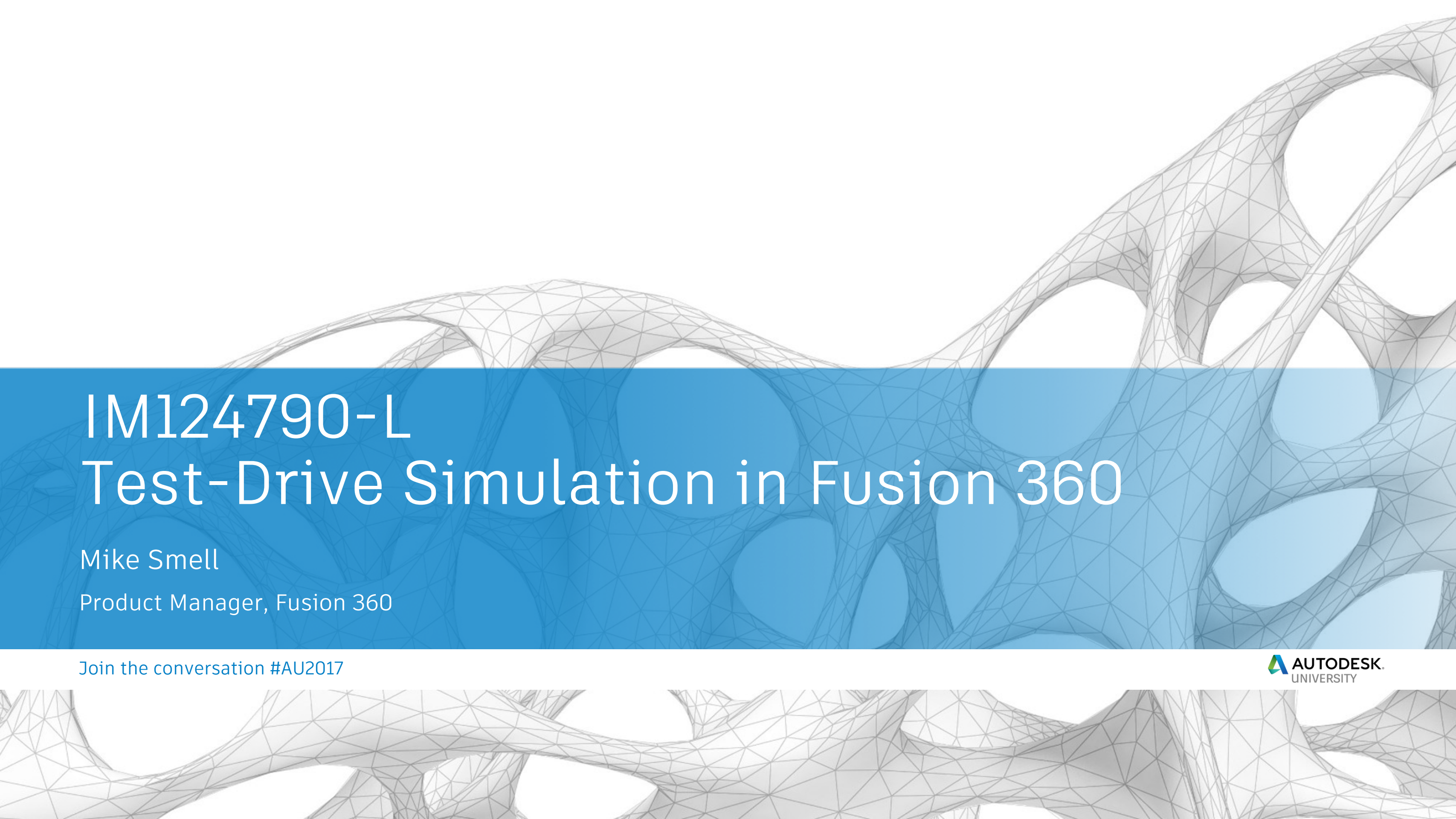




IM124790-L Test-Drive Simulation in Fusion 360

Mike Smell

Product Manager, Fusion 360

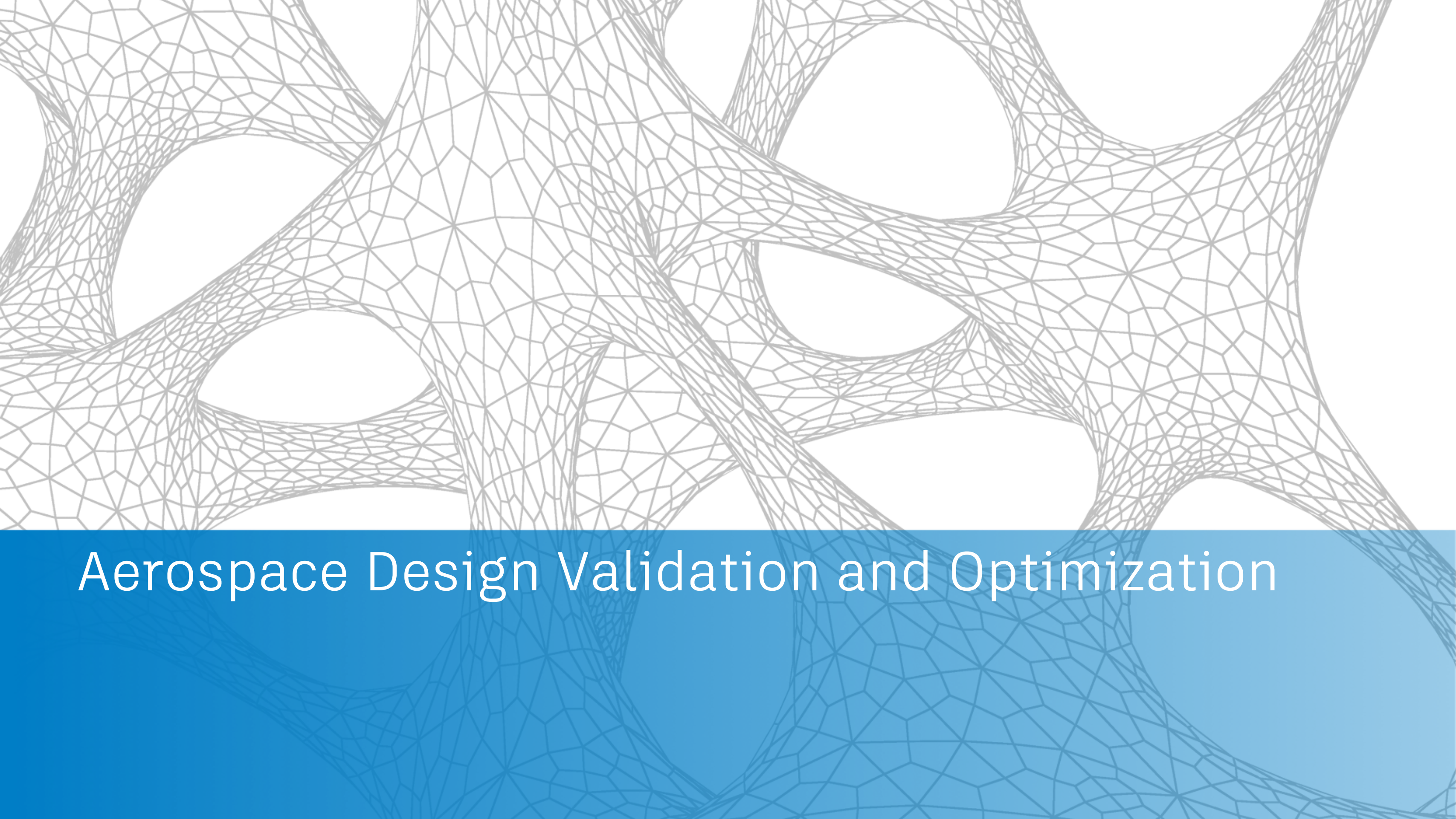
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Class Summary

