

GEOTEXTILE INSTALLATION SPECIFICATION FOR HAND-HELD WEDGE WELDING

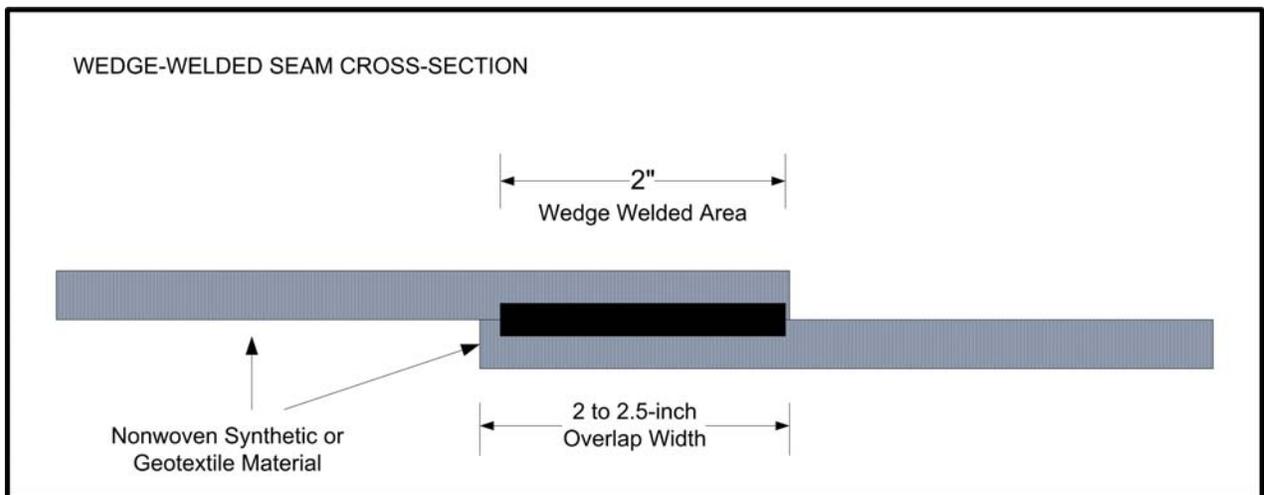
By Glenn W. Lippman

I. Overview

Hand-Held Wedge Welders are used to “wedge weld” or “seam weld” together nonwoven, and, to a limited extent woven, synthetic geotextile liners. Geotextile nonwoven materials that are easy to wedge weld include polypropylene, polyester and nylon as used in geotextile liners, geocomposite/geonets, and geosynthetic clay liners (GCL). The material weights best suited for hand-held wedge welding ranges from 6 ounce per square yard (0.20 kg/m^2) to 60 ounce per square yard (2.03 kg/m^2). Hand-held wedge welding is typically used for small production applications or patchwork and maintenance of a geotextile liner system.

II. Preparation of Geotextile Material to be Welded

Prior to wedge welding geotextile liner materials, clean welding area of dirt and remove standing water or moisture. Next overlap upper geotextile material by 2 to 2.5-inches over lower geotextile material. If geotextile materials are laid out over soft soil, it may be necessary to locate a liner or non-liner covered board under the lower geotextile material, and this board would then need to be pulled along the seam in the direction of welding.



III. Wedge Welding the Liner Materials

After the liner materials have been prepared for wedge welding, and the top liner is overlapped over the lower liner by 2 to 2.5 inches, then the wedge welding process can begin. Refer to the user’s manual or operating instructions for the hand-held wedge welder and adjust the temperature control to desired temperature. Set the temperature dial indicator to mid range for lighter materials

and higher range for heavier materials to accommodate welding speeds of approximately 10 feet per minute. Increase respective settings for faster welding rates. Wait for the wedge to reach set temperature.

Once the wedge is ready, locate the wedge between the upper and lower geotextile liners, and insert the wedge such that the wedge is about an 1/8-inch inside of the upper liner and angle the wedge such that the side angle of the wedge is in very close intimate contact with both layers of geotextile liner material. Make sure that the wedge is level with the geotextile material and is not leading front or back or side-to-side. Next, use a silicon hand roller and locate the silicon hand roller above both layers of geotextile liner material and “snugged-up” to upper layer of material offset by inserted hot wedge. Welding occurs when silicon roller is pushed down and forward thus pushing the heated wedge between both layers of liner material, and in the direction of the length of geotextile materials.

The heavier the geotextile liner material, the more heat needs to be absorbed by both layers and the slower the welding speed becomes. For example, the welding speed for a 16-ounce per square yard polypropylene nonwoven geotextile may range from 10 to 12 feet per minute, while a 20-ounce per square yard polypropylene nonwoven geotextile may range from 7 to 10 feet per minute. Polypropylene nonwoven geotextiles have less heat sealing friction resistance than polyester nonwoven geotextiles, and therefore it is easier and faster to seal polypropylene nonwoven geotextile materials.

IV. Testing for Seam Strength

Refer to ASTM Standard Test Method for Strength of Sewn or Thermally Bonded Seams of Geotextiles, D4884-96. Conventional testing for seam strength of wedge welded geotextiles includes a destructive shear test. Test Specimen needs to be at least 8-inches (200 mm) wide by 8-inches (200 mm) length. The Specimen width must have 4-inches (100 mm) on either side of wedge welded seam width.

Glenn W. Lippman is president of Novaseal Corporation. Since 1994, Novaseal has been developing and producing technologies for heat sealing plastics and nonwoven synthetic textiles. For product information on the Novaweld™ GT-100 Hand-Held Wedge Welder, contact Novaseal Corporation or one of Novaseal's distributors located in various countries throughout the world, or visit their website at www.novaseal.com, or call toll free 800-500-1581 or 561-470-3267, or via email to glippman@novaseal.com. © 1998. All rights reserved.