Qualification of a Porous Media Air Bearing For Pumping Applications

Overview
Design a test fixture that can impose radial load(s) and/or shaft misalignment on the test air bearing at varying running speeds. Vibration, temperature, and displacement test results will help determine if the bearing is suitable for pumping applications.

Objectives
The team's job this semester was to research methods to test New Ways porous air bearings. The majority of the semester was filled with coming up with concepts on how to go about doing this while the last few weeks were spent taking these concepts and creating a test fixture.

Approach
- Visited Flowserve to determine objectives and customer needs of the problem at hand
- Brainstormed possible solutions to the idea
- Conducted patent search on ideas generated
- Used Multi-Voting to make determine an initial concept of the rig
- Created CAD Model
- Showed CAD Model to professors and sponsors and asked for feedback multiple times
- Re-edited CAD Model multiple times
- Finalized design of Rig
- Ordered materials and built the test rig
- Machined all necessary components
- Assembled final test fixture
- Handed off to sponsor to perform tests

Outcomes
- Allow user to monitor behaviour of New Way air bearings when subject to radial misalignment
- Allow user to monitor behaviour of New Way air bearings when subject to radial load.
- Help Flowserve determine whether New Way air bearings can replace oil bearings currently in their pumps
- Potentially reduce the size and weight of Flowserve's pumps