Modular Coil Type-C

Status of Lead Blocks Design

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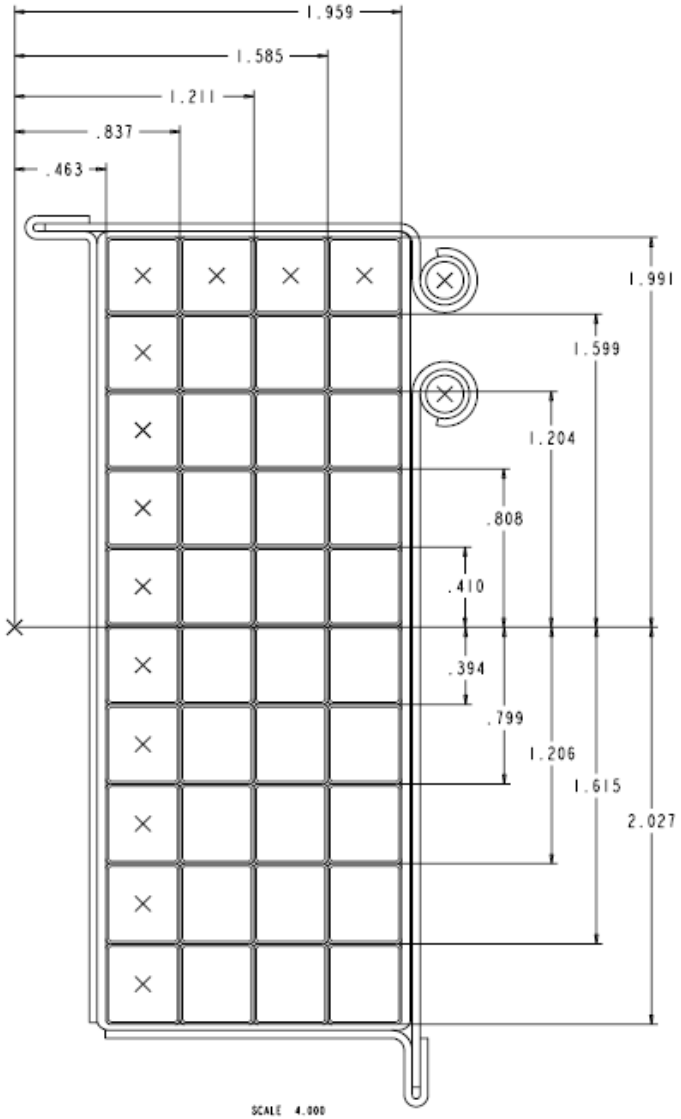
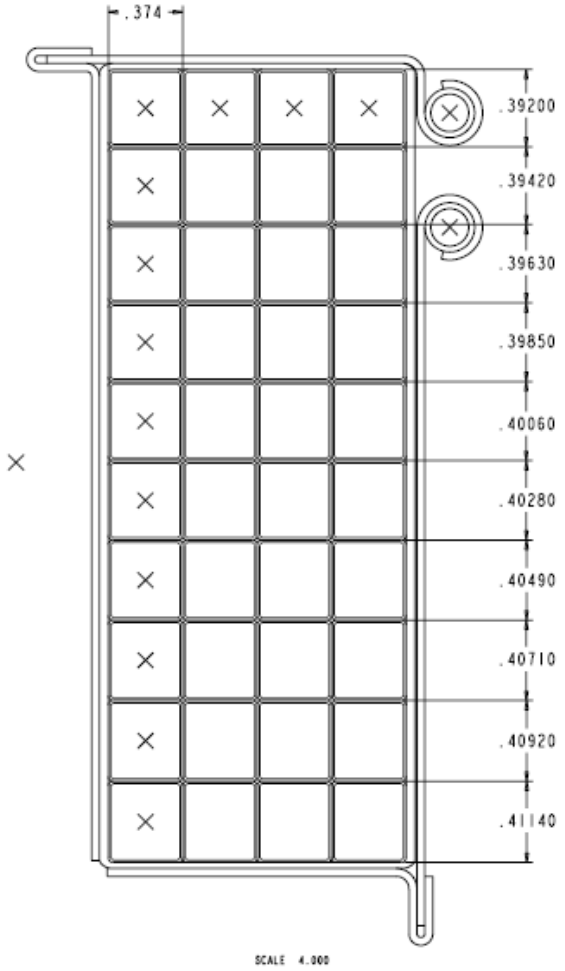
Introduction

- Lead block layout using TRC geometry is complete
- Layout introduces problem of large gaps, does not fix the tight conductor bends seen in TRC
- New layout addresses both, but with fab implications
- Terminal design has also been improved
- Need decision to proceed with changes, conduct FDR for lead blocks next week

Winding pack dimensions

NCSX

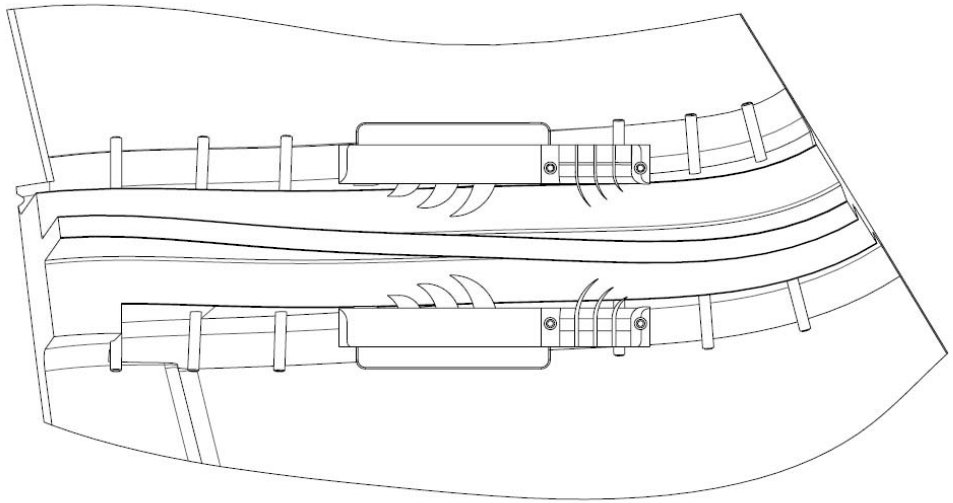




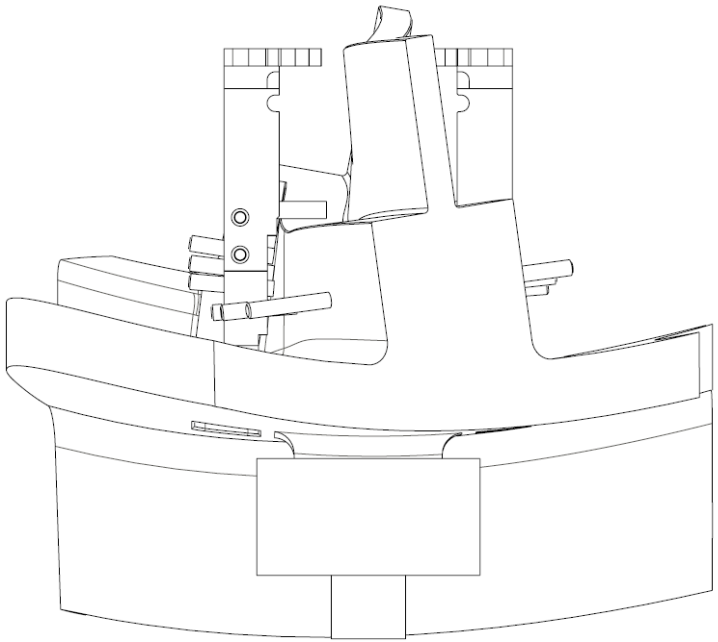
TRC lead block asm

NCSX

- SE142C-020.ASM shows TRC lead blocks assembled to MCWF C1
- Working on addition of mounting bosses to back of straight blocks, contour of finger blocks to fit complex winding pack shape

