

Senior Design Project Description

Company Name	Interroll Corporation	Date Submitted	4/25/2017
Project Title	Drummotor Test Rig (INTER_TEST)	Planned Semester	Fall 2017

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project. 250 hours are expected per person.

Complete the following table if this information is known, otherwise the Senior Design Committee will develop based on the project scope:

Discipline	Number	Discipline	Number
Mechanical	4	Electrical	4
Computer		Systems	
Other ()			

Project Overview:

Interroll Corporation manufactures several material handling products out of our facility in Wilmington, North Carolina. This project will involve our drum motor product line. A drum motor is a motorized pulley that is typically used to drive conveyor belts in food, airport, grocery/check-out and security applications. See the attached video which describes Interroll Drum Motors:

<https://vimeo.com/142129133>

The goal of this project is to create a single load testing device to be used in our engineering laboratory. The project will develop equipment that will apply a known controlled load to our motors. The device should apply a measurable and variable mechanical load to the drum motor roller assembly, and capture the relevant operational parameters of the drum motor and test rig. A holding fixture for the unit under test will be designed and built as part of the project. The holding fixture is intended to be universal to the Interroll Drum motor product line. The data should be able to be logged by serial number and shared over our network.

Initial Project Requirements:

Purpose:

The purpose of this project is to develop a device to mechanically load Drum Motors during their final run test in production, and record the input and output parameters (mechanical, electrical).

1. Device must apply a measurable and variable mechanical load to drum motor assembly
2. Device must be compatible with all the drum motor models produced in the Wilmington facility which require flexibility of the following physical and electrical parameters.
 - a. Between Frame Lengths
 - b. Shaft Dimensions
 - c. Drum Shell Diameters
 - d. Power Ratings
 - e. Velocity Ratings
3. Device must measure and record
 - a. Drum Motor Voltage (3-phase 230V/460V and 1-phase 115V/220V)
 - b. Drum Motor Current Draw
 - c. Drum Motor Shell Velocity
 - d. Drum Motor Output Torque/Power
 - e. Drum Motor Input Power
4. Store all the measured parameters under the drum motor's serial number. Operator would input serial number, load test fixture, run test and test data results logged using LabView type of system.
5. Data must be able to be shared wirelessly or wired to Interroll's plant network
6. Ability to scale to support multiple types of drum motor products configurations considering size of drum motor, shaft sizes and power requirements.

Expected Deliverables/Results:

1. Develop a method and device to apply a controlled and measurable mechanical load on Interroll drum motors as part of the final bench test during production.
2. Device must be capable of applying at least 100 Nm of torsional load to the drum motor.
3. Device must accommodate drum motor diameters: 3.21" to 10.00", as well as the standard shaft sizes offered by Interroll.
4. Device must accommodate drum shell velocities up to 650 feet per minute.
5. Device must record and store: Electrical inputs to test device (Voltage, Current and Power)
Mechanical outputs of Motors (Torque, Velocity)



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Disposition of Deliverables at the End of the Project:

Industry supporter to take possession of test apparatus immediately after the Design Expo and Supporter to transport to Interroll's Wilmington facility.

List here any specific skills, requirements, knowledge needed or suggested (If none please state none):

- LabView or equivalent knowledge by some of the team members to be able to do data logging of tests
- Ability to travel to Client location in Wilmington NC for data gathering or design reviews. Travel costs will be re-imbursed from Project budget.