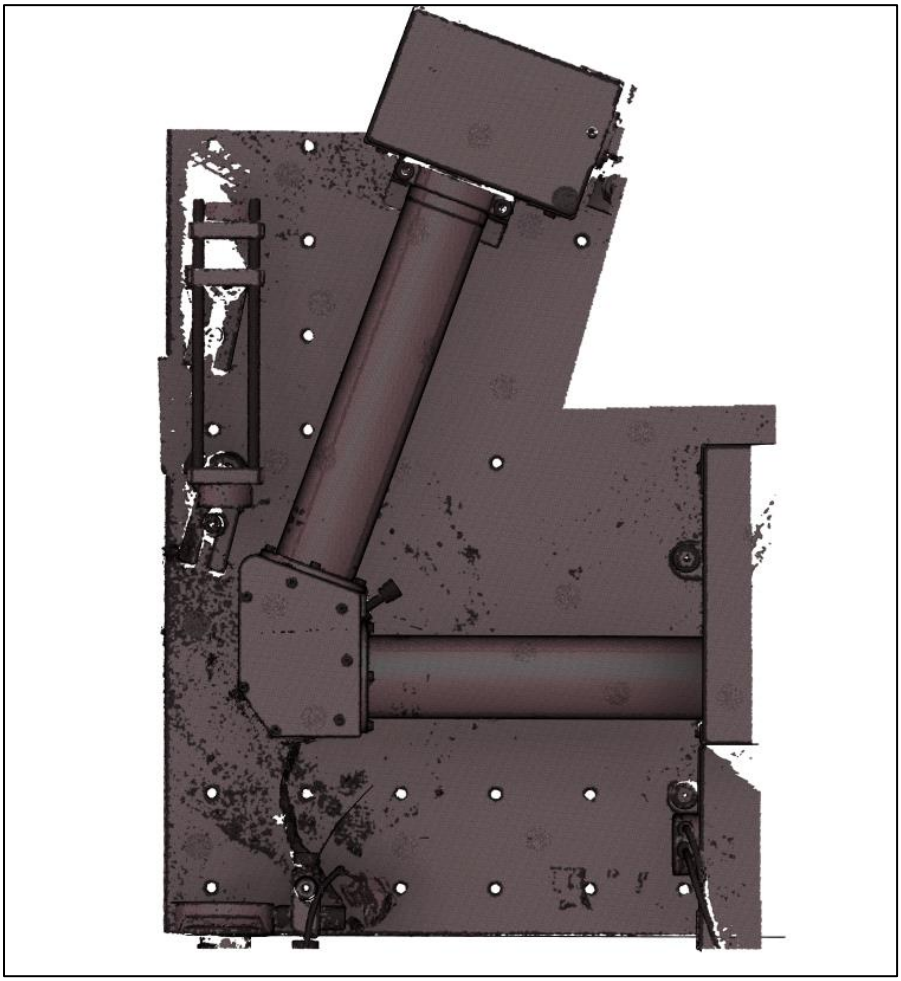
Closed-cell honeycomb baffle for high-frequency noise reduction on Resonant Scanning devices

Supplementary Document

3D-Scanning

The 3D-Scanning is performed to ensure a) an accurate digital representation of the setup is captured for reverse engineering a custom-fit baffle around the components. b) to perform a virtual fitment check to ensure the designed baffle fits the existing components.

The software used to capture scanned point cloud data is *Creaform VX Elements* and the file is aligned to coordinate planes using *Materialise Magics*.