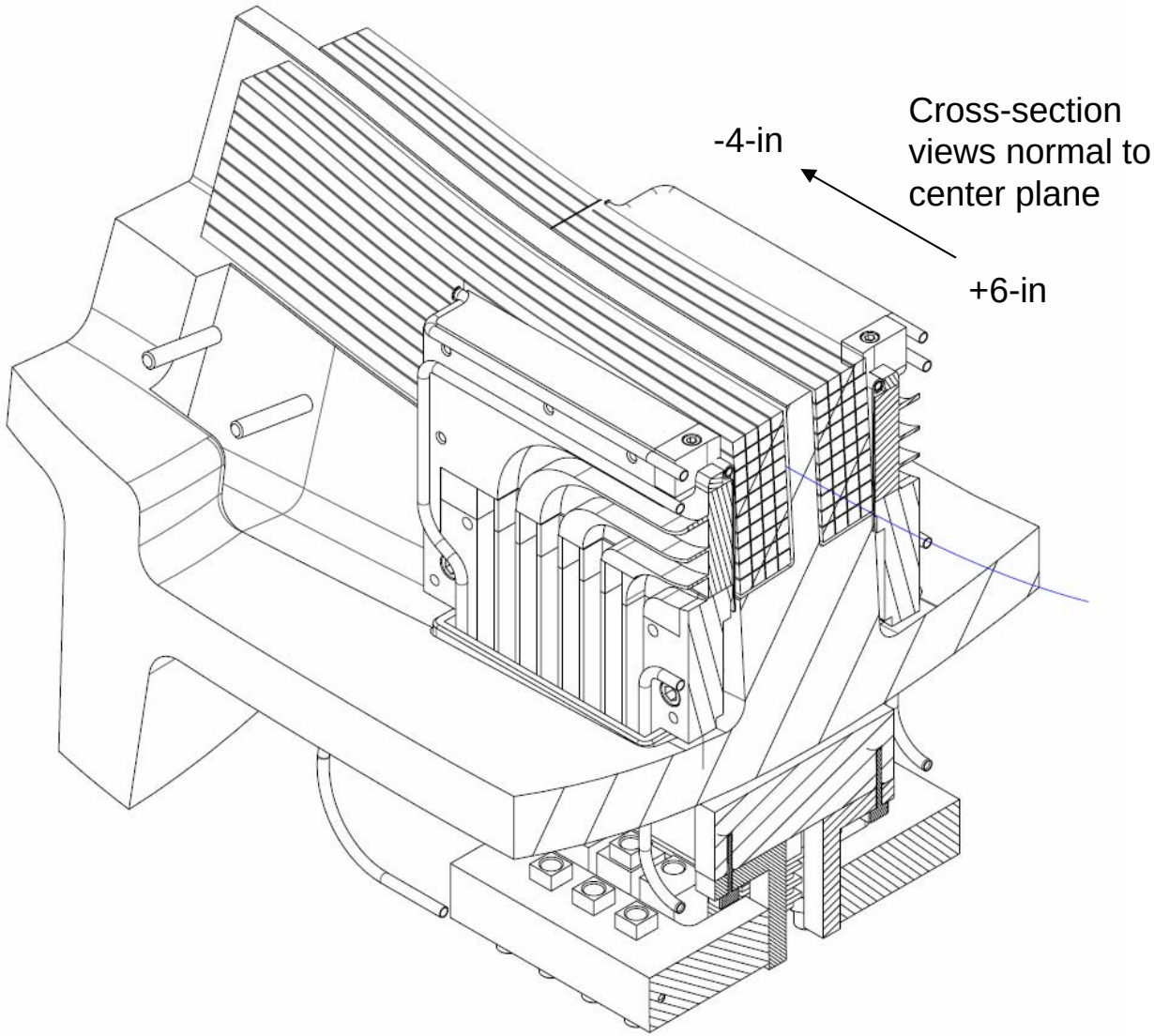


Plan View

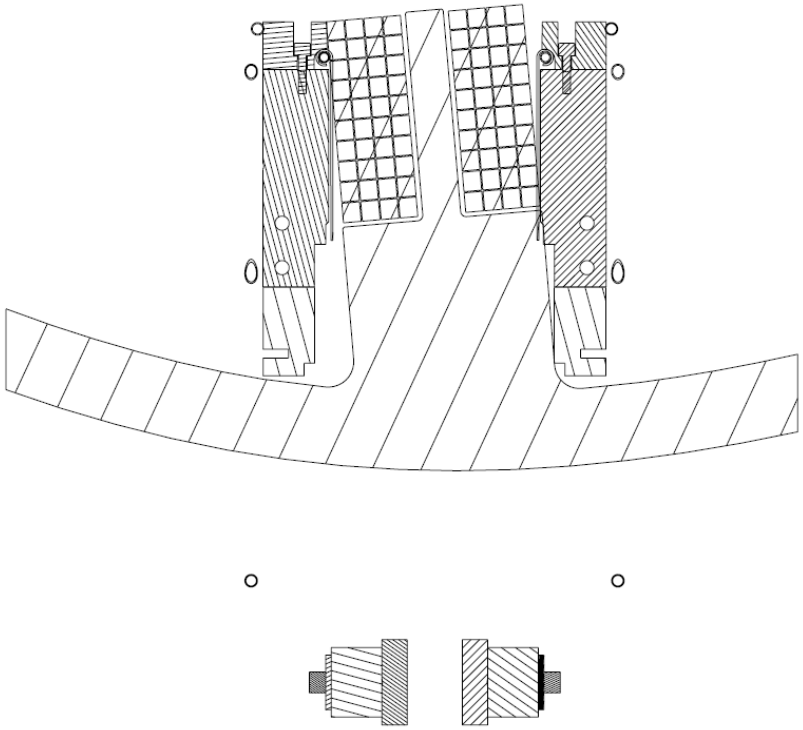


End View

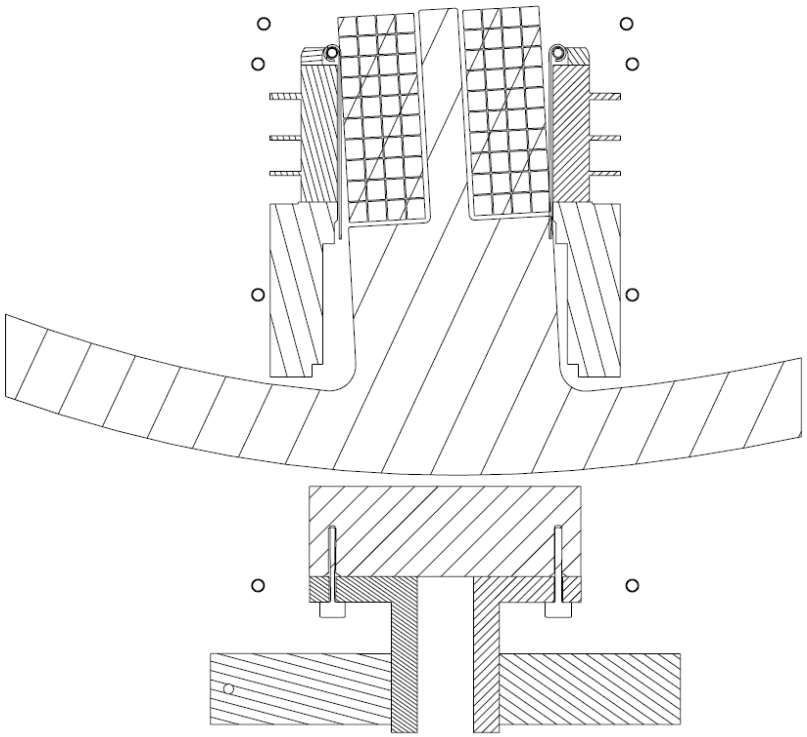
Xsec thru Type-C winding pack



Cross-sections

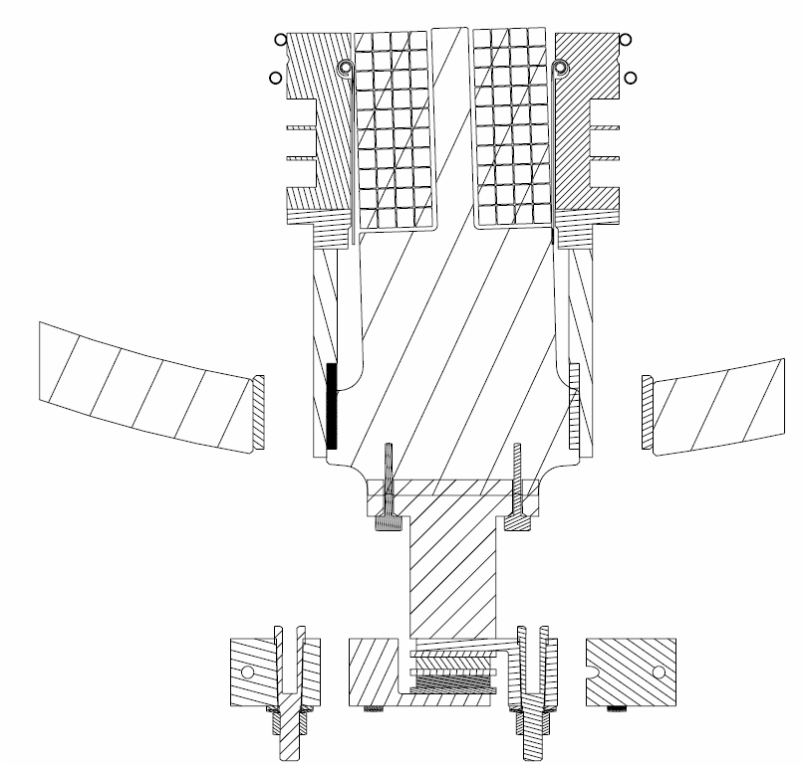


+6-in

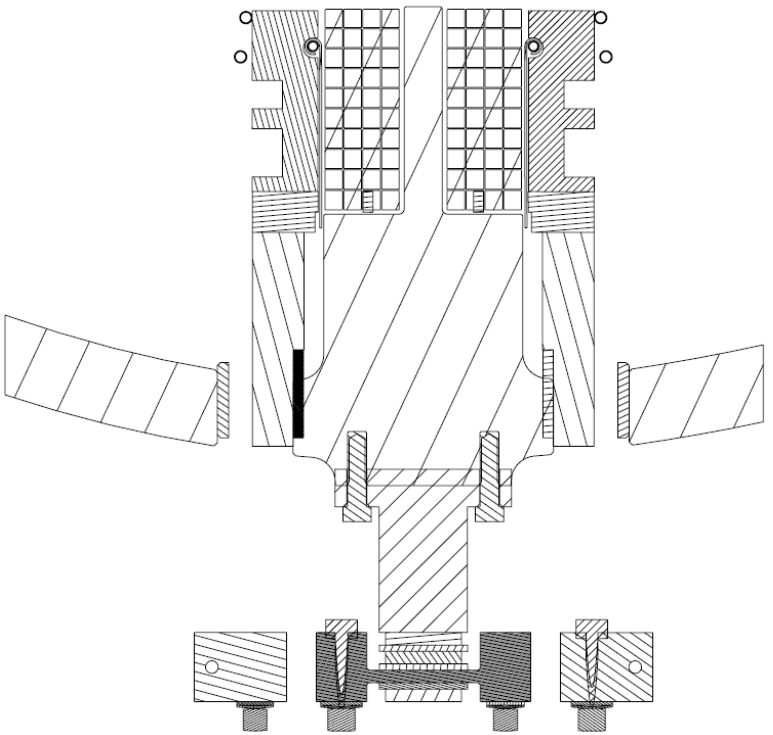


+3.75-in

Cross-sections

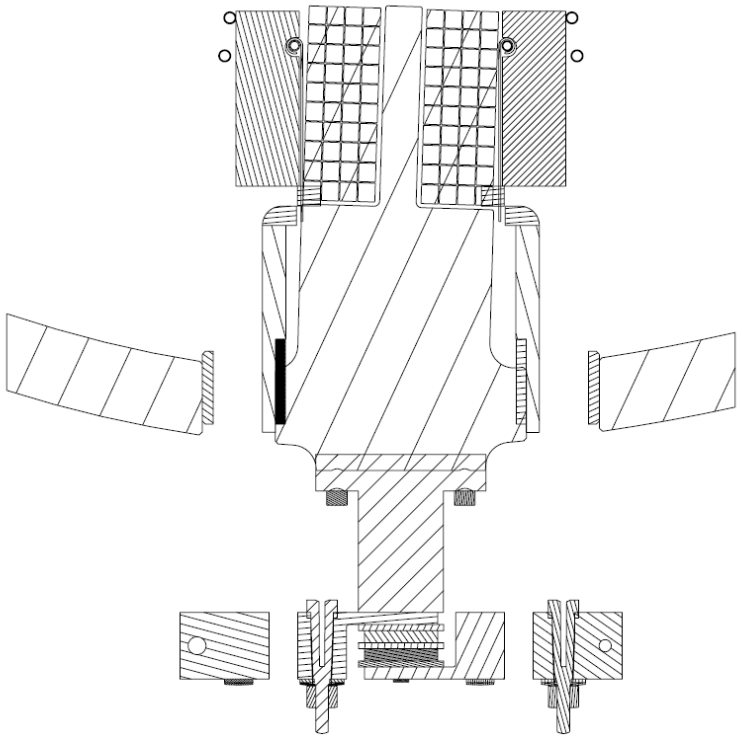


+2-in

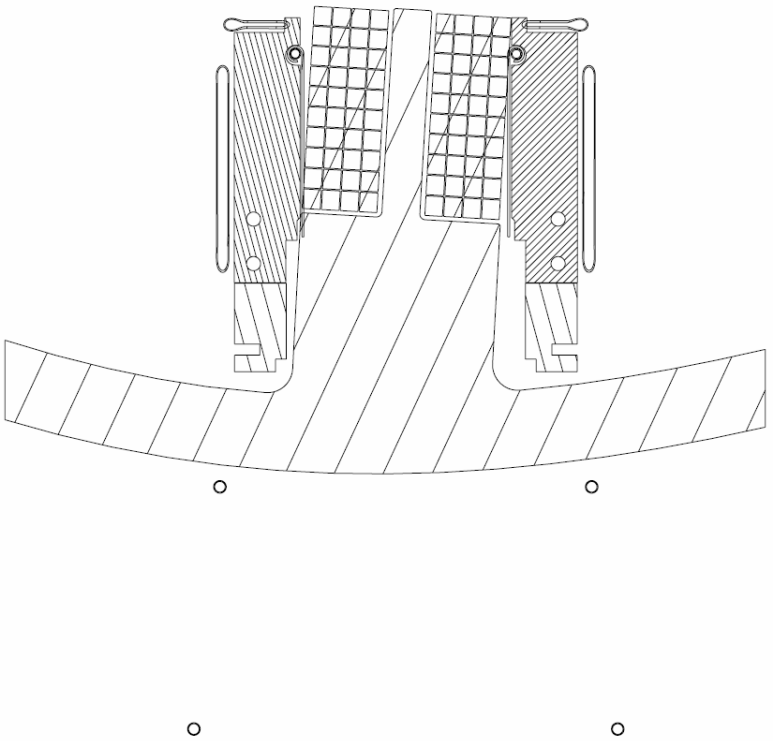


center plane

Cross-sections



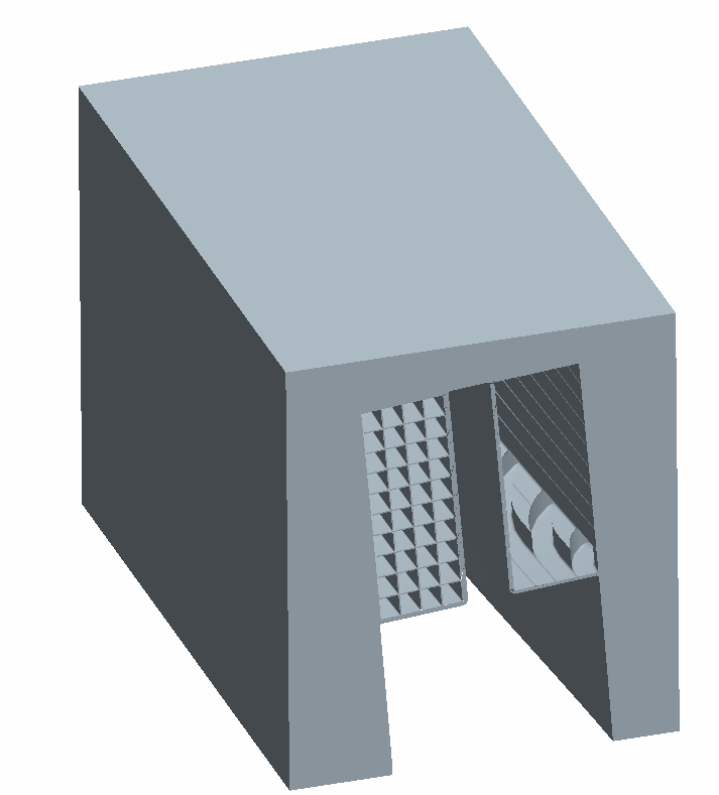
-2-in



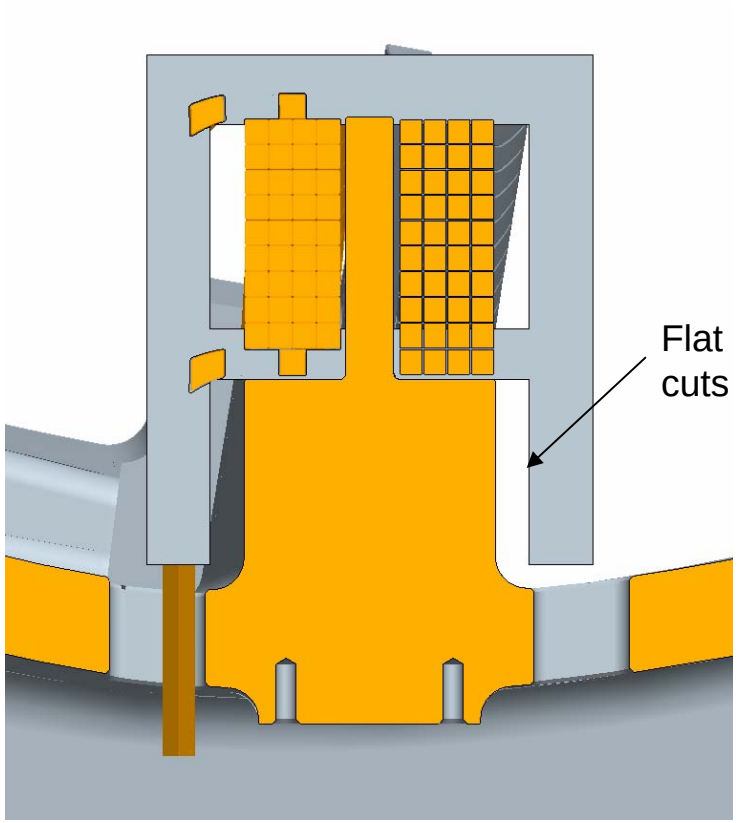
-3.75-in

Modifying the TRC geometry

- Most practical method to get finger block geometry is by subtraction
- Flat cuts must be wide to clear twisting WP, creating gaps >.5-in



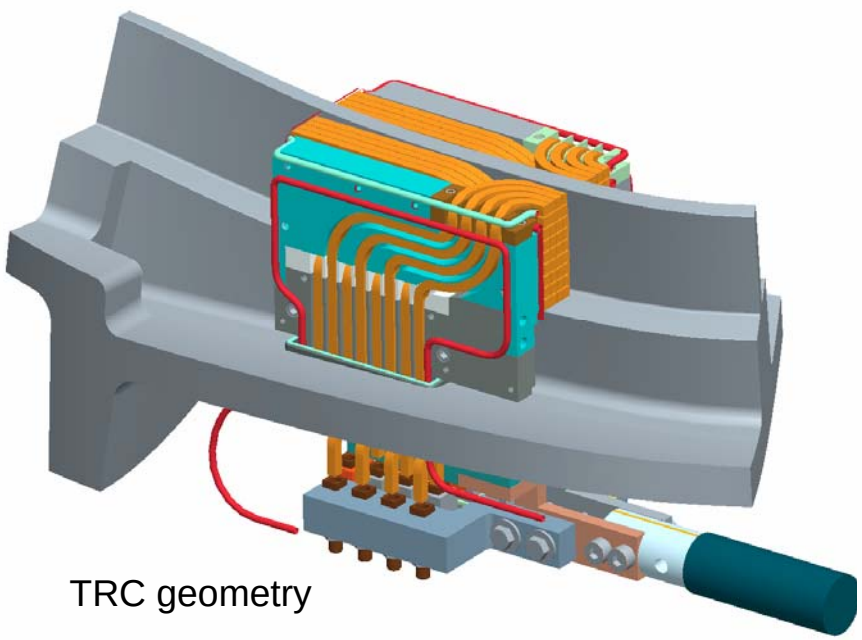
Tee, WP subtracted from lead block



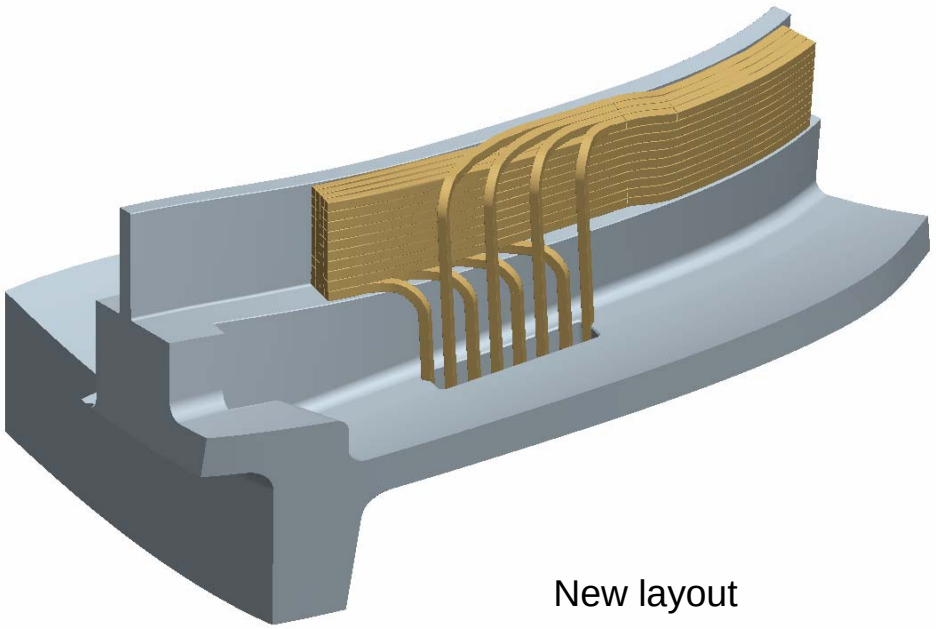
Section thru center plane w/ flat cuts added

New layout revises conductor path

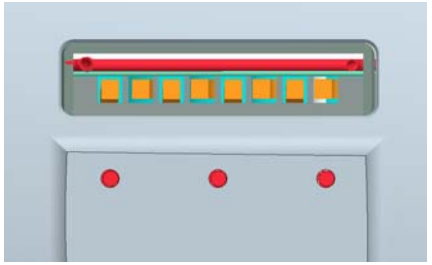
- Conductor ramps up to level of layer #11 (+.392-in)
- Lateral bend at 45-deg, minimum radius increased to ~1-in
- Slight spreading of downward legs required, need to revise MCWF opening

