Data Bulletin

Friction Stir Welding in I-Line™ Combo Panelboard
Class 2110

Retain for future use.

Introduction

The I-Line™ Combo Panelboard is the latest Square D brand panelboard offer which contains NQ or NF lighting sections which are hard-bussed to an I-Line power section. With the introduction of the I-Line Combo Panelboard, new methods of construction have been explored and implemented at Schneider Electric, including the use of friction stir welding. With the use of friction stir welding, Schneider Electric engineers were able to design a solid bus structure that is integrated into the panelboard. This document explains the benefits of this type of welding and how it pertains to the development of this unique bus structure. Since this innovative panelboard design is the first of it's kind, there may be some questions that arise in the field. The intent of this paper is to educate the industry and clarify any misconceptions about this new design.

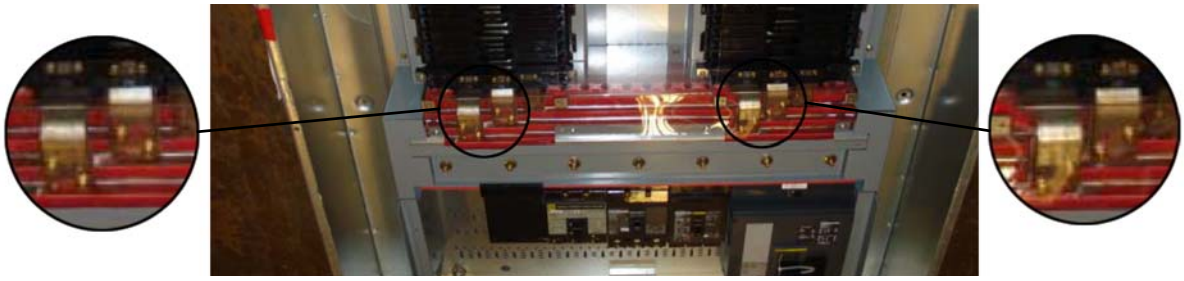
What is Friction Stir Welding?

Friction Stir Welding (FSW) was developed to maintain the atomic integrity of metal. This is accomplished by heating the metals as little as possible during the process of welding two components together. During this process, rotational tools with varying speeds are used to generate heat, which softens the metal to the texture of molding clay. As the two sheets of metal heat and soften, a solid amount of pressure is applied and the pieces are fused together in what is known as dynamic recrystallization. FSW has been used in Busway equipment for years; however, this type of welding is new to panelboards and has a number of advantages over conventional fusion welding processes. Not only does the process generally yield a clean appearance but more importantly it ensures a seamless transfer of heat between the two plates of metal.

How is FSW integrated into the Line Combo Panelboard?

With the development of the I-Line Combo Panelboard, the FSW process was incorporated in the new design, which results in a solid bus structure throughout the whole panelboard. This type of welding was used to fuse together the lighting section bus bars to the stacked bus structure of the I-Line power section. The single bus structure, which combines up to three sections, is an industry exclusive concept that has been tested and approved per the UL67 panelboard standards. The connections between the lighting sections and power section have clear barriers surrounding them to prevent accidental contact with the bussing. Removable plugs can be detached for thermography scans.

As shown in the photo below, the hard-bussed connection has been friction stir welded to ensure a quality connection in the panelboard.



Schneider Electric USA, Inc.
1415 S. Roselle Road
Palatine, IL 60067 USA
1-888-778-2733
www.schneider-electric.us