

Company Information

Company Name	Michelin Aircraft Tire Company	Date Submitted	5/28/2021
Project Title	Design of an Auto-Collapse Drum (MICHELIN_DRUM)	Planned Starting Semester	Fall 2021

Senior Design Project Description

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills:

Discipline	Number	Discipline	Number
Mechanical	4	Electrical	1
Computer		Systems	
Other			

Company and Project Overview:

MICHELIN® Aircraft Tyres provide bias tires, radial tires, and tubes for aviation customers around the world, in a range of applications including commercial and regional airlines, general aviation and military aviation. Michelin technology's working with the biggest companies and constructors in the world (Airbus, Boeing, Bombardier, Comac, Dassault, Embraer, Gulfstream, Hondajet, Lockheed Martin, Pilatus, Sukhoi, Textron, ...). 50 years of experience in aircraft tire production, 250 customers place their trust in us, Michelin works alongside 90 percent of the top 20 airlines companies, Almost 50 percent of commercial aircrafts land with Michelin tires, Aviation operations in 87 countries, Over 3 million radial aircraft tires have been manufactured. Thanks to its global reputation, Michelin is internationally recognized as the No.1 tire manufacturer in the world. For over 100 years, Michelin has confronted challenges faced by the aerospace industry. It has pioneered new technology, seeking to development offerings that provide greater mobility solutions.

Michelin Aircraft Tire Company's US11 Facility in Norwood, NC produces bias aircraft tires. Here are some examples of Michilen's Bias aircraft tires:



The plant manufactures tires on rotating assembly called a drum. The products are assembled in a layered-fashion until the process is completed.

This video covers the basics about how a tire is made: [Michelin Tire Making Video](#)

The tire must then be removed from the drum. Several different styles of drums are used. Newer-style drums utilize a “self-collapsing” feature which permit the outer diameter to reduce enabling the removal of the tire from the drum. We do not currently have an “auto-collapse” drum in the 15” diameter. We have a prototype that was unsuccessful.

Project Requirements:

The project team will review the current tire building manufacturing process and current drum design. They will analyze the shortcomings of the failed prototype and design a drum that will “auto-collapse” for the 15” dimension. Michelin to supply the “collapsed” drum dimension required for tire removal.

Expected Deliverables/Results:

- Solid Works Model of the drum with detailed material specification to include detailed drawings (General Assembly, Sub-Assembly, and component details including physical dimensioning) to permit manufacturing quotation from machine suppliers.
- Prototype of the design in form that is appropriate to project schedule and budget (3D printing, scale version, partial build, etc.)

Disposition of Deliverables at the End of the Project:

The work product will be displayed at the last Expo then immediately handed over to the supporter unless arrangements have been made to deliver at a future date.



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

- Interest in Material Science
- Mechanical Machine Design/Layout/Modeling Skills
- Solid Works
- Travel to Michelin's Norwood, NC facility as required.