

## Issue no. 02/2025

### Radiator quality and performance: is heavier and bigger always better?

*It is often assumed that radiators that weigh less or have a shallower core depth are of lower quality or offer inferior performance. But what do the facts reveal?*

#### The manufacturing process is key

Depending on the production method, a basic distinction can be made between brazed and mechanically joined radiators. In brazed radiators, the cooling fins and the tubes through which the coolant flows are brazed to form a solid unit. In mechanically joined radiators, on the other hand, stamped cooling fins are attached to tubes. As a result, the cooling fins in mechanically joined radiators can be positioned much closer together than the rolled corrugated fins used in brazed models. Both types of radiators operate according to the same principle: air flowing past the cooling fins (the core) absorbs heat from the coolant.

Whether the coolant flows vertically (downdraft) or horizontally (crossflow) has no impact on the effectiveness of the cooling.

#### Advantages of mechanically joined radiators

Due to the smaller distance between the cooling fins, mechanically joined radiators offer the same cooling capacity within a smaller space. As a result, the core depth can be reduced while maintaining the same radiator width and length. This is an advantage for several reasons. Firstly, a reduced core depth ensures that radiator connections fit perfectly. Secondly, in modern vehicles, where several radiators are sometimes installed side by side, a shallower core saves valuable space in the engine compartment. Since there is no need for brazing, joined radiators can also be manufactured in a more cost- and energy-efficient way. And they offer the same performance while weighing less.

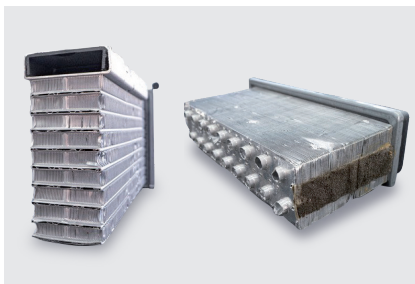


Figure 1: Sectional view of a brazed (l) and mechanically joined (r) radiator

	Mechanically joined	Brazed
Tube	Oval or round	Braze-clad flat tubes, reinforced by pleating or beading
Fins	Stamped, attached	Rolled corrugated fins
Assembly	By expanding the pipes and attaching	By brazing
Other	Lower weight	<ul style="list-style-type: none"> <li>One flat tube is usually sufficient for the entire system depth</li> <li>The height of the component determines the number of flat tubes</li> </ul>

Figure 2: Differences between mechanically joined and brazed radiators

#### Important!

Weight and core depth do not indicate the quality of a radiator. Mechanically joined radiators offer at least the same cooling capacity as a comparable brazed radiator, but with a reduced core depth and less weight.