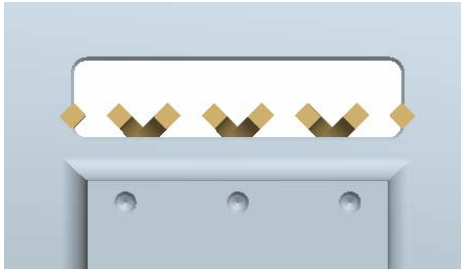


TRC geometry

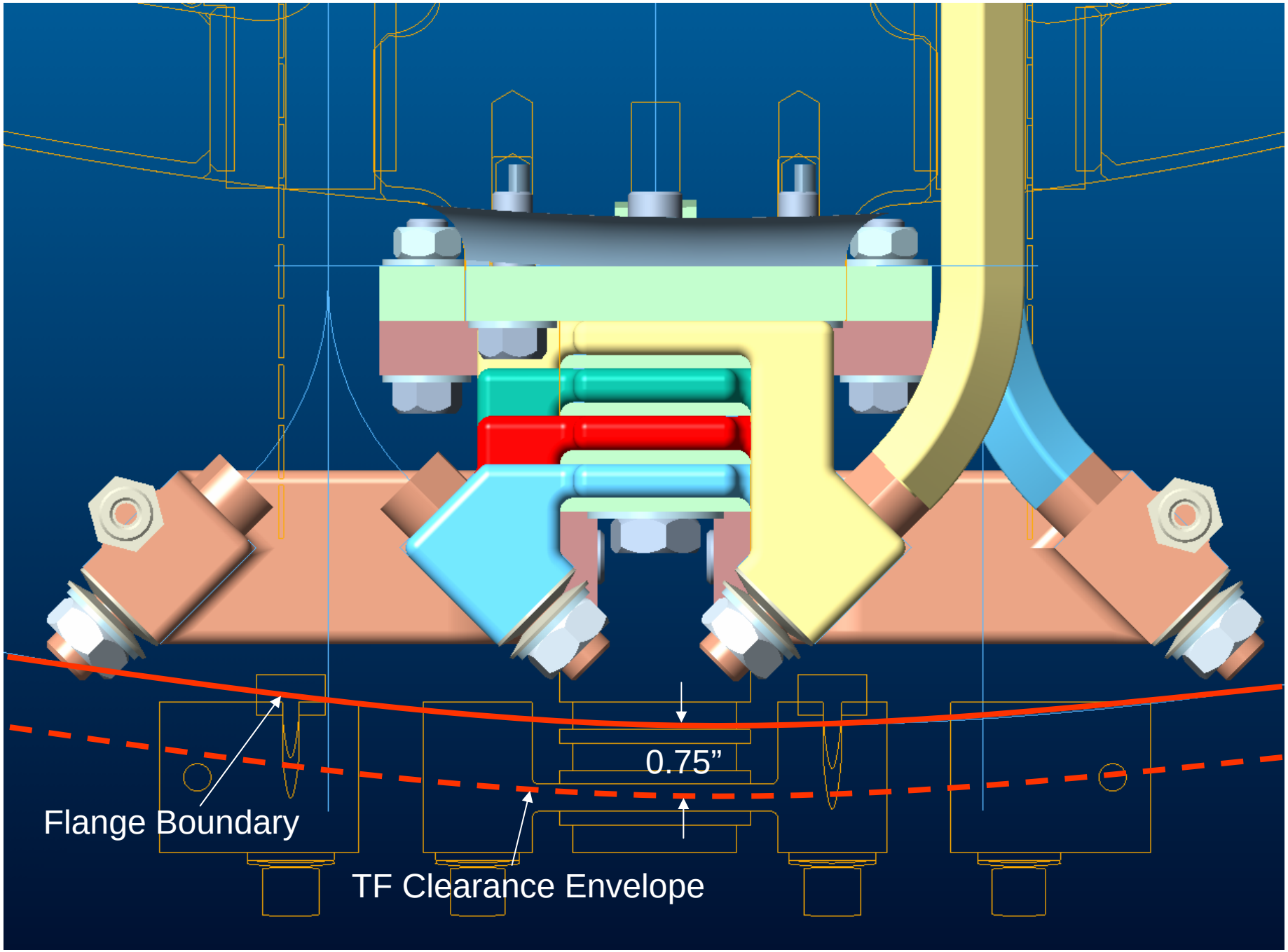


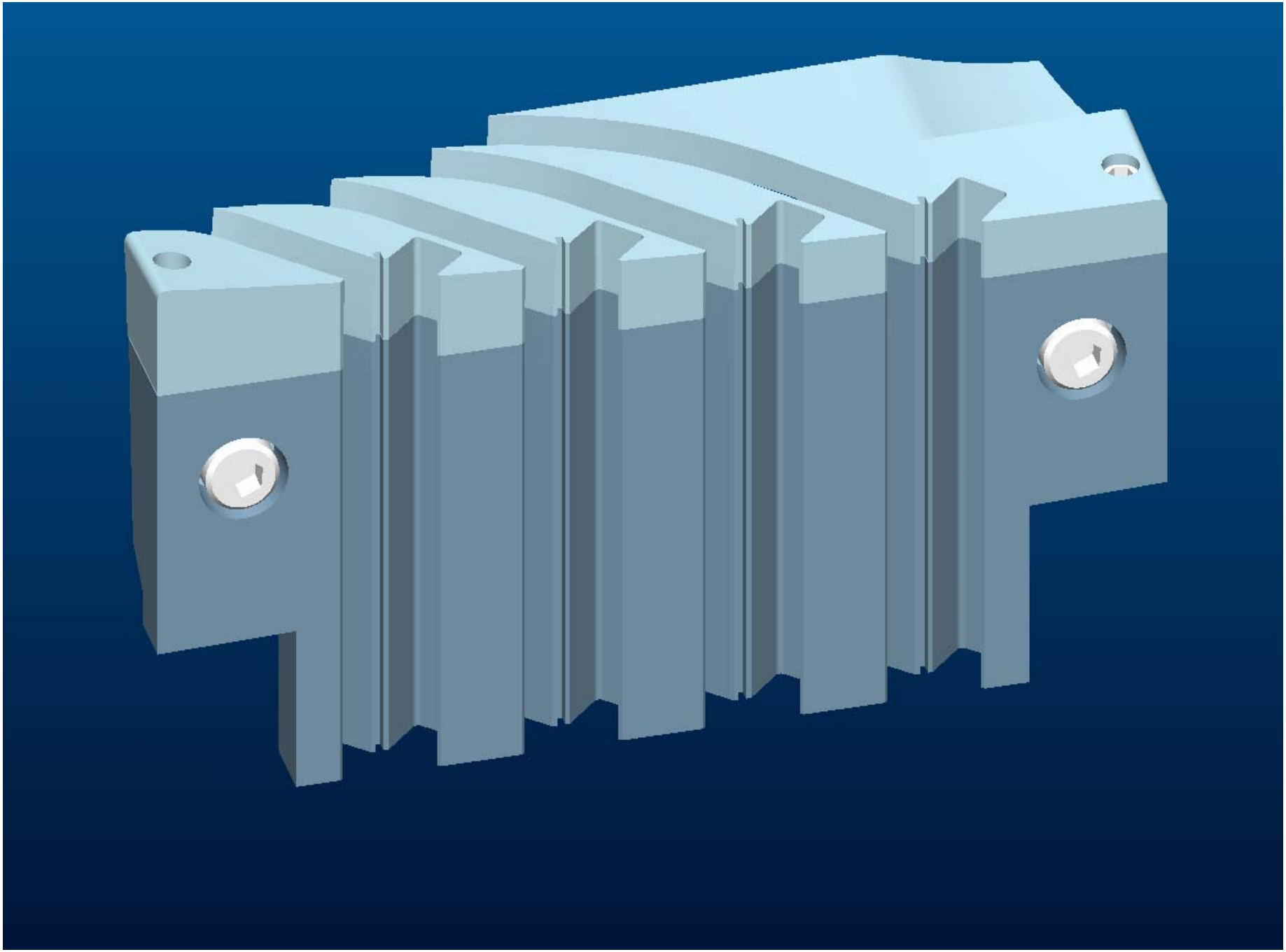
New layout

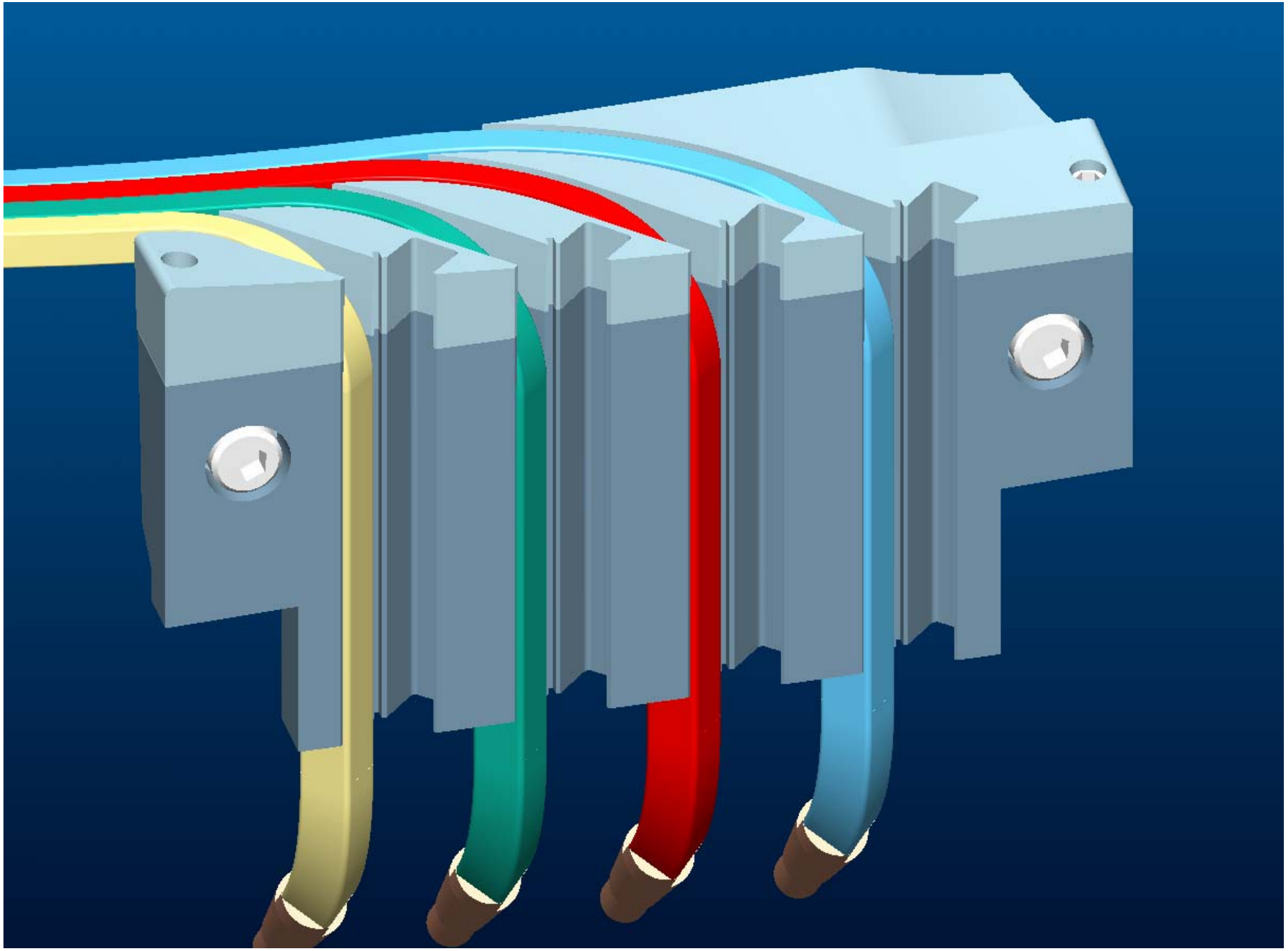


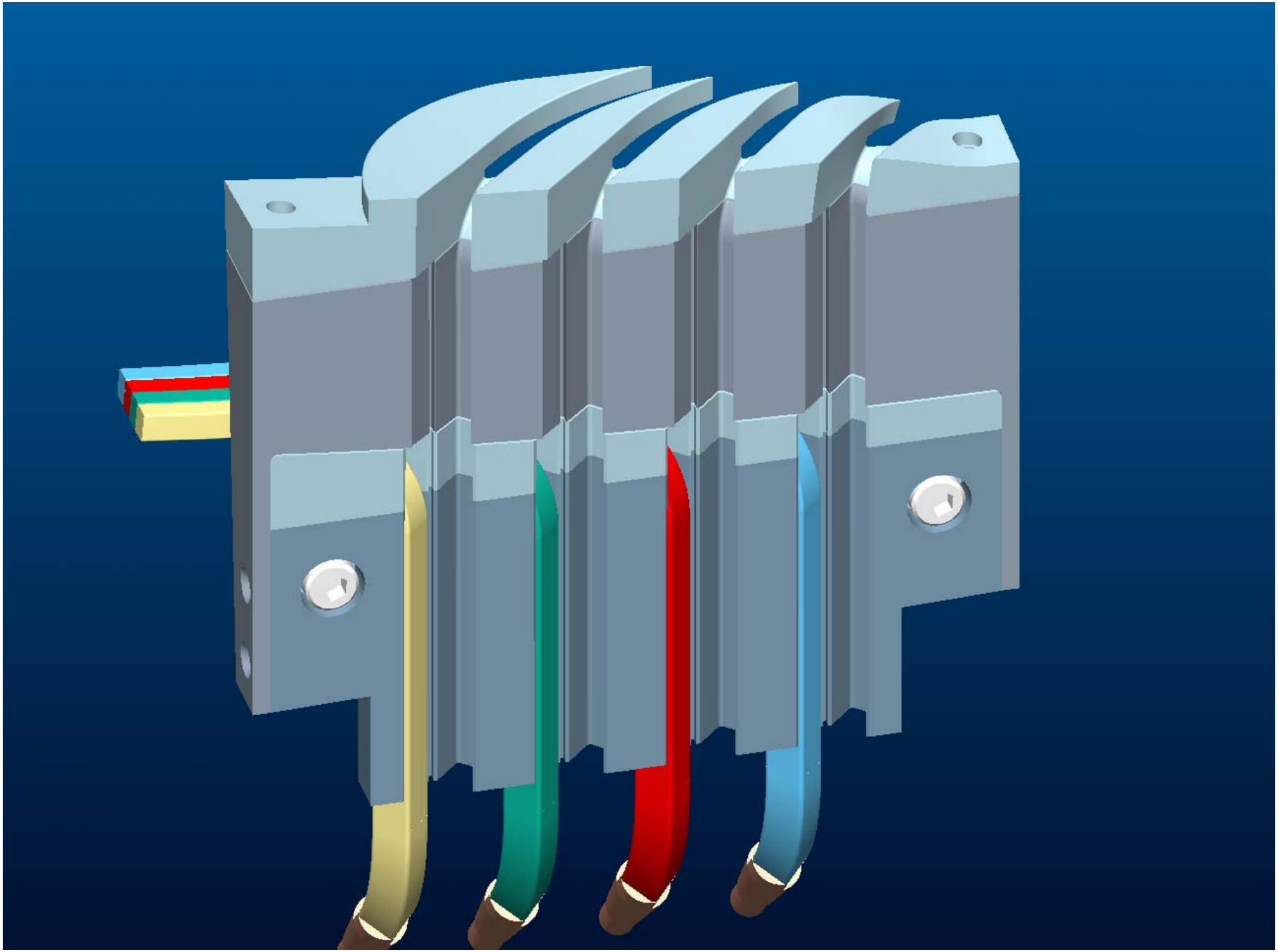


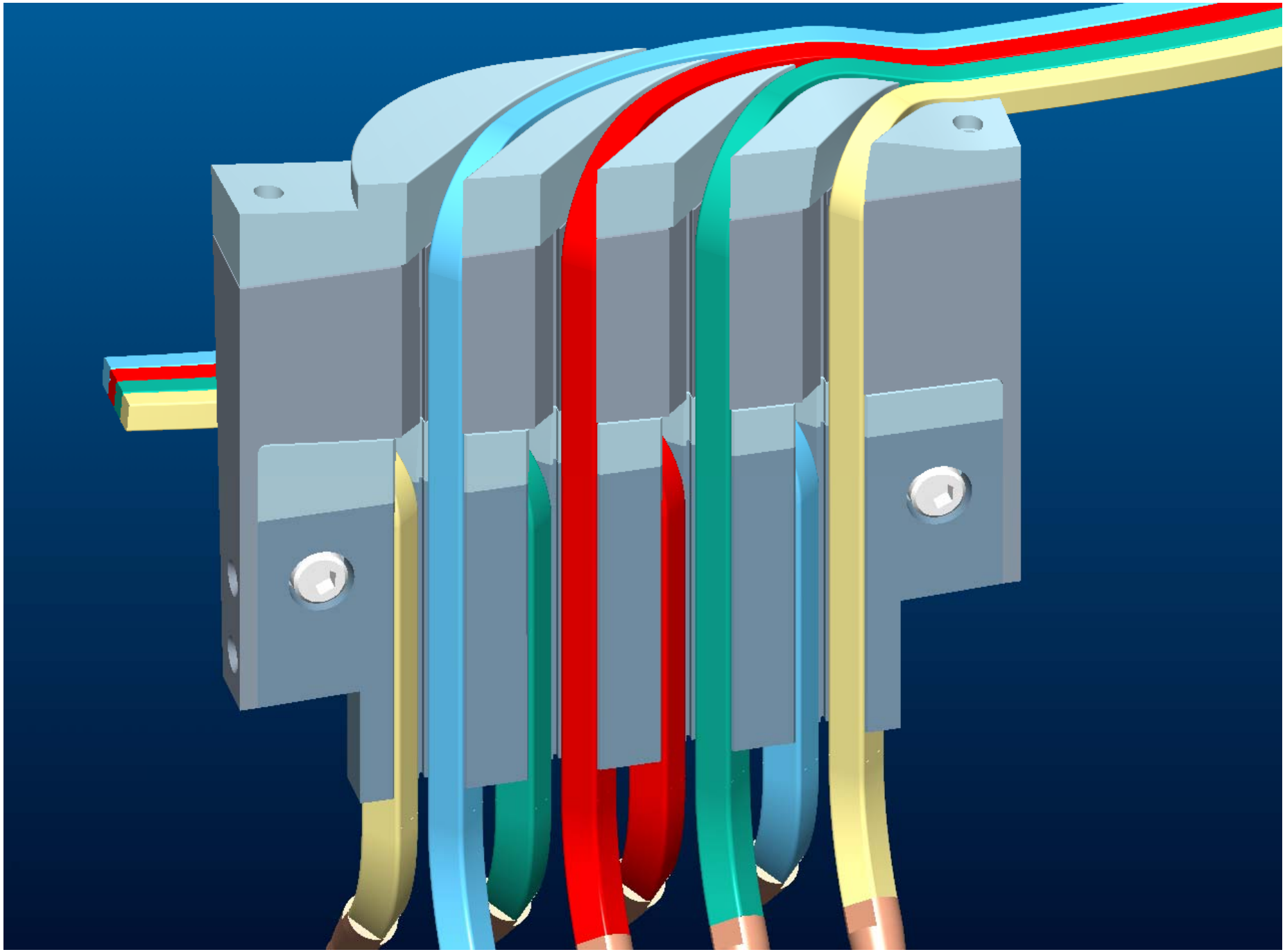
Go to Paul’s slides

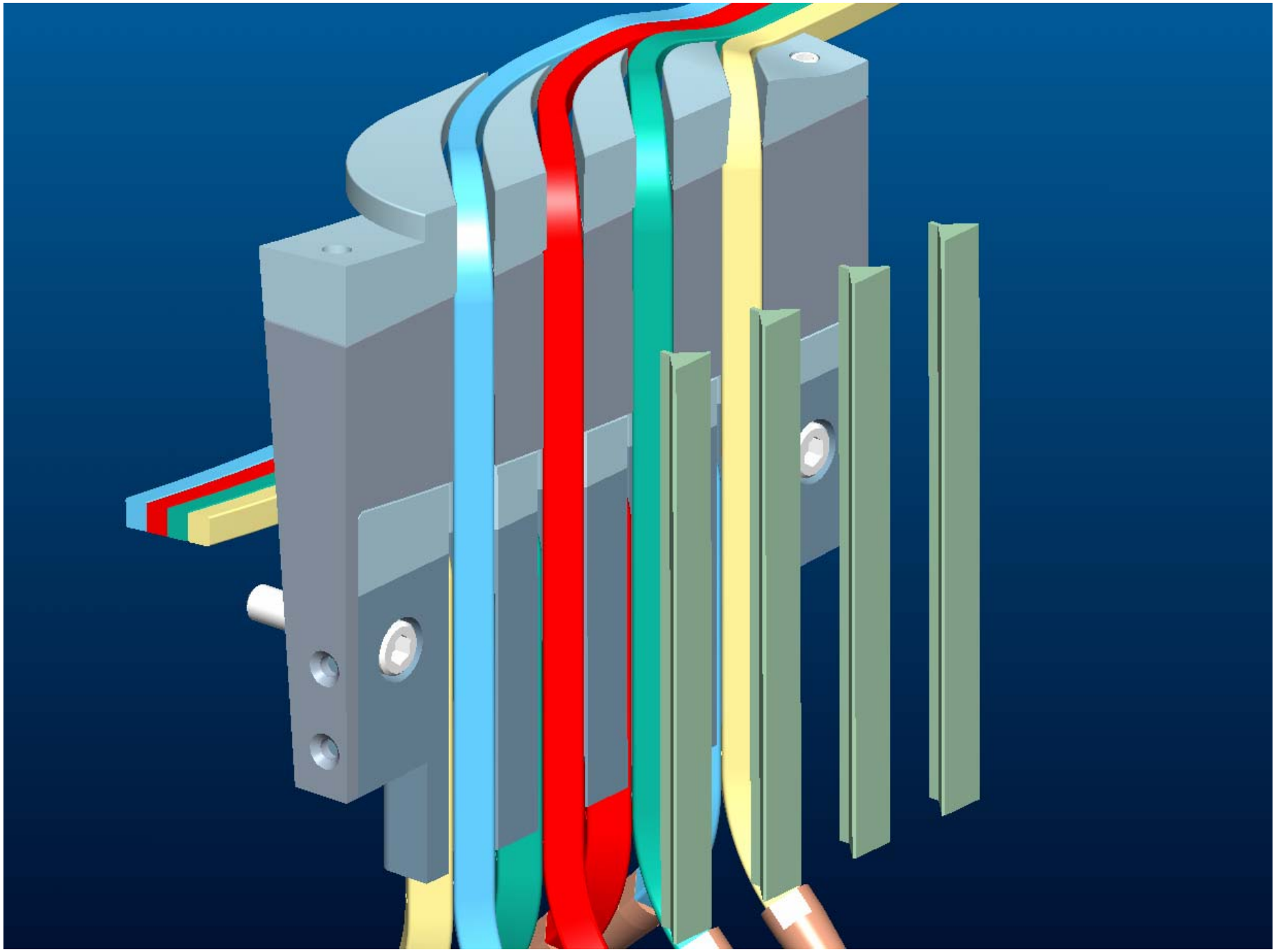

0.75”
Flange Boundary
TF Clearance Envelope

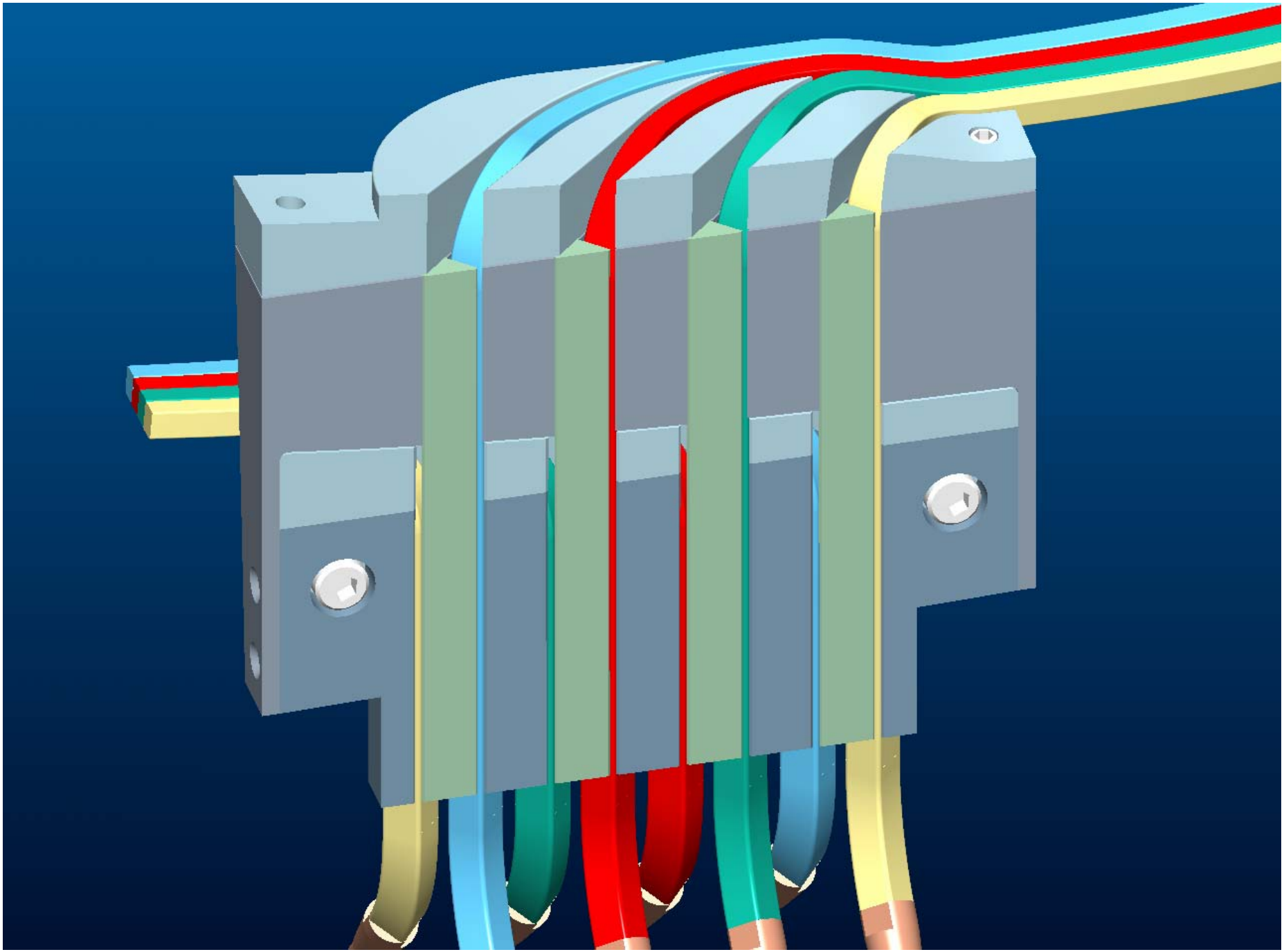


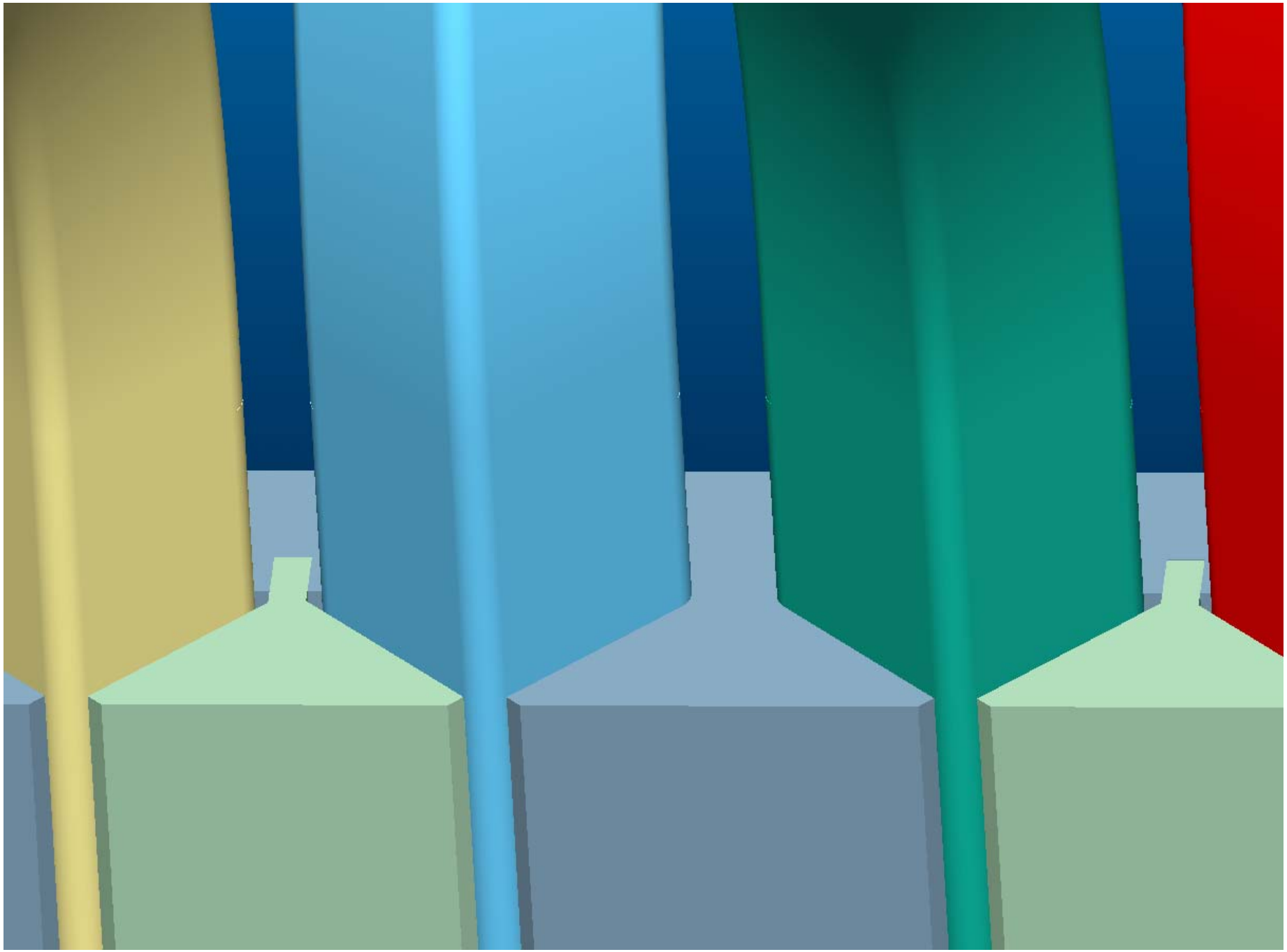


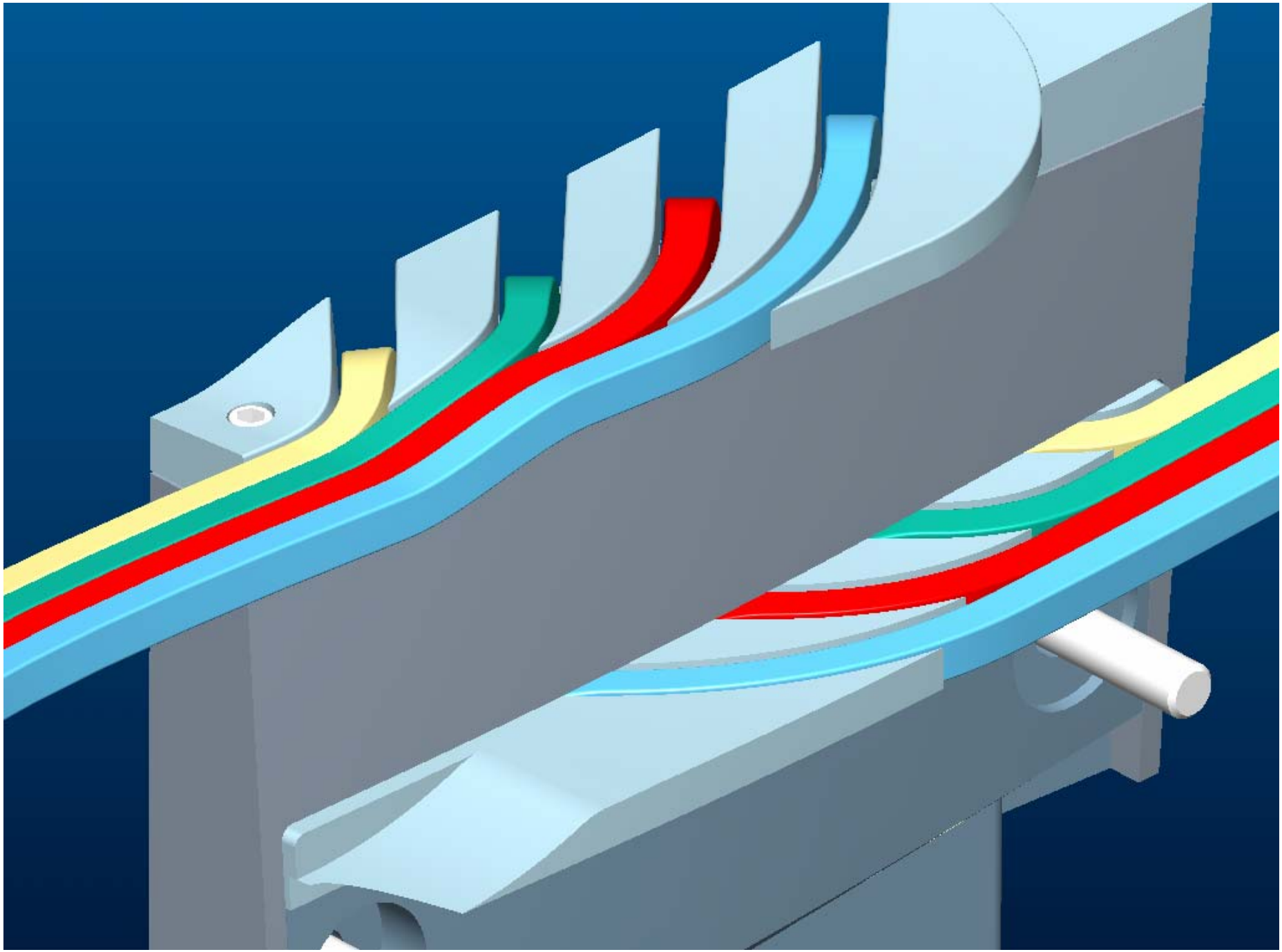


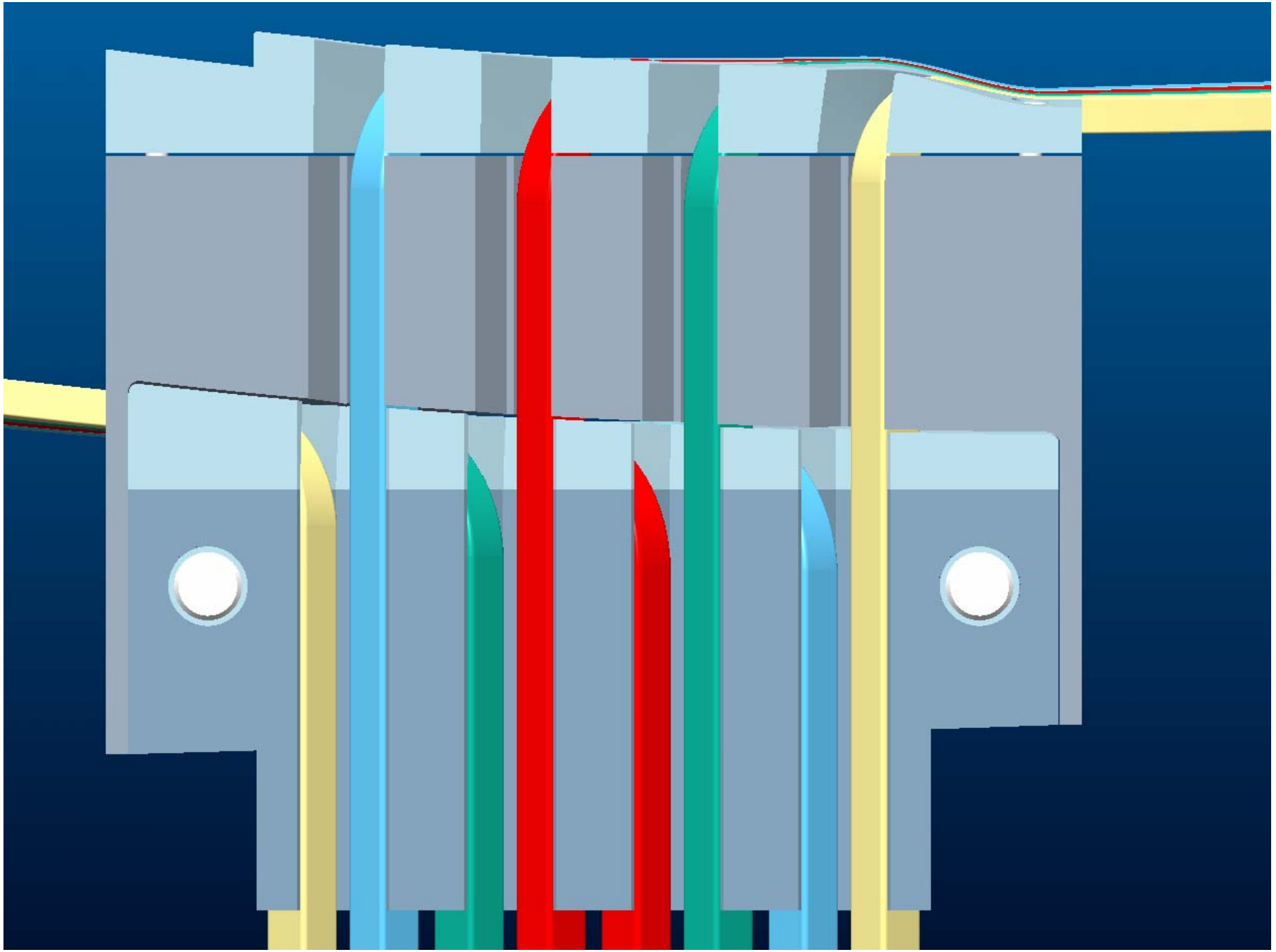


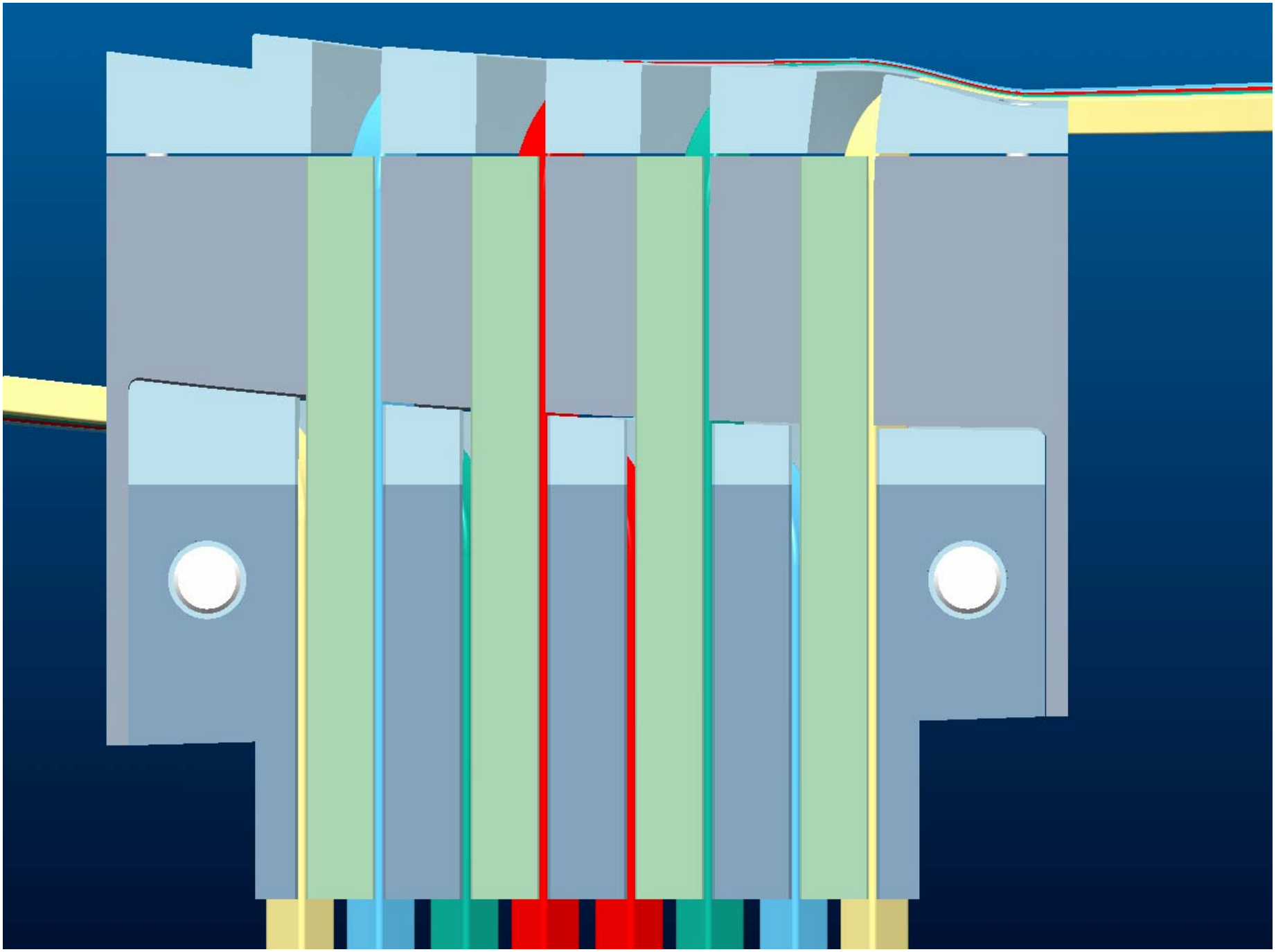


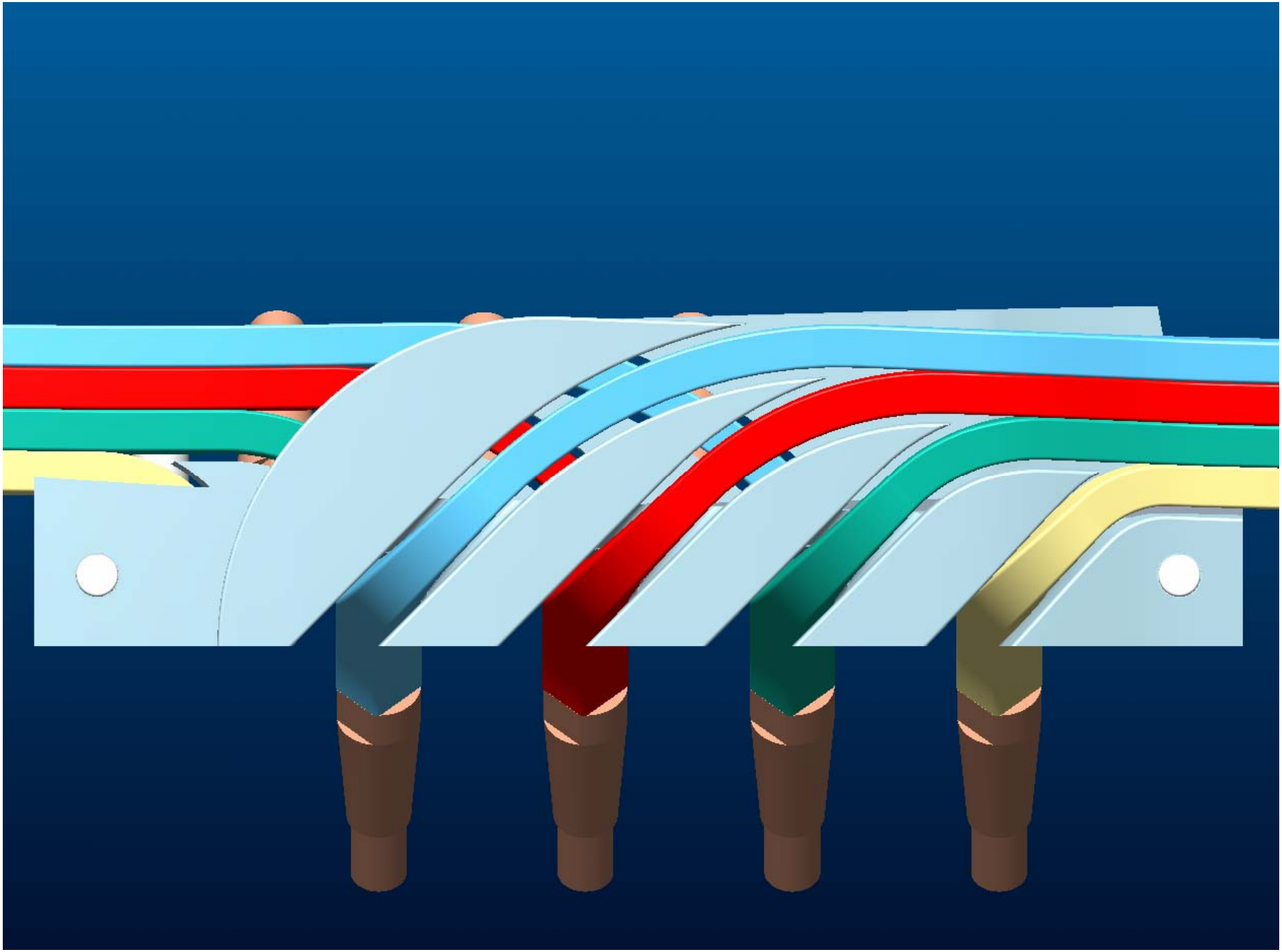


