



Mechanical Seal Analysis (MSA)

Date	8/14/22	Pump Position	805P1-B
MSA #	2022-032	Seal Manufacturer	FSI
Inquiry #	I-22-0086	Seal Model	MS1040HD0038-2511
Customer	Anchor Seals	Shaft Size	2.375"
Customer Ref #	12693853	Drawing #	FSI-2511
End User	USS Clairton Works	Seal Serial #	02386
Pump House	TEC	Inboard Rotary Material	Tungsten Carbide
Contact	Brandon Spithaler	Inboard Stationary Material	Tungsten Carbide
Phone	412-865-2101	Outboard Rotary Material	-
Salesperson	Brandon Spithaler	Outboard Stationary Material	-
		Elastomers	FFKM

General Seal Condition

The seal was removed assembled and covered in product.



Figure 1: Seal Assembly

The flush port was filled with liquid product residue.



Figure 2: Flush Port

The quench port appeared to be clear of debris.



Figure 3: Quench Port

The Drain port was found to be clogged with hardened debris.



Figure 4: Drain Port

Seal Face Conditions

The Tungsten Carbide stationary face showed evidence of wear and a lack of lubrication across the seal face.



Figure 5: Stationary Face

The Tungsten Carbide stationary face showed evidence of wear and a lack of lubrication across the seal face.



Figures 6: Rotary Face

Elastomers

All O-rings were in good condition for sealing purposes.



Figure 7 & 8: O-Rings

Metal Components, Springs, Pins

All metal parts are in good working condition.



Figure 9: Metal Components

All the springs flexed freely when removed.



Figure 10: Springs

Failure Explanation/Recommendation

Failure Explanation: It appears that the seal failed due to a buildup of product on and around the seal faces. This is probably a result of the seal drain port eventually being clogged with debris over time. This would have eliminated the ability of the steam quench to carry away the traces of particles that make their way across the seal faces during operation.

Recommendation: Please repair this seal and return it to service. It is important to always maintain the steam quench source to the seal, as well as to limit the amount of sharp turns the drain piping has in it to help to prevent clogging.

Additional Note: