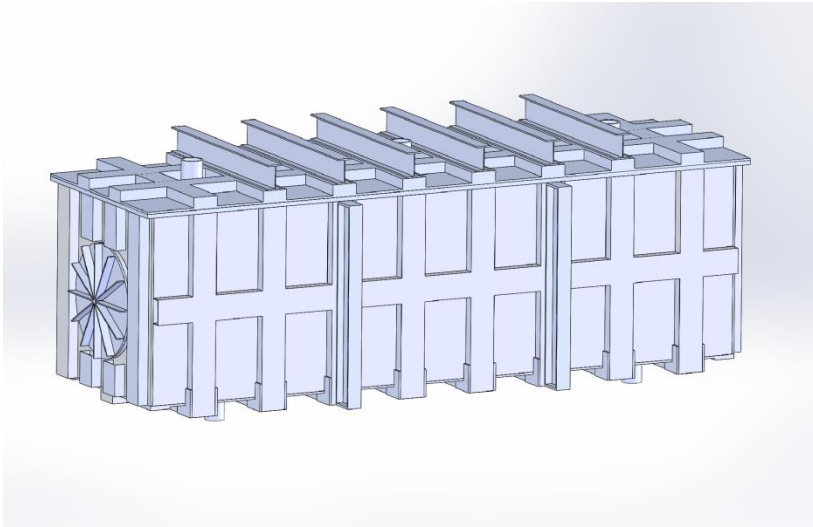


# FEA of Moller Hybrid Vacuum Chamber

J Kelsey

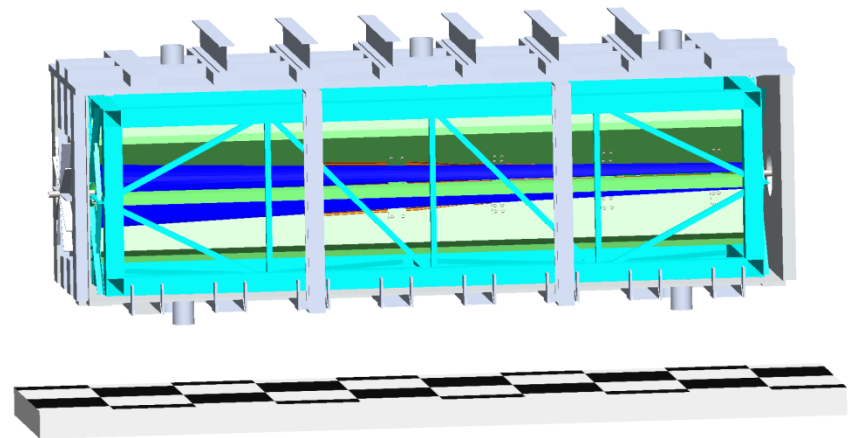
Oct 2013

# Moller Hybrid Toroid Vacuum Chamber



- Aluminum chamber with reinforcement. Weight approx. 19,000 lbs. (8600 Kg)  
End blankoff flanges for initial testing.

