

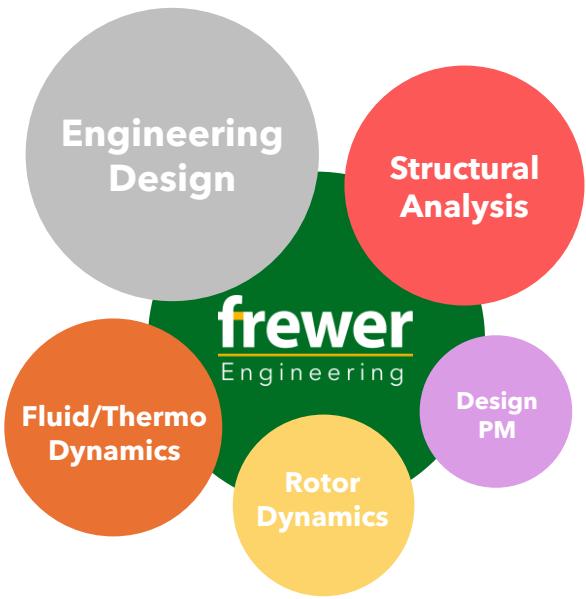
## Case Studies: Blade Testing Rigs

Frewer Engineering's proven capability in structural analysis, rotordynamics, and integrated design for high-speed machinery enables the development of cutting-edge blade testing rigs for fan, compressor and turbine testing.



### Single Arm Units

We have developed single-arm blade test units for overspeed and bird strike testing of large fan blades. Through structural and rotordynamics analysis, windage modelling, and precise balancing, we delivered a safe, high-performance rig for demanding aerospace testing.



### Trailing Blade Integrity (TBI)

We have designed TBI testing rigs, to integrate customer blade designs with bespoke blade discs and dummy blades for TBI testing. This involved assessment of the components under large out-of-balance loading, detailed rotordynamics and balancing analysis and the design of dummy blades that adequately mimic the behaviour of a full blade.

### Fan Blade-Off (FBO)

Our engineers are well versed in the development of FBO testing equipment. We have provided customers with fully balanced and protected drivelines to allow for repeat use of equipment, despite being subjected to extreme imbalance loading. In addition, we have designed FBO containment systems, using explicit dynamic simulations to ensure high energy impacts can be absorbed to prevent dangerous component release.

