



Fristam Pumps USA

Designing for the Customer's
Hygienic Applications

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Details Considered When Selecting Pump MOC

I. Items reviewed during selection process

- Product details
- Cleaning chemicals being used
- Temperature range of all processes

II. Components affected by fluid properties

- Gasket Materials
- Seal face materials
- Metal component materials

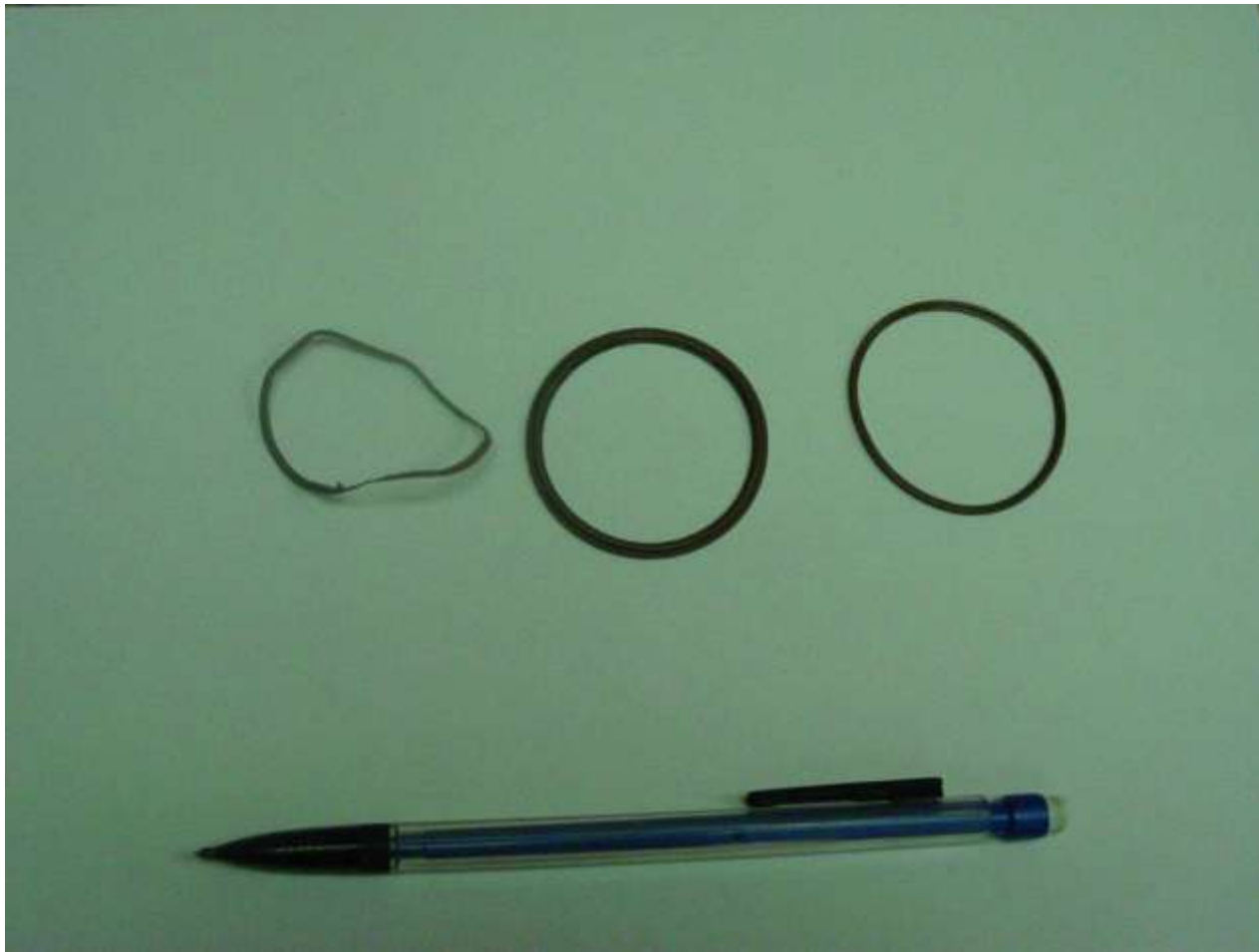
Gasket Materials

- Review product/chemical compatibility
 - May not receive complete details of chemicals.
 - Default to standard Viton/BUNA materials.
- Improper compatibility creates issues
 - Swelling of gaskets can occur preventing correct operation of mechanical seals.
 - Gasket material lost will cause failure of seal.

Examples of Gasket Issues

- Peracetic Acid
 - EPDM recommended/Viton & BUNA rated poor
- Nitric Acid
 - Viton recommended/EPDM is ok/BUNA is poor
- Ozonated Water
 - EPDM recommended/Viton & BUNA rated poor

Failed gaskets



Seal Face Materials

- Standard Face Materials
 - Ceramic-coated stainless
 - Carbon
 - Multiple recipes available
- Optional Face Materials
 - Silicon carbide
 - Options for reaction-bonded or sintered

Examples of Seal Face Issues

- Brine or chlorinated products
 - Affects bonding of ceramic coating
- Potassium Hydroxide
 - Requires Sintered SC, reaction bonded turns green
 - May require special Carbon material
- Sodium Hydroxide
 - Requires Sintered Silicon Carbide
 - May require special Carbon material
- Nitric Acid
 - Higher concentrations require Sintered Silicon Carbide
 - May require special Carbon material

Metal Component Materials

- 316L stainless is normally sufficient for most applications.
- Optional higher alloys may be needed for more corrosive products.
 - AL6XN
 - Has been used on brine systems
 - Hastelloy C276
 - Has been used on corrosive chemical applications

One option for pump materials

	Cast AL6XN CN-3MN	Cast 316L CF-3M
Carbon	0.03% max	0.03% max
Manganese	2.00% max	1.50% max
Phosphorus	0.04% max	0.04% max
Sulfur	0.01% max	0.04% max
Silicon	1.00% max	1.50% max
Chromium	20-22%	17-21%
Nickel	23.5-25.5%	9-13%
Molybdenum	6-7%	2.0-3.0%
Copper	0.75 max	0%