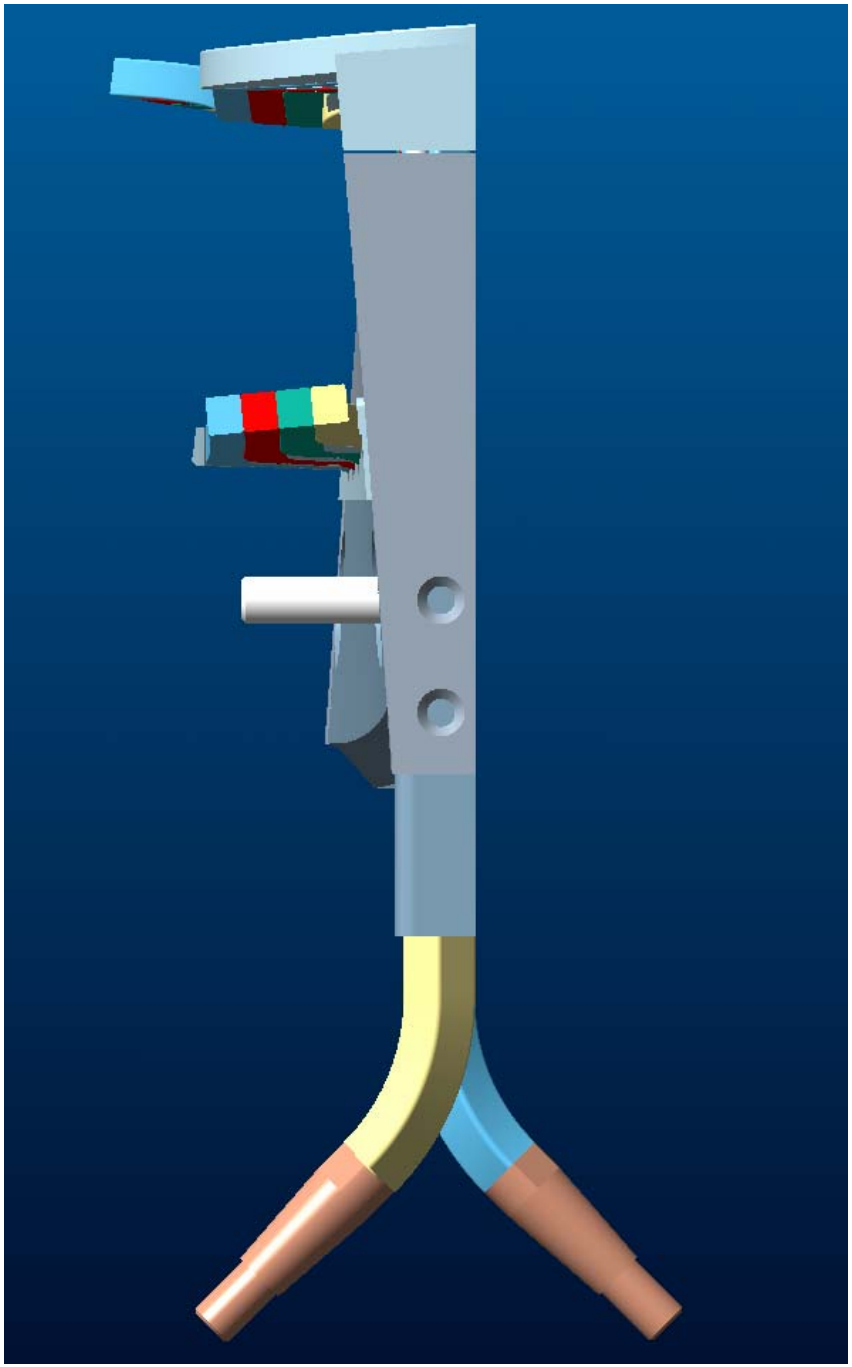


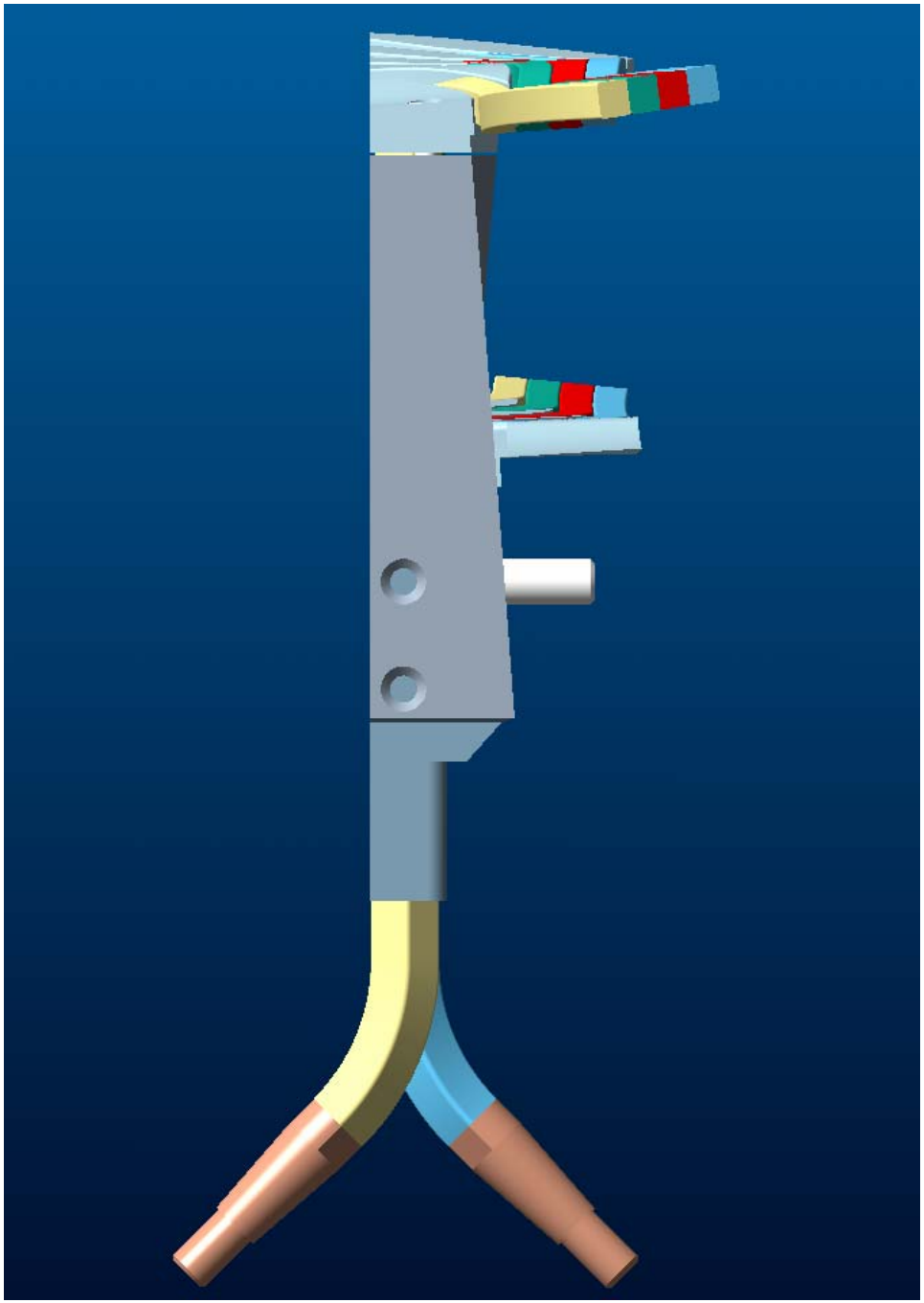


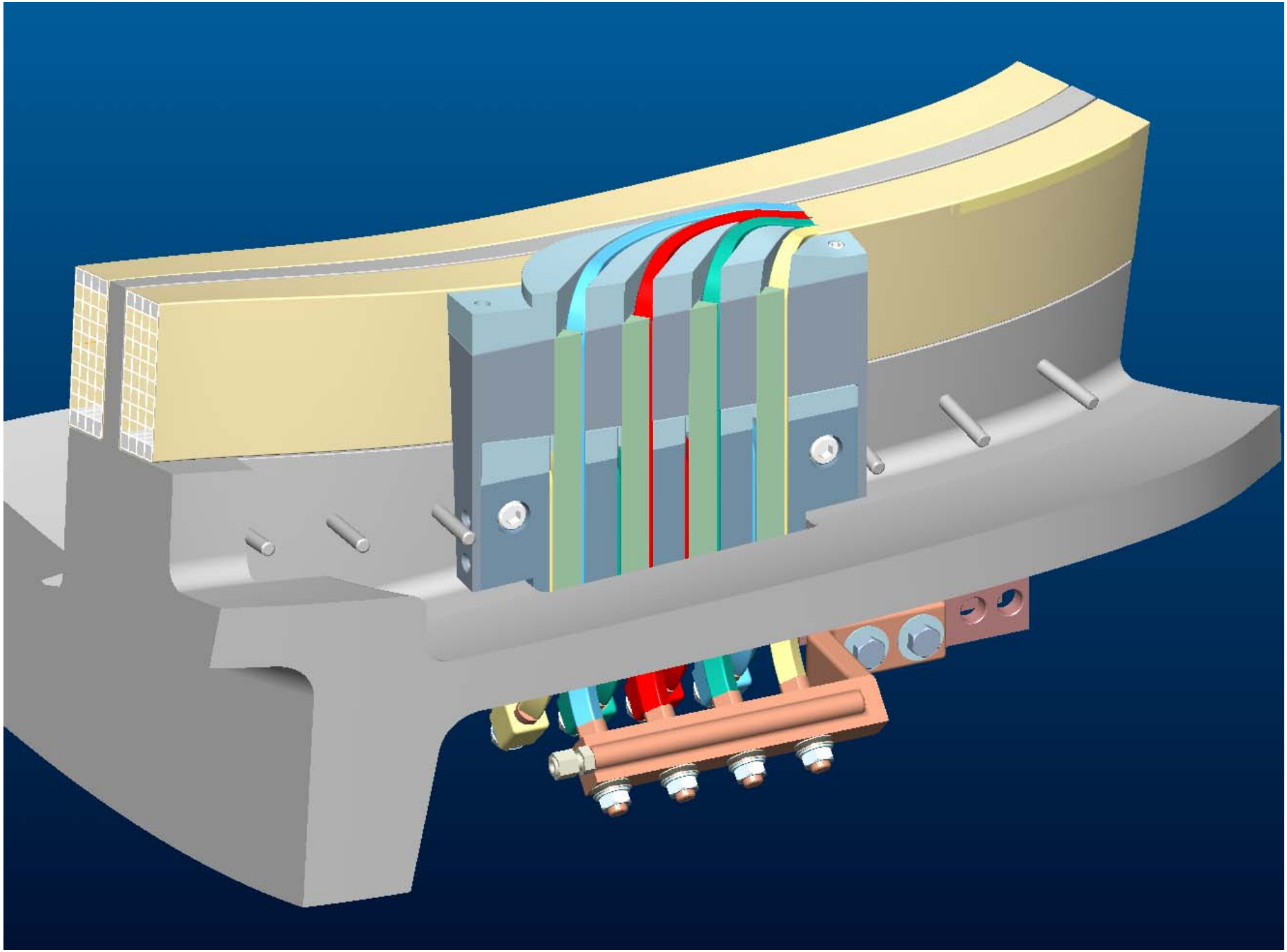


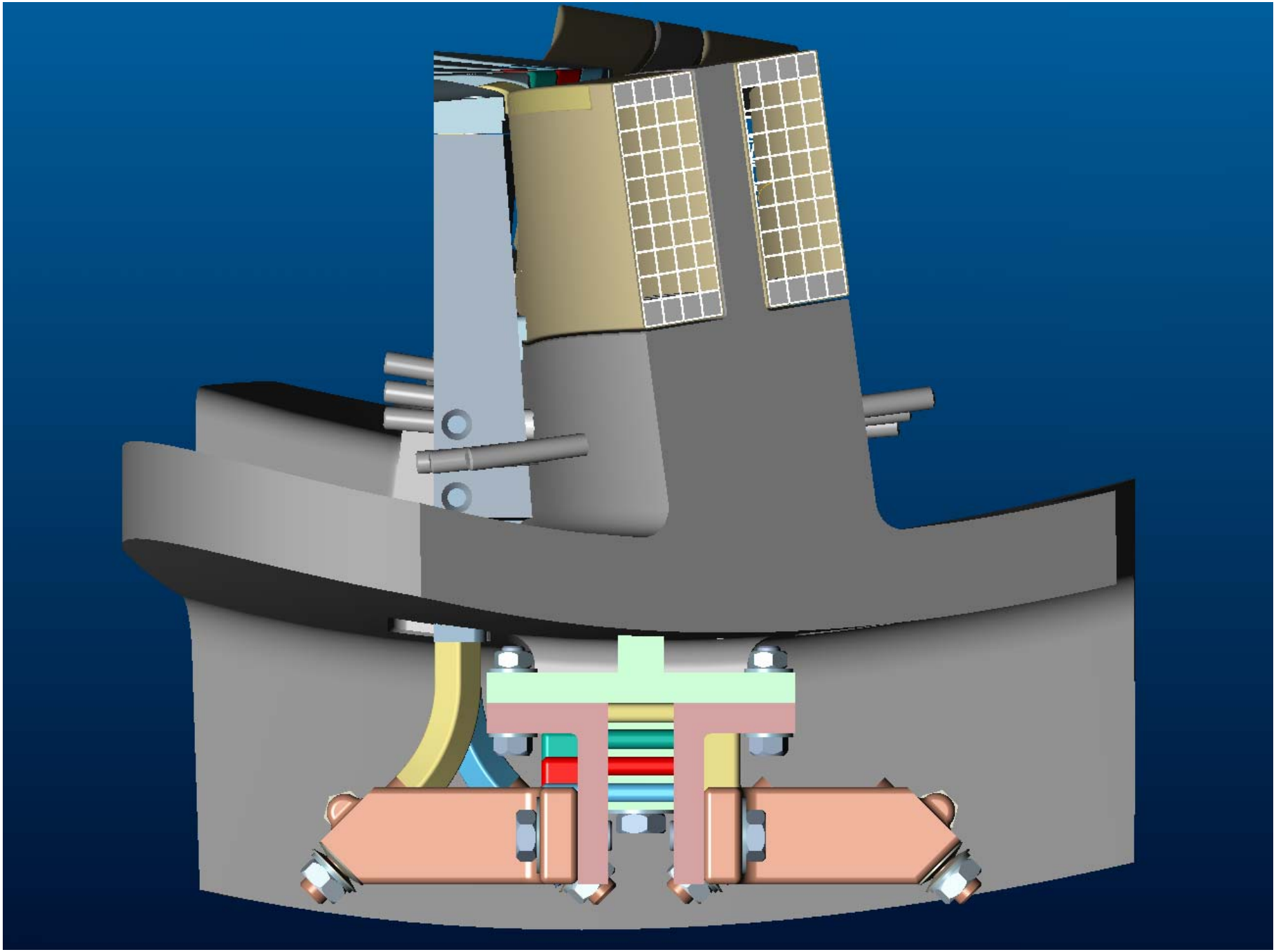


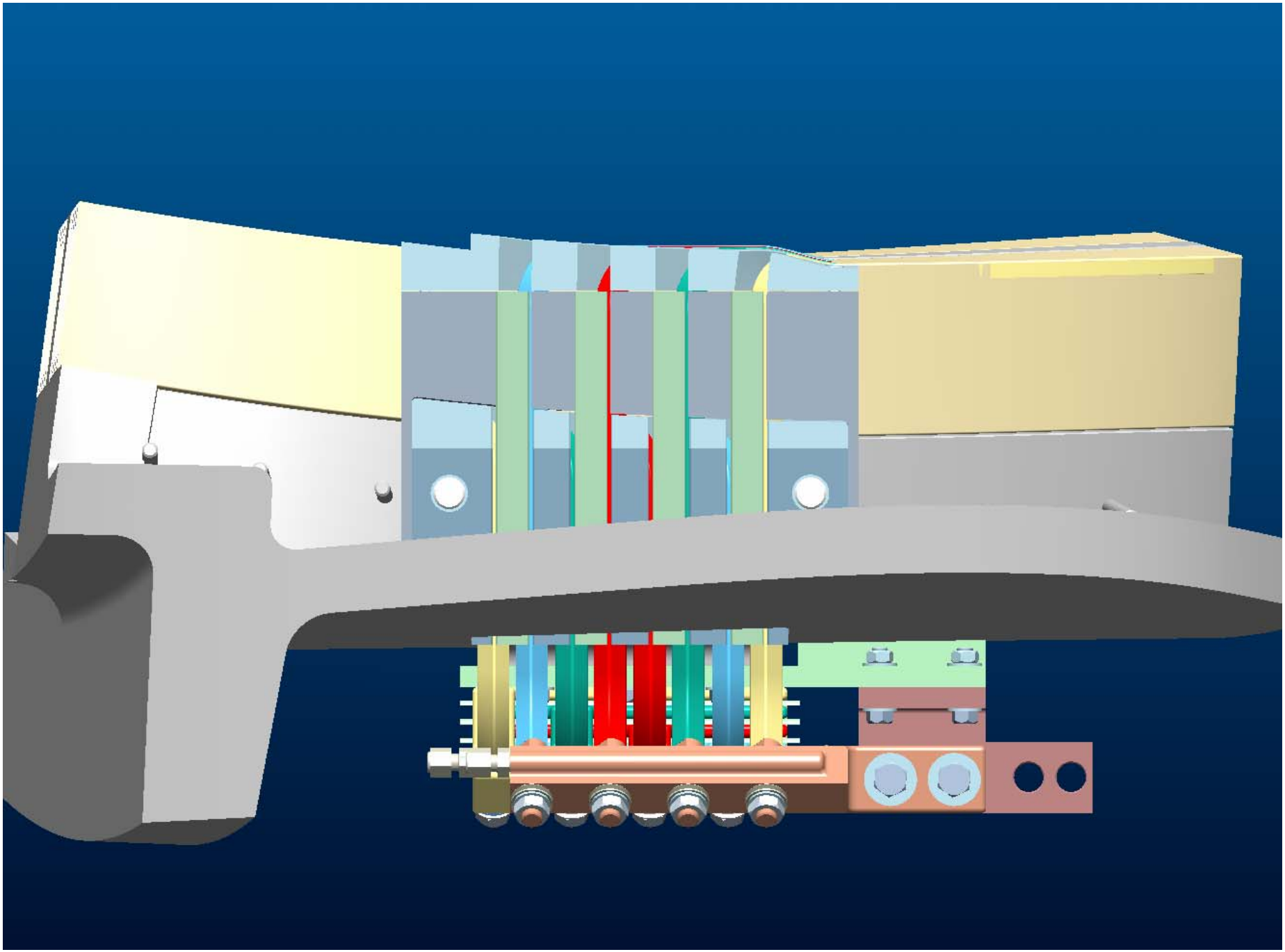


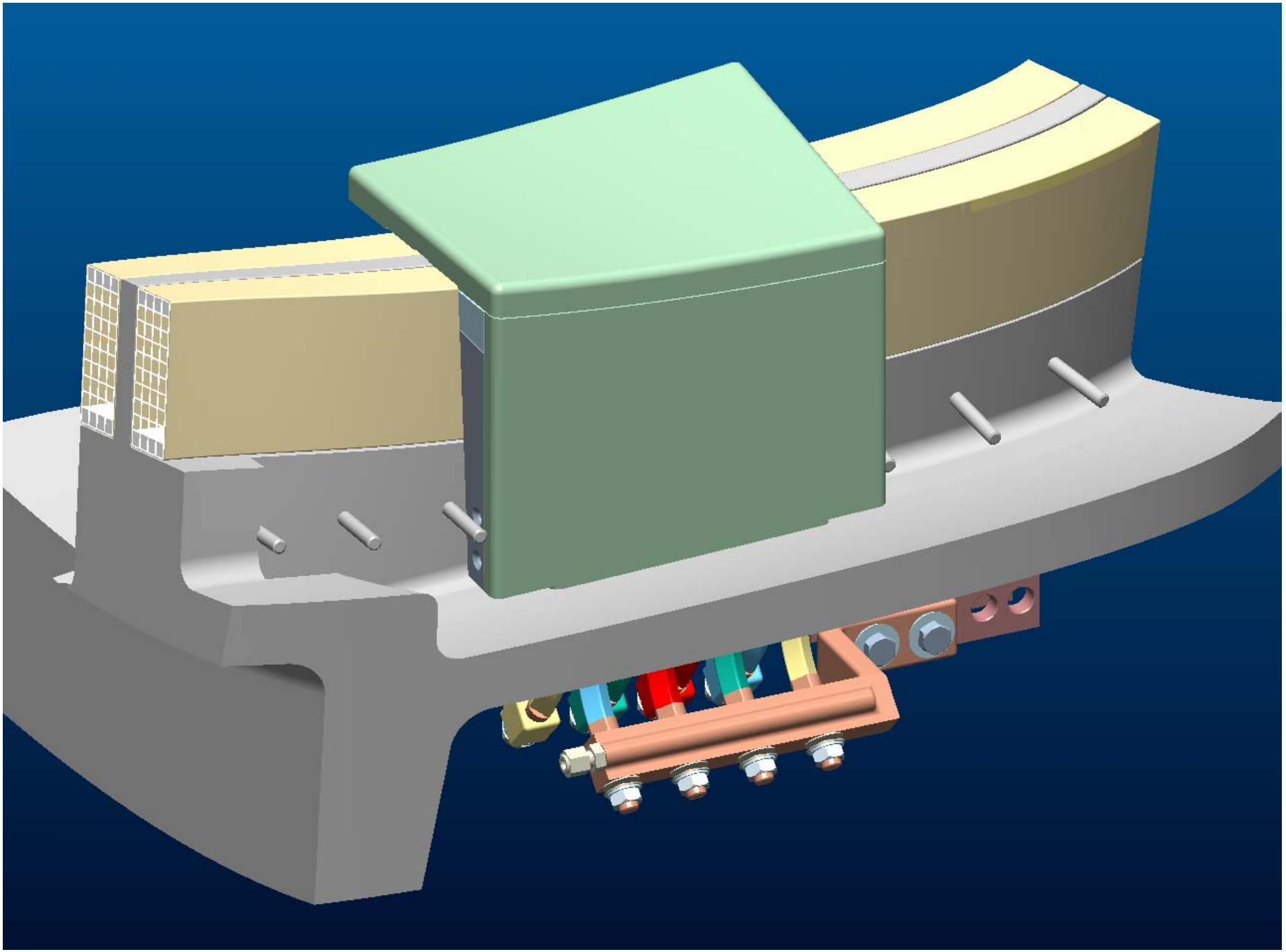


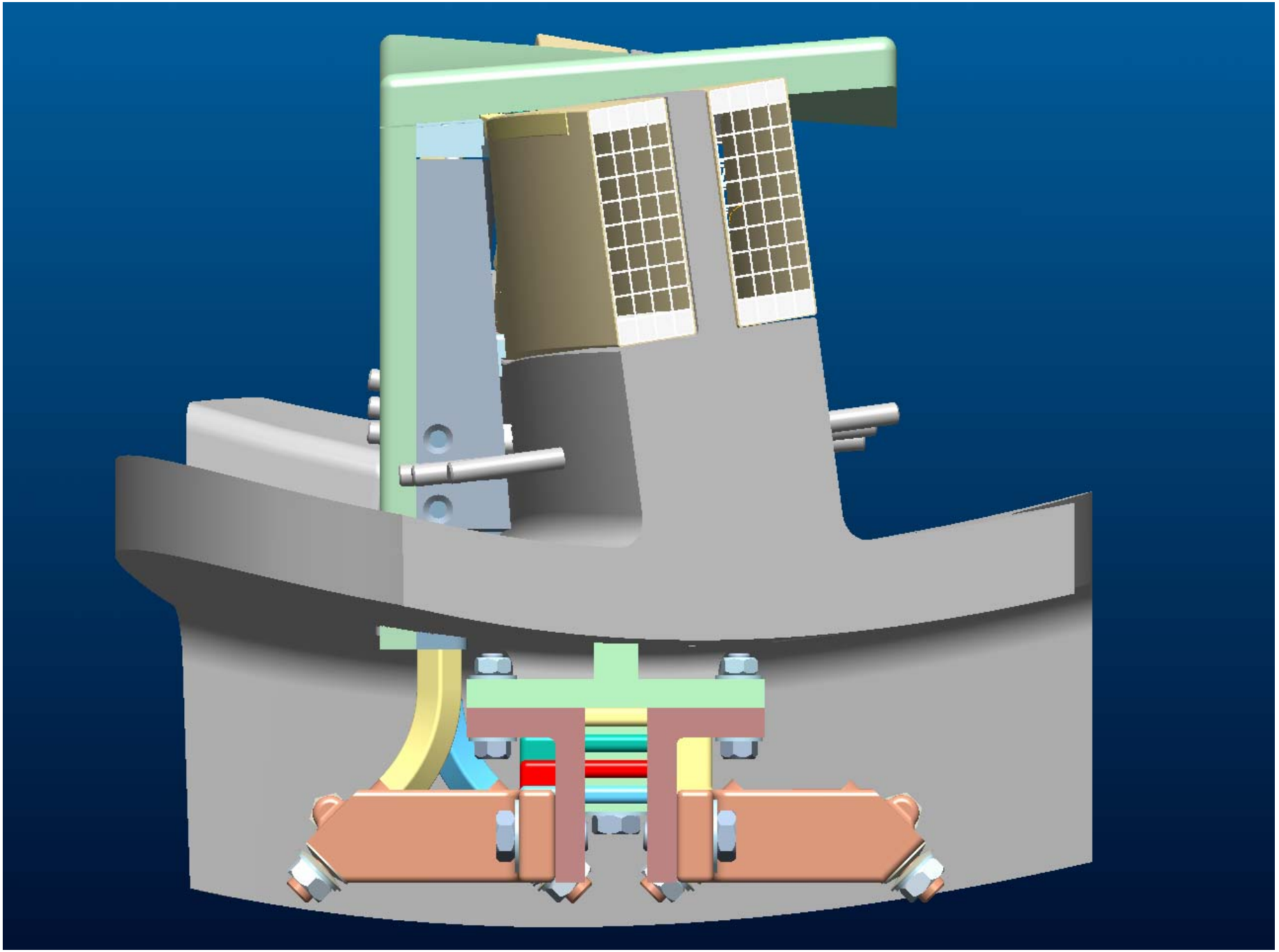


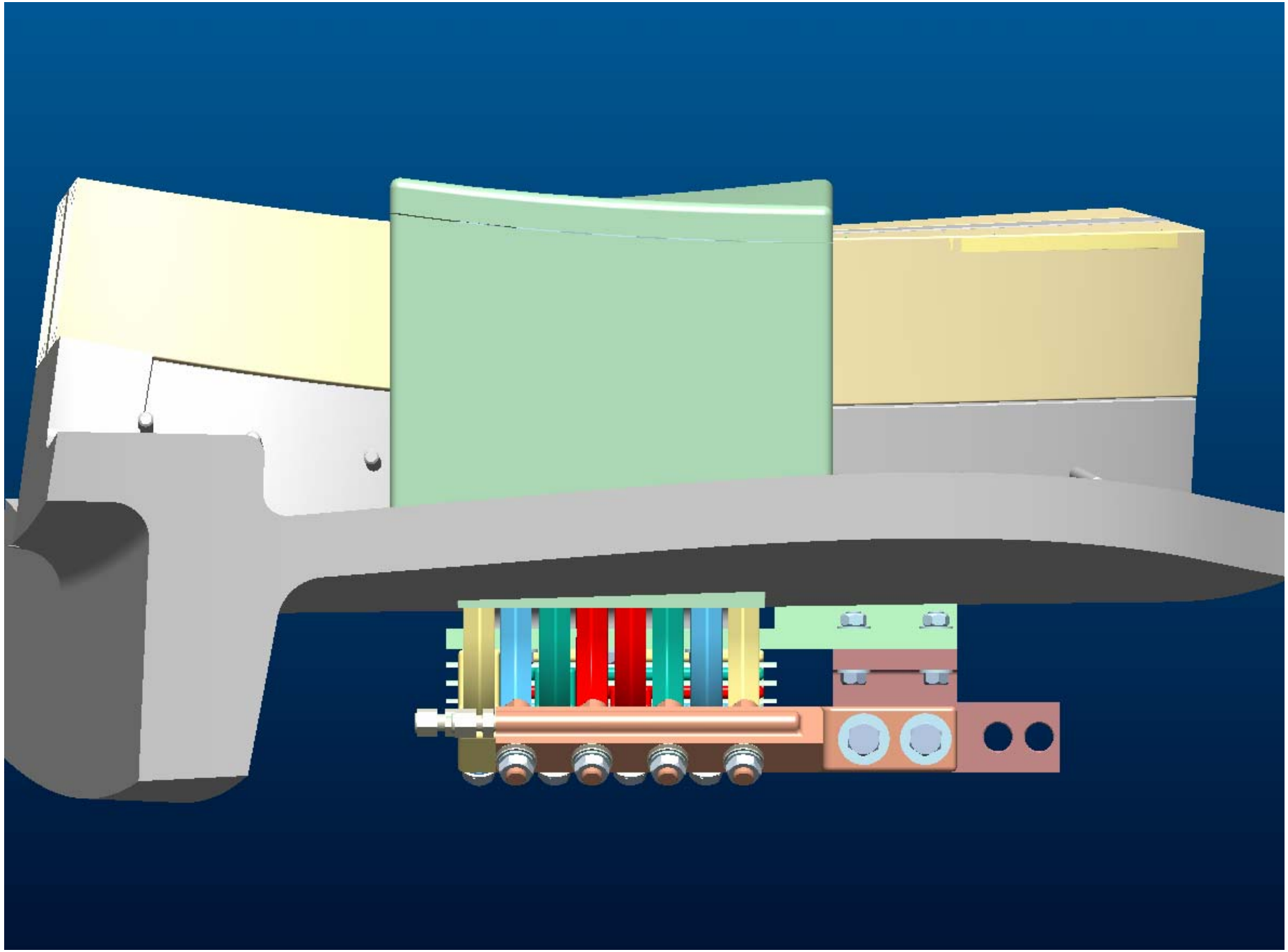


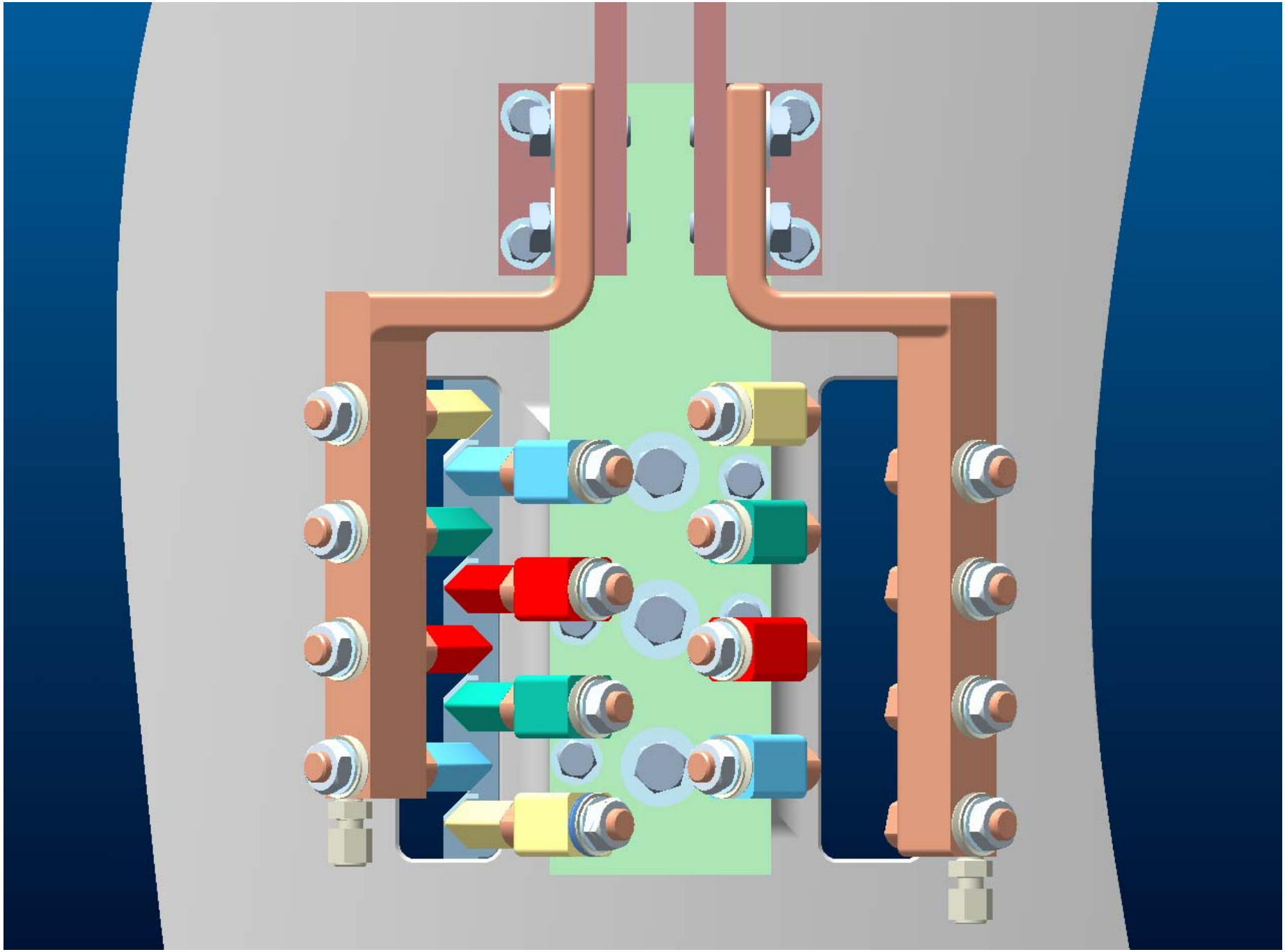


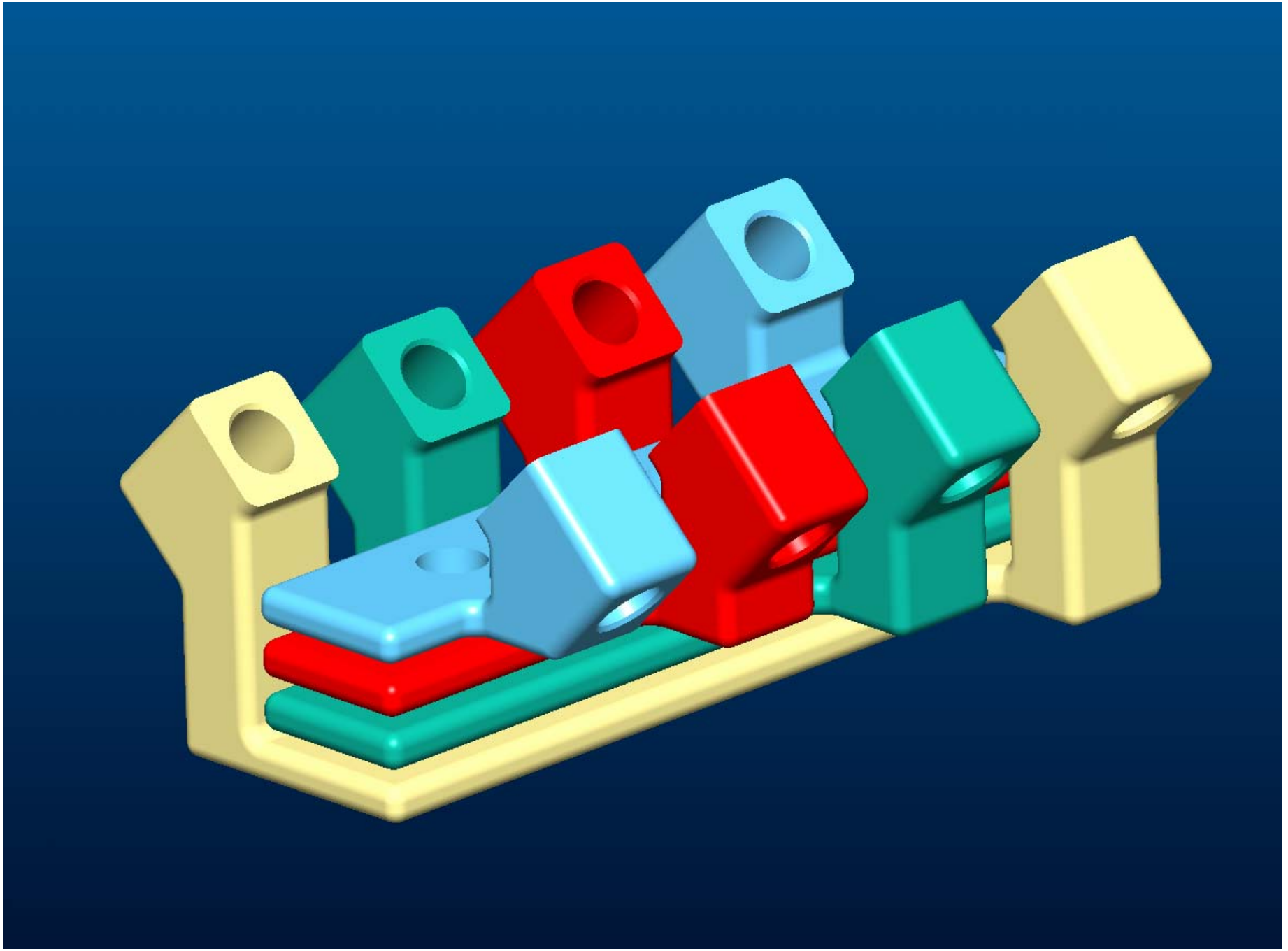


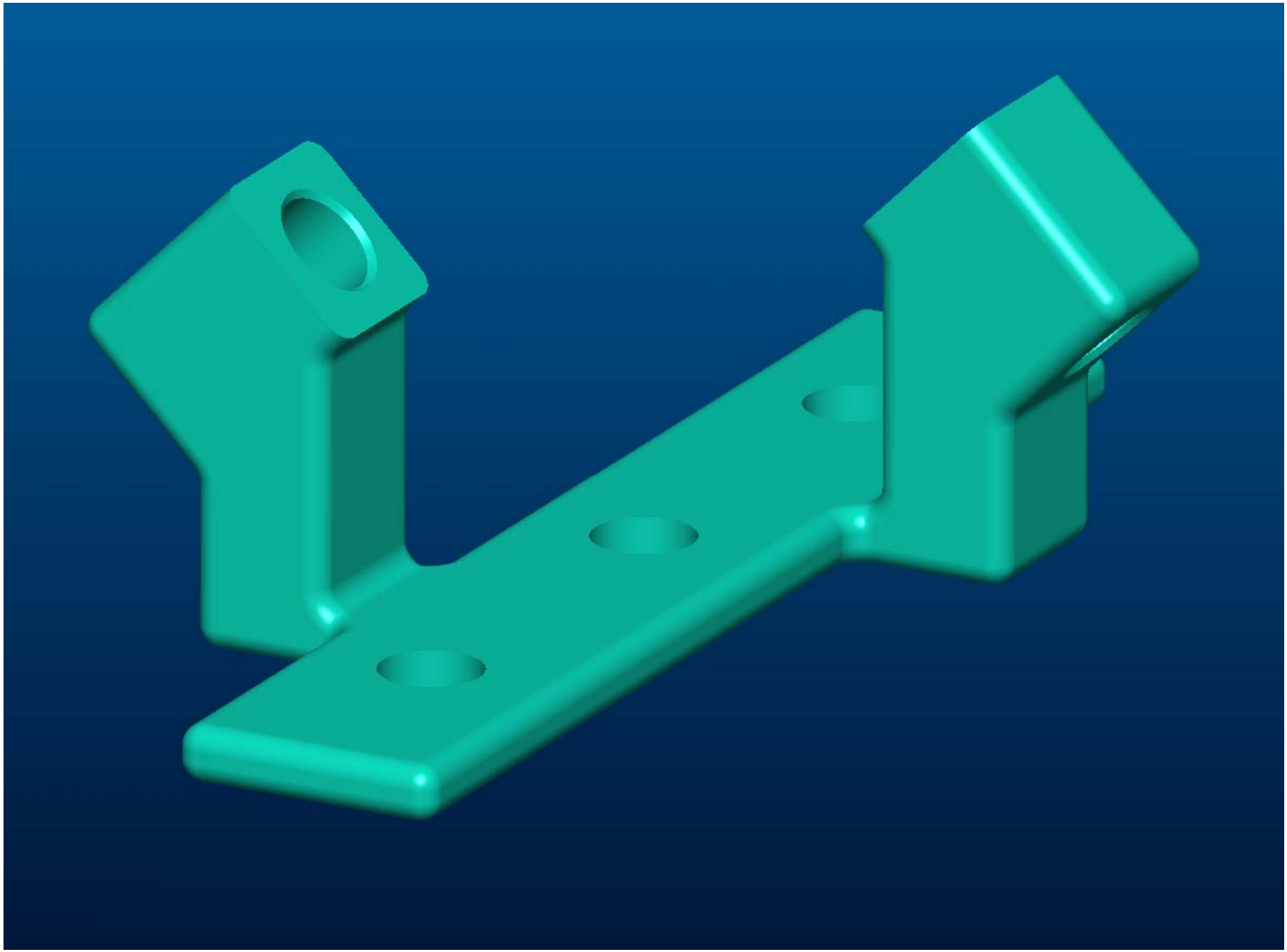




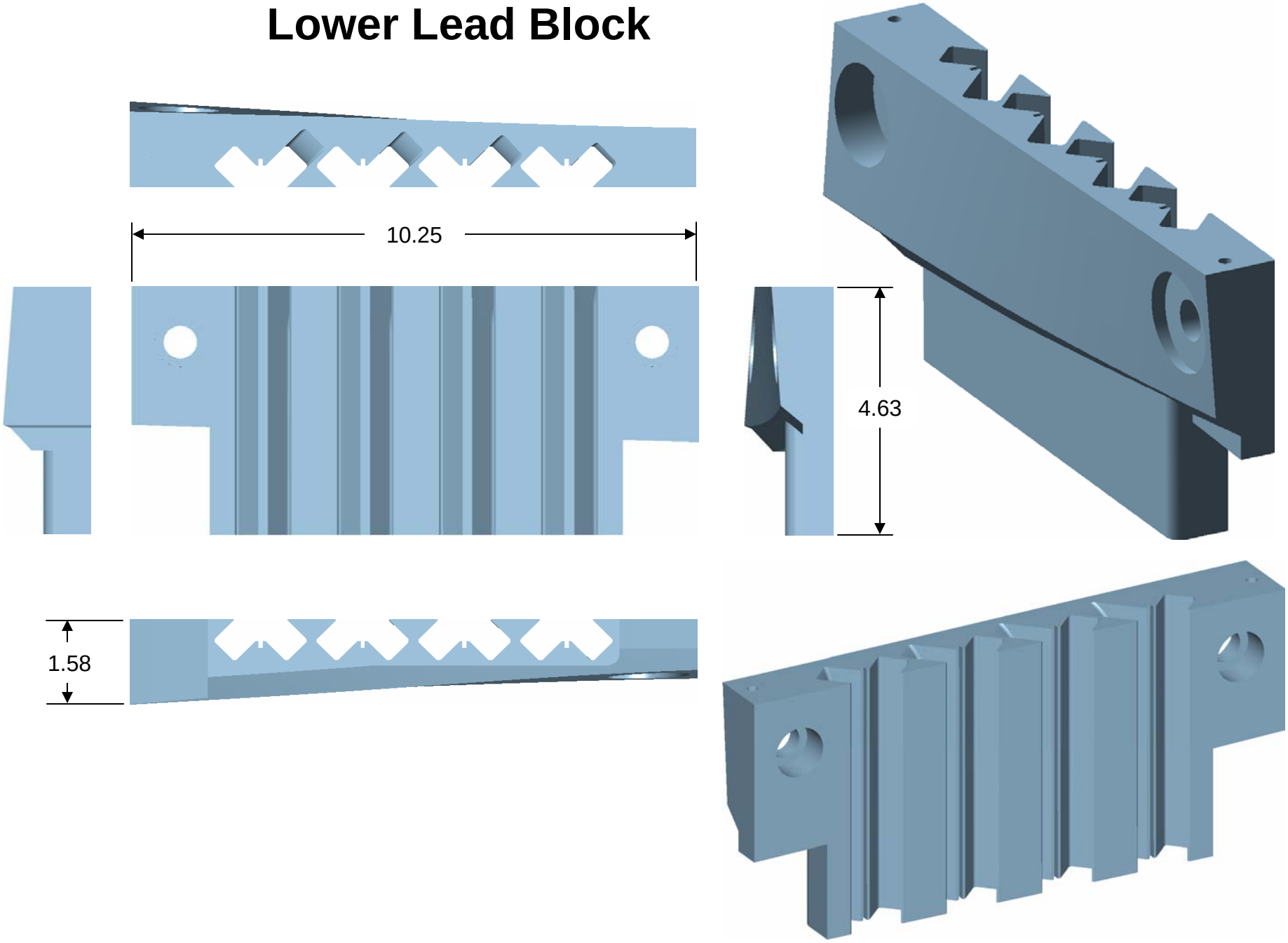


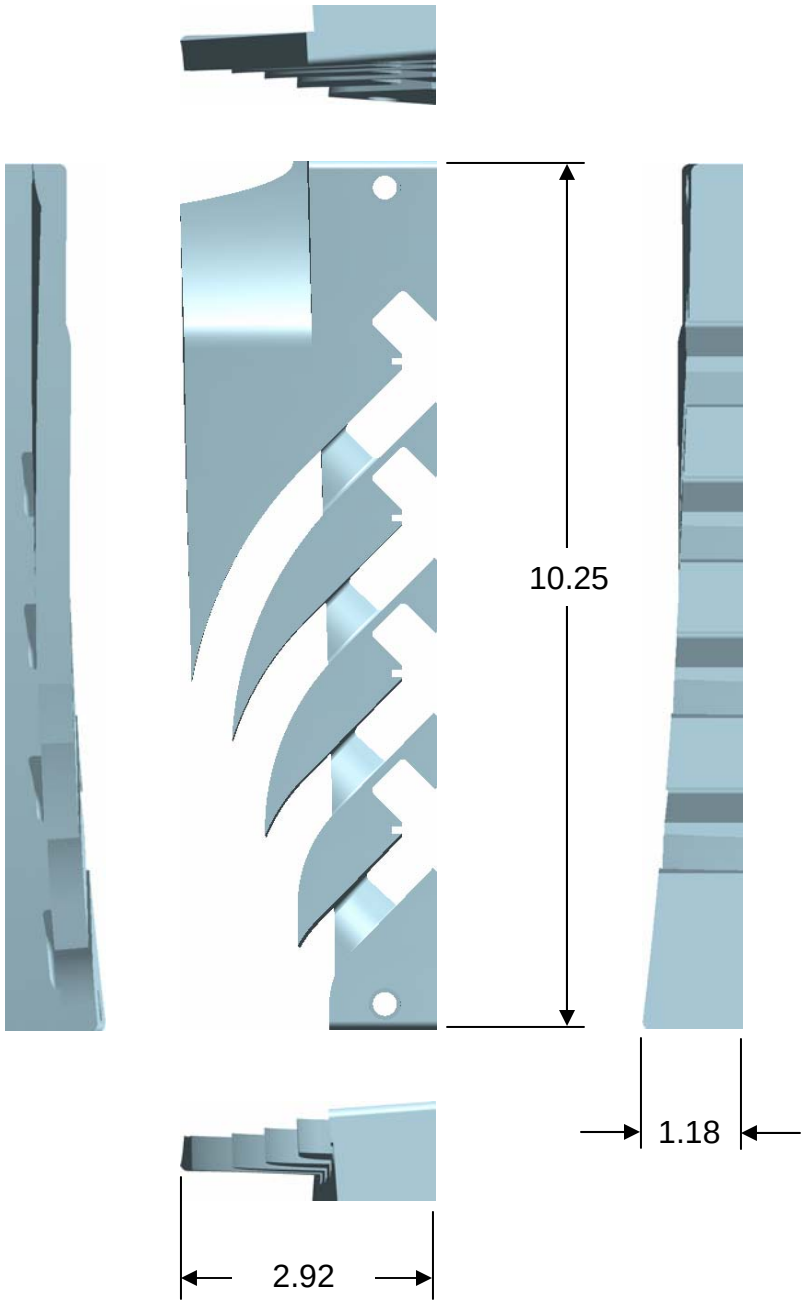


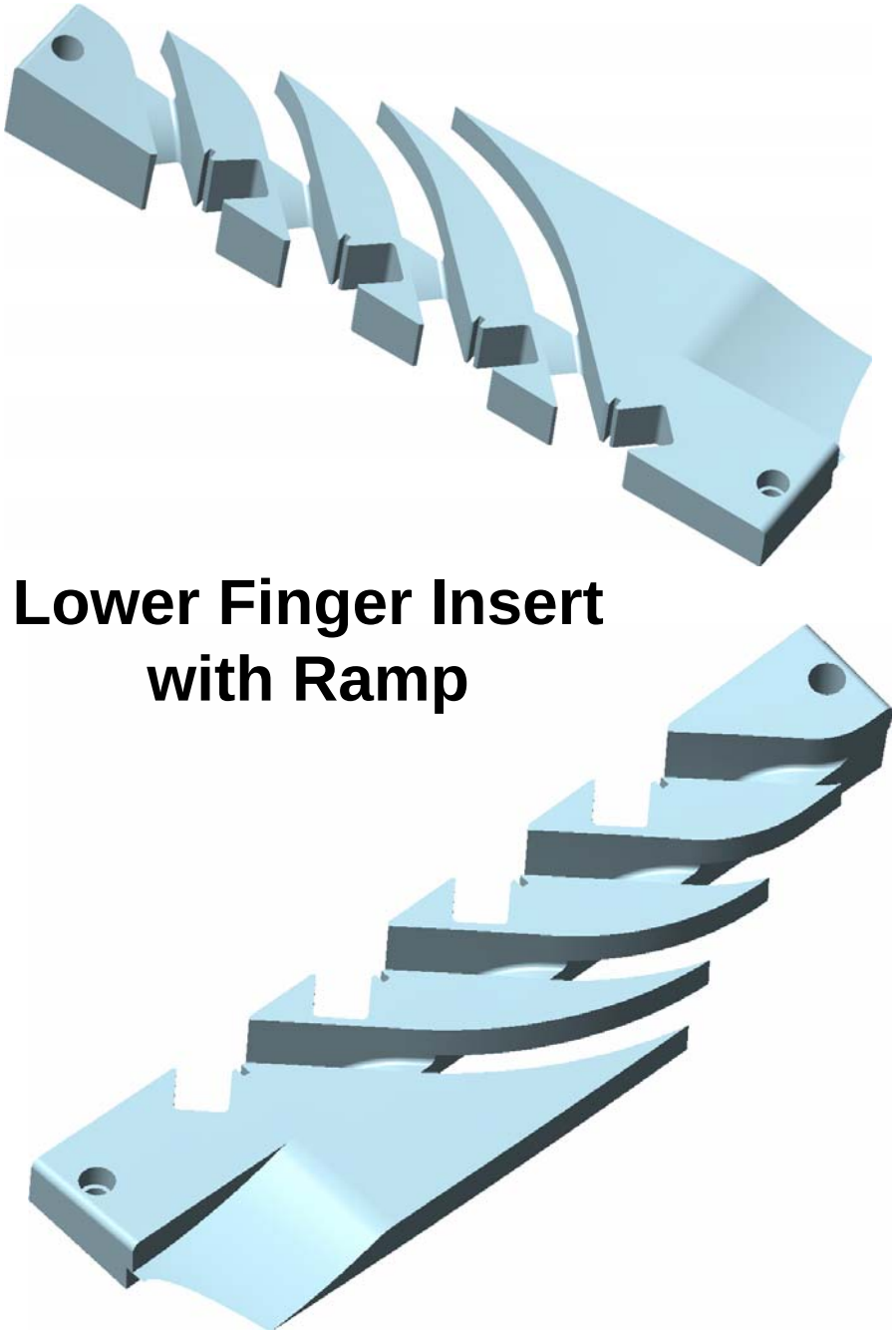




Lower Lead Block

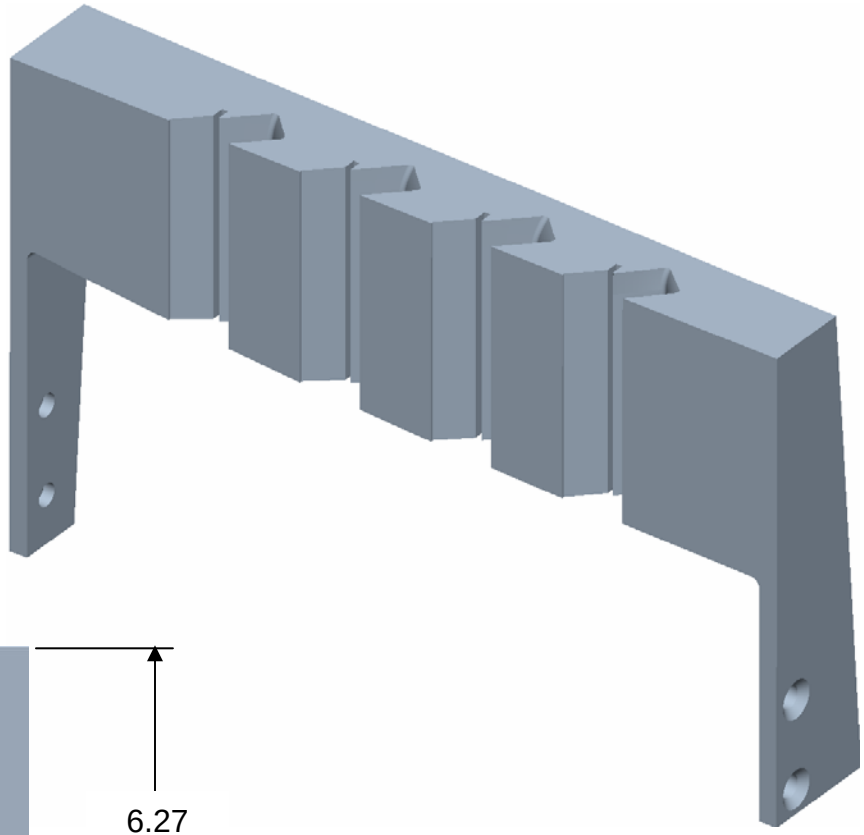