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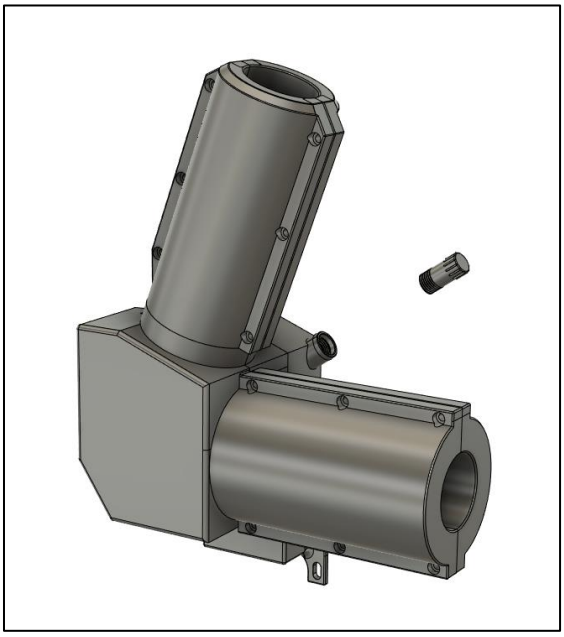
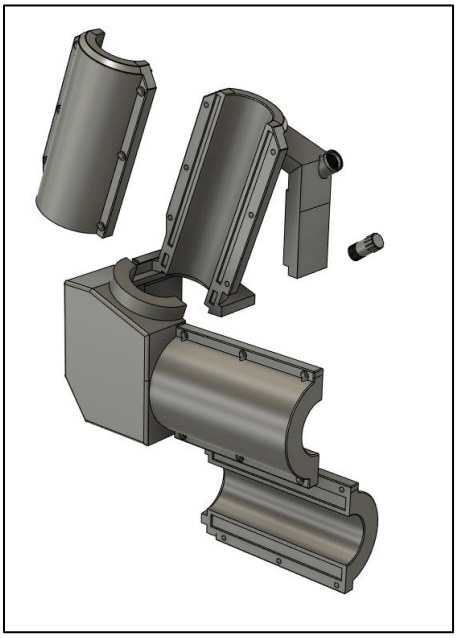
Reverse Engineering

Using the 3D-scan file, a custom baffle enclosure is designed using Autodesk Fusion-360. The components are designed to be produced in seven individual pieces for a) easy disassembling for technicians and b) constraints set forth by the limited printable build area by the 3D-Printer. This design consisted of solid walls that will be later used to create latticing on the inside and also contains an offset for an after-market polyurethane foam to compress. The design has custom screws and plugs for adjustment of a calibration screw fitted in the resonant tubes.





