal of the exhaust gas before the turbocharger



## Function of the charge air cooler

Designed for specific engine models

The GEA charge air cooler shown here has been specially designed to the „Mining Truck“ requirement profile specified by the customer. The challenge of orientating the cooler to the special environmental conditions in mines around the world is one of the strengths that GEA Maschinenkühltechnik brings to its projects.

