



Method Statement

Ref. #: DCP00/05-0115-A-2022



Hydrostop Range

[PVC waterstops]



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Section A : General Comments

General Notes:

The information below is a detailed overview for the application of DCP's **Hydrostop Range** waterproofing system and should be read in conjunction with the relevant technical data sheet prior to application. All DCP Products should be applied by experienced specialist contractors.

All the points below assume correct preparation of the relevant surface.

*Note: This guideline is written specifically for **Hydrostop AB, AW, HD, HQ, HW, AW203, TP, EA, EW, HA.***

Tools and Equipment:

It is suggested that the following list of equipment are adopted as a minimum requirement

Personal protection

- : Protective overalls
- : Goggles or a face mask
- : Good quality gloves
- : Safety shoes
- : Safety helmet



Equipment

- : Electrically heated welding blade (Fig.1)
- : Utility knife with blade (Fig.2)
- : Seem tool (Fig.3)
- : Spark tester (Fig.4)
- : Jointing jig (Fig.5)



Fig.1: Electrical Welding blade



Fig.2: Utility knife with blade



Fig.3: Seem tool



Fig.4: Spark tester



Fig.5: Jointing jig

Section B : Application

Please note that the quality and durability of a waterstop are determined by using the correct product profile and size. While the most critical steps are proper surface preparation and appropriate welding and application.

1.0 Waterstop Selection

- 1.1 The choice of width of the profile is mainly governed by the slab or wall thickness, the position of reinforcing bars, and aggregate size.
- 1.2 This range of products is available in different profiles and sizes for different applications.
- 1.3 As a general rule, 250 mm width profiles are used for slab or wall thickness above 250 mm, allowing for good compaction and width of barrier to water penetration.
- 1.4 For concrete members of less than 250 mm thickness, the use of a smaller profile approximating the actual slab or wall thickness will be sufficient.
- 1.5 Internally/centrally placed profiles: are usually located midway in the slab or wall thickness across the joints in concrete structures.
- 1.6 Externally placed profiles: are usually cast into the outside water face and used for basement, foundation, floor slab, and sub-structures applications in both vertical and horizontal joints.

2.0 Method of Installation


2.1 Centrally Fixed Waterstops

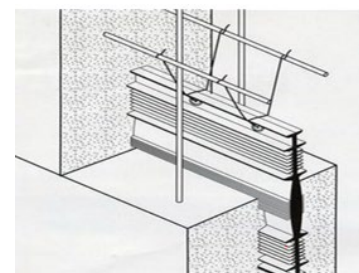


Centre fix for construction joints



Centre fix for Expansion Joints

- 2.1.1 Centrally fixed waterstops are installed prior to concrete placement to ensure proper positioning and concrete consolidation around the waterstop.
- 2.1.2 The waterstop should be clean and free from any contamination such as oil, grease, and concrete residue prior to concrete placement.
- 2.1.3 Align the centerline of the waterstop with the center of the joint.
 
- 2.1.4 The waterstop should be properly secured and fixed inside the shutter prior to concrete placement. This was accomplished with the factory-applied brass eyelets placed along the edge flanges of the waterstops at 30 cm spacing.
- 2.1.5 Tie the waterstop by wires to the adjacent reinforcement through these eyelets.



Note: Self-supportive versions are available (**Hydrostop AB/Hydrostop HA/Hydrostop EA**), which do not require fixing using the brass eyelets.

- 2.1.6 This is done to firmly hold the waterstop in position to prevent misalignment or “Folding Over” during concrete placement. A tight fit between the waterstop and the form is also necessary to prevent excessive leakage of concrete paste, which could lead to the honeycombing of the concrete.



Properly fixed PVC waterstop

2.2 Externally Fixed Waterstops (Rear-guard)

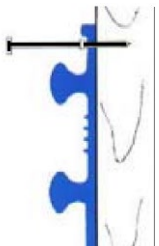


External/Rear fix for Construction Joints



External/Rear Fix for Expansion Joints

- 2.2.1 Externally fixed waterstops are installed prior to concrete placement to ensure proper positioning and concrete consolidation around the waterstop.
- 2.2.2 The waterstop should be clean and free from any contamination such as oil, grease, and concrete residue prior to concrete placement.
- 2.2.3 When used on ground slabs where the waterstop is supported on blinding, profiles usually require no fixing. Lay the waterstop centrally over the line of the joint to be formed. For additional support, the waterstop may be fixed by nailing through the outer nailing flanges.
- 2.2.4 When used vertically, fixing to shuttering is done by nailing through the outer nailing flange the head of the nail exposed so that it is held in the cured concrete. This prevents displacement when the shutter is struck.