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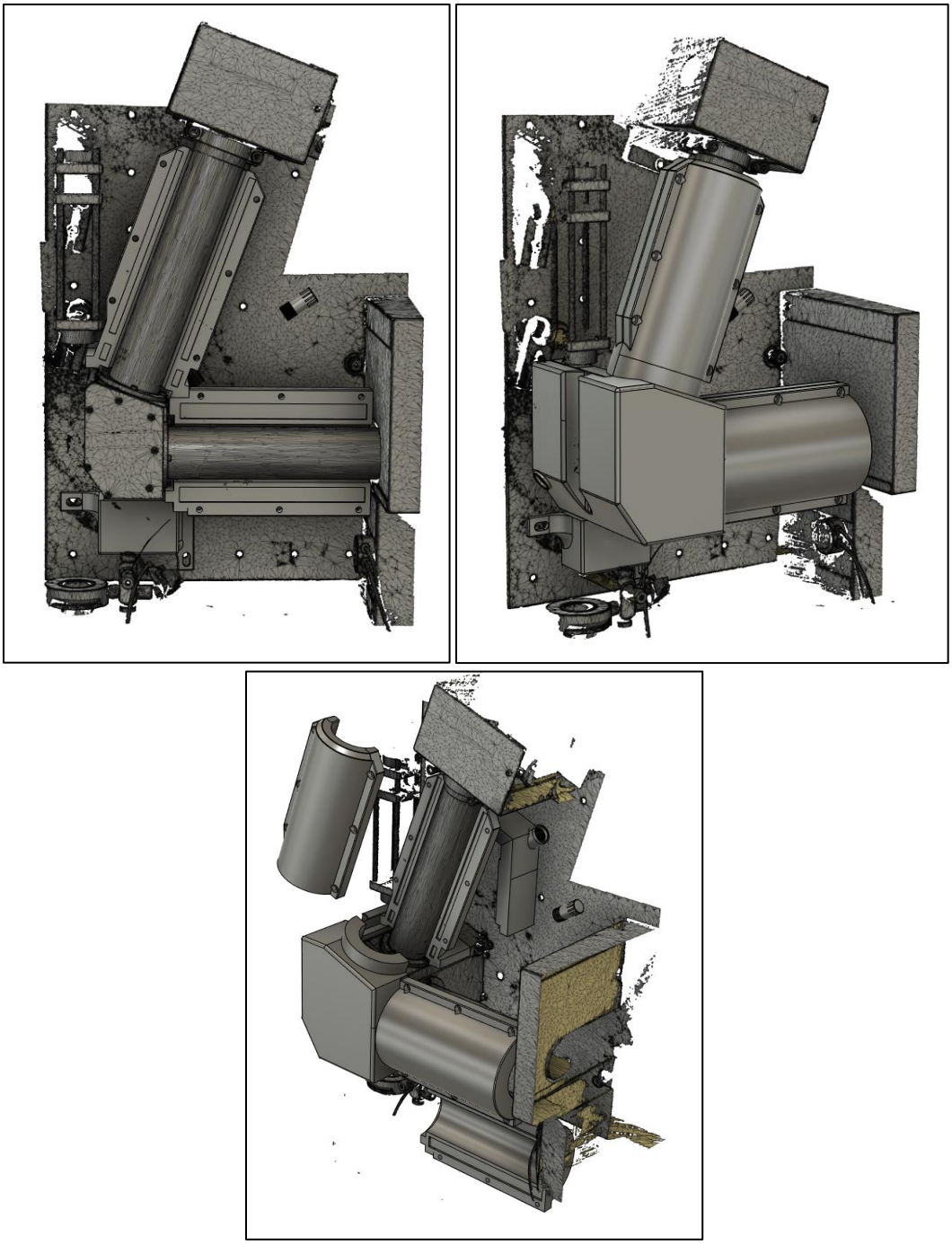
Design Fitment Check

The designed CAD model is overlaid on the 3D-scanned CAD to ensure all components fit without unwanted interference.



