Project Number	P17221
Title of Test	Wrap Angle Test
Subsystem	Crossfeed
Administered by	Patrick Burke
Test Date	TBD
Location	Machine Shop

Brief Summary of Test Performed and Purpose of Test
Quantify the assembled crossfeed wrap angle capabilities as a function of increasing tension and increasing wrap angle.

Required Equipement (includes sensors, custom mounting brackets, electrical needs)

1. Assembled Winder frame and crossfeed
2. Laptop to control winder
3. Source of electricity capable of powering the machine
4. Protractor
5. Wrenches for adjusting tension system

Procedure for test and data collection (machine setup, changes made during test)

1. Small Angle Test
    a. Position the cross feed at the minimum distance from the front of the spindle
    b. Run fiber through tensioning and pulley system and attach fiber to the mandrel perpendicular to the axis of the mandrel
    c. Use controller software to write a file using a wrap angle of 1 degree
    d. Run part file
    e. Observe any skipped steps or audible problems with the crossfeed drive system
    f. Use the protractor to measure the wrap angle of the fiber on the tube at the locations shown in Table 1
    g. Repeat steps a through f for five trials for each tensioning distance called out in Table 1
2. Intermediate Angle Test
    a. Position the cross feed at the minimum distance from the front of the spindle
    b. Run fiber through tensioning and pulley system and attach fiber to the mandrel perpendicular to the axis of the mandrel
    c. Use controller software to write a file using a wrap angle of 45 degrees
    d. Run part file
    e. Observe any skipped steps or audible problems with the crossfeed drive system
    f. Use the protractor to measure the wrap angle of the fiber on the tube at the locations shown in Table 2
    g. Repeat steps a through f for five trials for each tensioning distance called out in Table 2
3. Large Angle Test
    a. Position the cross feed at the minimum distance from the front of the spindle
    b. Run fiber through tensioning and pulley system and attach fiber to the mandrel perpendicular to the axis of the mandrel
    c. Use controller software to write a file using a wrap angle of 85 degrees
    d. Run part file
    e. Observe any skipped steps or audible problems with the crossfeed drive system

f. Use the protractor to measure the wrap angle of the fiber on the tube at the locations shown in Table 3
g. Repeat steps a through f for five trials for each tensioning distance called out in Table 3

Expected Results

Based on feasibility analysis, the crossfeed will be able to maintain the wrap angle commanded by the GUI within 1 degree of the input value.

Summary of Collected Data

	Distance from beginning of tube (in)		
Tensioning Distance (in)	**4**	**8**	**12**
0.1			
0.3			
0.5			
0.7			
0.9			

Table 1: Recorded Measurements from small angle test

	Distance from beginning of tube (in)		
Tensioning Distance (in)	**4**	**8**	**12**
0.1			
0.3			
0.5			
0.7			
0.9			

Table 2: Recorded Measurements from intermediate angle test

	Distance from beginning of tube (in)		
Tensioning Distance (in)	**4**	**8**	**12**
0.1			
0.3			
0.5			
0.7			
0.9			

Table 2: Recorded Measurements from intermediate angle test

Conclusions (general conclusions from data and how they change current and future design)

TBD

Links to Relevant documents (folder path to spreadsheets, pictures, videos, BOM)