Externally fixed PVC waterstop

Application Notes


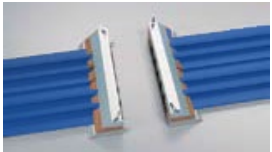
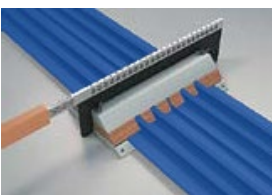
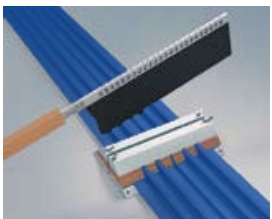
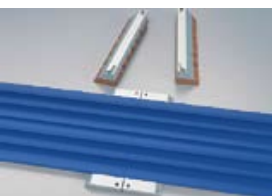
- The centerline of the waterstop should be aligned with the center of the joint.
- Waterstop should be positioned inside the joint so that one-half of the waterstop width is embedded into each concrete pour.
- Never place nails or screws through the body of the internal fixed waterstop.
- External fixed waterstops are to be secured into position by concrete nails that are hammered only through the specially designed outer flange areas of the waterstop.
- Vibrate concrete nearby the joints (especially under the waterstop) to enhance the contact with the waterstops and ensure proper consolidation of the concrete to avoid air entrapment and prevent honeycombing or voids around the waterstop.
- For the best performance of the waterstop, there must be intimate contact between the concrete and the waterstop.
- Ensure adequate clearance between reinforcing steel and the waterstop (typically twice the maximum aggregate size) to prevent any formation of voids due to aggregate bridging.
- Never cut or modify the waterstop to allow the reinforcement bars to pass through it.
- Ensure steel reinforcing bars do not interfere with the proper positioning of the waterstop.
- Care should be taken during concrete placement to prevent excessive movement of the waterstop.

- On the second pour, sweep horizontal joints to insure there is no foreign matter to interfere with positive contact between the waterstop and the concrete.

3.0 Site Welding





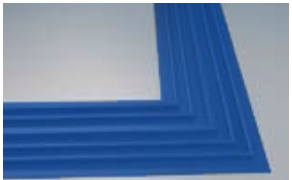
The key to a leak-free waterstop network is correct onsite jointing. DCP's Hydrostop Range is made of thermoplastic PVC, and can be easily welded using suitable heating processes, such as welding knife or heated welding blade or using special equipment.

Note: Full range of factory-made junction pieces are available for all profiles, for the following (Flat and vertical cross, Flat and vertical T, Corner pieces, Flat L), other non-standard pieces can be made as required by project shop drawings.

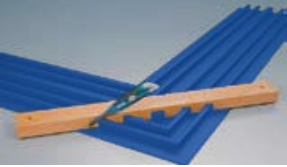

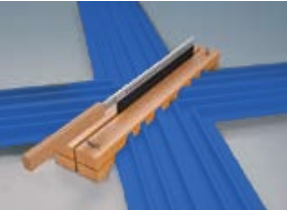

	<ul style="list-style-type: none"> • Plug in the welding blade and allow it to warm up, preheat the heating element to the required temperature of 450 °C. Using a small offcut from the waterstop, check that the blade has reached a temperature sufficient to melt the waterstop.
	<ul style="list-style-type: none"> • When the blade's temperature is adjusted, evenly cut the ends of the waterstops to be welded. Fasten the connected ends of waterstops in the joining jig. Place it between the mating ends of the waterstop and press the waterstop firmly against the blade.
	<ul style="list-style-type: none"> • Open the jointing jig move the waterstop a little forward from the jointing jig and clamp again. Place a heating element into the operating position between the waterstop ends. • Maintain the pressure against the blade until a 5 mm bead of molten PVC has formed on both sides all around the section.
	<ul style="list-style-type: none"> • Lift away the blade with an upwards motion, avoiding too much displacement of the molten PVC bead. Press the two mating ends firmly together and hold for 20 seconds; until the joint has cooled and solidified. • Gently close the jointing jig bringing the waterstop ends to the heating element. This causes the formation of a bead of molten material. Make sure that melting is uniform.
	<ul style="list-style-type: none"> • Open the jointing jig, take out the heating element and close it again. Molten edges of the waterstop will close and fuse. Let cool down and dismantle the jointing jig, the bead of molten material formed along the perimeter of the welded joint should be cut with a utility knife.

4.0 Fabrication of Angular and Cross Shaped Joints





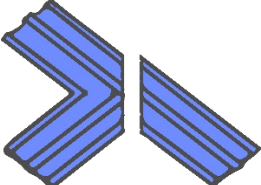
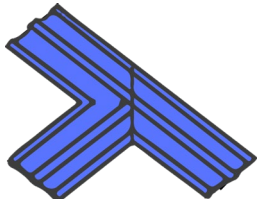

4.1 Corner Joints

	<ul style="list-style-type: none"> • Position and fasten the waterstops being connected in the jointing jig for corner connections and cut them along the jointing jig at a 45° angle.
	<ul style="list-style-type: none"> • Open the jointing jig and insert the waterstop, ensuring that it extends from the jointing jig and clamp it again.
	<ul style="list-style-type: none"> • Place a heating element into the operating position between the waterstop ends. Close the jointing jig gently, bringing the waterstop ends to the heating element.
	<ul style="list-style-type: none"> • After the waterstop ends are uniformly melted, take out the heating element and firmly press the clamps against each other.
	<ul style="list-style-type: none"> • Remove the clamp after cooling. A bead of molten material formed along perimeter of the welded joint should be cut with a knife. The corner joint is now ready.