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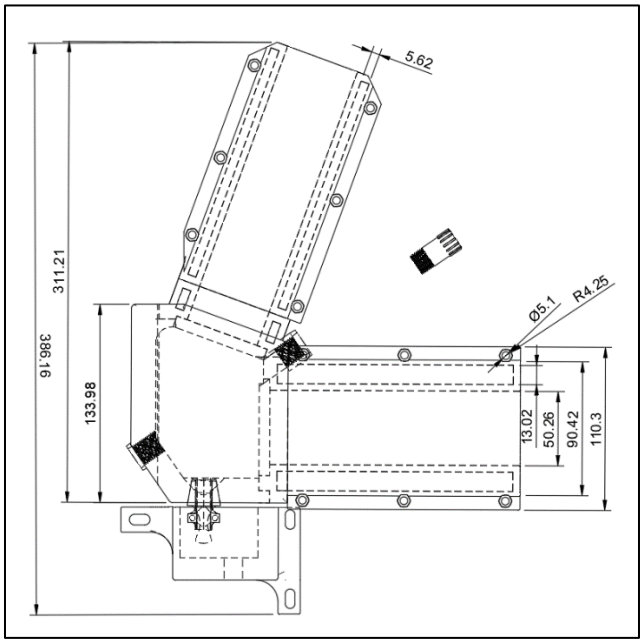
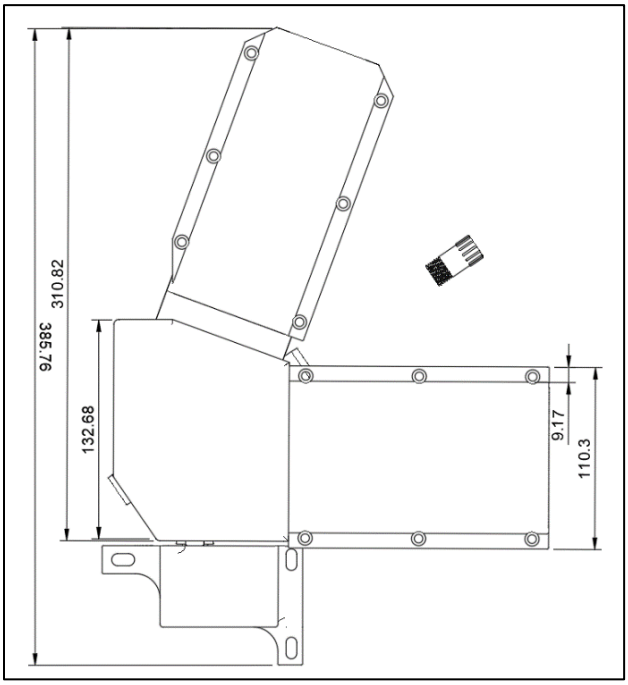
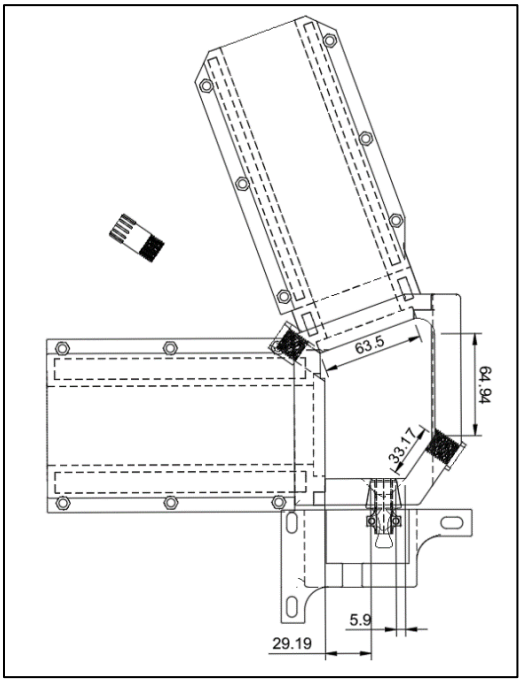
Dimensions of external baffle components

Drawings for the baffle assembly.







