Skills Compétences Canada

PROJECT E

Autobody Repair

SECONDARY and POST-SECONDARY

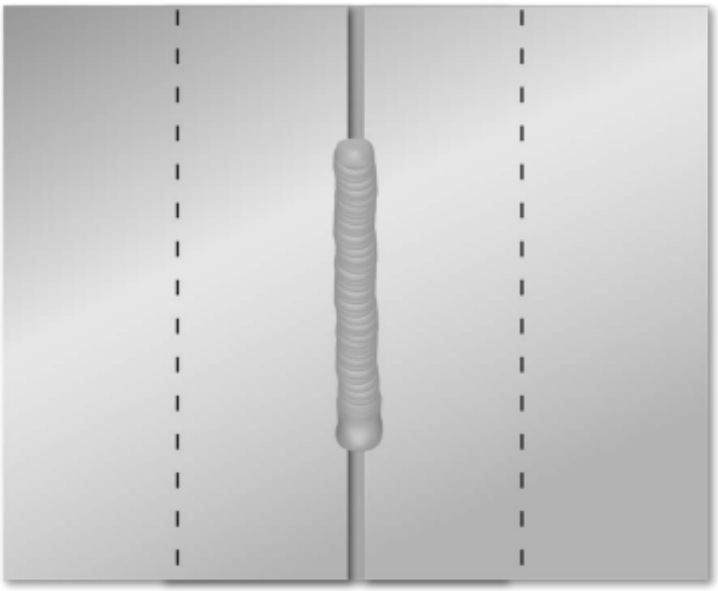
Welding Project Scope (Skills National) Project E

Aluminum Welding

- Complete a butt weld with backing weld using 2.5 mm thick aluminum coupons
- Complete a fillet/lap weld with a thin to thick panel set up. It will be a 1mm aluminum coupon over a 2.5mm aluminum coupon
- Both welds will be completed in the vertical welding position

Welding Parameters Aluminum

Butt Joint with Backing



- Butt two coupons edge to edge and center the third coupon behind the joint
- All coupons are 2.5mm thick 5052-H32 aluminum alloy
- The weld can be completed in a single pass or two passes to meet the weld parameters
- Make a continuous weld that is centered on the joint
- The weld will be graded using visual parameters and a destructive test

Visual Parameters

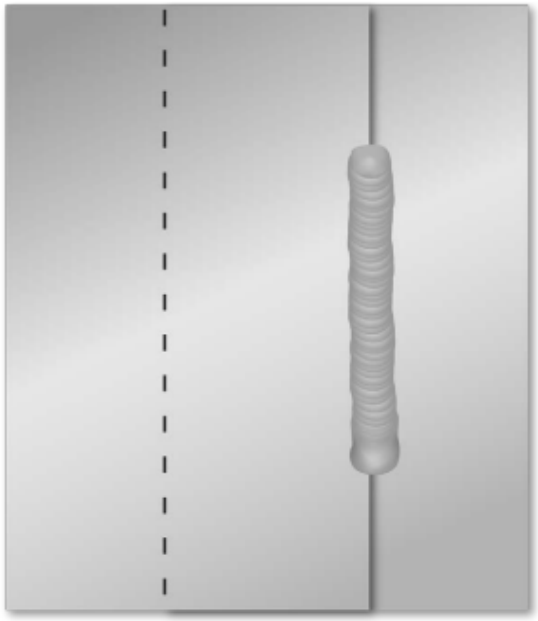
- Weld length must be between 57mm-76mm
- Weld bead width must be between 10mm-16mm
- Weld bead height must be under 3mm
- Melt through width of no more than 3mm
- Melt through height of no more than 2mm
- The weld must completely fill the joint

- No skips, voids or porosity in the weld
- The crater must be filled completely

Destructive Test Parameters

- The weld will be placed in a vise and the top coupons will be bent back and forth until they break free from the backing. The coupons should break, not the weld. Metal tear out of the top coupons should be visible for the entire length of the weld. The weld bead should show good penetration and be firmly attached to the backing piece with no separation.

Fillet/Lap Weld



- Lap the 1mm thick coupon lengthwise, halfway along the length of the 2.5mm coupon
- The 1mm coupon is 6061 T6 aluminum alloy, the 2.5mm coupon is 5052-H32 aluminum alloy
- Make a continuous weld that is centered on the joint
- The weld will be graded using visual parameters and a destructive test

Visual Parameters

- Weld length must be between 57mm-76mm
- Weld bead width must be between 5mm-10mm
- Weld bead height must be under 3mm
- Melt through width of no more than 3mm
- Melt through height of no more than 2mm

- The weld must completely fill the joint
- No skips, voids or porosity in the weld
- The crater must be filled completely

Destructive Test Parameters

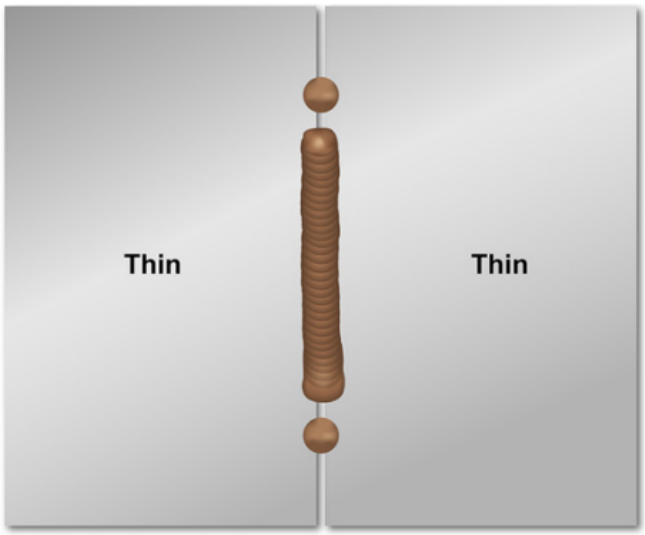
- The weld will be placed in a vise and the top coupon will be bent back and forth until it breaks free from the backing. The coupon should break, not the weld. Metal tear out of the top coupon should be visible for the entire length of the weld. The weld bead should show good penetration and be firmly attached to the backing piece with no separation.

Silicon Bronze Welding

- Complete an open butt weld using 22-gauge steel coupons
- The weld will be completed in the vertical welding position

Welding Parameters Silicon Bronze

Open Butt Weld



- Butt two coupons edge to edge
- All coupons are 22-gauge steel
- Make a weld that is centered on the joint

Visual Parameters

- Weld length must be between 57mm-76mm
- Weld bead width must be between 3mm-8mm
- Weld bead height must be under 3mm
- The weld must completely fill the joint

- No skips, voids or porosity in the weld
- Backside of the weld shows good capillary action

Destructive Test Parameters

The coupons will be bent back and forth until they break apart. The coupons should break and not the weld. Tear out should be visible for the length of the weld on one of the coupons when they break, on the other coupon the weld should remain intact.