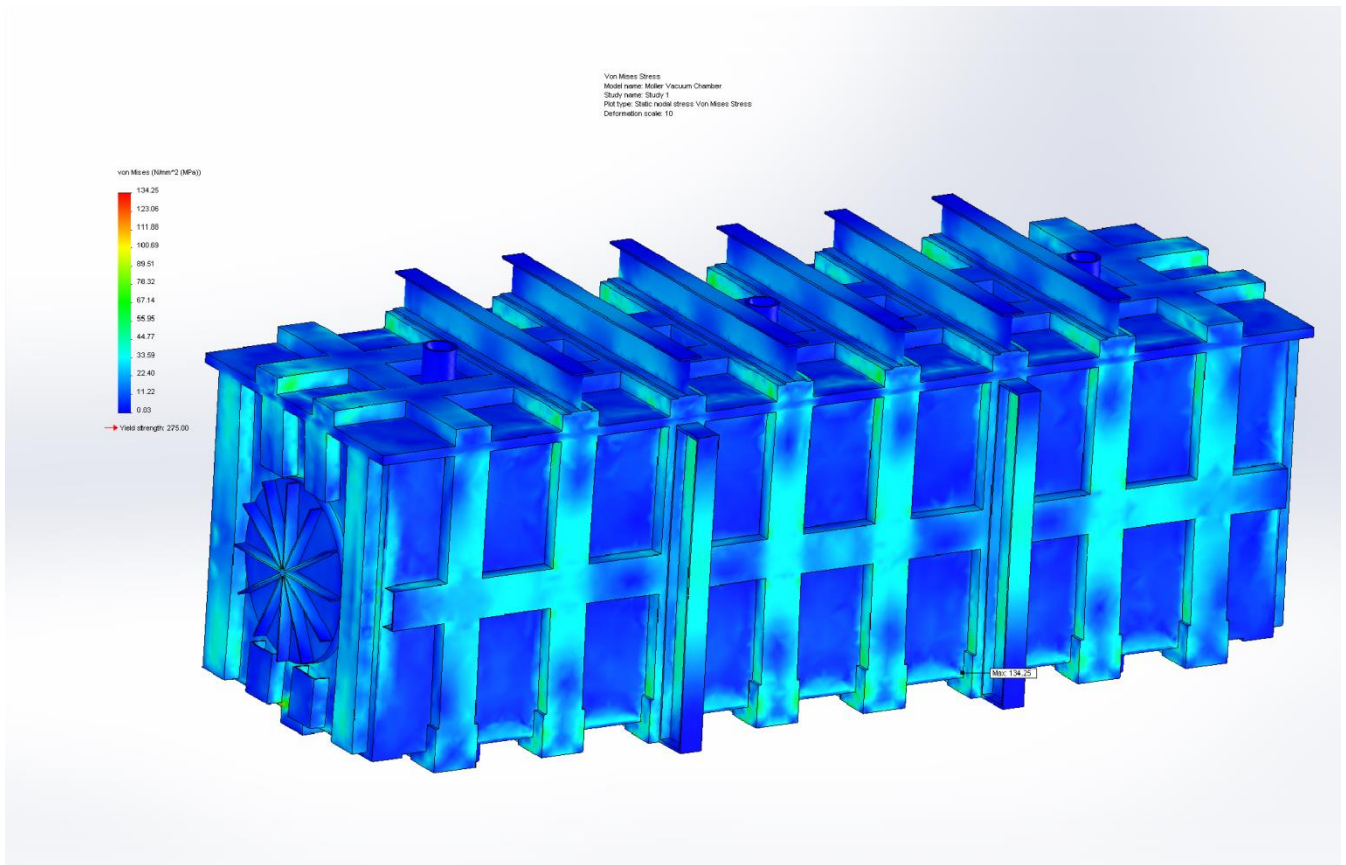
- Toroid carrier supported by strut system from top plate.



# Model

File Name	Moller Vacuum Chamber.SLDASM
File Configuration	FEA Von Mises Stress
Model Type	Solid, Static
Loads	Gravity + Toroid and Support (20,000 lb) + Vacuum load on all walls (14.7 psi)
Restraints	Flanges on bottom of chamber
Contacts	Bonded

- Upstream and Downstream flanges have appropriately sized ports to provide no interference for particles.