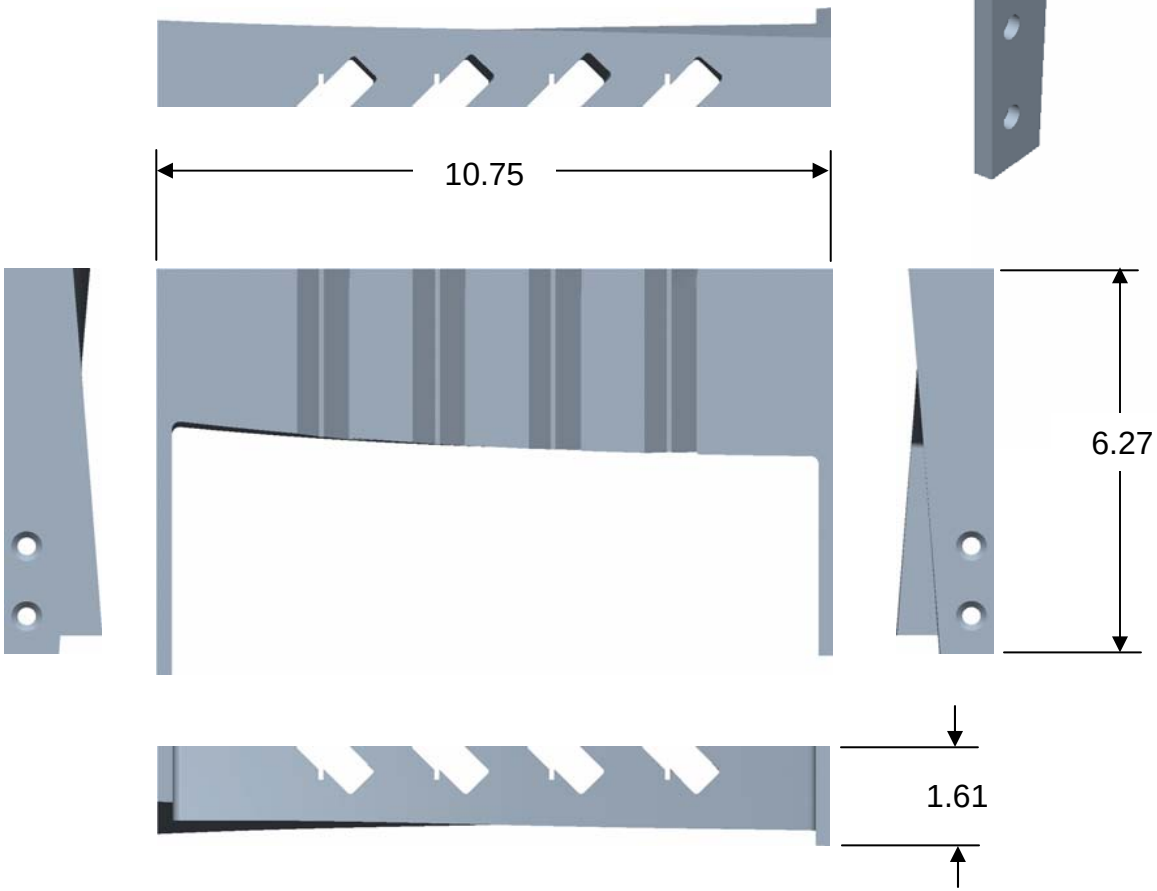




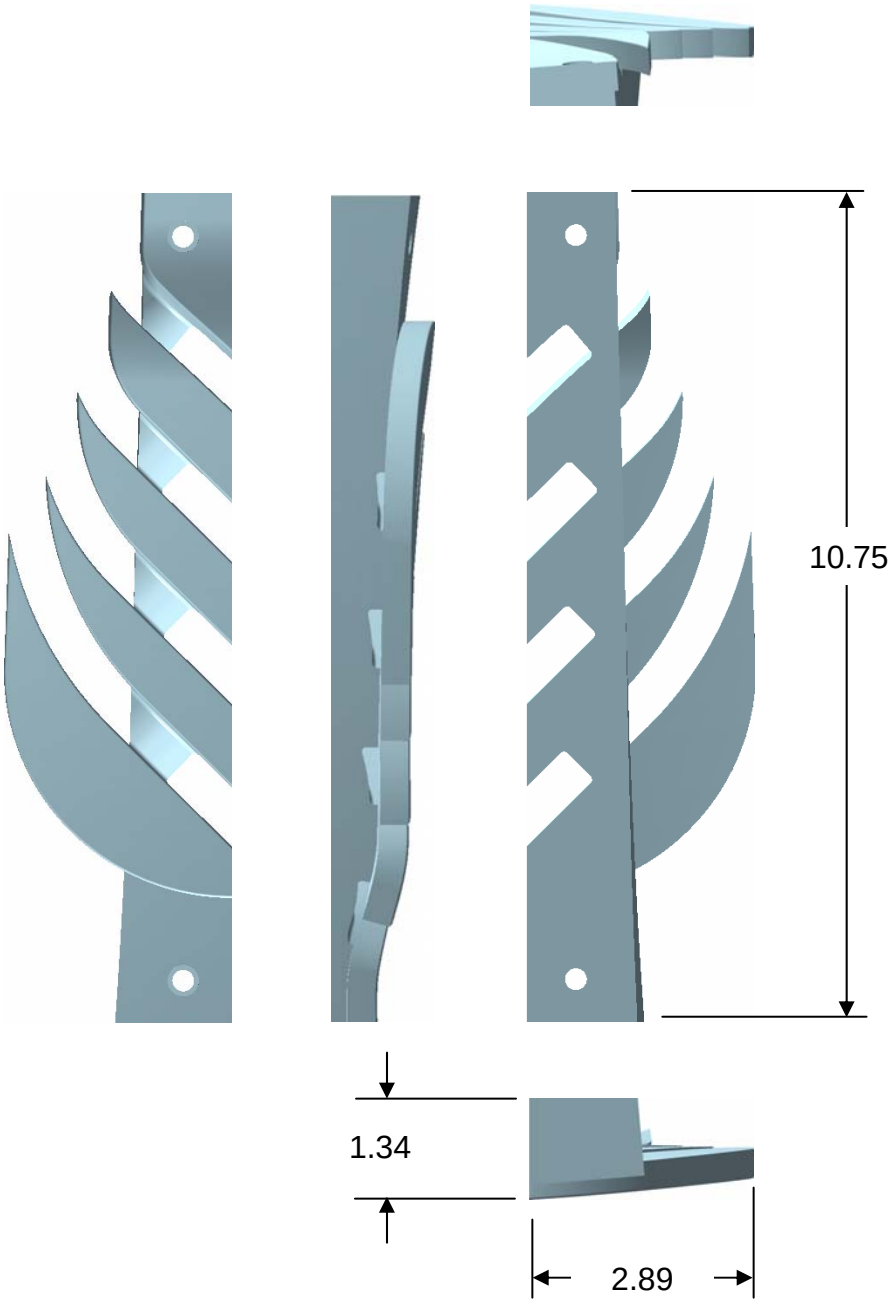
Lower Finger Insert with Ramp

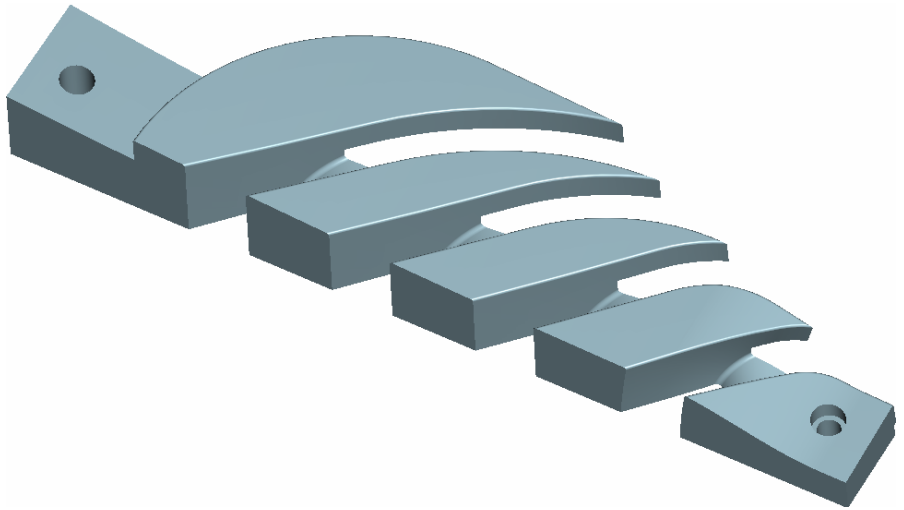
Upper Lead Block

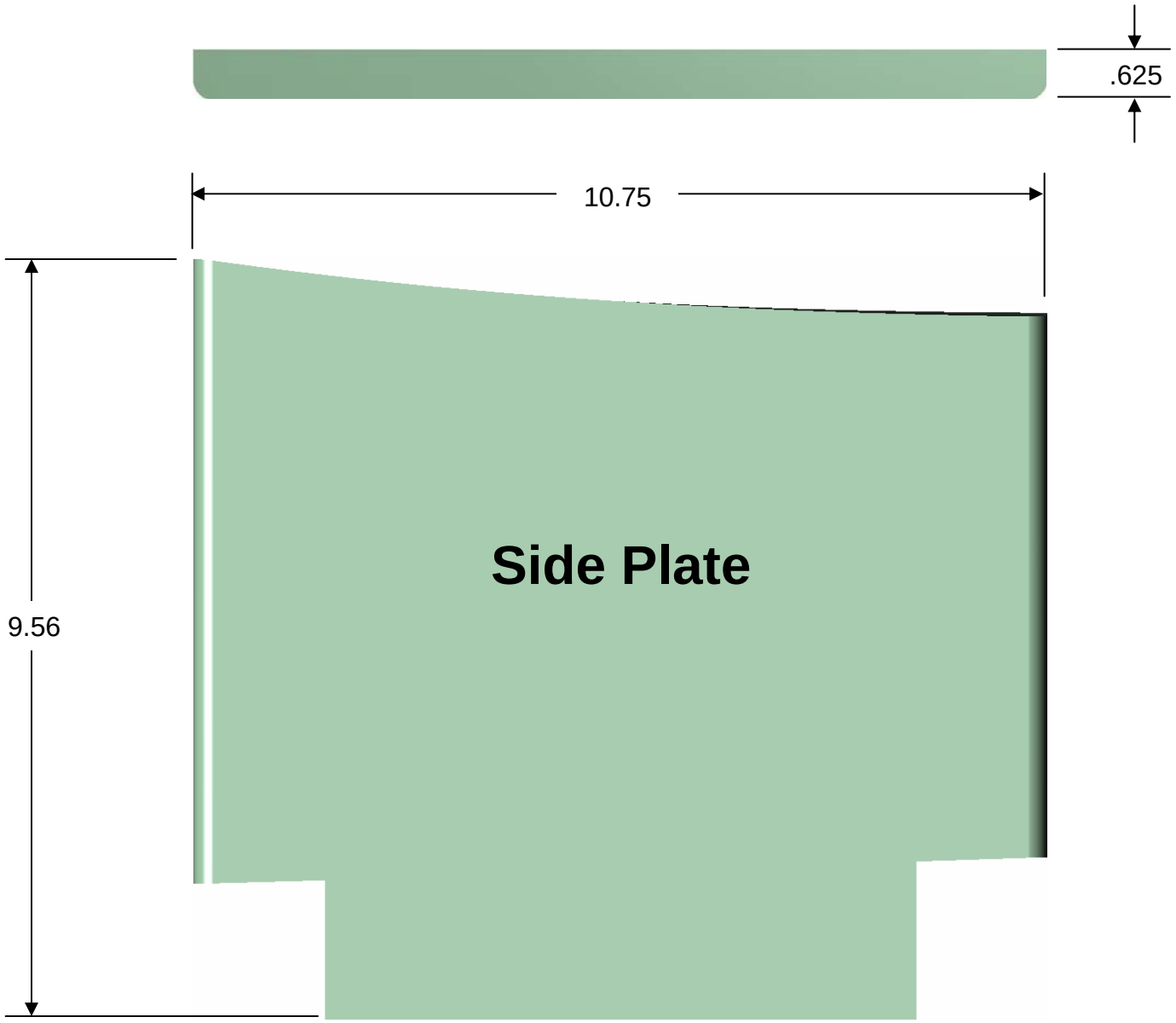


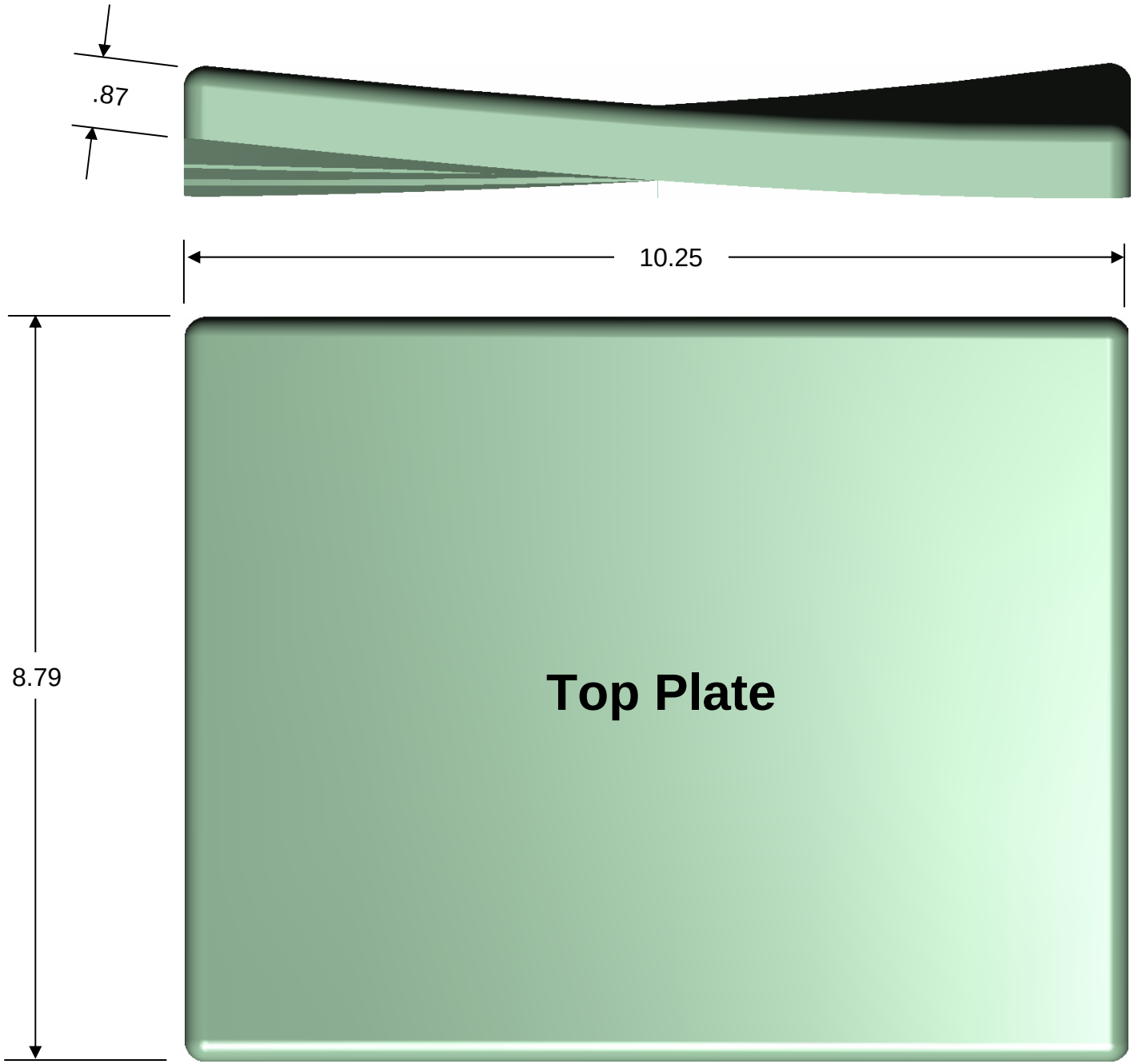


Upper Finger Insert

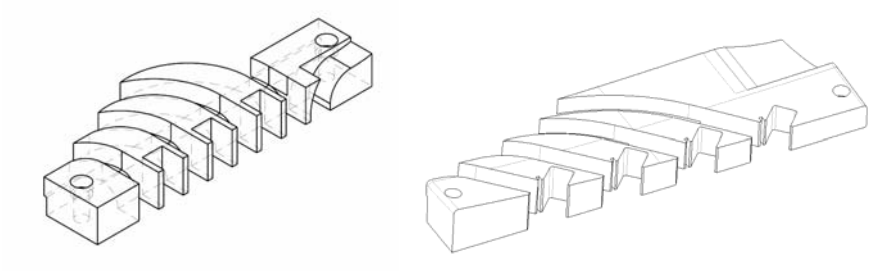




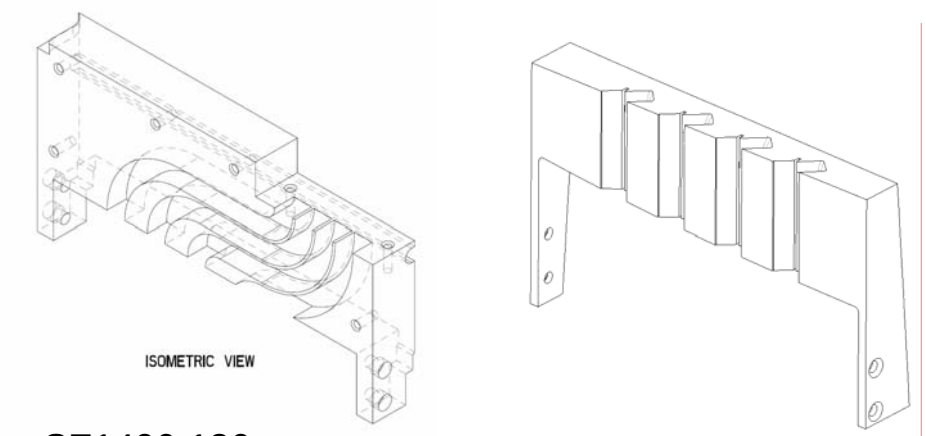

.625
10.75
9.56
Side Plate


.87
10.25
8.79
Top Plate

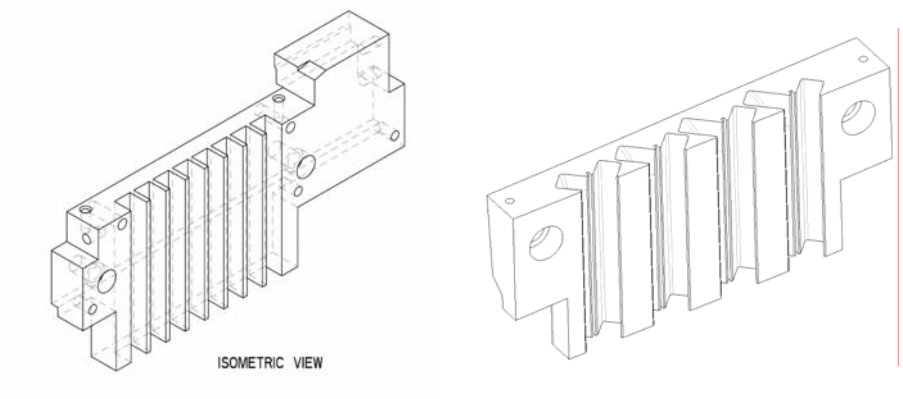
Part comparison



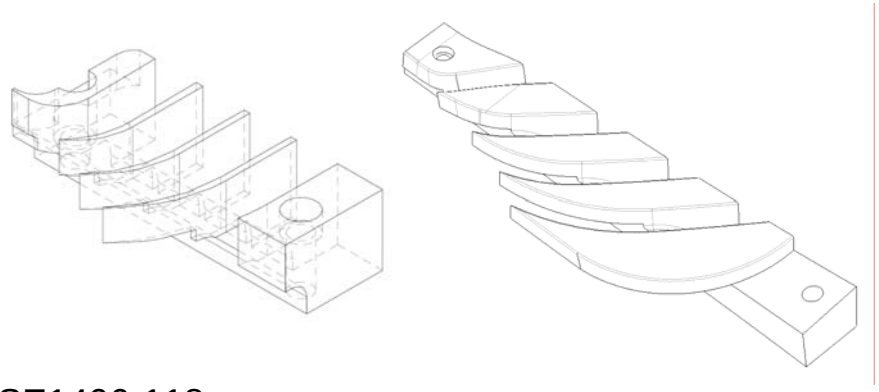
SE1406-122
Lower lead block, finger slots



SE1406-136
Upper lead block, straight slots



SE1406-134
Lower lead block, straight slots



SE1406-118
