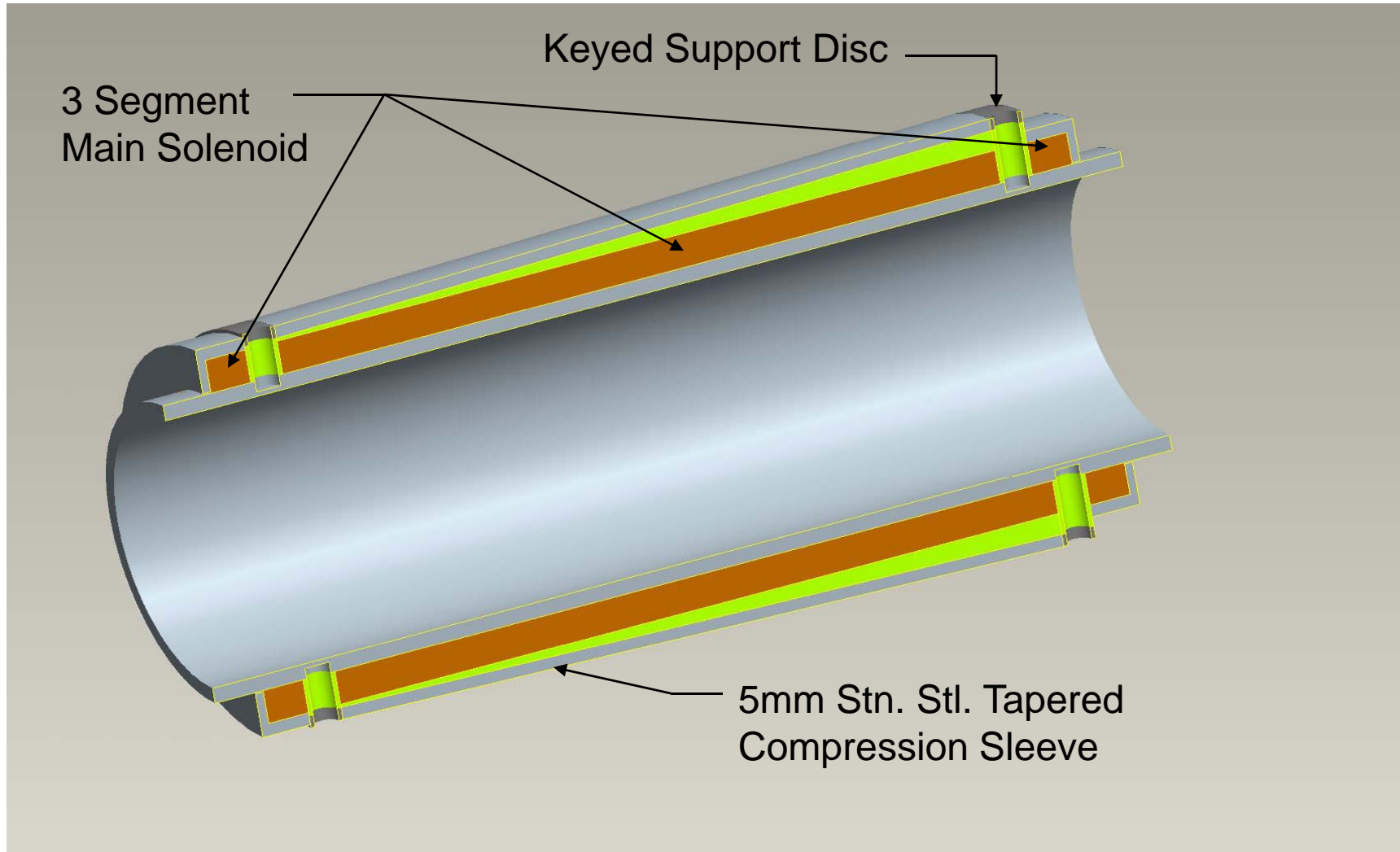


# E-LENS Main Solenoid Containment

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# Concept Layout



# Basic Coil Construction

- Coil in 3 sections continuously wound from layer to layer.
- Wound on 316L Stn. Stl. Support tube 10mm wall X 200mm O.D.
- Outer Stn Stl. Compression shell to resist radial and axial forces.
- Support discs with keys or pins to transmit axial forces to support tube and comp. shell.

# Coil Forces

- Outward radial pressure exerted by the solenoid ....approx. 1700 psi.
- Inward axial forces  
.....133,000 lbs (per side)

# Radial Force Restraint

- Radial forces can be restrained by 5mm of material stressed (hoop) to 42,000 psi.
- Resulting stress in supt. Tube (pressure vessel).....17,000 psi.
- Strain required for stn.stl (.0014)  
for Alum. (.0042)
- Diametrical interference required  
Stn. Stl. (.014)  
Alum. (.042)

# Radial Force Restraint, con't

- Stn. Stl. Tube heated 80 degrees C. will give required interference.
- Tube has 10mm radial taper to minimize the assembly risk of tube “getting stuck”.
- Aluminum would need to be heated 180 degrees C. above ambient.

# Axial Force Transmission

- The axial forces exerted by the outer solenoid sections are transferred around the center section.
- The keyed support discs transfer the load to the support tube and the compression sleeve.
- Modeling being done to determine the attachment of keys to support tube stresses.