



M.R. Snyder Company

Industrial Drive and Control Systems

Success Story # 8 – Synthetic Fiber Winders

Customer Situation:

- Customer has three synthetic fiber lines with 1980's technology drives and controls, 56 winders per machine, 168 total
- The custom hardware is obsolete, failing at high rates, and is no longer supported
- Each lines hardware is different and the customer wants one common solution
- A separate logic controller or PLC would be required to control the timing functions of the air panel for winder doffing
- Sophisticated winding control is needed to achieve 1,000 mpm speeds with full dancer control
- Customer would like a solution where the drive controls the winder and all of the discrete air panel functions
- Budget is extremely limited due to international competition
- Must have reduced downtime to meet production needs

Solution:

- New Siemens AC drives that control the winding functions and the air panel control
- Drives can be installed all at once or in groups of 28
- Existing panel retrofits to reduce cost and downtime
- Unique winding algorithms to control the dancer as the as the diameter builds from core to maximum
- Discrete logic capability of the drive, along with drive option relay cards allow us to control the timing of the air panel control with all inputs and outputs connected directly to the drive
- Drive prototyped in one position for several months to prove capability and reliability



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Results:

- No PLC required for discrete logic timing and control, reducing overall cost significantly
- Only one parameter has to be changed per product change where the old systems required many changes
- Reduced downtime saved significant production losses
- Reliability went from frequent failures to none reported so far
- Cost saving solution for partial retrofit capability vs. entire machine retrofit

MR Snyder services required:

- Develop drive winding logic
- System retrofit design
- Startup services
- Develop drive discrete logic
- Extensive prototyping
- Training

AC Drives for Synthetic Fiber Winding

- Winder diameter calculation done in drive
- Full diameter compensated dancer control at 1,000 mpm
- Control the timing and solenoids with relay outputs for the following
 - Frame In
 - Frame Out
 - Brake
 - Chuck Release
 - Push Off
 - Fiber break or fray
 - Magnet release
 - Push off
- Source the existing LVDT for dancer position
- Use the following digital inputs for control
 - Yarn break
 - Zero speed switch
 - Start/stop
- Total four digital inputs and eight relay outputs

