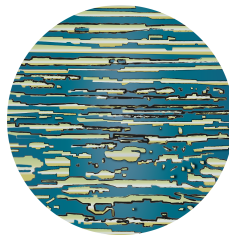


# Light and resistant



Increasingly used, especially in the railway sector, duplex stainless steel stands out for its mixed microstructure - austenite and ferrite - which gives it superior mechanical properties compared to other stainless steels.

**The result? Thinner thicknesses can be used without compromising structural integrity, resulting in lighter but equally strong components.**



Austenitic-ferritic structure

These characteristics mean that duplex grades are selected for applications that must withstand intense stresses with the lowest possible weight. In the case of rail transport, it is used in structures of wagons or fastening systems subjected to vibrations. By reducing the overall weight without losing performance, the energy efficiency of the system is also improved.

Another strength of duplex is its excellent resistance to chloride and stress corrosion - crucial in aggressive environments such as maritime or rail transport. **What does this mean in practice? Less maintenance, lower operating costs, and higher availability of equipment throughout its lifetime.**

## In addition, duplex provides a safety bonus:

Its energy absorption capacity and fire resistance make it a reliable option for designing durable, safe, and efficient solutions.

Among the most commonly used grades in this field, grade 1.4162 (S32101) stands out. This low alloy stainless steel, known as lean duplex, combines strength and versatility. In addition to transportation, this duplex finds applications in storage tanks, piping systems, the paper and pulp industry, the oil & gas sector, and even in domestic heaters. Its high chromium content gives it excellent resistance to general corrosion, and it can be easily welded by methods such as MMA/SMAW, TIG, MIG, SAW, FCAW or laser, with appropriate precautions in each case. Due to its austenite-ferrite structure, it does not present common problems such as solidification cracking, grain growth or martensitic transformations.



With these features, duplex stainless steels are consolidating as a key tool for engineers and designers looking for resistant and versatile materials to face the challenges of modern transport. Are you already counting on them in your projects?

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