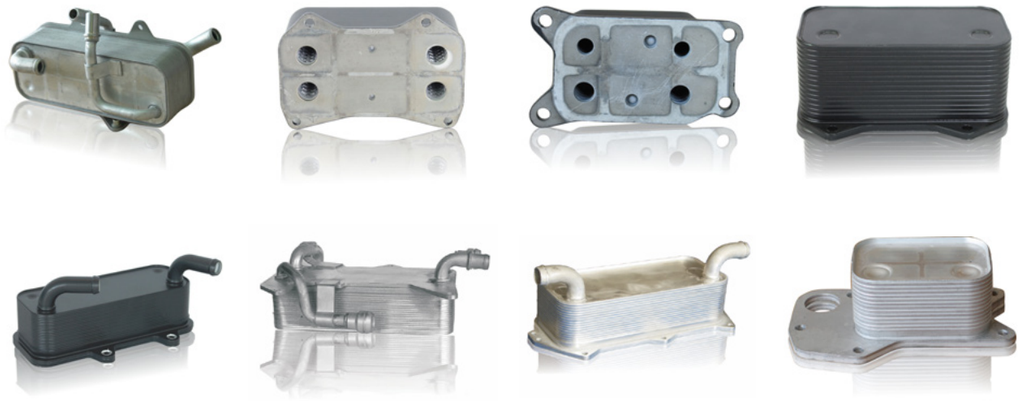
RAAL®

complete cooling solutions

Cooling solutions for AUTOMOTIVE

RAAL manufactures heat exchangers in brazed plates constructive solution for: automobiles, motorcycles, ATV's, water scooters, aircrafts, etc.



RAAL Brazed Plates heat exchangers have been designed to increase the thermal performances in the fluid-to-fluid cooling applications. This type of heat exchangers are entirely made of aluminium alloys using controlled atmosphere brazing technology. Different working fluids can be used: water, oil, air, refrigerant, etc.
The Brazed Plates design can be used for the various types of heat exchangers.

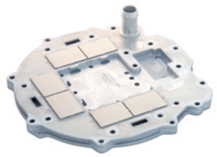
• Water Cooled Oil Coolers (WCOC):

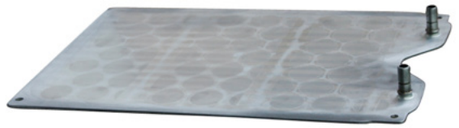
Transmission Oil Coolers (TOC), Engine Oil Coolers (EOC), Clutch Oil Coolers (COC), Retarder coolers

• Water Cooled Charge Air Coolers (WCAC) • Evaporators • Fuel Heaters for eco-diesel

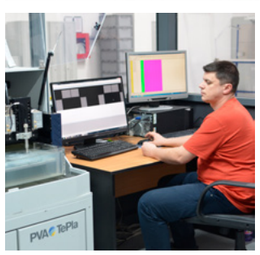
RAAL has a dedicated manufacturing hall for the production of heat exchangers in brazed plates constructive solution.

RAAL manufactures HEAT SINKS, COLD PLATES, BATTERY COOLERS for hybrid and electric cars





RAAL has recently opened a new production hall dedicated to the production of heat exchangers designed for cooling of electronic circuits and batteries for hybrid and electric vehicle applications.



RAAL manufactures cooling systems and individual heat exchangers for applications in automotive industry: radiators, oil coolers, air coolers, fuel coolers, heaters, condensers, evaporators.

Applications: cars, motorcycles, karts, ATV's, water scooters, snowmobile, aircrafts.