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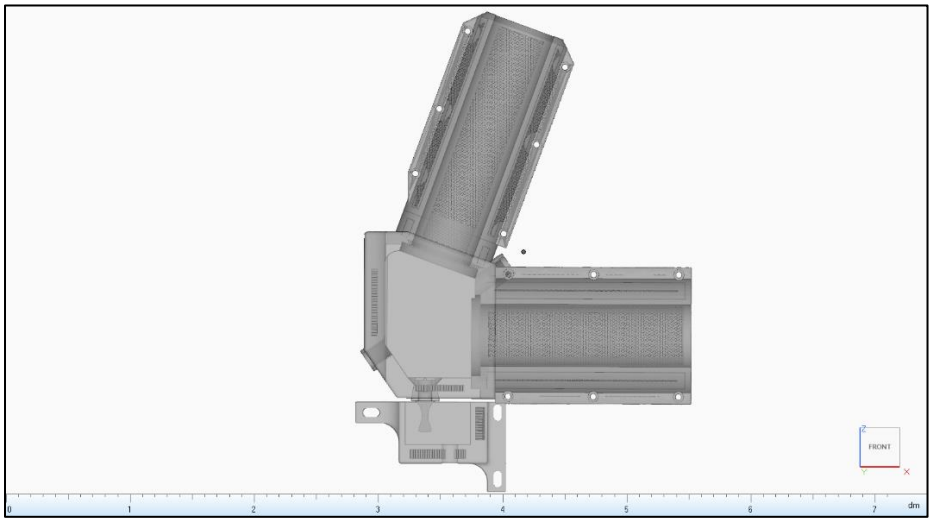
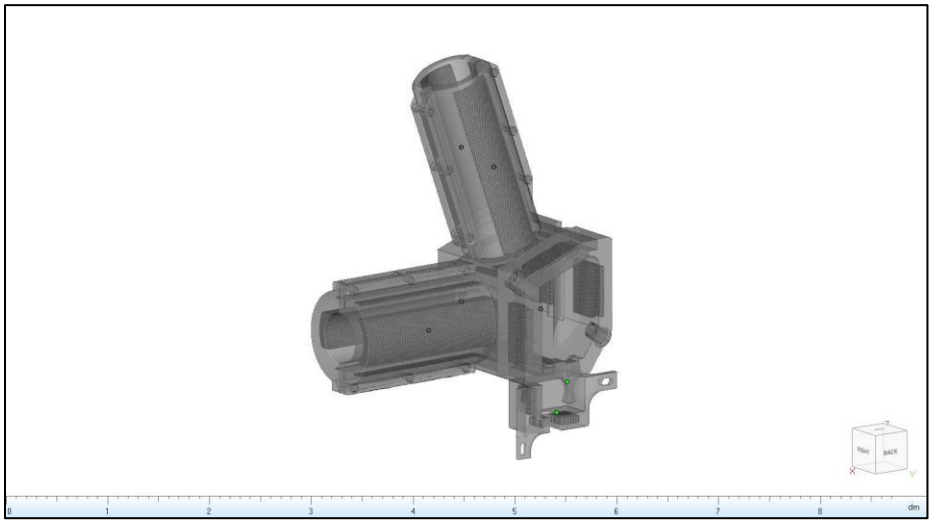
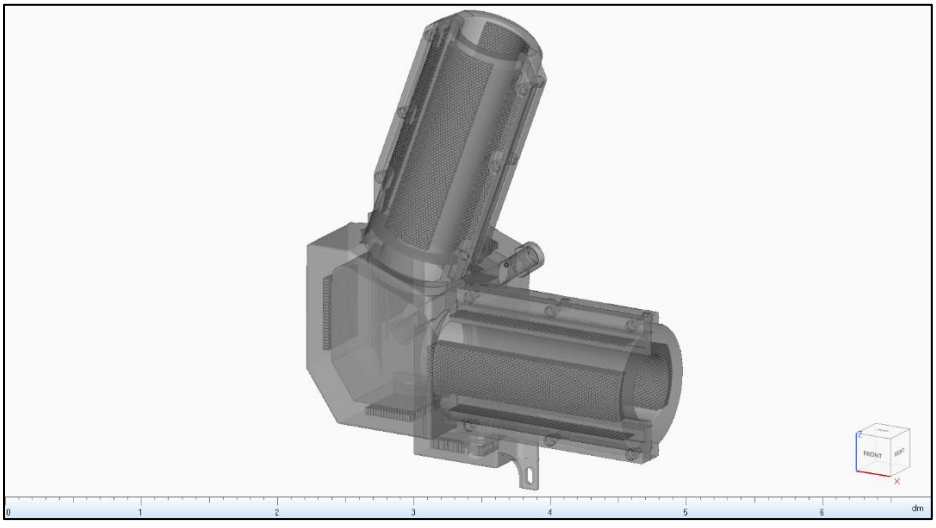
Closed-cell honeycomb design

Transparent view of regions with closed-cell honeycomb design.







