Roll Bonded Bi-Metal Weld Transitions

What is roll bonding?

Roll bonding is a solid state welding process in which two or more metals are passed through a pair of rollers. The immense pressure creates a permanent metallurgical bond between dissimilar metals.

What is a metallurgical bond?

A metallurgical bond is a bond of metals characterized by diffusion, alloying, or intermolecular attraction caused by high pressure. This allows dissimilar metals to bond together as one without the need for a low strength interlayer.

About Spur

Based in Spokane, Washington, Spur Industries is an industry leader in the world of clad metals and roll bonding. We specialize in aluminum alloys but our experience with numerous other materials is extensive. Our 40+ years of experience gives us the knowledge and expertise to create personalized solutions for even the most demanding applications.

Contact Info

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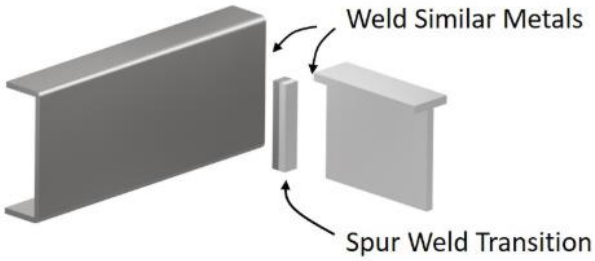
The Simplest Way to Weld Dissimilar Metals

- High strength, permanent bond
- High weld temperature resistance
- No galvanic corrosion
- Supports common weld methods



Solutions

Steel to Aluminum:

The roll bonded Spur interface has low porosity and minimal risk of galvanic corrosion. In addition, Spur saves cost and weight by directly bonding alloy aluminums without the need of a low strength interlayer.

Each side of the transition is welded to its own respective metal resulting in a permanent dissimilar metal connection that eliminates corrosion. Typical layer thicknesses of 0.375 - 0.500 inches.

Materials

- Most common: A36 Steel to 1050 Aluminum, but alloy aluminums are supported
- Custom versions available

Bond Strength

- > Aluminum Strength (75MPa / 11,000psi)

How it Works

The roll bonding process uses high pressure to form a metallurgical bond between two or more metals. The result is permanently bonded weld transition. The bimetal transitions are easily implemented into your application. Simply weld each side to its respective metal and let the Spur bond take care of the rest. Metallurgical bonds prevent the entry of electrolytes which means **no galvanic corrosion**. Typical welding techniques such as MIG, TIG, EB, or laser can be used which means no need for special equipment.

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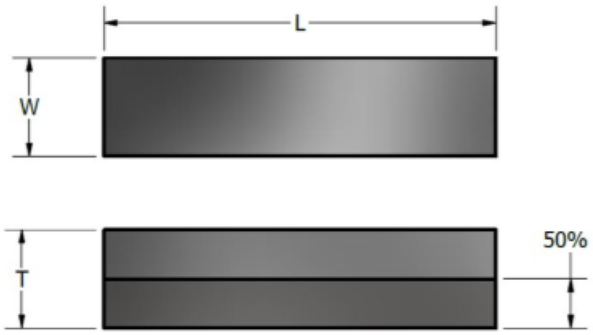
Standard Weld Transitions

Weld Transition (in)			Part Number
Width	Length	Thickness	1050 AL A36 ST
0.5	2	0.75	40-10023
0.5	3	0.75	40-10024
0.5	4	0.75	40-10025
1	2	0.75	40-10026
1	3	0.75	40-10027
1	4	0.75	40-10028



Engineering

The optimal weld transition is wide enough to provide the strength needed to support the structural transition and loads. The bond strength will exceed the strength of the aluminum and thus the aluminum strength should be used for stress analysis. With a temperature limit of 750°F (400°C) during welding, the thickness of the bond is ideally 3/8 inch or greater for supporting traditional welding techniques such as MIG, TIG, arc and gas.

Testing

- 90 Degree bend test – standard
- Ultrasound scanning
- Tensile Strength test

Welding

- Do not exceed 750˚F at the bond line
- Preferably weld aluminum side first

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