A thermal weld study was conducted on various gauges of PVC for the purpose of identifying a temperature window in which PVC could be welded. The material test strips used were 20 mil PVC, 30 mil PVC, and 40 mil PVC; manufactured by Occidental Chemical Corporation.

A thermal welder was used utilizing a split wedge. The welded area consisted of two ½” welds with a ½” air channel in between. The welder is adjustable from 0 to 10 feet per minute for the travel speed, and 0 to 500 degrees Celsius for the wedge temperature. The constant speed used for these tests was 7 feet per minute, and the wedge temperature was started at 100°C and increased at 25°C intervals until the material fused together, and continued incrementally up to 425°C, or until a point at which the weld becomes unacceptable.

A sample strip of sufficient length, (approximately 100 feet) was prepared of each of the three materials. Once the weld occurred at the lower Temperature, a 16” sample could be fabricated at each 25°C interval from the lowest to the highest weldable temperature. The ambient room temperature for fabrication of these test strips was 21°C Celsius, and the humidity was 64%.

Five specimens of each temperature range sample were removed for peel testing per NSF-54. The average of the five specimens from each sample were recorded on a graph. Each material type is shown on the accompanying graph.

The graph illustrates the thermal welding window for all three thicknesses of PVC would be 250°C Celsius to 375°C Celsius. Although the window for some thicknesses may be larger than the three combined, the ultimate goal was to establish the range of temperatures for thermal welding PVC.