- The Simulation workspace in Fusion 360 software has been evolving at a rapid pace. In this hands-on lab, you'll get experience setting up and solving many of the study types in Fusion 360. If you're new to Fusion 360, this will be a great opportunity to see all that the Simulation workspace has to offer. If you are new to Simulation, this will be a great opportunity for you to see how easy it is to start improving your designs.

Hands-on Test Drive Agenda

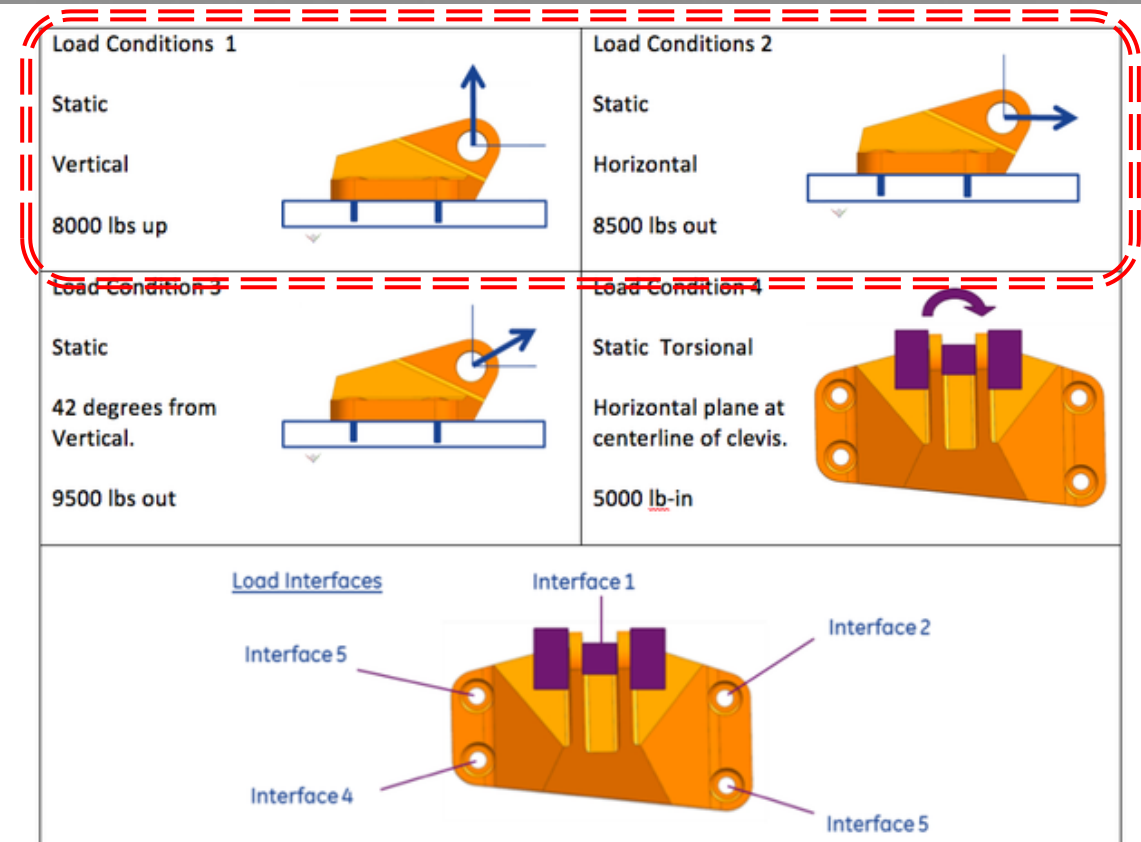
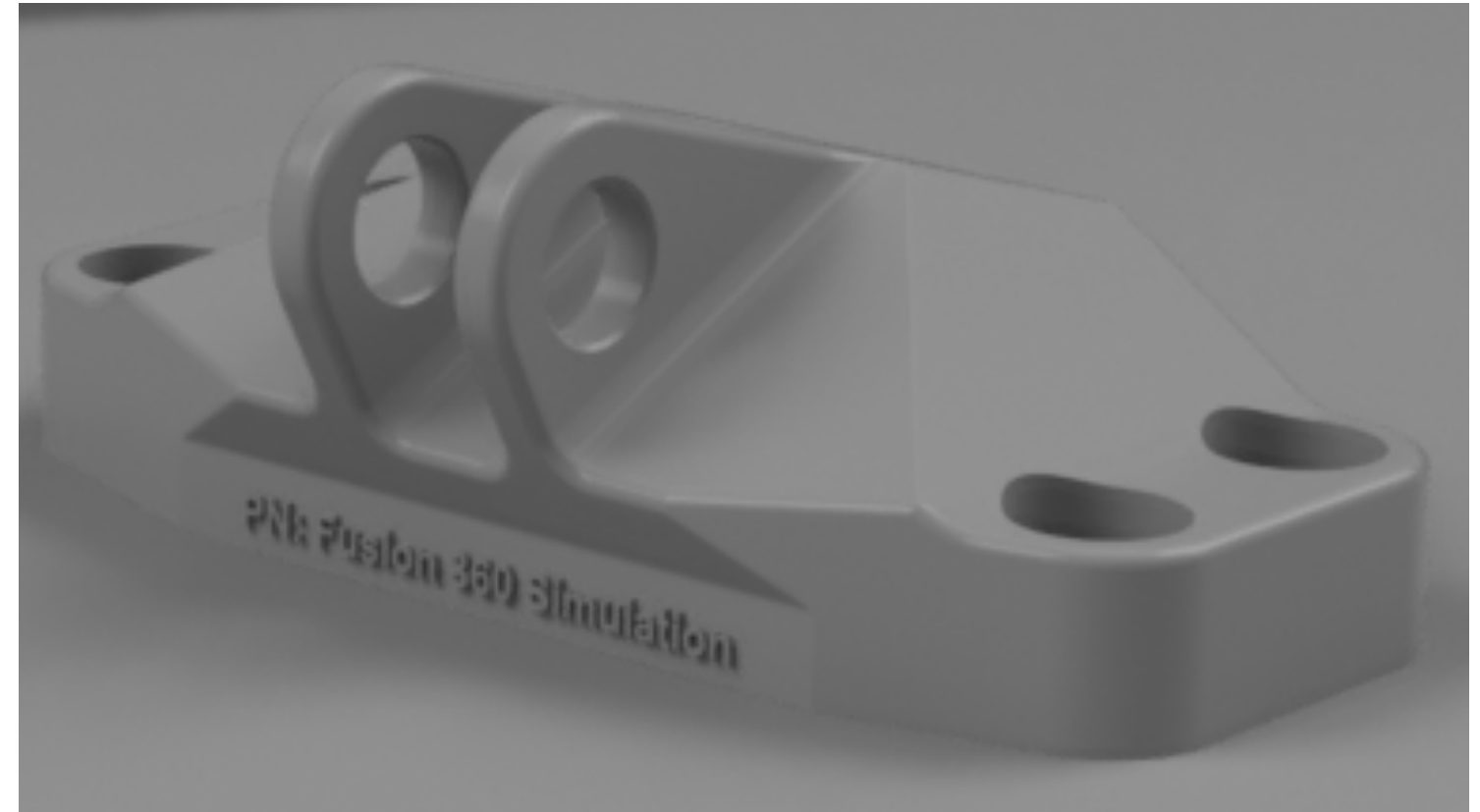
- Aerospace Design Validation and Optimization
 - Linear Static Stress and Shape Optimization
- Machine Design Validation
 - Modal Frequencies
- Manufacturing Component Design Validation
 - Thermal
- Consumer Product Validation and What-if Testing
 - Nonlinear Static and Event Simulation
- Furniture What-if Testing
 - Structural Buckling



