



STAINLESS STEEL WATERSTOP JOBSITE GUIDE

WESTEC STAINLESS STEEL WATERSTOPS are for use in concrete joints subjected to severe chemical, ozone, or high temperature exposure. Embedded in concrete, stainless steel waterstops span the joint to form a continuous, watertight diaphragm that prevents the passage of fluid. The waterstop must be designed and installed properly to accommodate joint expansion, contraction and other lateral and transverse movements.

FORMING AND POSITIONING REQUIREMENTS

Stainless Steel waterstops are installed prior to the initial concrete pour to ensure proper positioning. Split formwork is generally required. This allows half of the waterstop to be positioned inside the first pour with the other half projecting into the second pour. The centerline of the waterstop should be aligned to coincide with the center of the joint. The split form should firmly hold the waterstop in position to prevent misalignment of the waterstop during concrete placement. A tight fit is also necessary to prevent excessive leakage of concrete paste, which could lead to honeycombing of the concrete. When installed in joints with expected movement, a 2" wide strip of duct tape should be placed over the center "V" section to prevent concrete paste from filling the "V" area.

Once embedded in the first pour of concrete, the rigidity of the waterstop offers sufficient support to withstand the second placement of concrete. Attachment to surrounding formwork or reinforcing steel is not generally required.

SPLICING REQUIREMENTS

Continuity of the waterstop, including the flanges and the centerline "V" section, is critical for optimum performance. Continuity should be maintained through changes in

direction, intersections, and transitions by the use of mitered welds. Poorly constructed intersections and splices are prime locations for leaks. Riveting or bolting of the waterstop should never be permitted. Properly constructed mitered welds should be performed by a qualified welder using proper TIG welding equipment.

TIG is extremely well suited to join thin sheets since the heat input in this process is small and the chance of "burn through" is minimal. TIG welds do not create undercuts or excessive penetration, with lowest distortion when compared to any other welding process. For this reason, "stick welding" or Shielded Metal Arc Welding (SMAW) are not recommended splicing methods.

Properly cutting and fitting mitered ends of the stainless steel waterstop is difficult and best performed under controlled conditions in a shop environment. It is therefore WESTEC'S recommendation that factory fabrications be used for all changes in direction, intersections and transitions, leaving only straight end-to-end splices for field welding.

In this way, the owner, engineer, and contractor can be assured of a high quality waterstop system.

Below is a general list of items required for performing TIG welds in the field.

Consumables

- Tungsten electrode - .040, 2% Thoriated AWS Class EWTH-2 (red identifying band). Prepare a pointed-end for DCEN welding (DC-Straight Polarity)
- Wire – 316L .030
- Backing Flux – Solar B Flux mixed with methanol to paste-like consistency (brushed on the underside of the weld section to prevent contamination of the weld as the Argon gas does)
- Shielding Gas – Argon 100%

Equipment

- WP20 - Weldcraft TIG Torch, Air Cooled with Flow Meter for Argon or similar
- Torch Accessories
 - .040 Collet
 - 45V42 Collet Body Gas Lens
 - 53N60 Ceramic Cup Gas Lens with 3/8" orifice
- Welding Hood with #9 lens
- Light weight gloves with gauntlets

Working Conditions

- Minimum ambient temperature 0°F
 - Shield against winds over 20mph
- Use LPS Zero Tri Spray cleaner or equivalent to ensure material is free of dirt, grease, water, etc.

Manual Welding Parameters for 316L Stainless Steel							
Welding Method	Thickness (in.)	Current (amps)	Voltage (volts)	Filler Rod (AWS)	Argon Flow (ft ³ /h)	Weld Speed (in./min)	Wire Feed (in./min)
TIG	0.030	30/70 DCEN	12-14	ER316L	20-30	2-4	As Required

Figure 1

UNACCEPTABLE SPLICING DEFECTS

Defects would include misalignment of center “V” section more than 1/32nd inch, tensile strength less than 80% of the parent section, or visible porosity or “burn through” in the weld.

IMPORTANT PRECAUTIONS

Thoroughly consolidate the concrete around the waterstop to prevent voids or honeycombing next to the waterstop. Pay particular attention to the underside of horizontally placed waterstops. Intimate contact of the concrete and waterstop is necessary for full performance of a waterstop. Voids next to the waterstop can significantly reduce its water stopping ability. Maintain adequate clearance between reinforcing steel and the waterstop. Typical clearance should be twice the maximum aggregate size. Inadequate clearance can promote the formation of voids due to aggregate bridging.

It is important to maintain continuity of the entire waterstop system. Splices must be properly completed at all changes of direction, transitions, intersections, and butt joints. Any breach in continuity can be a point of leakage.