

GILLIAN A. PINSKY

B.S., ENGINEERING

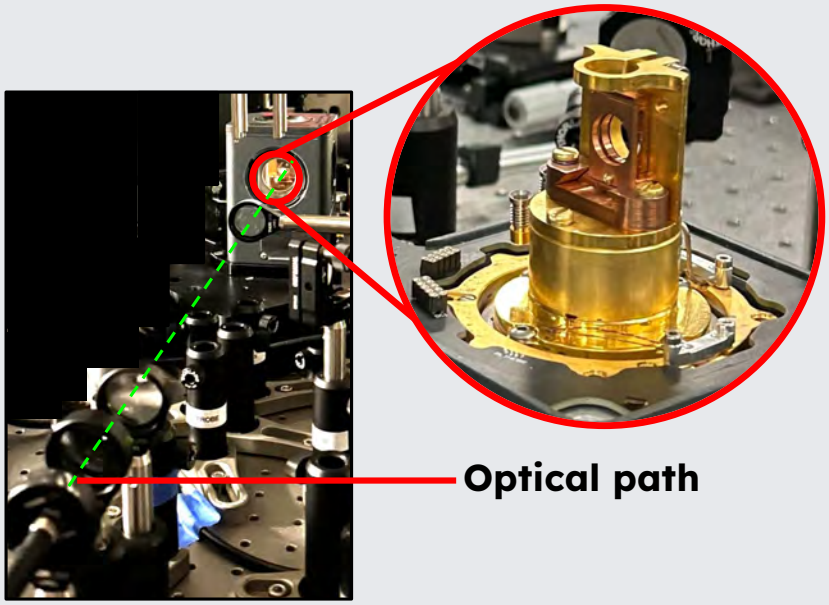
May 2026

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CUSTOM CRYOGENIC SAMPLE HOLDER

Project Overview

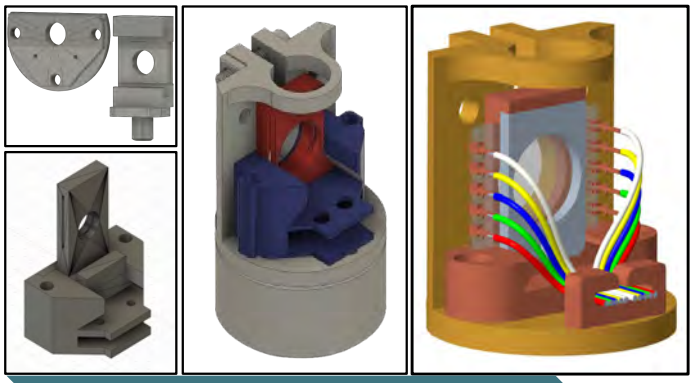
Designed and implemented a stable cryogenic sample mount to enhance alignment precision, safety, and thermal performance within the Montana Instruments Cryostat system.



