## **Department of Mechanical Engineering** THE UNIVERSITY OF UTAH



# **Design Requirements**

## Analysis

- Thermal test determined that pushpins anneal during bakeout.
- Conclusion: process needed to fix pushpins to pins.



Compression force test determined 80 N began compression and 360 N fully compressed.



# 9 Pin Crimping Tool For Varex Imaging Anthony Eiting, Francisco Montano, Sophie Milne, Adam Tingey, Ben VanDyke

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### Background

Varex Imaging is developing a multi-beam tube. Each tube will require x-ray connecting 108 wires to 108 feedthrough pins on the vacuum side of the tube. The current process is performed manually, Ultrasonic Horn Design requiring considerable

cost.

time, effort, and

**Pushpin-pin Connection** 

Pushpin Force



• FEA analysis of Ultrasonic horn determine that the horn design matched transducer at 28 kHz.



### Solution

Connecting ribbons to vacuum feedthroughs through a 2-phase process.

Phase 1 – Preformed Outside vacuum chamber.

 Connect copper ribbons to pushpins using 9 pin crimp.

Phase 2 – Preformed Inside vacuum chamber Connect pushpins to vacuum side pin using

laser weld.

#### **Conclusion and Future Work**

The 9-pin crimping tool and press will reduce time cost of connecting 108 ribbon wires to 108 pushpins.

Testing and analysis has shown that a laser weld is a viable option to join the metals in the vacuum (see figures below).