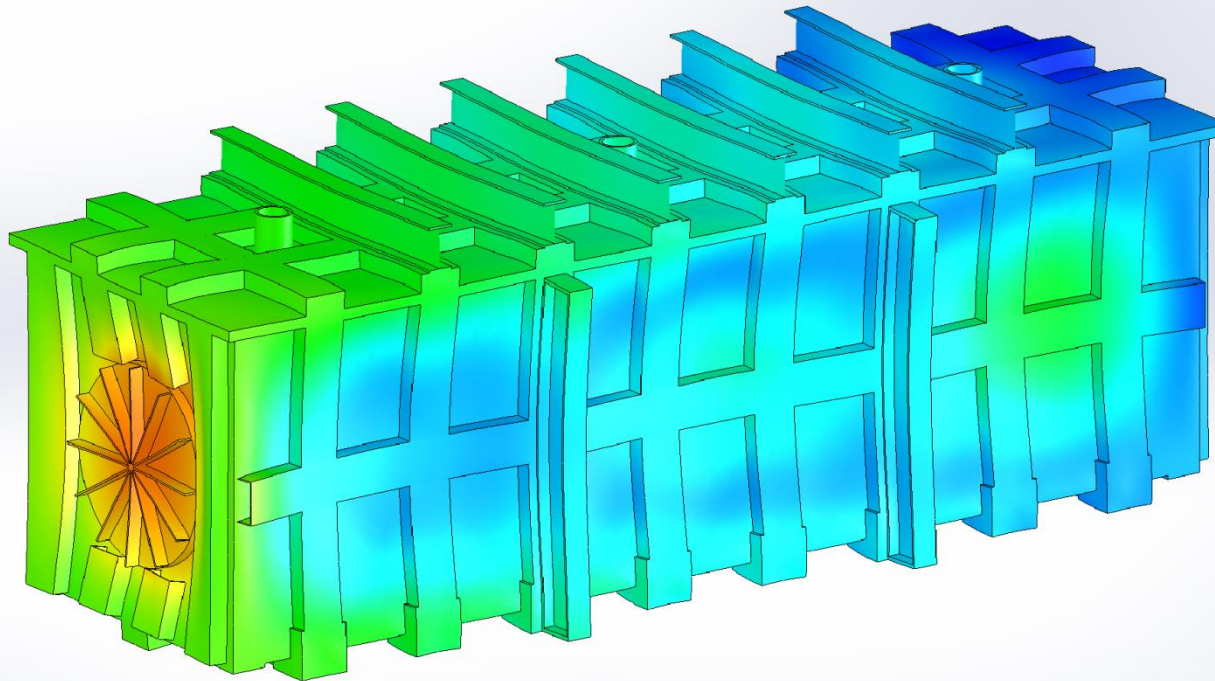
## Model

File Name	Moller Vacuum Chamber.SLDASM
File Configuration	FEA Deflection
Model Type	Solid, Static
Loads	Gravity + Toroid and Support (20,000 lb) + Vacuum load on all walls (14.7 psi)
Restraints	Flanges on bottom of chamber
Contacts	Bonded

- Toroid support from top plate. Maximum deflection on top plate is 0.044" (1.12 mm)



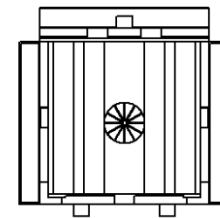
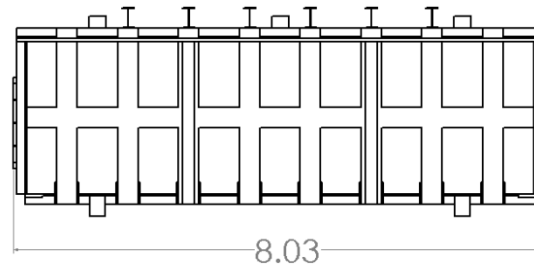
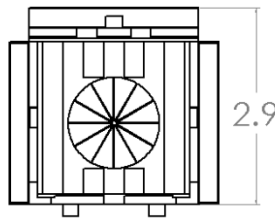
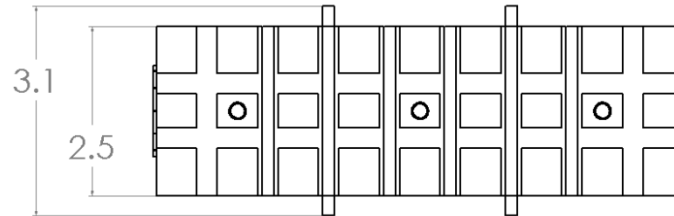
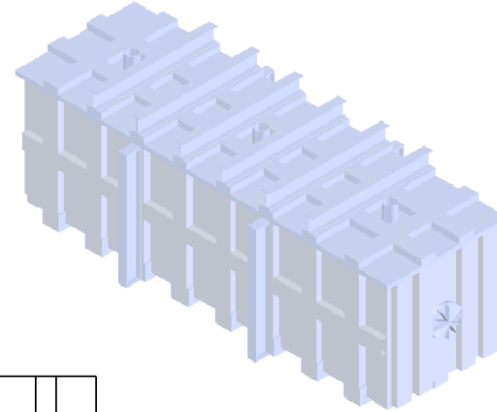
Model name: Moller Vacuum Chamber  
Study name: Study.1  
Plot type: Static displacement Displacement  
Deformation scale: 50



# Model

File Name

Moller Hybrid Vacuum Chamber Drawing



METRIC  
UNITS  
WEIGHT IN KILOGRAMS.  
8361

APPROVED FOR FABRICATION		APPROVED FOR DELIVERY	
DATE	BY	DATE	BY
DESIGNED BY		CHECKED BY	
DRAWN BY		SCALE	
PROJECT NO.		JOB NO.	
REVISIONS		DATE	

INDIA  
APPROVED FOR DELIVERY  
BY RAJESH KUMAR  
RATIS (INDIA) ACCELERATOR CENTER

MOLLER Hybrid toroid  
Vacuum Chamber

1:20

# Conclusions

- Stress has a safety factor of 2 and deflection on top plate is approx. 1mm.
- Probably will require cryo-pumps due to outgassing volume. Large seals will be differentially pumped viton o-rings.
- Services for the toroid will all come through the top plate.