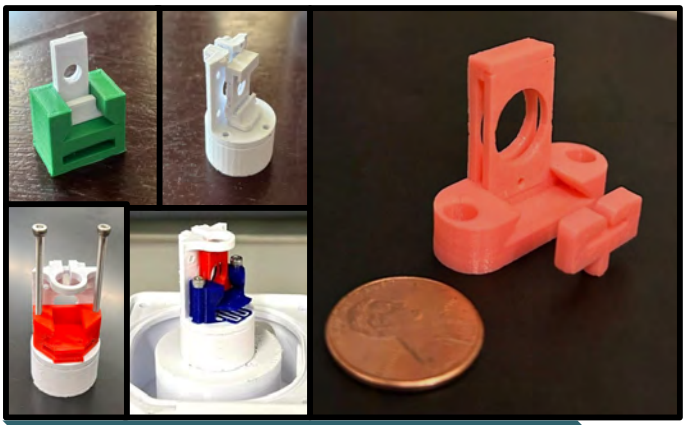
Design Process



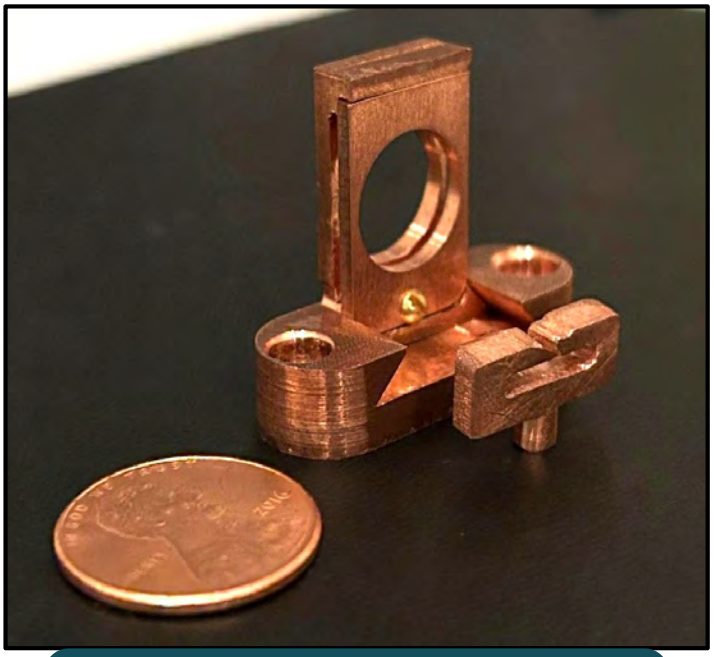
Problem Definition



Iterative CAD Design



3D Printed Prototypes



Machined Final Design

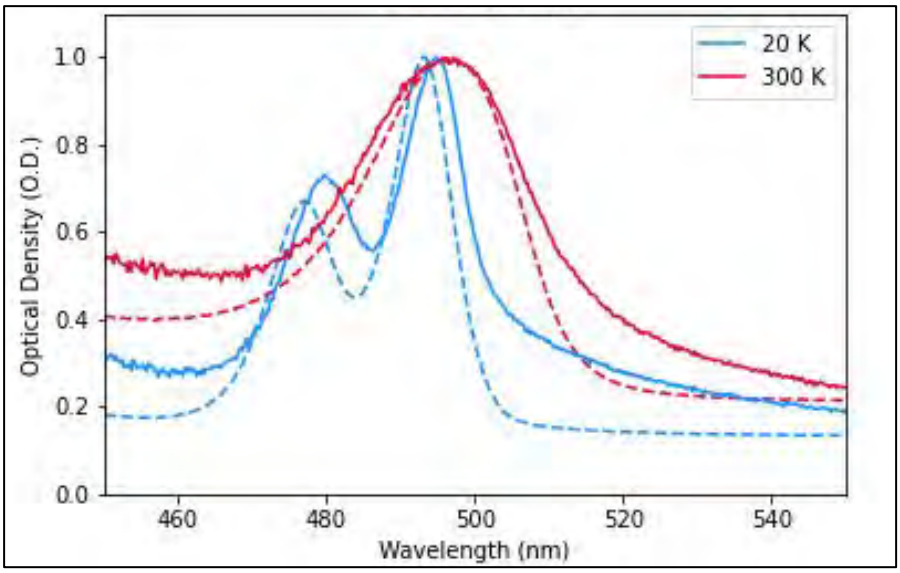
Skills Used

- CAD (Autodesk Fusion 360 & Creo)
- Rapid Prototyping
- 3D Printing
- Tormach PCNC 440
- Wazer Waterjet
- Project Management
- Data Analysis

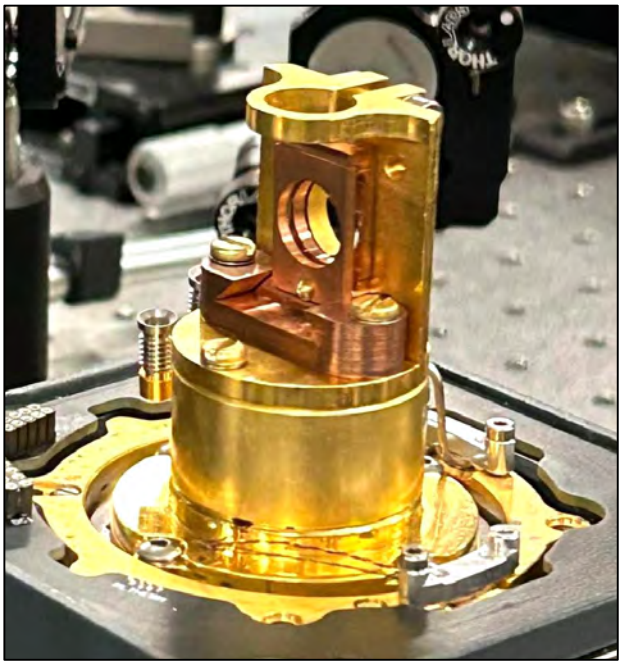
Results & Impact

- Noise reduced by ~79% (20 K) and ~31% (300 K), improving signal clarity.
- Spectral fidelity maintained: peak shift < 5 nm confirms optical neutrality.
- Enhanced thermal and mechanical stability, minimizing drift during cooling.
- Enables reproducible, low-noise cryogenic absorption measurements.

