



Preventing Water Intrusion

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What is the typical Sump Environment prior to leaks

- Cocktail of gases present, Ozone, Hydrocarbons , greatly increased if the sump lid is conductive to suns radiation/temperature variations
- Vapor erosion acts like micro biotic bacterial erosion
- Fittings become "eaten away"
- Many fittings leak and allow mix of permeated hydrocarbons and fuel with ground water



Entry fitting development

First fittings used were taken from the plumbing industry eg. Fernco's made from Nitrile or Buna rubbers (made in some cases by major oil companies' rubber divisions)

They were immersed in gasoline to test suitability and performed reasonably in terms of swell/tensile strength

Specialty fittings were designed in the late 80s and 90s using the same material, Mainly Nitril or "Buna" rubber

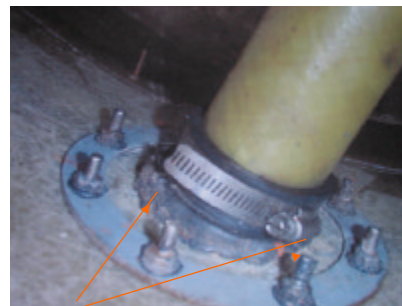
Nitril rubber is compression molded.

Some major manufacturers invested in expensive compression molding equipment and it is extremely expensive to retool and change to Thermal Injection molding

Thermal injection molding allows use of a much wider range of raw materials And offers the best chance of highest fuel resistance.

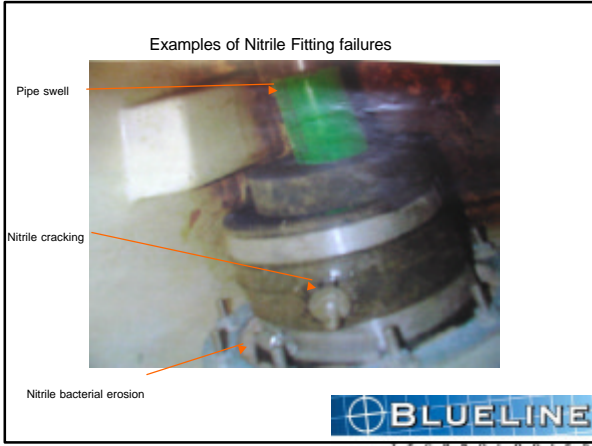


Examples of Nitrile Fitting failures



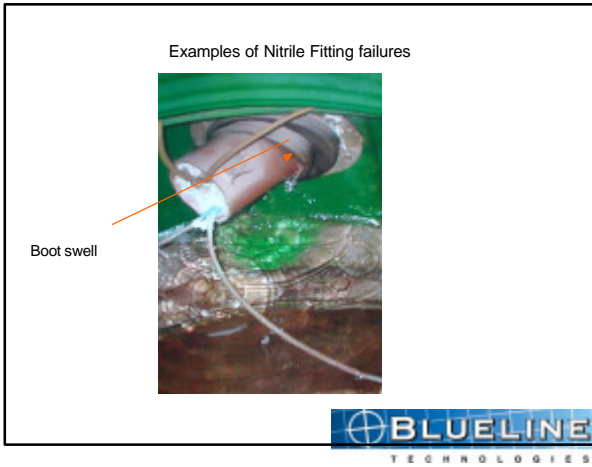
Nitrile bacterial erosion





Other causes of leaks

- Poorly fitting Sump lid
- Non watertight Sump lids
- Sump distortion and cracking
- Pipe swell from permeated hydrocarbons ripping boots
- No entry boots in place!



Nitril Vs Alcryn and Pellethane

- Nitril and natural rubbers generally have good chemical resistance but poor resistance to ozone and aromatic hydrocarbons. They also swell in fuel
- Polyurethanes demonstrate much greater resistance to ozone and hydrocarbons. We have found that Pellethane 2355 is the best and make all Blueline Fittings from this material. It also now has passed UL.
- Some urethanes suffer from hydrolysis (expansion in water) but Pellethane has very low swell attributes.

Blue line repair kits and products

- Split , fill able/bondable boot repair kits
- Split reducers and inserts
- Retrofit sump lids & PetroSeal Paste
- Adhesives, bonders fillers and sealants



Who approves, specifies our products

- RHL Design 3rd Party
- Shell, Chevron, Conoco Phillips, etc.



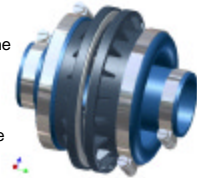
Blueline new construction fittings

- Double and single sided entry fittings
- Reducers
- Inserts
- Accessories



Kwik fit fittings Available June 2004

- Simple "cut one hole only" installation
- Semi rigid, tough, durable, housing construction and UL Pellethane® flexible boots
- Fast installation
- 1 man job
- Simplified fitting sizes and choice
- Provides single and double sided options
- Remove need to screw new holes through the sump
- Economically priced
- Provides flex features for sideways AND lateral movement
- Provides maximum mechanical flange torque for total seal



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