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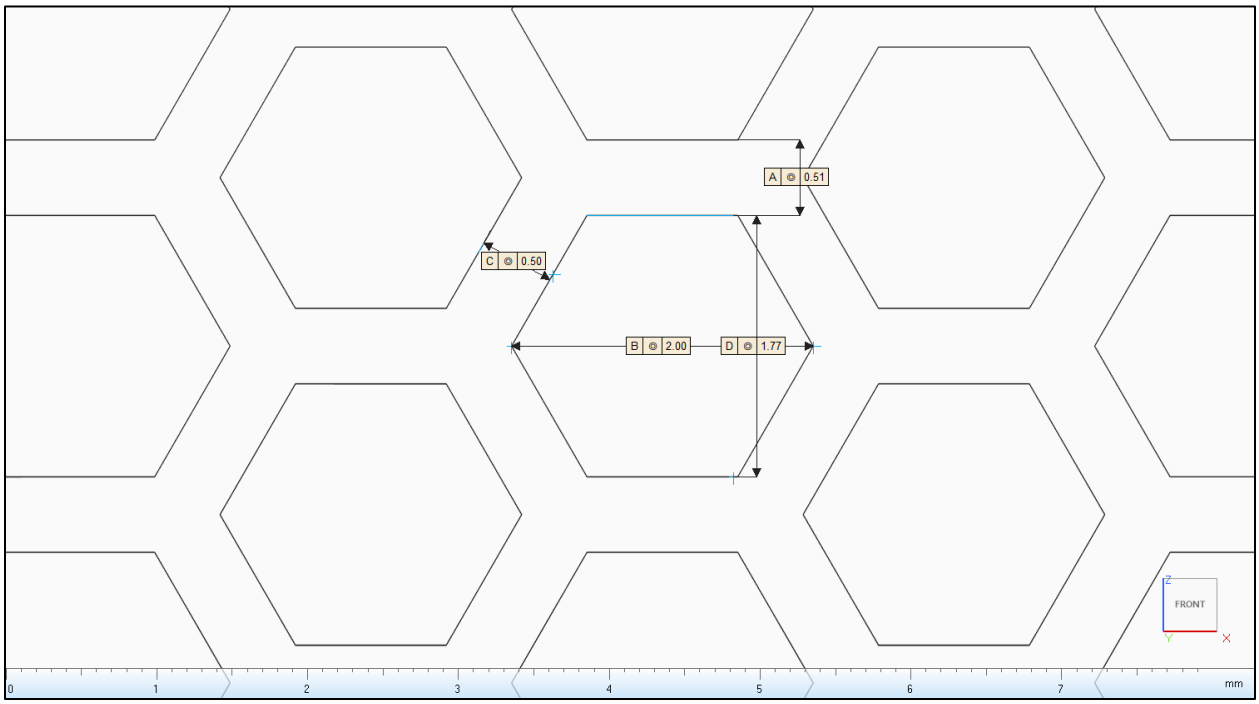
Dimensions of closed cell honeycomb design

Annotated dimensions of the closed-cell honeycomb design.



