DRS Spout and Baffle Wear Measurement Results

SUMMARY

Trimill installed DRS baffles in two spouts in the Alberta Seed Processors Three Hills plant on January 8, 2024. Between early January and Early July (approximately 5 months), around one million bushels of mainly wheat was handled by these two spouts, out of which spout #1 handled 0.4 million bushels and spout #2 handled 0.6 million bushels.

Immediately after installing the baffles, it was observed that the amount of dust created in the spouts was significantly reduced.

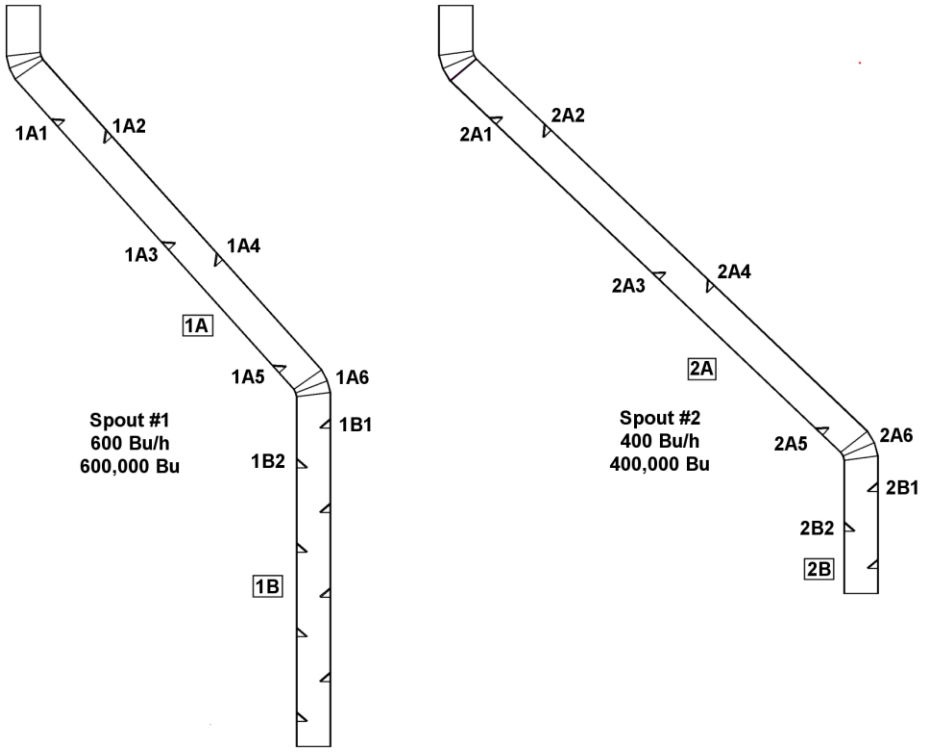
On July 9, 2024, the spouts were taken apart and Trimill's technician performed thickness measurements on the baffle plates and spout walls to check for the wear rate. He also took photos of the baffles, spouts and the dust and grain that remained in the spouts after 5 months of operation.

The measured wear was converted into the throughput at which 100% of the thickness of the spout wall or baffle plate is expected to wear out in places with heaviest wear. The numbers obtained are 15.5 million bushels for spout #1 and 13.5 million bushels for spout #2.

Dust (with some embedded grain) accumulation was observed in the inclined portions of the spouts. It appears that most of the dust accumulation wasn't due to the baffles, however, more work should be done in order to confirm this.

WALL THICKNESS MEASUREMENTS

Spout wall and baffle plate thicknesses were measured in the locations indicated in the figure below.



The results of the measurements are summarized in the tables below, which show calculated throughput in million bushels at which 100% of the plate/wall thickness will be worn out.

