

Axial Fan Blade Fatigue Tester



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TEAM 18

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DESIGN CONSTRAINTS:

- No more than two people to operate.
- System must collect force, strain, and position data
- Blade clamp will not apply any additional forces other than push and pull.
- Safety cage will be easily replaceable.
- Blade clamp must not interfere with data collection.
- No delay or interference with signals.
- Hydraulics must be able to run for full fan blade lifetime.
- No twisting, bending, and sharp edges.

PROJECT SUMMARY:

Twin Cities Fan's aluminum cast axial fan blades can have small defects that degrade their operational lifetime. Twin City Fan wants a fatigue testing platform to recreate the forces on a fan blade in use to determine the highest quality samples, with the longest life.

DESIGN GOAL:

Our team goal is to design and manufacture a system that evaluates the operational lifetime of different types of fan blades. It must incorporate a hydraulics system, electrical controls system, and universal clamp system to be used with different fan blades. The system must work for all TCF's aluminum axial fan blades. While testing it will collect data such as the number of cycles force applied to the fan blade.

Fatigue Testing Frame