Optical Stability of $(R\text{-}MBA)_2PbI_4$ with Sample Holder



Solid lines (with holder) show smoother, lower-noise spectra and consistent excitonic peaks, confirming improved optical stability.

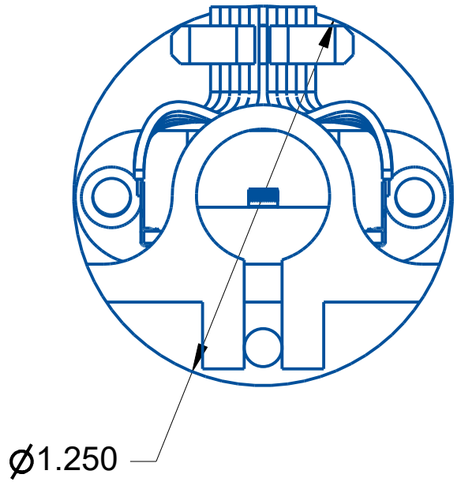


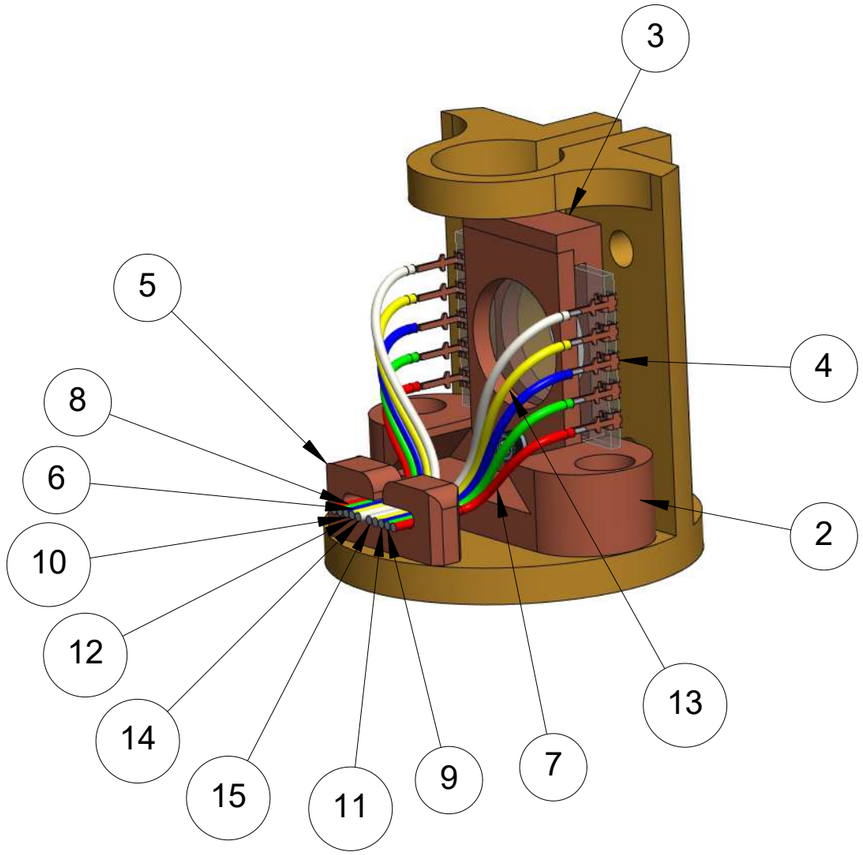
Final copper design installed in cryostat.

