

Transportation - Rail Transport

Arguably, passenger safety is the foremost consideration when designing passenger railcars. Thankfully, serious collisions are very infrequent these days, but higher operating speeds increase the likelihood of injury when they do occur.

Many railcar operators have chosen to construct carriages from austenitic stainless steel, in preference to alternative materials such as carbon steel and aluminium alloys, and this choice carries several safety-related benefits:

- high energy-absorption at impact
- a greater level of fire-resistance
- less likely than carbon steel to be weakened by corrosion.

It is important, however, to recognise that increased passenger safety does not have to carry a cost penalty. Although stainless steel is inherently more expensive than some competing materials, its strength and corrosion-resistance enable thinner sections and panels to be used, which makes it more cost-competitive. In some cases, operators may choose to leave all or part of the carriages unpainted, which offers further savings in cost and weight.

A further attraction of lighter railcars is their impact on operating costs. Significant energy savings, especially on “commuter” and “metro” routes, result from overall weight savings.

In some cases, stainless steels such as the ferritic 12% Chromium types, have even been employed for the rail transportation of freight where they directly compete with carbon steels.

In this section, further details can be found of the experience gained from stainless steel passenger and freight railcars over many decades, and of their relative performance in terms of safety and economics.