

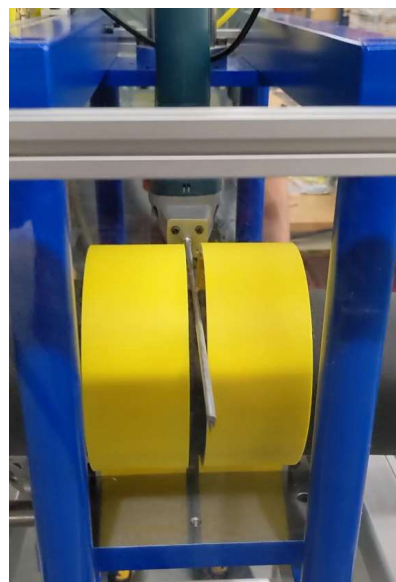
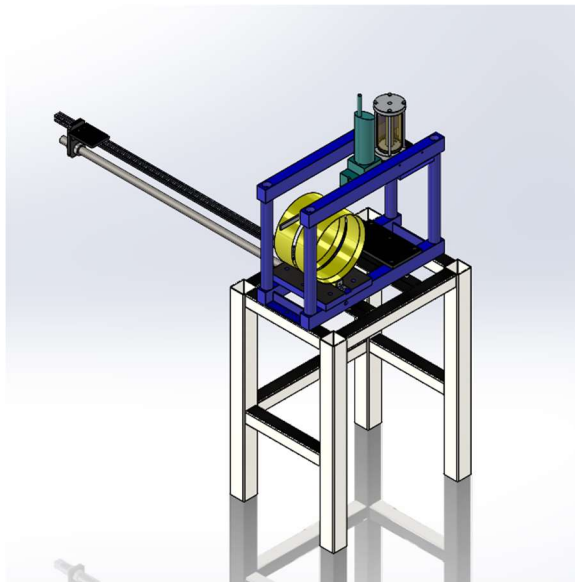
Rubber Foam Tube Cutter

Project Number: A-146

[Project Video](#)

Summary

A customer in the HVAC industry required a machine able to achieve a clean, smooth cut on a long ArmaFlex rubber foam insulation tube with variable lengths and diameters. AIM-Joraco designed and fabricated a machine consisting of a reciprocating saw attached to a Direct-Aire model 300H press with confinement mandrels and a support cradle.



Tags: Direct-Aire, 300H, cutting, rubber foam, adjustable support, saw, deformation, HVAC

Customer Requirements

- Provide a smooth/flat cut
- Cut 6" and 8" diameter tubes
- Cut to lengths ranging from 12" to 42"
- Safety features

Design Challenges

- Compressibility of the material resulting in deformation and barreling when cutting
- Variable diameters and lengths necessitating adjustable supports
- Long stock length of tubing limiting internal support options

Process

- Several cutting methods including hot wire, band saw, guillotine blade, and reciprocating saw were tested to determine which would result in the best cut
- Various support methods were evaluated to determine the best way to support the tube while allowing it to be easily fed through the machine
- The machine was designed to be as compact as possible so it could fit within the press frame with only minor modifications to the open height being needed
- A custom fixture was designed to securely mount the saw to the press ram
- Various ram descent speeds were tested to minimize cutting time without causing compression of the tube
- The machine was tested with both tube diameters and various cut lengths to ensure support was sufficient and cuts met customer requirements

Results

- A reciprocating saw was found to be the best option to cut with minimum deformation of the material
- Exterior confining mandrels were used to support the tubing while accommodating the long stock length
- Confinement mandrels were made interchangeable for different diameter tubes
- An adjustable stop with support cradle was included to allow for cutting to various lengths
- Four sided guarding and an emergency stop button were included for safety