



Mechanical Seal Analysis (MSA)

Date	03/25/21	Pump Position	112J
MSA #	2021-014	Seal Manufacturer	FSI
Inquiry #	I-21-0027	Seal Model	MS1030SP0048-2286
Customer	Anchor Seals	Shaft Size	3.00"
Customer Ref #	2198376	Drawing #	FSI-2286
End User	USS Clairton Works	Seal Serial #	02236
Pump House	TEC	Inboard Rotary Material	Silicon Carbide
Contact	Jason DiBiase	Inboard Stationary Material	Tungsten Carbide
Phone	412-299-6900	Outboard Rotary Material	-
Salesperson	House	Outboard Stationary Material	-
		Elastomers	Kalrez 6375

General Seal Condition

Seal was returned assembled but with the drive collar screws and locating screws backed out until the seal was unloaded.



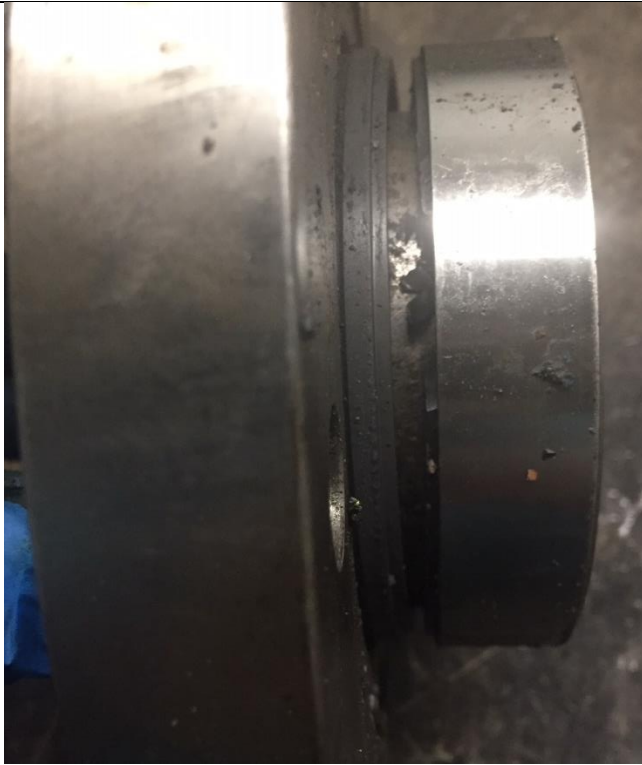


Figure 1-3: Seal as Received Condition

Seal Face Conditions

The tungsten carbide stationary face showed an even and concentric wear pattern.



Figure 4 & 5: Stationary Face

The Silicon carbide rotary face was broken and chipped in multiple locations.



Figure 6: Rotary Face

Elastomers

All O-rings appeared to be in fair condition for sealing purposes.



Figure 7 & 8: O-rings

Metal Components, Springs, Pins

Most metal parts were in good condition with the exception of the back of the sleeve and rotary holder that are damaged and in need of replacement. This damage may have occurred from the seal being removed from the pump.



Figure 9: Metal Components

The springs flexed freely after removal.



Figure 11: Springs

Failure Explanation/Recommendation

Failure Explanation: Based on the condition of the seal in the condition we received it is unclear as to what damage was sustained to the seal during operation and what damage was sustained during seal removal from the pump. The damage to the inboard end of the seal sleeve, rotary holder and busted silicon carbide rotary face may have all been experienced when being removed from the pump. Therefore the root cause seal failure was undetermined.

Recommendation: Repair the seal and return it to service. As well as follow all FSI manufacturer specifications when installing the mechanical seal to the pump.

Additional Note: