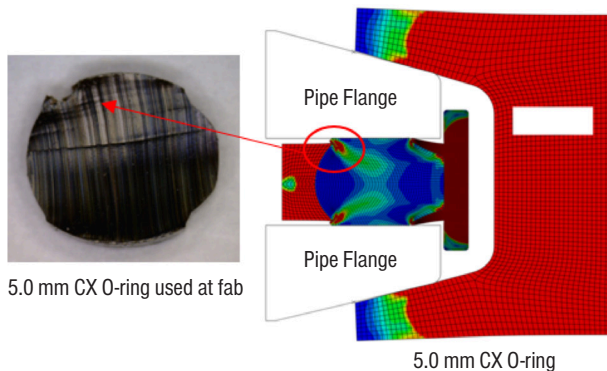


Chemraz® SubFAB (SFX) Enables High-temperature Exhaust Lines

The Challenge

A fab running plasma-enhanced deposition was experiencing problems with the fluoroelastomer (FKM) seals they were using in their subfab exhaust lines. The seals could not handle the high temperatures. As the temperature in the lines increased above 200°C, the FKM seals began to fail prematurely.

Standard 5.0 mm CX O-ring Analysis in ISO Fitting

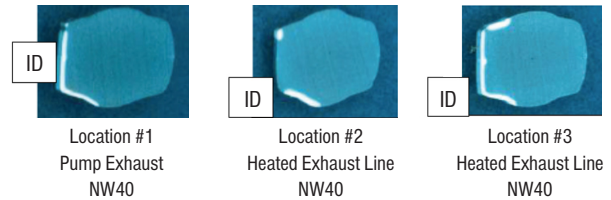
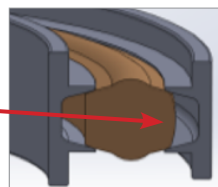


- 170°C temperature
- FEA analysis shows extrusion due to overfill
- Used part shows actual extrusion

The Greene Tweed Solution

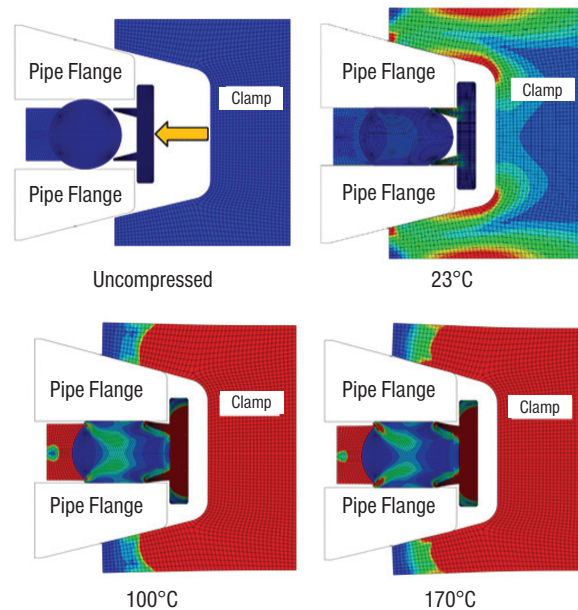
Greene Tweed developed a new FFKM sealing material, Chemraz® SubFAB (SFX), along with a custom-designed, patent-pending seal geometry to withstand the harsh temperature and chemical environment of today's subfab environment. Designed specifically for subfab use, Chemraz® SFX provides high-temperature sealing without "overstressing" the material.

- Many conventional FKM sealing materials can no longer handle the increasing temperatures and chemical exposure found in many subfab applications.
- Chemraz® SFX's ISO fitting seal design enables high-temperature exhaust handling. Its ability to handle high temperatures and harsh chemicals make it a premium choice when sealing system upgrades are needed.
- Chemraz® SFX offered the customer exhaust handling up to 300°C/572°F at three locations (pump exhaust and two heated exhaust lines) in their deposition system, which was running TEOS, NF3, and other effluents at >200°C:



All three locations showed very little deformation and material breakdown after three months of usage.

By comparison, FEA modeling shows potential extrusion and damage to standard 5-mm FFKM o-rings at higher temperatures, as illustrated below:



The Results

- Greene Tweed custom-engineered a new FFKM material and developed a unique, patent-pending seal design to provide the best possible customer solution.
- Greene Tweed's unique Chemraz® compound, Chemraz® SFX, can help subfabs cost effectively transition from FKM to FFKM (perfluoroelastomers).
- Chemraz® SFX enables high-temperature subfab applications, up to 300°C/572°F.
- Chemraz® SFX's ISO seal eliminates overfill and extrusion from thermal expansion where typical o-rings fail in the subfab.