Aerospace Design Validation and Optimization

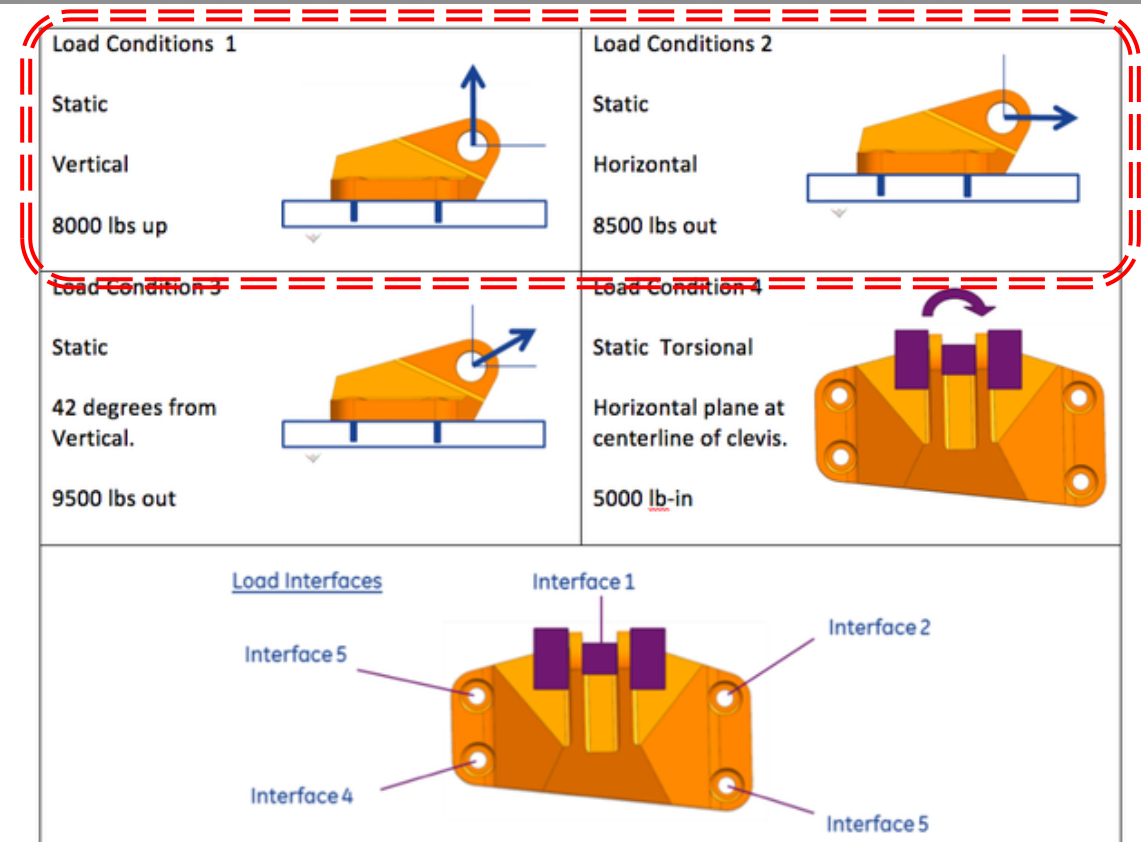
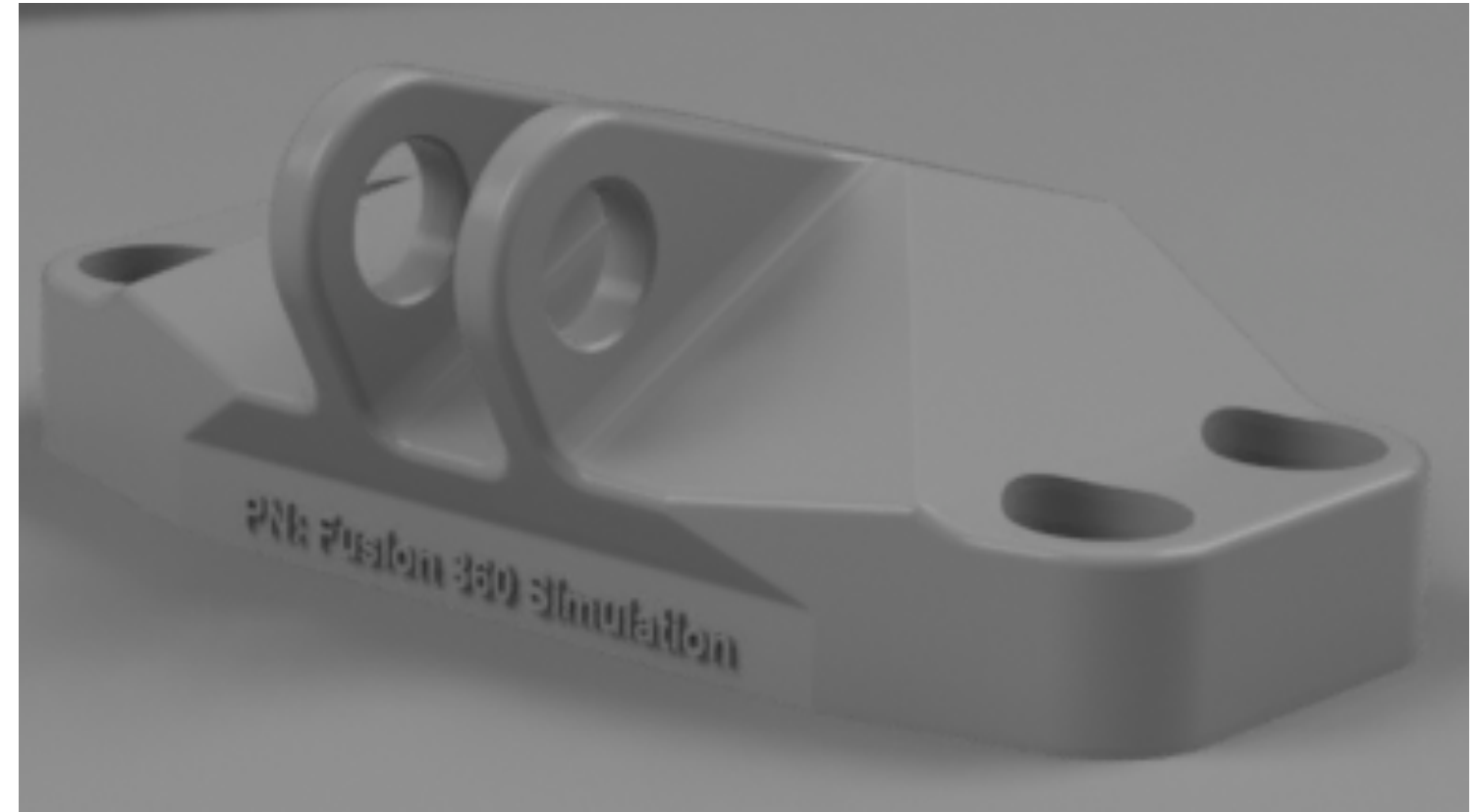
Example 1 - Problem Statement

- Evaluate the Factor of Safety for two static load scenarios
- Load Scenarios
 - 8000 lb. in vertical direction applied evenly across lifting lugs
 - 8500 lb. in horizontal direction applied evenly across lifting lugs
- Assume rigid connection at bolt locations



Example 2 - Problem Statement

- Investigate a strategy for light-weighting the existing design
- Load Scenarios
 - 8000 lb. in vertical direction applied evenly across lifting lugs
 - 8500 lb. in horizontal direction applied evenly across lifting lugs
- Assume rigid connection at bolt locations

