

# **Automotive Charge Air Cooler Market by Type (Air-cooled, Liquid-cooled), Position(Integrated, Standalone), Design(Tube & Fin, Bar & Plate), Fuel Type(Gasoline, Diesel), Vehicle(PC, LCV, Truck, Bus), Material, Sales Channel & Region-Global Forecast to 2026**

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## **Abstracts**

Automotive charge air cooler market is estimated to be USD 2.8 Billion in 2021 and is projected to grow to USD 3.9 Billion by 2026, at a CAGR of 7.1% during the forecast period.

Today, the automotive industry is taking significant steps toward more stringent emission regulations and fuel consumption, which has resulted in increased demand for components and modules to control air intake temperature in conventional vehicles. This factor is expected to drive the demand for charge air coolers significantly during the forecast period.

Automotive charge air coolers are used to reduce fuel consumption and CO2 emissions in combination with turbocharging. These components maintain and improve power output and torque in vehicles. As the degree of turbocharging increases, the necessity of cooling the heated air grows. Thus, charge air coolers play a critical role in cooling the engine. With the trend of engine downsizing in the automotive industry, automakers and manufacturers are focused on reducing fuel consumption and increasing efficiency of vehicles.

In vehicles, charge air coolers primarily function on increasing engine combustion efficiency. Government regulations of carbon emissions and rising performance demand

for ICE vehicles is growing significantly. Companies such as MAHLE GmbH, Modine Manufacturing Company, and Dana Incorporated are some of the leading manufacturers of thermal systems like charge air coolers, battery coolers, coolant pumps, and EGR coolers in automotive and other industries. The latest stage of development at MAHLE includes indirect cascaded charge air cooling integrated into the intake pipe. This system provides minimal pressure loss and significant packaging advantages. It produces charge air temperatures close to that of the coolant by using a two-stage cooling process.

#### “ADVANTAGES OVER LIQUID-COOLED CHARGE AIR COOLERS TO DRIVE THE SEGMENT”

Air-cooled charge air cooler, as the name suggests, uses air as a medium for cooling the charged air coming from the turbocharger. This type of charge air cooler works by passing the charged air through a network of small tubes, followed by a series of cooling fins. The heat is transferred from the hot compressed air into the cooling fins that are further cooled by the airflow coming from outside of the vehicle.

Air-cooled charge air coolers are more popular than liquid-cooled charge air coolers. Some of the prominent advantages of air-cooled coolers include design simplicity, low cost, lightweight, easy function, and higher reliability. This makes these charge coolers suitable for use across all vehicle segments. In addition, the cooling provided by these air coolers is fairly good, making them the preferred choice of OEMs. Thus, operational and cost advantages, along with fairly high efficiency, would ensure steady growth for air-cooled charge air coolers during the forecast period.

Asia Pacific is the largest market for air-cooled charge air coolers, accounting for over 56% of the total air-cooled segment. The market here is primarily driven by China, India, Japan, and South Korea, which have high automotive production of passenger cars as well as commercial vehicles. With the growing penetration of turbochargers in gasoline vehicles, along with the price-sensitive nature of the region, Asia Pacific would retain its dominant position in the air-cooled automotive charge air cooler market.

#### “INCREASING ADOPTION OF HVAC SYSTEMS TO DRIVE THE FIN & TUBE SEGMENT”

A fin & tube heat exchanger typically has tubes with fins attached to the outside. In this type of charge air cooler, the heat transfer rate is greater due to the liquid flowing through the inside of the tubes for heat transfer and the additional heat transfer surface

area due to the fins. Fin & tube type is the most widely used heat exchangers in the automotive domain. This type of heat exchanger is used in car radiators and condensers and evaporator coils of HVAC systems. The increasing adoption of HVAC systems in developing countries is driving the market for fin & tube charge air coolers.

Asia Pacific leads the fin & tube segment of the automotive charge air cooler market. These charge air coolers are mostly used in passenger cars and some LCVs. Due to high production of passenger cars, especially in China, Asia Pacific is expected to continue dominating the market throughout the forecast period. North America is expected to register the highest growth rate due to the growing penetration of turbochargers in gasoline passenger cars, thereby driving the fin & tube segment.

#### “GOVERNMENT ENCOURAGEMENT TO REDUCE EMISSIONS TO DRIVE THE GASOLINE SEGMENT”

Gasoline engines are mostly used in passenger cars and light-duty vehicles. The usage of gasoline in heavy commercial vehicles is virtually zero. North America and Asia Pacific are the largest markets for gasoline passenger cars. The use of turbochargers in gasoline vehicles is a new trend to reduce emissions and increase the efficiency of the vehicle. The application of turbochargers in passenger cars in North America and Europe is high because of strict emission regulations.

Stringent environmental norms on vehicle emissions have led to the adoption of gasoline systems. The governments of various countries plan to phase out diesel vehicles in the long term. With plans to phase out diesel cars, gasoline cars are expected to gain more prominence during the forecast period. In addition, increasing turbocharger usage would ensure continued demand for charge air coolers in the years to come.

The usage of gasoline engines is projected to increase at a substantial rate due to the decrease in the price of technology and new emission regulations, which will encourage OEMs to increase the penetration of turbochargers in gasoline passenger cars.

The study contains insights from various industry experts, ranging from component suppliers to tier 1 company and OEMs. The break-up of the primaries is as follows:

By Company Type: Tier 1 - 34%, Tier 2 – 59%, Others - 7%

By Designation: C level - 26%, D level - 43%, Others - 31%

By Region: Asia Pacific- 35%, North America - 26%, Europe - 39%, Middle East and Africa -14%, RoW-10%

Major players profiled in the report are MAHLE GmbH (Germany), T. RAD Co. Ltd. (Japan), Dana Incorporated (US), Valeo (France), and Modine Manufacturing Company (US).

### Research Coverage

The report segments the automotive charge air cooler market and forecasts its size, by value and volume, on the basis of type (air-cooled charge air cooler and liquid-cooled charge air cooler), fuel type (gasoline and diesel), design (fin & tube and bar & plate), vehicle type (passenger cars, light commercial vehicles, trucks, and buses), position (standalone and integrated), material [aluminum, stainless steel, copper, others (plastic, reinforced fiber etc.)], sales channel (OEM and aftermarket) and region. It also covers the competitive landscape and company profiles of the major players in the automotive charge air cooler market ecosystem.

### Key Benefits of Buying the Report:

The report will help market leaders/new entrants in this market with information on the closest approximations of revenue and value for the automotive charge air cooler market and its sub segments.

This report will help stakeholders understand the competitive landscape and gain more insights to better position their businesses and plan suitable go-to-market strategies.

The report will also help the market players understand the impact of COVID-19 on the automotive charge air cooler market.

The report also helps stakeholders understand the pulse of the market and provides them information on key market drivers, restraints, challenges, and opportunities.

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