

Project Title: Concentric Wire Tape Head Redesign

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Area: Mechanical Engineering

Date: Alconex Magnet Wire

Alconex Magnet Wire manufactures insulated magnet and non-ferrous wire used in transformers, motors, and other electrical or electronic components. The wire is insulated using a concentric taping machine, in which a taping head rotates around the wire as it is drawn through the center, helically wrapping insulation tape around it.

The current taping head produces inadequate insulation quality when $\frac{3}{4}$ and 1 inch tape is utilized. This is due to the wider tapes flipping and folding throughout the taping process, applying to the magnet wire inconsistently. Inconsistent tape application leads to a non-uniform insulation, which increases chances of the wire becoming exposed when bent or shaped. Alconex is looking to correct the flipping and folding issue by redesigning the current taping head to accommodate larger tape widths.

The goal of this project is to diagnose the root cause of the flipping and folding issue and redesign the taping head to prevent it from continuing. The solution must allow for tape sizes of $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, and 1 inch in width to be installed and wrapped. The budget for this project is \$5,000.