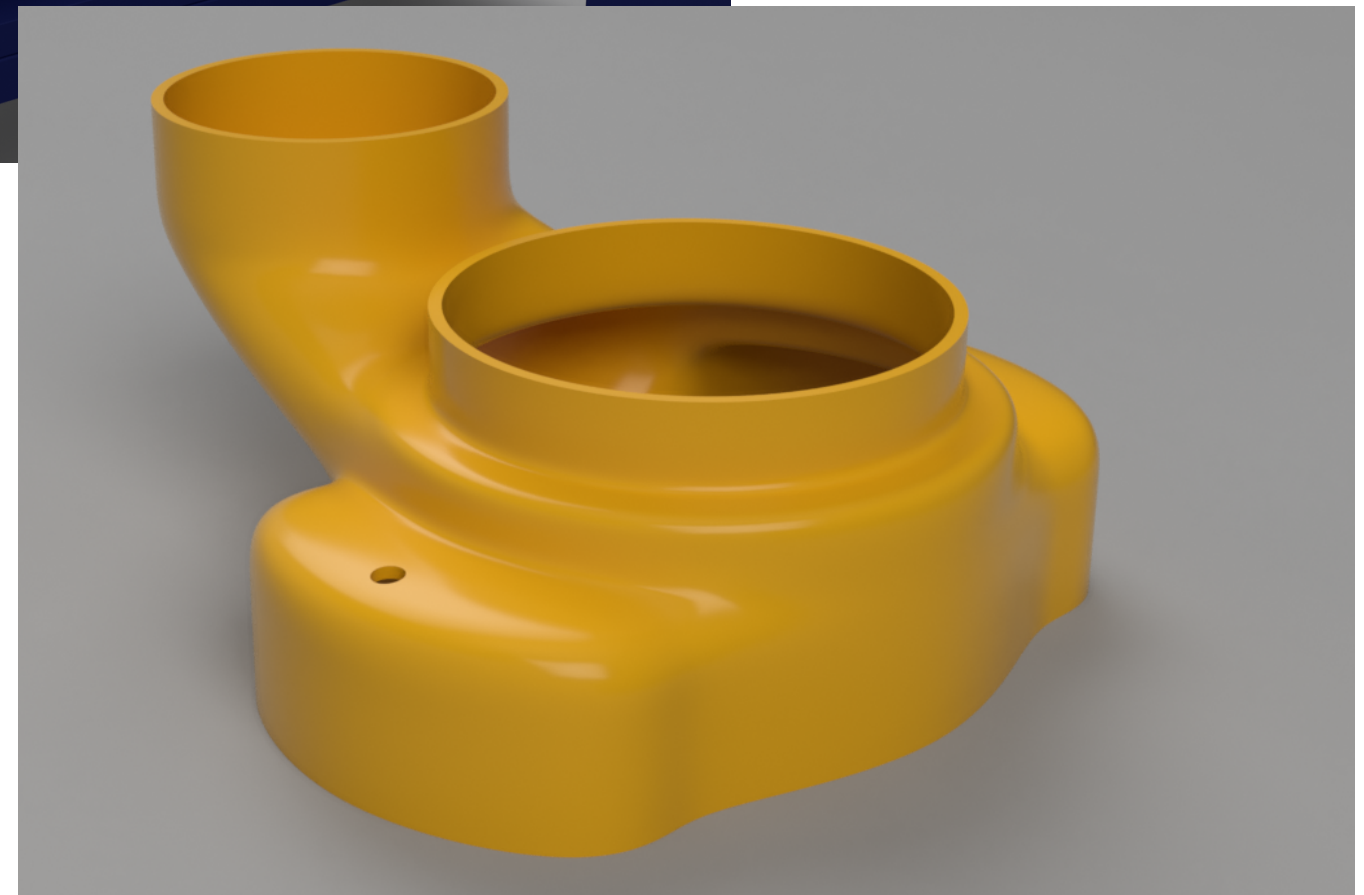
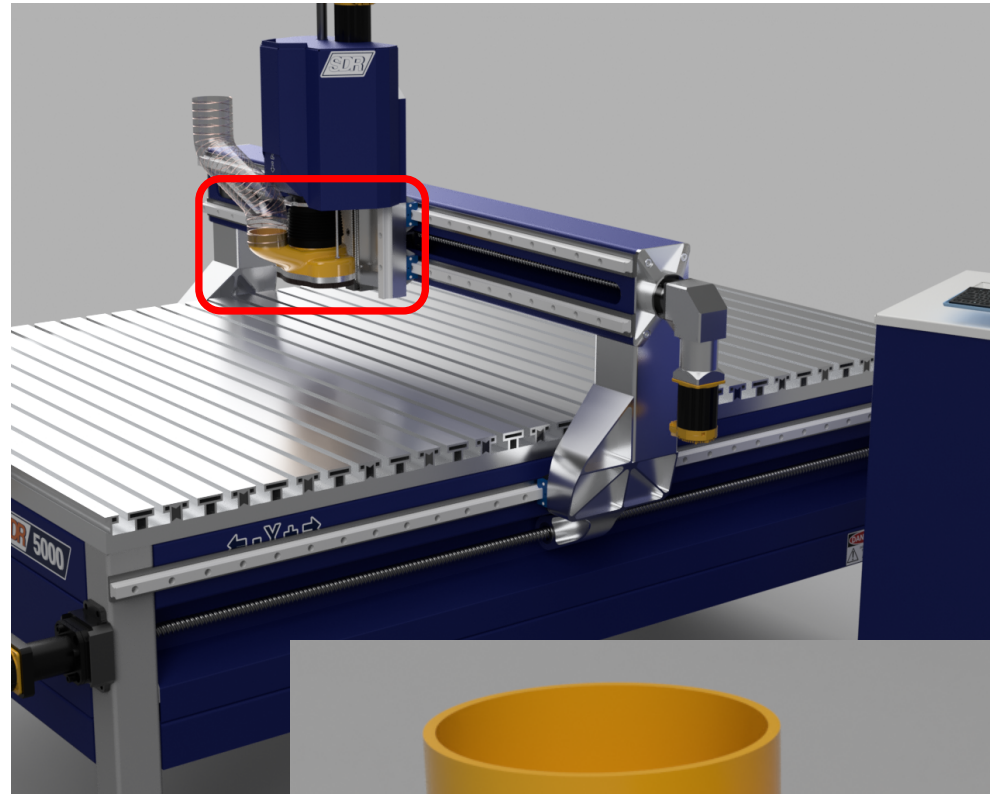


