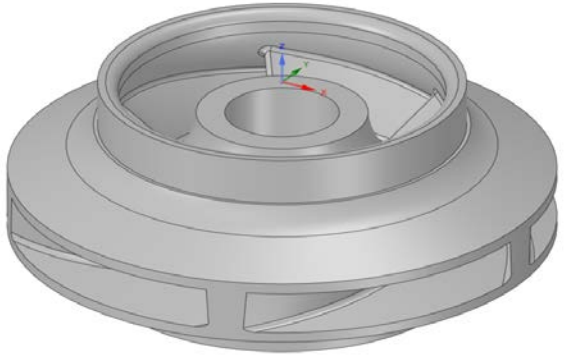
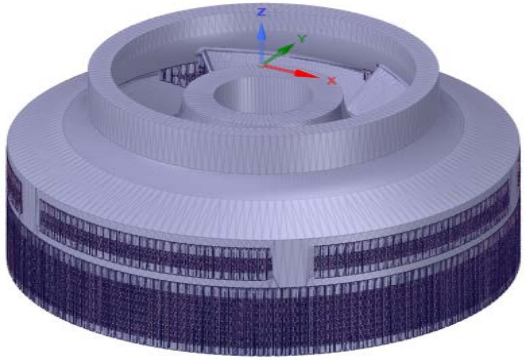
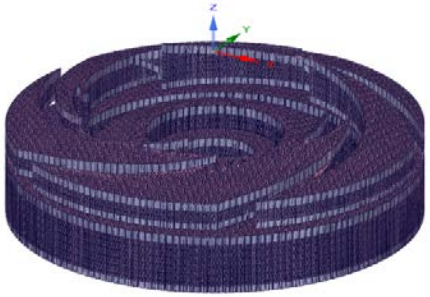
3D Printing of Pump Impellers



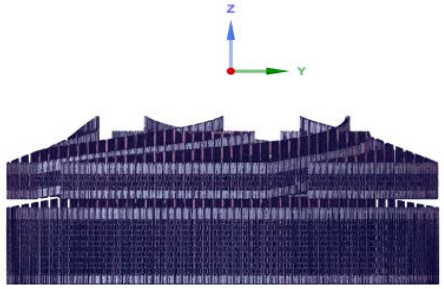
Travel Screen Wash Pump Impeller (VMS80) – used for Condenser Intake Screen Cleaning



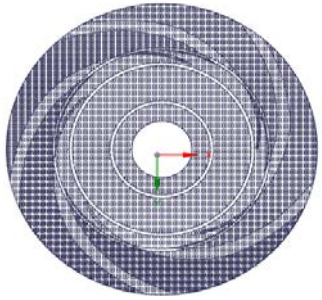
Impeller (VMS80) 3D printing simulation with support generation



