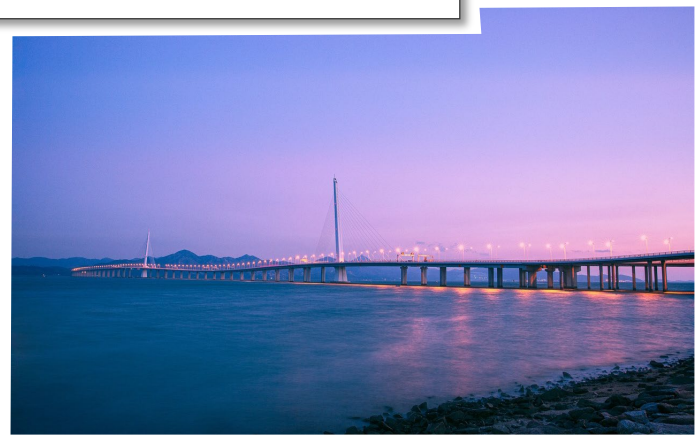
SIDERVAL
SPECIAL PROFILES IN STEEL

Mech. Engineering & Manufacture

Hybrid Profile in Stainless and Carbon Steel for Corrosion Resistance

Profile:
Special Composite Profile
Material grade:
Carbon & Stainless Steel
Execution:
Hot Extrusion + Laser Welding
Destination:
Worldwide

BACKGROUND

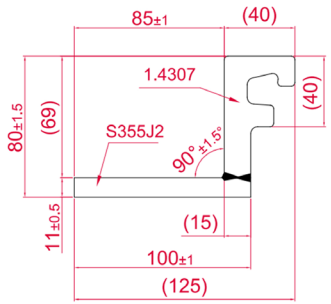


The customer turned to **Siderval** because we have been supplying a similar profile entirely made of carbon steel for some time.

However, in this specific case, the operating conditions required greater **corrosion resistance**, making the use of stainless steel necessary in at least part of the component.

Producing the entire profile in stainless steel would have resulted in a cost that was too high for the customer, who therefore proposed purchasing **two separate profiles** — one in stainless steel and one in carbon steel — to be welded together later at their own facility.

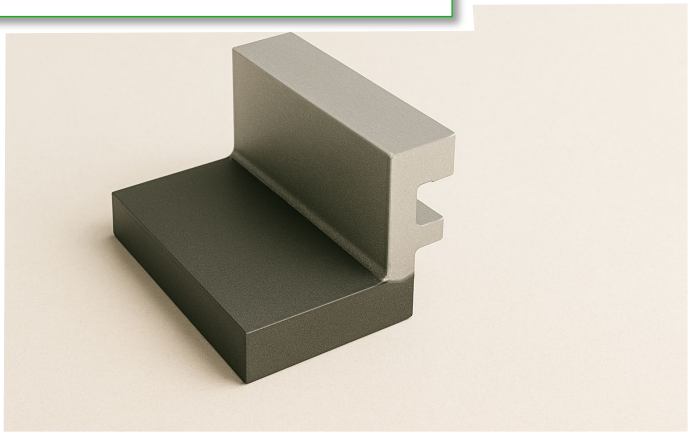
CHALLENGE



Manufacturing a **hybrid profile** combining stainless steel and carbon steel involved a series of technical and production challenges, which we addressed with tailored solutions.

- Welding materials with different thermal behaviors while maintaining joint quality.
- Ensuring **tight dimensional tolerances** along the entire profile length.
- Avoiding deformation during post-weld cooling.
- Guaranteeing perfect straightness on 6-meter-long bars.

SOLUTION



We proposed a more efficient alternative: the in-house production of a single **hybrid profile**, achieved through laser welding between an AISI **304L** stainless steel extrusion and a carbon steel **S355J2** flat bar. This configuration allows the stainless steel to be positioned only where corrosion resistance is needed, keeping costs under control by using the noble material selectively. The extrusion was carried out at Siderval, while the laser welding process was performed at **Montanstahl**, demonstrating the synergy within the group. The welding ensures a precise and low-heat-input joint, enabling the customer to receive a finished product that is ready for installation and fully compliant with dimensional specifications. The result is a reliable, functional, and **cost-effective** component, optimized both technically and economically.