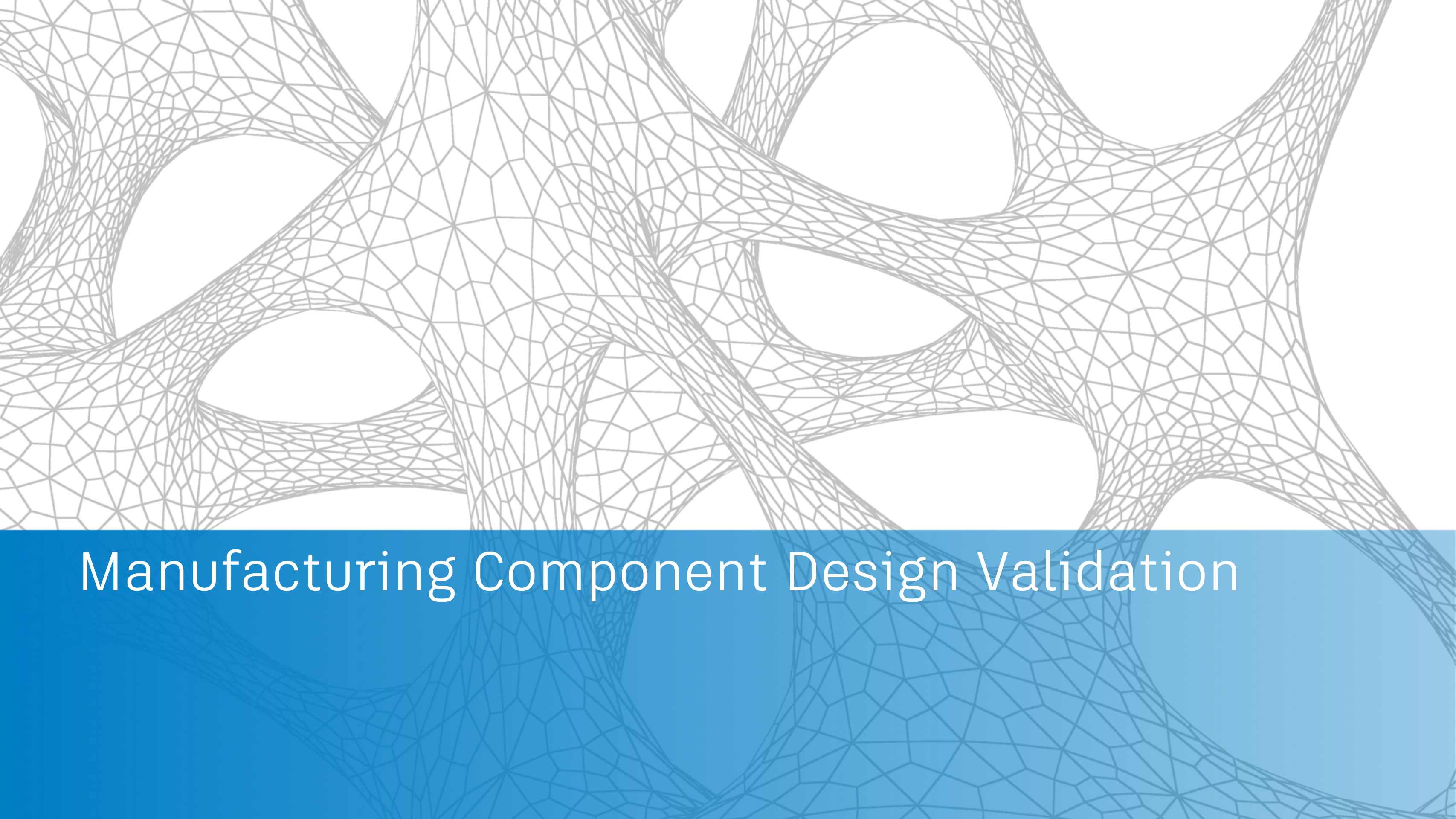


Machine Design Validation

Example 3 - Problem Statement

- Ensure dust cover does not encounter resonant vibration during operation
- Motor operating range
 - 18000 – 24000 RPM
 - *1 RPM = 1/60 Hz
- Assume rigid connections at the bolt holes and allow only vertical translation where the dust cover meets the spindle
- Assume the connection to the flex hose for dust collection is free