Upper lead block, finger slots

New layout exceeds blank dimensions

NCSX

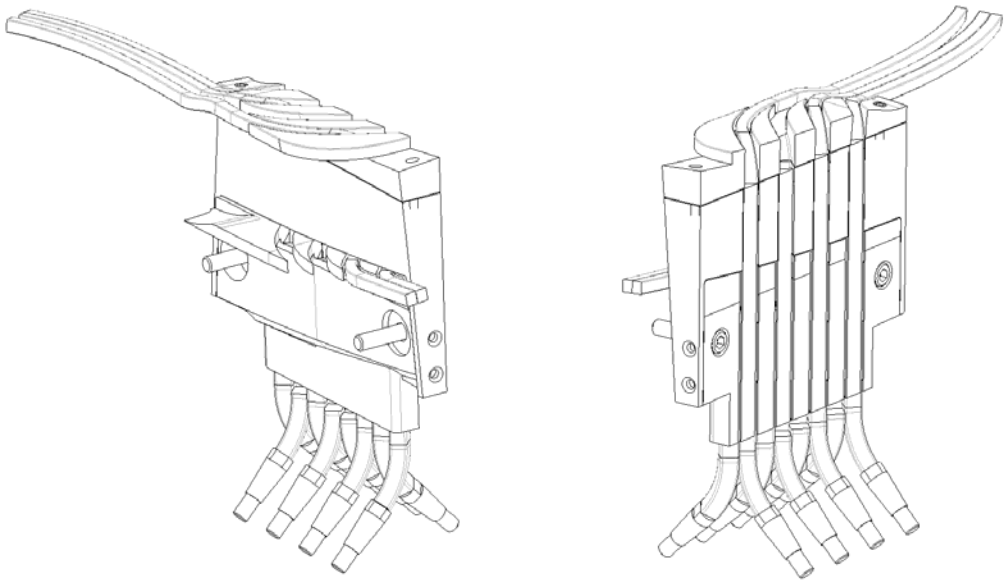
Modular Coil Type-C -- NEMA Grade G-11CR Blank Dimensions

No.	Qty	File Name	Description	Dim1	Dim2	Dim3
1	2	se142c-048.prt	TYPE-C TERMINAL JUMPERS BASE BLOCK	3.750	5.875	9.125
2	2	se142c-116.prt	TYPE-C SIDE-A LEADS ENCLOSURE SIDE PLATE	1.000	9.625	12.000
3	2	se142c-117.prt	TYPE-C LEADS ENCLOSURE TOP PLATE	1.000	9.625	12.000
4	2	se142c-118.prt	TYPE-C SIDE-A UPPER LEAD BLOCK FINGER SLOTS	1.125	2.625	4.125
5	2	se142c-119.prt	TYPE-C SIDE-B UPPER LEAD BLOCK FINGER SLOTS	1.125	2.625	4.125
6	2	se142c-121.prt	TYPE-C SIDE-B LEADS ENCLOSURE SIDE PLATE	1.000	9.625	12.000