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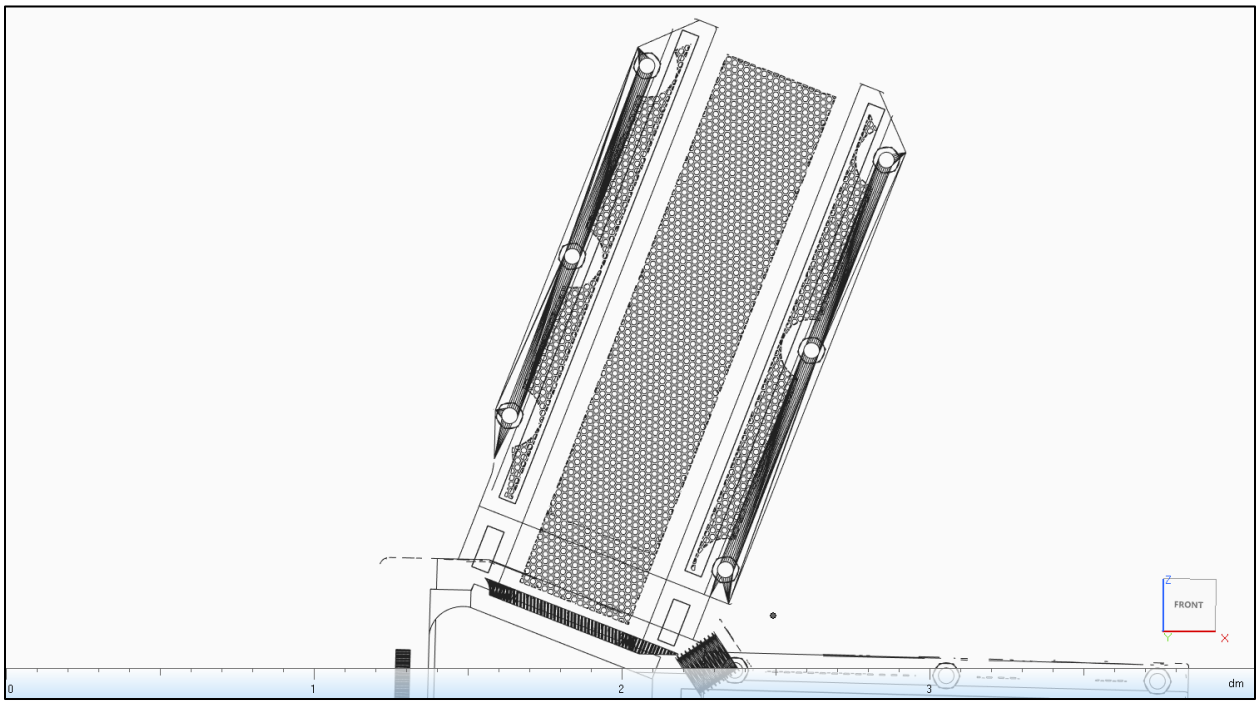
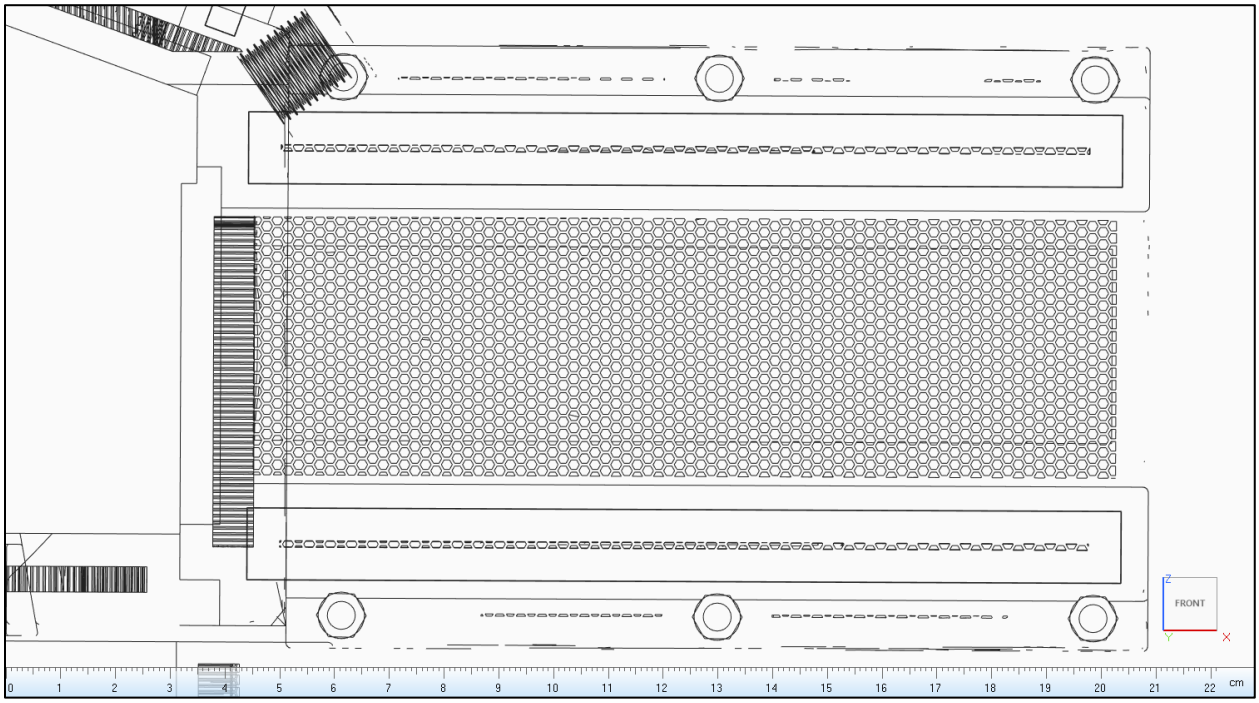
Wireframe cross-sections of closed-cell honeycomb design

Wireframe screenshots of certain regions of the baffle assembly and components.





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