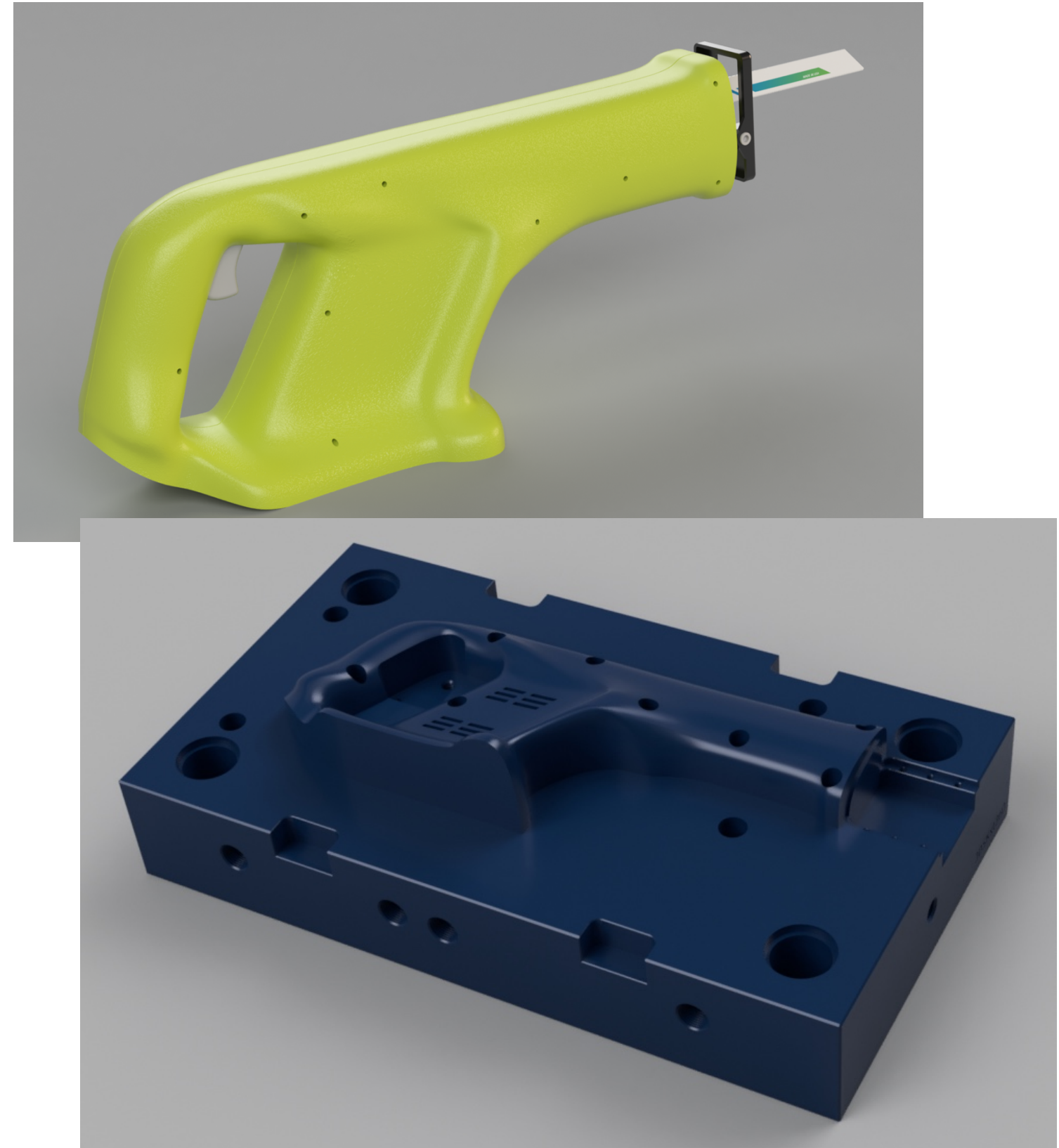




Manufacturing Component Design Validation

Example 4 – Problem Statement

- Evaluate cooling channel arrangement for hotspots around part body at “just-filled” state
- Assume constant part surface temperature of 240 °C
- Assume constant fluid temperature in cooling lines
 - h : 7500 W/m²/K; Temperature: 15 °C
- Assume external convection on exterior side walls of mold core
 - h : 50 W/m²/K; Temperature: 35 °C