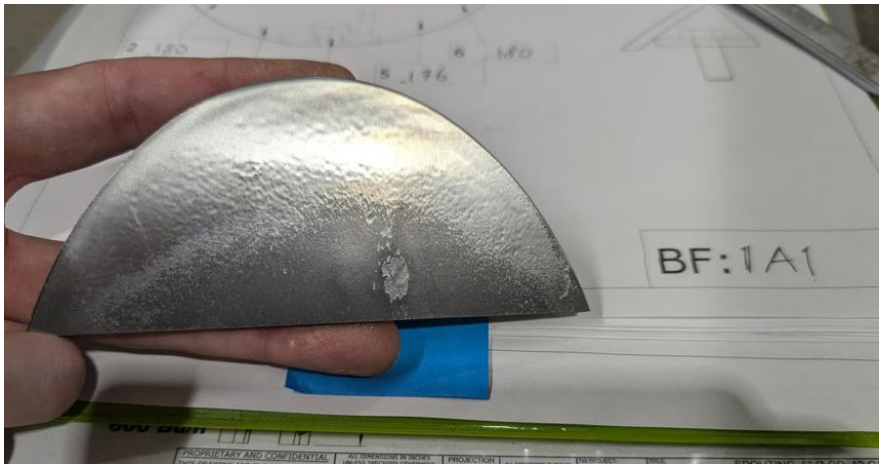
Position	Original Thickness [in]	Measured Minimum Thickness [in]	Measured Wear [in]	Total Throughput [million Bu]	Throughput to wear 100% of Wall Thk. [million Bu]
Spout #1 Baffles					
1A1	0.180	0.176	0.004	0.4	18.0
1A2	0.181	0.180	0.001	0.4	72.4
1A5	0.181	0.178	0.003	0.4	24.1
1B1	0.180	0.177	0.003	0.4	24.0
1B2	0.182	0.180	0.002	0.4	36.4
Spout #1 Walls					
1A1	0.113	0.111	0.002	0.4	22.6
1A2	0.116	0.114	0.002	0.4	23.2
1A3	0.114	0.112	0.002	0.4	26.8
1A4	0.116	0.116	0.000	0.4	>100
1A5	0.114	0.112	0.002	0.4	22.8
1A6	0.133	0.130	0.003	0.4	17.7
1B1	0.116	0.113	0.003	0.4	15.5
1B2	0.116	0.114	0.002	0.4	23.2

Position	Original Thickness [in]	Measured Minimum Thickness [in]	Measured Wear [in]	Total Throughput [million Bu]	Throughput to wear 100% of Wall Thk. [million Bu]
Spout #2 Baffles					
2A1	0.180	0.176	0.004	0.6	27.0
2A2	0.180	0.178	0.002	0.6	54.0
2A5	0.180	0.172	0.008	0.6	13.5
2B1	0.181	0.176	0.005	0.6	21.7
2B2	0.179	0.176	0.003	0.6	35.8
Spout #2 Walls					
2A1	0.114	0.113	0.001	0.6	68.4
2A2	0.115	0.115	0.000	0.6	>100
2A3	0.113	0.108	0.005	0.6	13.6
2A4	0.115	0.114	0.001	0.6	69.0
2A5	0.114	0.109	0.005	0.6	13.7
2A6	0.134	0.134	0.000	0.6	>100
2B1	0.103	0.103	0.000	0.6	>100
2B2	0.103	0.101	0.002	0.6	30.9

Comments:

1. The minimum total throughputs at which 100% of the walls or baffles are expected to wear out in places with heaviest wear are 15.5 million bushels for spout #1 and 13.5 million bushels for spout #2.
2. Most of the wear was found at the bottom of the spouts and on bottom baffles.
3. The baffles plates were made from mild steel to allow for more precise wear measurement. They can easily be made of AR plate, which would greatly extend their life.

PHOTOS



Baffle 1A1

Spout 1A looking down

Spout 1A looking up

Spout 1B looking down

Spout 1B looking up

Spout 2A looking down

Spout 2A looking up

Spout 2B looking down

Spout 2B looking up