



6 Welding processes

The joint can be considered in two parts – the root and the fill. The welding process and consumable selection should reflect this. The root requires a controllable welding process and filler capable of delivering the necessary corrosion resistance. The welding process for the filling runs can be selected to provide maximum productivity, and the consumable selected to deliver the required mechanical properties (strength and toughness). The range of suitable welding processes are summarised on the following page:

Welding Duplex Stainless Steel Pipework

Which welding processes fit ?

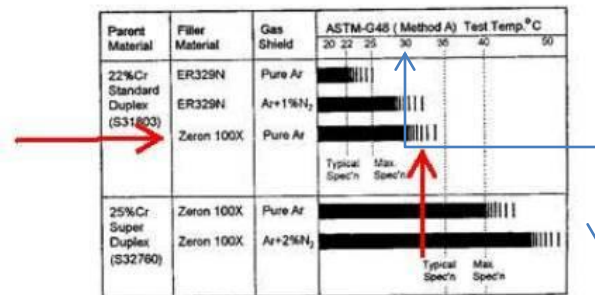
Single-side V-butt joints

Downhand eg. 1G / 1G R		Fixed Positional eg. 2G / 5G / 6G
GTAW (manual / mech) PAW (mech) PGMAW (mech)		GTAW (manual) PGMAW (mech)
GTAW (manual / mech) SMAW (mech) PGMAW (mech) FCAW SAW		GTAW (manual) SMAW (mech) PGMAW (mech) FCAW

7 Root welding

Filler wire must always be added, root runs should not be made autogenously. Because of the control it allows root runs are nearly always deposited using the TIG process. The root run is critical in order to achieve good corrosion resistance so care should be taken to ensure the root is deposited correctly. The aim should be to add as much filler as practical within the heat input restrictions that are imposed. As a guideline the root run thickness should be ~2mm on thin wall tube (3-4mm) rising to 3 or 4mm as pipe thickness increases.

To ensure good corrosion properties (and good G48A performance) on 22%Cr duplex a superduplex filler wire is often used for the root run; this approach is recommended for G48A tests at +25°C. To optimise root corrosion performance in superduplex base material the superduplex filler can be used in conjunction with argon 1.5-2.5% nitrogen shielding gas; this approach is recommended if G48A testing is required at +40°C.



This arrow points to the 30 C mark. Now look how far past the black line goes past the blue line with the arrow right on the 30 C mark!