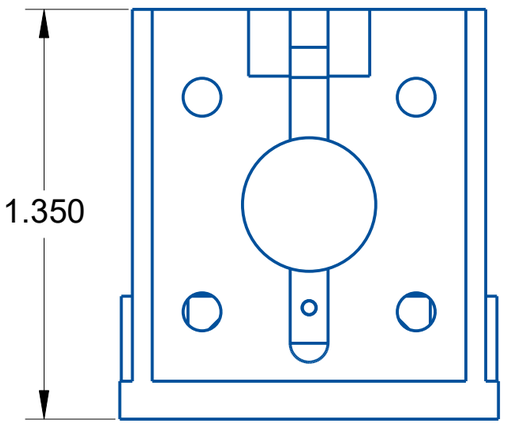


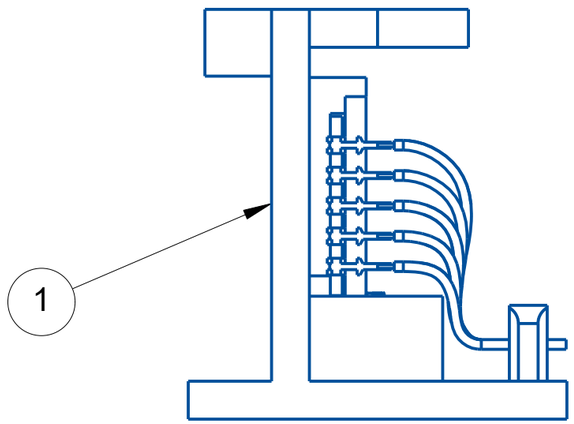
Final copper assembly after modification.

Interference between the dovetail base and cryostat casing was resolved by widening one mounting hole with a drill press, maintaining screw support and restoring clearance.









1	BASE	PART
2	EGR-50005-001_DOVETAIL	PART
3	SLIDER	ASSEMBLY
4	LEGSANDGLASS	ASSEMBLY
5	EGR-50005-004_WIRE_HOLDER	PART
6	WIRE_1	PART
7	WIRE_1M	PART
8	WIRE_2	PART
9	WIRE_2M	PART
10	WIRE_3	PART
11	WIRE_3M	PART
12	WIRE_4	PART
13	WIRE_4M	PART
14	WIRE_5	PART
15	WIRE_5M	PART
ITEM	DESCRIPTION	TYPE

UNSPECIFIED TOLERANCES
ANGLES ± 1°
TWO PLACE DECIMAL ±.010
THREE PLACE DECIMAL ±.005
FOUR PLACE DECIMAL ±.0005
SURFACE FINISH √125

MATERIAL:

FINISH:

WAKE FOREST UNIVERSITY

TITLE:
CRYOSTAT - Assembly

DWG SIZE: B | Scale: 2:1 | DRW#: EGR-50005-000 | REV: A

DATE: 10/16/2024 | DRWN BY: G. Pinsky

SHEET METAL PLATES



Project Overview

Designed and validated compact sheet-metal mounting plates to improve accessibility, manufacturability, and serviceability within the dental laser chassis.

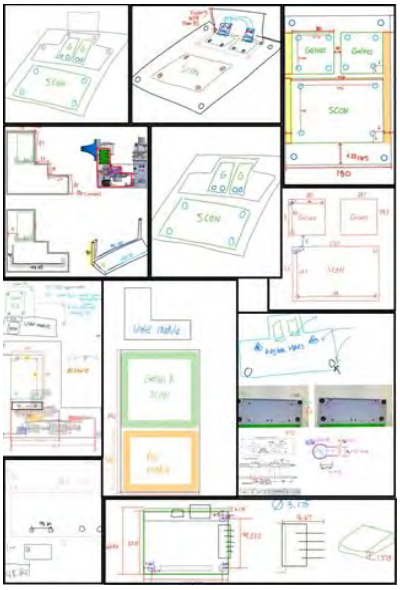
Skills Used

- SolidWorks
- Sheet Metal Design
- Assembly Design
- Mechanical Design for Manufacturability (DFM)

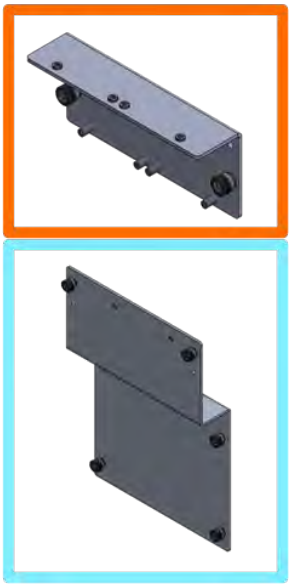
Results & Impact

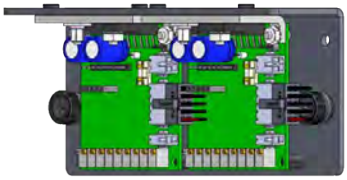
- Improved internal layout efficiency and space utilization.
- Simplified assembly and maintenance for faster service operations.