7	2	se142c-122.prt	TYPE-C SIDE-A LOWER LEAD BLOCK FINGER SLOTS	1.000	2.750	7.750
8	2	se142c-123.prt	TYPE-C SIDE-B LOWER LEAD BLOCK FINGER SLOTS	1.000	2.750	7.750
9	2	se142c-134.prt	TYPE-C SIDE-A LOWER LEAD BLOCK STRAIGHT SLOTS	1.500	5.625	12.000
10	2	se142c-135.prt	TYPE-C SIDE-B LOWER LEAD BLOCK STRAIGHT SLOTS	1.500	5.625	12.000
11	2	se142c-136.prt	TYPE-C SIDE-A UPPER LEAD BLOCK STRAIGHT SLOTS	1.500	5.875	12.000
12	2	se142c-137.prt	TYPE-C SIDE-B UPPER LEAD BLOCK STRAIGHT SLOTS	1.500	5.875	12.000

New layout dimensions

1.399	2.938	10.785
1.220	3.048	10.292
1.593	4.625	10.250
1.822	6.830	10.891

Dimensions based on part bounding box + 10%, rounded to nearest 1/8-inch



Plan to complete lead blocks

NCSX

- Order long lead G11-CR blank material – must revise
- Develop ProE models of Type-C, Side-B lead blocks and revise drawings for both sides – by 5/18
- Evaluate current filaments for field errors, all coils – by 5/18
- Revise drawings for terminal, incl template for conductor alignment – by 5/18
- Conduct FDR for lead blocks and terminal – by 5/18
- Revise MCWF machining in leads area – by 5/20
- Revise/issue part drawings in order of need for C1 – by 5/20
- Create STL model of lead block asm to check fitup of actual parts – by 6/3
- Pre-fit parts with STL assembly before use on coil – by 6/29