4.2 Cross-shaped Joints

	<ul style="list-style-type: none"> • To create a cross-shaped joint, fabricate two corner joints.
	<ul style="list-style-type: none"> • Cut the apex off both corner joints as shown in the figure.
	<ul style="list-style-type: none"> • Fasten the parts in a special X-jointing jig. Place a heating blade into the operating position between the waterstop ends. Gently close the jointing jig, bringing the waterstop ends to the heating blade. This causes the formation of a bead of molten material. • After the waterstop ends are uniformly melted, take out the heating blade and firmly press the clamps against each other.
	<ul style="list-style-type: none"> • Remove the jointing jig after cooling. A bead of molten material formed along the perimeter of the welded joint should be cut with a utility knife.

4.3 T-shaped Joints

	<ul style="list-style-type: none"> • To create a T-shaped joint, fabricate one corner joint.
	<ul style="list-style-type: none"> • Cut the apex off the corner joint as shown in the figure.
	<ul style="list-style-type: none"> • Position and fasten the waterstops being connected in the jointing jig for corner connections and cut them along the jointing jig at a 45° angle.
	<ul style="list-style-type: none"> • Open the jointing jig and insert the waterstop, ensuring that it extends from the jointing jig and clamp it again.
	<ul style="list-style-type: none"> • Fasten the parts in the jointing jig. Place a heating blade into the operating position between the waterstop ends. Gently close the jointing jig, bringing the waterstop ends to the heating blade. This causes the formation of a bead of molten material.
	<ul style="list-style-type: none"> • After the waterstop ends are uniformly melted, take out the heating blade and firmly press the clamps against each other.
	<ul style="list-style-type: none"> • The T-shaped joint is now ready, check the quality of the welded joint using a seem tool.



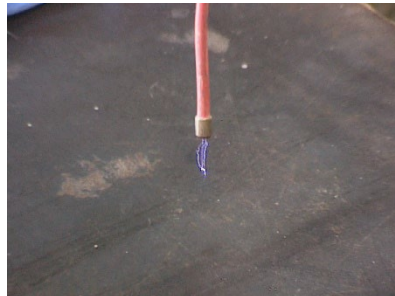
Unacceptable Welding notes:

- Visible porosity in the weld.
- Bubbles or inadequate bonding.
- Misalignment of more than 1.5 mm in the center bulb.
- Misalignments that reduce the waterstop's cross-section by more than 15%.
- When bending the cooled splice by hand at a sharp angle, visible splice separation in the weld/splice occurs.
- Burning or charring spots in the waterstop.

5.0 Verification of Welding

The system must be completely closed in order to have a proper waterstop application, in addition to the waterstops continuity. Spark test must be taken into consideration as it can detect any voids or holes present at weld areas where a test metal backing is applied.

- 5.1 The instrument produces a high-frequency spark that can be traced along the seam of a Waterstop weld and will produce a definite change in both appearance and sound when a pinhole is detected.
- 5.2 Place weld joint on a steel plate.
- 5.3 On the instrument turn the adjustment knob to maximum voltage and hold the tester tip directly above the weld area.
- 5.4 Turn on the tester and move the tip along the weld, keeping the tip just above the material. (Note the color and noise of the spark as you start the test).
- 5.5 If a crackling sound is heard and the color changes, this indicates the location of a pinhole in the weld.



6.0 Cleaning

- 6.1 The heater blade should be cleaned while it is still hot, clean thoroughly with emery paper or a wire brush ready for the next joint.



7.0 Limitations

- 7.1 Store the waterstops Indoors in shade and dry conditions and avoid direct exposure to sunlight and extended UV exposure.
- 7.2 Lapping of the waterstop should never be permitted.
- 7.3 Ensure full continuity of the waterstop profile, including the ribs, and center bulbs through changes of direction and transitions.
- 7.4 Allow the newly welded waterstop to cool completely before installing.
- 7.5 Always ensure that the ends of the waterstop to be jointed are of the same width and profile.

Section C : Cautions

Health and safety

Hot welding of PVC will generate acidic hydrogen chloride fumes; jointing should take place in a well ventilated area or while wearing an oxygen mask. Avoid breathing fumes.

Fire:

Hydrostop Range is nonflammable.

For further information on refer to the Material Safety Data Sheet.

Section D : Approval and Variations

This method statement is offered by DCP as a 'standard proposal' for the application of **Hydrostop Range**. It remains the responsibility of the Engineer to determine the correct method for any given application. Where alternative methods are to be used, these must be submitted to DCP for approval, in writing, prior to commencement of any work. DCP will not accept responsibility or liability for variations to the above method statement under any other condition.