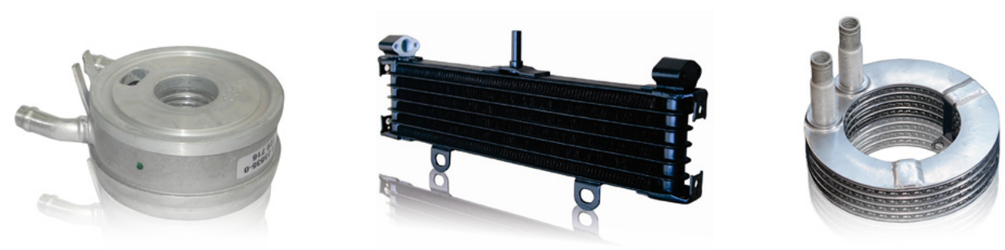
TUBE&FIN RADIATORS

TUBE&FIN INTERCOOLERS

Features of **RAAL** cooling systems for automotive

- high cooling performance
- various available constructive solutions & configurations
- high resistance to dynamic thermal loads
- compact construction
- low maintenance costs
- reliability

SHELL TYPE OIL COOLERS



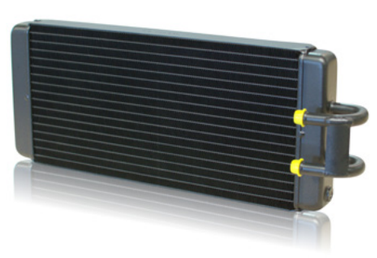
PLATE&BAR OIL COOLERS

IN-TANK PLATE OIL COOLERS

BRAZED PLATES OIL COOLERS

CONDENSERS (parallel flow)

HEATERS



ENGINEERING

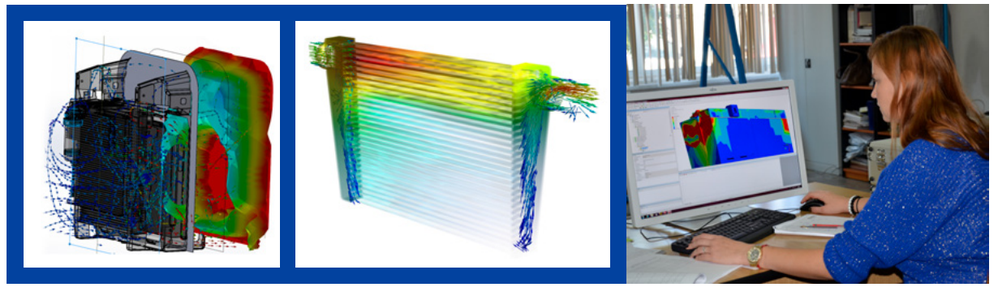
RAAL is an integrated company, all activities (manufacturing, design, testing, etc.) being carried out "in house". This competitive advantage provides both a very short development and assimilation cycle in production of new products as well as short term manufacturing and supply of series production.

• Design, calculation and simulation

RAAL uses its own dimensioning software for heat exchangers, software developed in-house based on theoretical studies and thousands of tests performed.
RAAL uses FEA (Finite Element Analysis) to simulate the structural, flow and vibration stress conditions.

• Product design

RAAL has vast experience in designing heat exchangers and cooling systems. Starting from the specifications, dimensions or CAD data of the application, **RAAL** designers are able to find the best solutions for the most efficient use of the available space.
RAAL designers have the ability to continuously optimize the products, so as to fully meet the requirements of the application.



• Testing and validation

RAAL Testing Center is the facility where the validation of new products is performed. Based on technical specifications or on the parameters obtained by means of DAQ performed on customer equipment, the heat exchangers are tested for performance and strength.
RAAL Testing Center capabilities:

- thermal and fluid-dynamic performance tests on the wind tunnel
- durability tests: thermal cycle, pressure cycle, burst pressure, performed at ambient or at high temperatures in the climate chamber
- durability tests: shock and vibration
- internal cleanliness tests
- chemical and accelerated corrosion tests
- metallographic studies

• Tools and equipment

RAAL engineers have a vast experience in tool and die design, and in designing the specific equipment necessary for the manufacturing process.
RAAL places special importance on the design, manufacturing and optimization of the new generation of fin forming machines, which provide a wide range of fins and turbulators.

QUALITY

All **RAAL** products are manufactured in compliance with the following standards:

ISO 9001:2008 and **ISO/ TS 16949:2009** - Quality Management System.
EN ISO 14001:2004 - Environmental Management System
OHSAS 18001:2007 - Occupational Health and Safety Management System

Main Factories

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