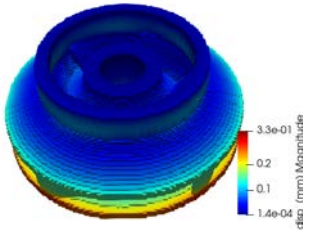
Impeller support only – isometric view



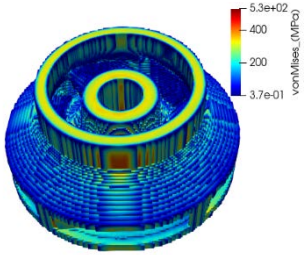
Impeller support only – front view



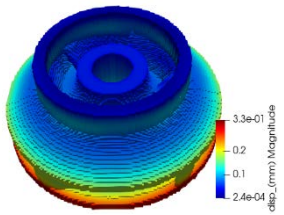
Impeller support only – bottom view



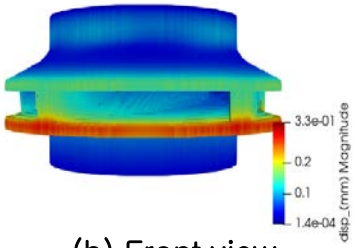
(a) Isometric view



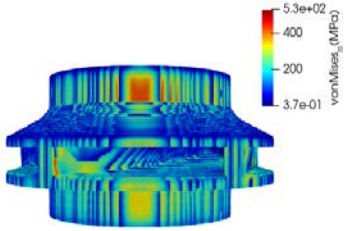
(a) Isometric view



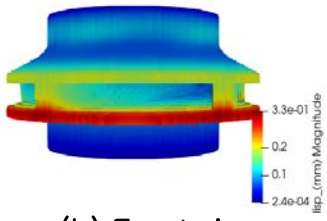
(a) Isometric view



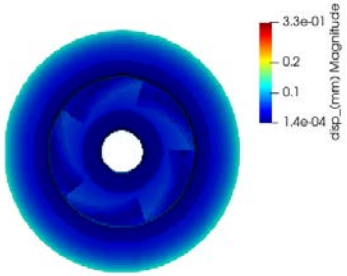
(b) Front view



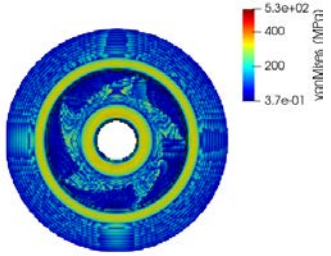
(b) Front view



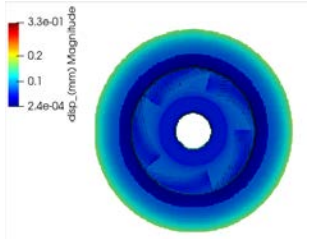
(b) Front view



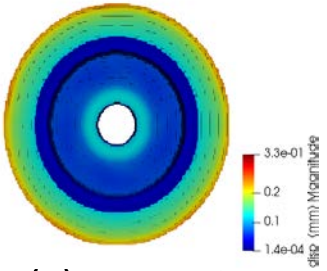
(c) Top view



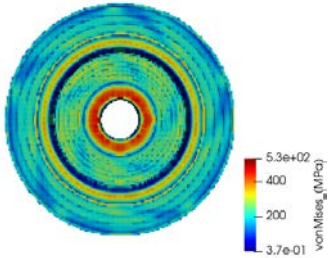
(c) Top view



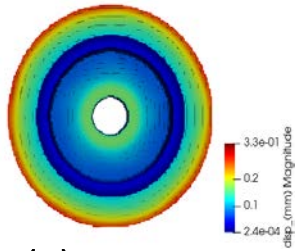
(c) Top view



(D) Bottom view



(D) Bottom view



(D) Bottom view

Impeller distortion before support removal

Impeller stress distribution before support removal

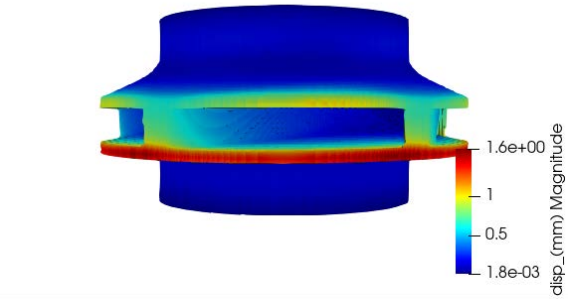
Impeller distortion after support removal

Before Support Removal	
Radial dir. total diff.	0.159mm
Vertical dir. Total diff.	0.253mm

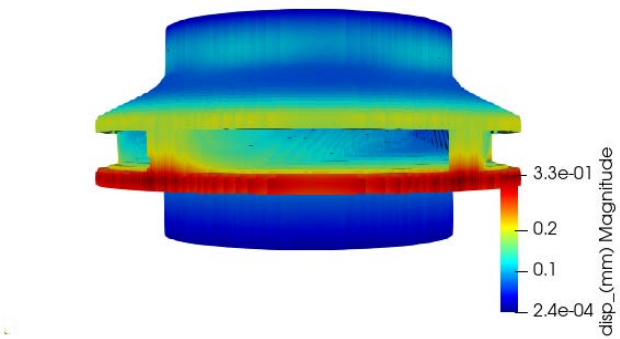
After Support Removal	
Radial dir. total diff.	0.153mm
Vertical dir. Total diff.	0.299mm

3D Printing of Pump Impellers – Design Compensation

- Comparison of impeller distortion before and after 3D printing considering scaling coefficient adjustment of both SSF (strain scaling factor) and ASC (anisotropic strain coefficients)
- Reduction of distortion
  - Maximum distortion before SSF/ASC adjustment: 1.6 mm
  - Maximum distortion After SSF/ASC adjustment: 0.33 mm



Before application of scaling coefficient adjustment



After application of scaling coefficient adjustment