

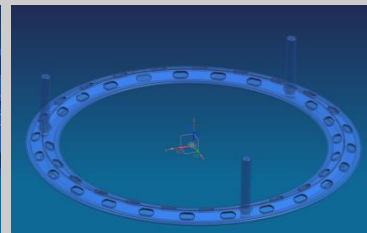
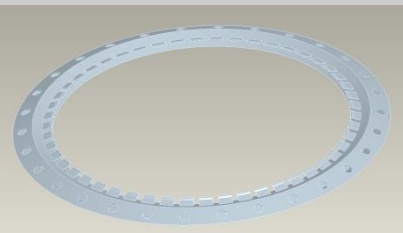
DESIGN FOR ADDITIVE MANUFACTURING CHALLENGE 2015



- By Dorine Laheij

SELF SEALING VACUUM SEAL

- Use vacuum force to realize vacuum tight connection rather than large amounts of bolts in pre described mounting sequence.

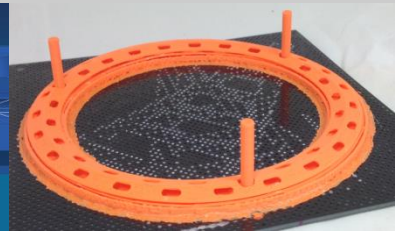
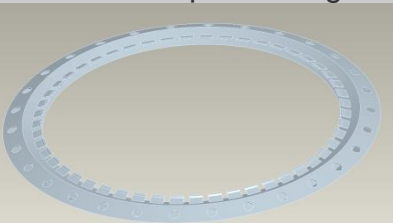


REASON WHY WE SELECTED OR PART



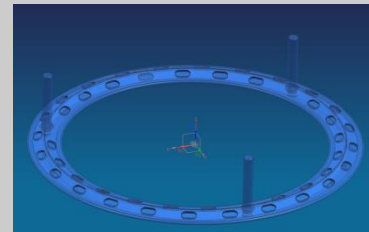
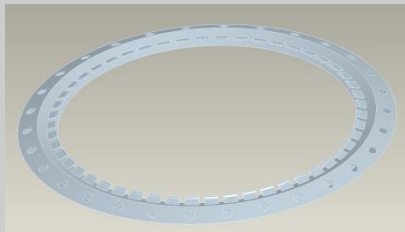
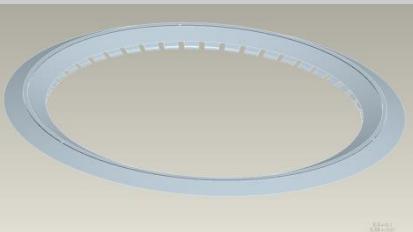
Desired is a vacuum seal with the following specifications:

- Vacuum tight / bake-able
- Low out gassing rate (CxHy)
- Limited mounting volume and mounting bolts (reduce installation time / errors)
- EMC Compatible
- Re-usable
- Accurate positioning



DESCRIPTION OF THE DESIGN

- Sealing ring will be positioned and mounted by three nuts on flange
- Flange is place and mounted (three bolts)
- Vacuum applied
- The pressure introduced by the sealing will be compressed the sealing ring

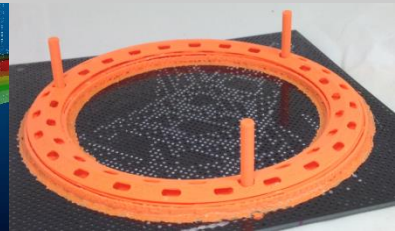
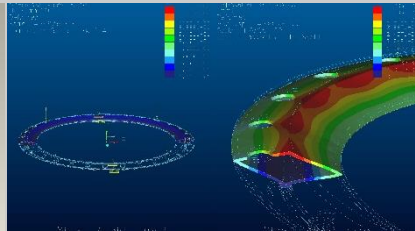
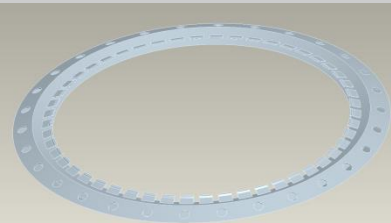


TOOLS WE USED IN THIS CHALLENGE

- ProE Wildfire 4 3Dmodeling
- Pro Mechanical
- Up pp3dp 3-D printer to create a prototype

Additive World

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CHALLENGE 2015

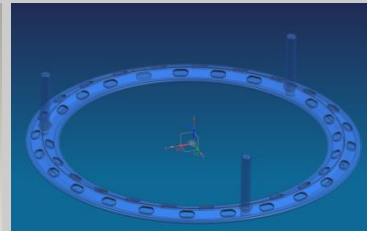
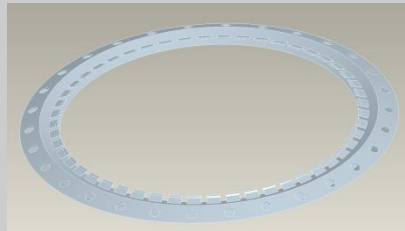
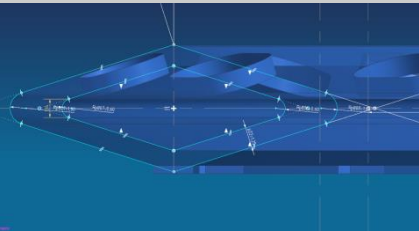


MOTIVATION WHY WE SHOULD WIN

- Optimal usage additive Manufacturing
 - Thin walls
 - Wall thickness differences
 - Hollow inner channel
 - Integrated functions (mounting, sealing, force transfer)
 - Further development will contain a integrated rubber part

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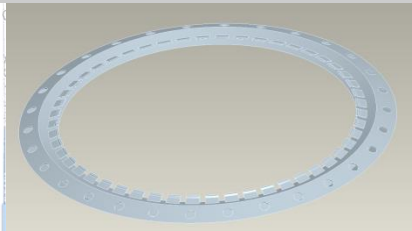
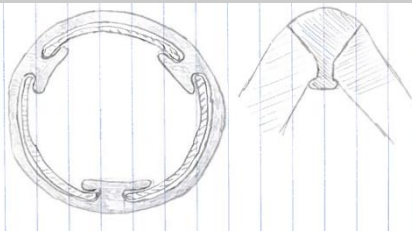


ROOM FOR IMPROVEMENT

- Applying a rubber inlay necessary to create vacuum or vulcanization of rubber on inner and outer diameter.
- Extra Mechanical calculations on material stresses needed and allowable

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SPECIAL THANKS TO

- M. van Wely (Stress calculations)
- Brainstorm (M. van Wely, R. Dona, H. Heerings, P van Putten, P van Rens)
- Technical feedback P. van Rens
- R. van der Kluit (3D prototyping)