

“Design and Development of Joining Method to Overcome Failure of Braze Welded Joint in Cassette Container”

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Abstract - The component named cassette container is made of galvanized sheet; it is form by applying a protective zinc coating to steel, to prevent rusting. The most common method is hot dip galvanizing, in which the parts are submerged in a bath of molten zinc; the material used is IS 277. It is generally used for protective sheet and non-corrosive properties.

The braze welding on the sheet breaks at the time of inspection as the braze welding is having a low strength. So we are replacing it by a spot welding as it has a high strength, and to stop leakage and for air tightening soldering is done.

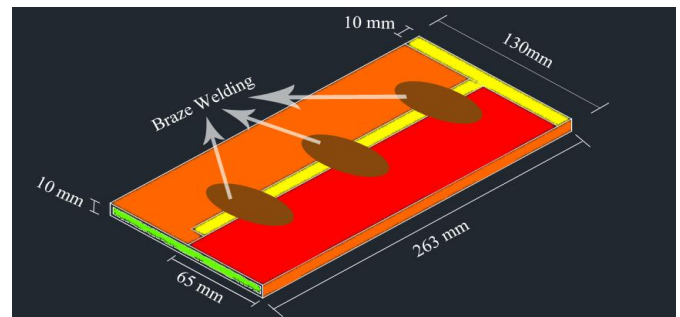
Key Words: Cassette container, Galvanized sheet, Rusting, Braze welding, Spot welding.

1. INTRODUCTION

The product cassette container is made up of galvanized sheet, which protect the parts from corrosion, it is form by applying a zinc coating to steel. Cassette container is form by various operations like Sheet shearing, Blank Cutting, Container forming, pressing operation and Soldering.

The welding operation is done before soldering to join the container as shown in figure, the welding done is braze welding which was done by bronze or brass fill rod coated with flux to join steel work piece. But at the time of inspection the Braze welding breaks as it is having a low strength.

So, our aim is to provide a good welding solution technique so that at the time of inspection the welding does not gets break. So by studying the various properties and parameters of galvanized sheet, we have decided to do spot welding on cassette container as spot welding joint has high strength than braze welding and it does not break easily. After the spot welding, soldering is done to stop the leakages in container.



1.1 Braze Welding

Braze welding is done to join the edges of the container, so that it will not get break while in use and to avoid leakage soldering is done.

The component is weld by a braze welding. Braze Welding is a Metal joining process in which two or more metal items are joint together by melting and flowing of filler metals into the joint. Braze welding is the use of a bronze or brass filler rod coated with flux to join steel work pieces. Filler material is having lower melting point than the adjoining metal. Braze Welding is done at above 425 deg. Celsius.

The component is having a braze welding for joining of component but at the time of inspection the component gets break where the welding is done. The welding breaks at a force of 560N. Also they found Braze welding is Expensive and costlier.

1	Temperature of Braze Welding	615 deg. Celsius
2	Filler Rod Material	Bronze (Brass)
3	Braze Welded Spot Size	20 mm
4	Gas Used	Oxy-Acetylene
5	Breaking Force	560N

1.2 Spot Welding

Resistance Spot Welding is the joining of overlapping pieces of metal by applying pressure and electrical current. These joints created by resistance spot welding form a

“button” or “fused nugget.” Resistance spot welds are found typically on flanges, staggered in a single row of consecutive welds. Vehicle manufacturers use resistance spot welding in the factory because they can produce high quality welds at a very low cost.

Spot welds are formed when a large amount of current is passed through the panels for the correct amount of time and with the correct amount of pressure. In a typical spot welding application there are two electrodes, opposite each other, which squeeze the metal pieces together. This squeezing pressure is controlled. The pieces to be welded are heated by passing welding current through them. Several thousand amperes of welding current are applied for a specified period of time. As the temperature is elevated, the metal is heated to a plastic state. The force of the welding tip will deform the metal and form a small dent as the metal gets hot. As the heat builds in the metal, a small liquid pool of metal is formed at the interface. This pool is typically the same size as the face of the welding tip. When welding temperature is reached, the timer should expire. The weld zone cools very quickly because the copper welding tips pull heat out of the weld zone. Heat also escapes as it flows into the surrounding metal.

2. Result

1. Resistance Spot Welding (RSW) is a process in which contacting metal surface points are joined by the heat obtained from resistance to electric current. It is a subset of electric resistance welding.
2. Work-pieces are held together under pressure exerted by electrodes. Typically the sheets are in the 0.5 to 3 mm (0.020 to 0.118 in) thickness range.
3. The process uses two shaped copper alloy electrodes to concentrate welding current into a small "spot" and to simultaneously clamp the sheets together.
4. Forcing a large current through the spot will melt the metal and form the weld.
5. The attractive feature of spot welding is that a lot of energy can be delivered to the spot in a very short time (approximately 10–100 milliseconds).
6. That permits the welding to occur without excessive heating of the remainder of the sheet.

CONCLUSIONS

After completion of our project we can conclude that:

1. The strength of Spot Weld is more than that of Braze Weld.
2. The time taken to finish the product reduces after implementation of Spot Welding.
3. The productivity of the component also increases.

4. Joints are not corroded due to use of Paint on the welded spot.

Sr. No.	Braze Welding	Spot Welding
1	The Joint breaks at the force of about 560 N	The joint breaks at the force of about 838 N.

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