

## TECHNICAL BULLETIN

**SUBJECT:** Structural Aluminum Welding

**SERIES #:** 106

**DATE:** 10/18/12

Welding aluminum is a very common structural practice, but many structures are improperly designed and are subject to brittle, cracking welds. The specific aluminum alloy used in aluminum frames has been specially heat treated to give it the high strength properties used for design. Subsequently, when that alloy is subjected to welding, the area around the weld becomes brittle and loses **up to 70%** of its strength. This applies to both 6061-T6 and 6063-T6 alloys.

Angle frame bleachers have been in existence for decades, so most current designs are based on some level of historical performance. Building codes are updated every 3 years to reflect up to date research, and to address failures that have occurred. It has been our experience that these historical angle frame designs are not updated to reflect the most recent building codes.

According to the current building code, most angles in an angle frame need to be designed as “weld affected”. The size of these pieces must be increased to compensate for the loss of strength from the welding process.

Our engineering analysis shows that many angles are not structurally adequate and **DO NOT MEET BUILDING CODE**, creating liability exposure for any organization using bleachers with this design. The minimum size for the horizontal angles in order to meet code required loadings is L2.5x2.5x3/16. Be sure to specify adequately sized welded frames in order to satisfy the building code and reduce the potential for serious personal injury.