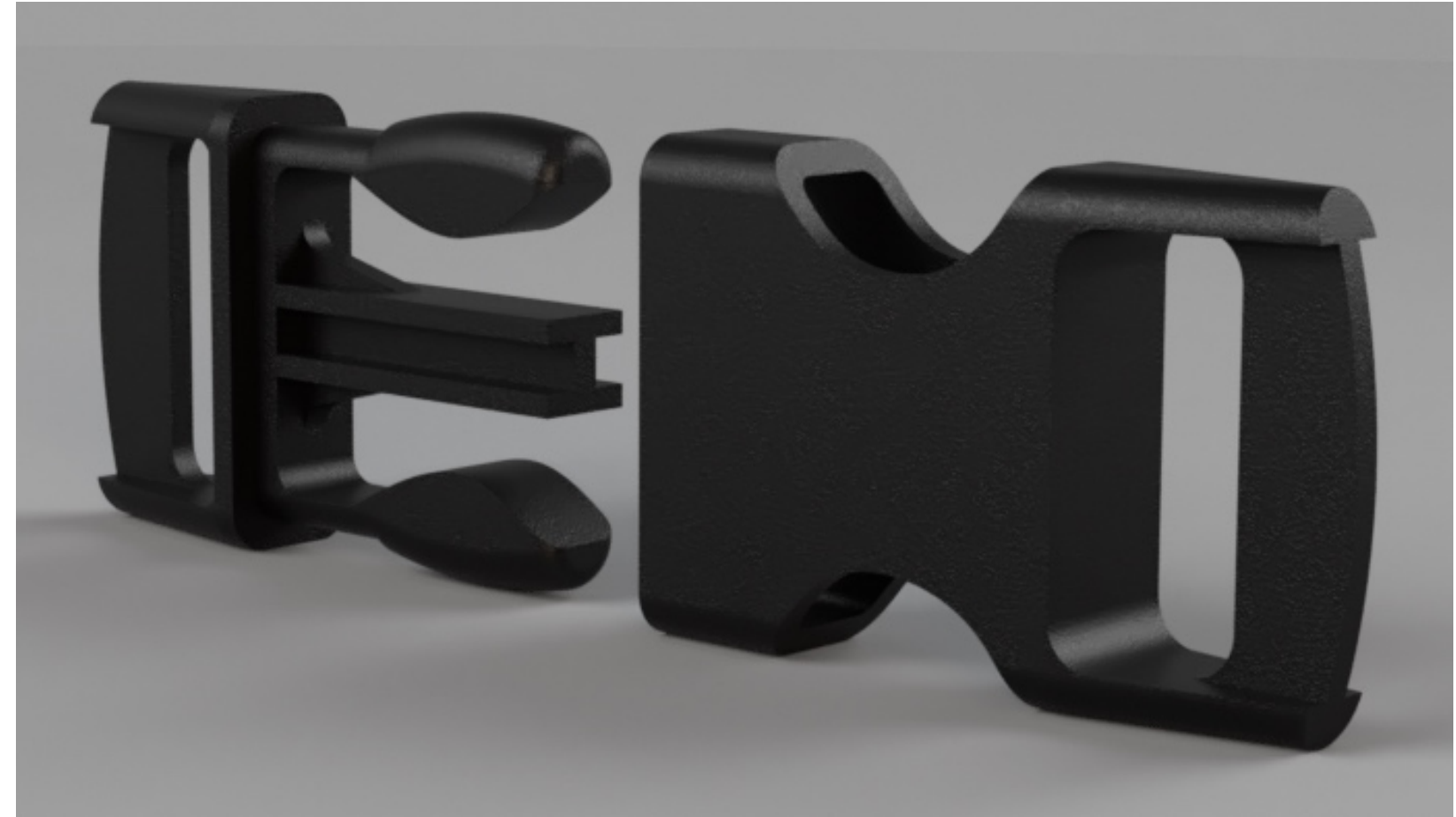




Consumer Product Validation and What-if Testing

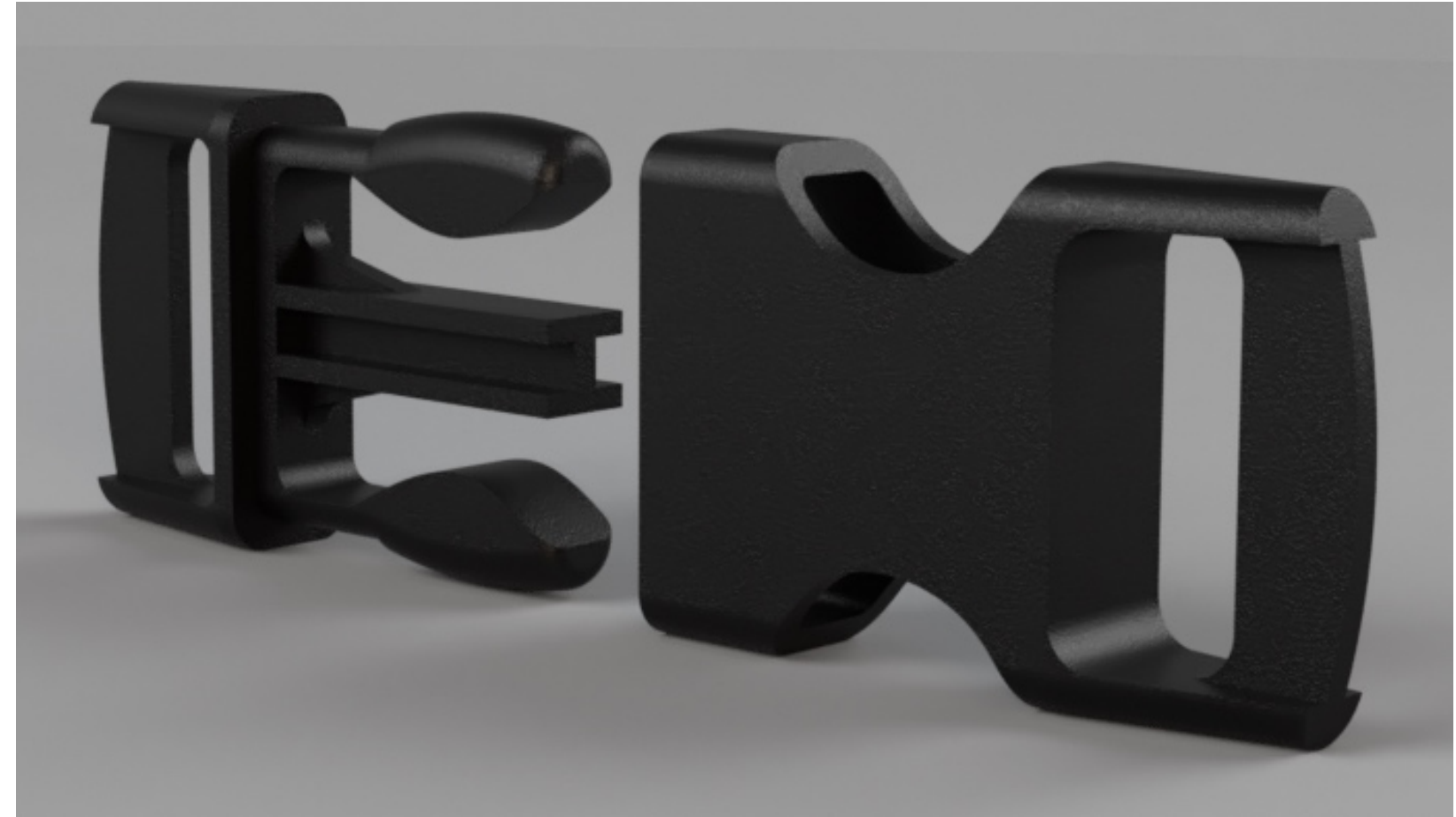
Example 5 - Problem Statement

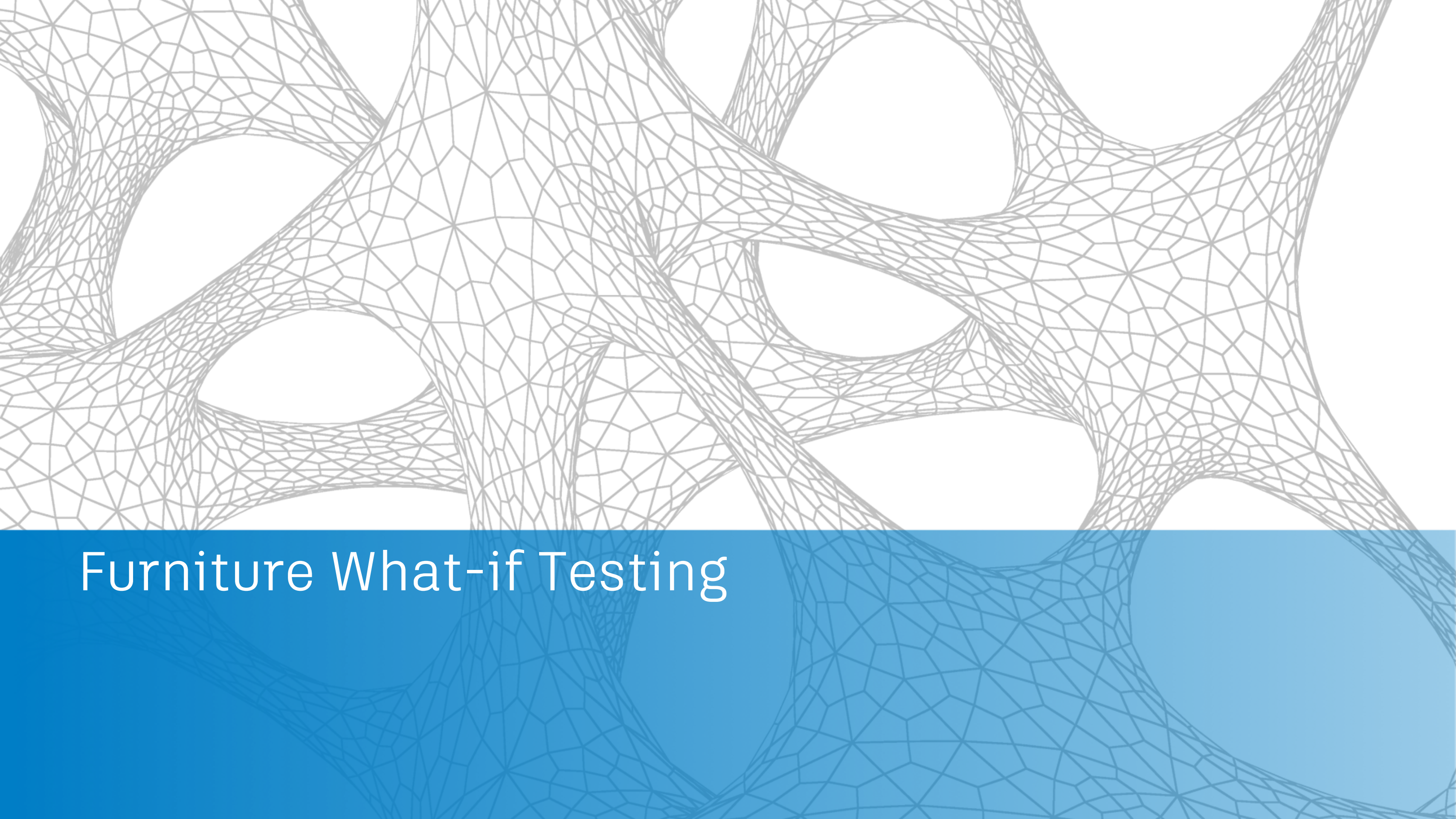
- Evaluate Factor of Safety of male buckle
- Push end of male buckle inward 1.9mm to simulate assembly
- Assume buckle is firmly held at the strap loop



Example 6- Problem Statement

- Evaluate if buckle assembly will survive abrupt pull out without disengaging side releases
- Assume buckle is firmly held at the strap loop on the female end, and is pulled from the strap loop on the male end



The background of the slide features a complex, abstract wireframe pattern. This pattern consists of numerous interconnected lines forming a mesh of irregular polygons, creating a three-dimensional, organic structure that resembles a stylized, flowing form. The lines are thin and grey. A solid blue horizontal bar spans the bottom portion of the image, providing a contrasting background for the white text.

Furniture What-if Testing

Example 7 - Problem Statement

- Evaluate potential risk of collapse or buckle when desk is sat on by a person
- Assume person weighs 250 pounds
- Assume desk is anchored to the ground