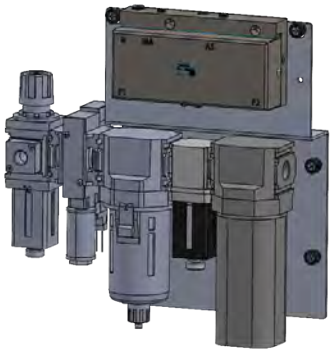
Design Process



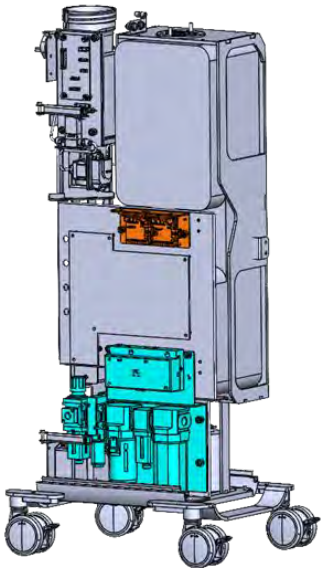
Concept Generation



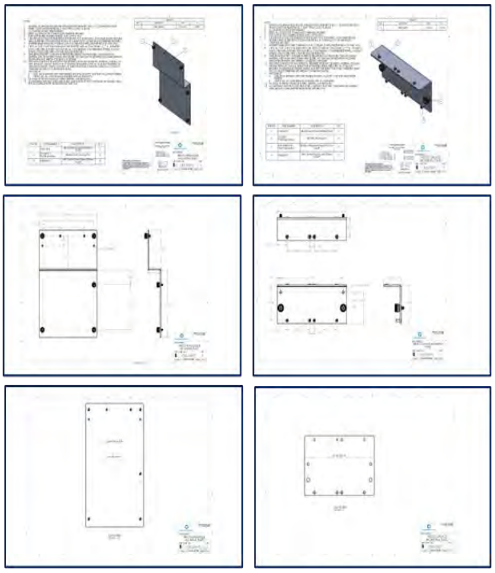




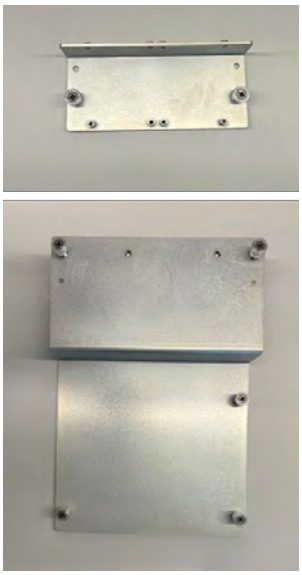
Iterative CAD Design



Fit to Chassis



Release Drawings



Final Sheet Metal Prototype

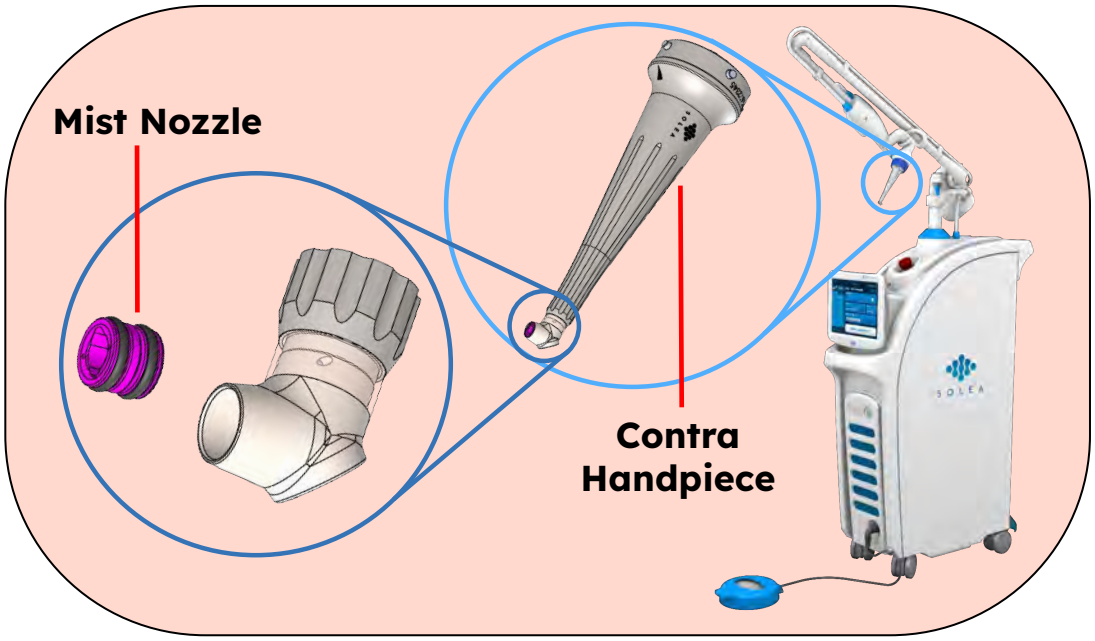
MIST NOZZLE TOOL

Project Overview

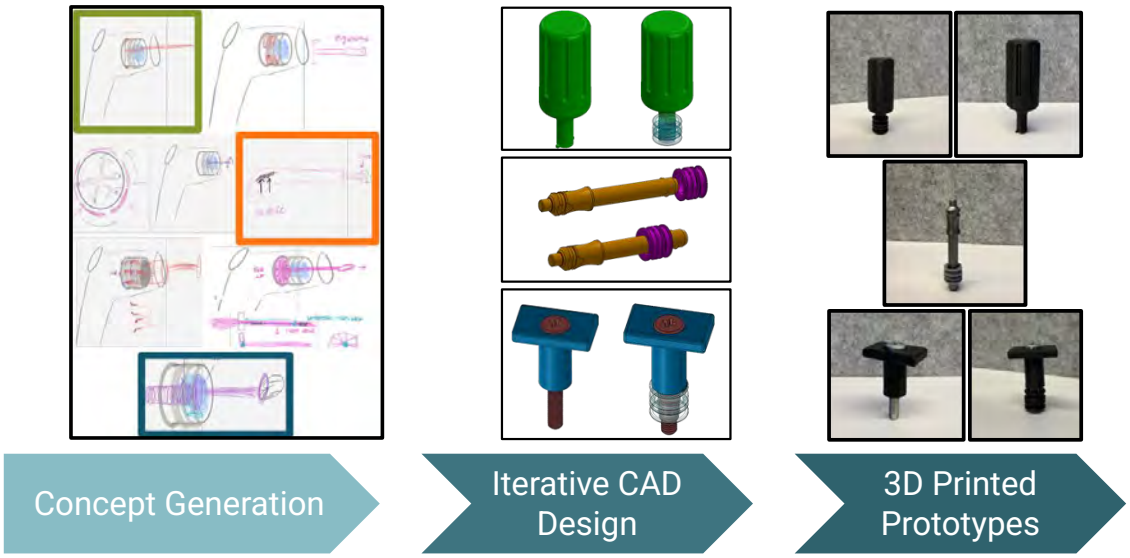
Designed and refined a tool to enable easy, tool-assisted removal and replacement of mist nozzles on the Solea Contra Handpiece.

Skills Used

- Concept Ideation
- SolidWorks
- Rapid Prototyping
- 3D Printing

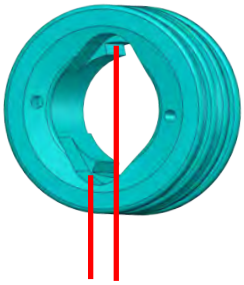


Design Process

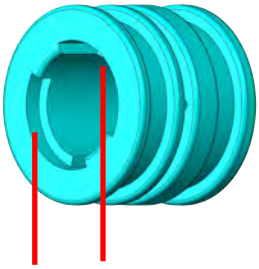


Results & Impact

- Reduced Field Service Engineer visits
- Quick, tool-assisted nozzle removal for easier maintenance
- Optimized nozzle geometry for simpler manufacturing and cleaning



Tool alignment slots



Turning lock tabs

