



Automotive

A New Stainless Steel Grade for EGR Cooler Applications

Location	Europe, USA
Environment	Outdoor
Fabrication process	Drawing and brazing
Grade/surface	EN 1.4521 (K44X)/2D
Main thickness or diameter	From 0.15 to 1.5 mm
Manufacturer	European & American automotive sub-suppliers
Material supplier	Aperam Stainless Europe
Source of information	Aperam

The Exhaust Gas Recirculation (EGR) Cooler is an air-to-liquid heat exchanger device that uses engine coolant to reduce the temperature of exhaust gases prior to recirculating them through the engine's intake system. EGR reduces engine combustion temperature, which prevents the formation of nitrous oxide (NO_x). The material used for this type of application must be capable of tolerating very high temperatures and very corrosive conditions. The new 1.4521 (K44X) ferritic stainless steel developed by Aperam fully meets these requirements. This material is a high chromium molybdenum niobium stabilised ferritic grade which offers excellent high temperature properties (cyclic oxidation, creep and thermal fatigue resistance), a low thermal expansion coefficient and very good brazability and formability. Furthermore, the molybdenum content provides a high corrosion resistance. This stainless steel grade offers an optimized solution for the different EGR cooler parts such as thin wall tubes, gas exchange plates and diffusers. An added advantage is that the high mechanical properties contribute to weight savings. Aperam is developing solutions for future EGR coolers both for the diesel low pressure EGR systems (severe corrosion conditions) and the high pressure gasoline cooled EGR (higher temperatures compared to diesel EGR).

