

Optical Film Bend Radius Tester



From left to right: Alex Robinson, Tim Barthold, Sam Prasher, and Saif Alishaqi

3M Science.
Applied to Life.™

TEAM 25

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DESIGN CONSTRAINTS:

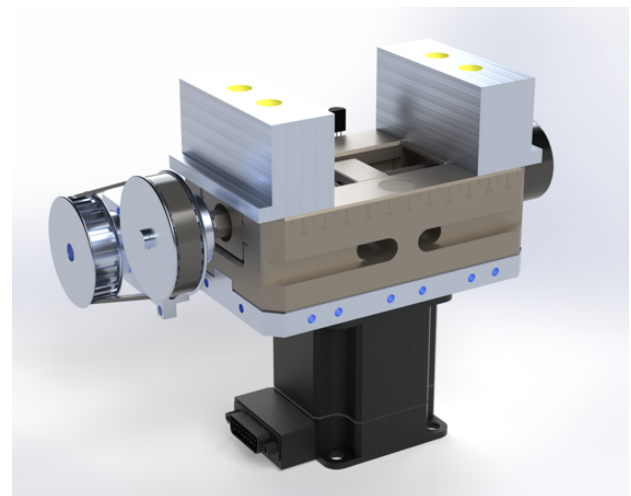
- Automatically perform bending tests on optical films with minimal manual input.
- Measure and record bend radius at which the film cracks.
- User control of test speed and starting position through a simple interface.
- Integrate with a microscope to keep the film in focus during testing.
- Operate safely and stop movement within one second when the stop button is pressed.

PROJECT SUMMARY:

As foldable display technology becomes more common, 3M is developing new thin, flexible films for these displays that must withstand repeated bending without cracking. Currently, testing these films is a slow, manual process that can vary depending on the operator. To improve this testing process, our team designed an automated system that simulates a common failure mode: bending and compressing the film until it begins to crack. By reducing human input and standardizing each test, our device allows for faster, more consistent evaluation of film durability-helping 3M develop more reliable films for foldable displays.

DESIGN GOAL:

A device that can automate testing to measure the bend radius of thin films. This will allow tests to be run with higher efficiency, reduced operator input, and greater consistency.



CAD Rendering of Final Testing Device