



## AT A GLANCE

- 2 Researchers led the project by focusing on determining the best materials suitable for crimping and welding.**
- 1 Student Researcher supported by utilizing sustainable values for welding parameters to meet high volume production targets required by automotive OEMs.**

# Crimping/ Welding Process Automation

## Project Overview

The project investigated the wire connections and multi-strand wires with insulation and insulated structures. The project conducted the research process to determine the best materials for crimping and welding using different materials and procedures for the trials and concluded the most success in the final report. This process consisted of three unique steps: crimping, welding, and measurements while navigating challenges such as the process of connecting two different kinds of wires.

## Purpose/ Objective

The project aimed to find the best materials from crimping and welding, as well as appropriate values for welding parameters to prevent any loss in strands to keep the conductivity of the wires. This consisted of developing a two-stage crimping/ soldering process for connecting the wires without reducing finished part quality. The team focused on the development by identifying both the high demand combinations and most difficult configurations, using the parametric study, analysis of the influence of total wire gauge, and testing the proposed crimping/ welding operations to examine quality.

## Company Information

St. Clair College partnered with industry leaders known for their expertise in welding. Their partnership allowed the Student Researchers for a hands-on analysis to redefine the developments of Crimping/welding Automation. Industry leaders technologies were used to enable the research on the Tungsten, Tapered Tip Copper, and The Larger Tip Diameter.

## Deliverables

- **Tungsten:** an electrode that is used for fusing very small workpieces like wires or ribbons together.
- **Tapered Tip Copper:** can be used if the distance between tips isn't as critical, energy will become more focused and penetrate more fully.
- **Larger Tip Diameter:** using a larger tip diameter for electrodes, can solve the concern of connection cross section while also eliminating the tripping and twisting of the wires.

## Technologies

- **Welding Machine:** the welding machine was a key component to this project when conducting the resistance and bulk resistance.
- **Semi-Automated Crimping Machine:** this is a flywheel-based drive design that uses 1/3HP, 110V, 230V, single-phase electric motor to produce uniform crimps.

