YORK-SHIPLEY

Boiler Boil Out Procedure

During manufacturing and installation, oil and grease contaminants may become attached to steel surfaces such as boiler shells, tubes and piping. Failure to remove these coatings may cause undesirable results such as reduced heat transfer. foaming, carry-over etc. It is recommended to “boil-out” the inside of a new boiler after installation and prior to commissioning.

The boil-out operation is easily accomplished by following the procedure as outlined below:

1. Fill the boiler to the normal water line.
2. Close boiler steam stop valve in the steam line.
3. Remove safety valves at the top of the boiler. The safety valves must be removed to prevent any contaminants or boil-out solution from entering them.
4. Tri-sodium phosphate & caustic soda in the amount of one pound each per 50 gallons of water is the suggested chemical for cleaning boilers. Dissolve the compound in water and add dissolved chemicals through an opening at the top of the boiler.
5. NOTE: When dissolving and mixing the boil-out chemicals, the use of a suitable face mask, goggles, rubber gloves, and protective clothing is mandatory. DO NOT permit the dry chemicals or the concentrated solution to meet skin or clothing.
6. It is necessary to connect an overflow pipe from the safety valve opening in the boiler to a safe point of discharge. Alternatively, the surface blowdown connection can be used for this. However, this will not clean the top of the drum and may take considerably longer due to the small piping size.
7. After adding the boil-out solution, add water to the boiler until it is completely filled. All other openings closed tight.
8. Fire the boiler intermittently at low fire for 4 to 5 hours. Maintain just enough heat to hold the solution at the boiling point. Be patient. It is important that the boiler is not over fired during this portion. Do not allow boiler to produce any steam pressure. During this procedure, allow just a small amount of water to enter the boiler to carry off any surface impurities through the overflow pipe. Oily residue must be captured and disposed of or filtered from the effluent.
9. Continue the process until the overflow water appears clear.
10. Stop the burner and allow the water to cool to about 120°F. Drain the boiler while the water is still warm.
11. NOTE: Prior to draining the boiler, check with local water treatment facilities to determine whether special instructions or permits are required to dispose of the water. PH must be <10 & >=7
12. Remove the handhole (and manhole) plates from the boiler and wash the interior with tap water at full pressure through a nozzle. Wash until all evidence of dirt, mud, and impurities are removed through the bottom handhole openings.
13. Inspect the internal surfaces. If not clean, repeat the boil-out procedure.
14. After closing the openings and reinstalling the safety valves, fill the boiler to its normal water level and fire it until the water temperature is at least 180°F to drive off any dissolves gasses and oxygen which might otherwise corrode the metal.

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Notes

On a steam system, the condensate should be wasted until test show the elimination of undesirable impurities. During the period the condensate is wasted, attention must be given to the treatment of the raw water used as make up so that an accumulation of unwanted materials or corrosion does not occur. Follow the advice of your water treating company.

On a hot water system, chemical cleaning of the entire system is generally necessary, and the entire system should be drained after treatment. Consult a water treatment company for recommendations, cleaning compounds, and applicable procedures.

York-Shipley 3-Pass Dryback, Typical Chemical Amounts				
Boiler Horsepower	Water Storage (Flooded)		Boil-Out Chemicals	
	Weight (Lbs)	Volume (Gallons)	Tri-Sodium Phosphate (Lb)	Caustic Soda (Lb)
25	1624	194.7	3.9	3.9
30	1858	222.8	4.5	4.5
40	2524	302.6	6.1	6.1
50	3207	384.5	7.7	7.7
60	3565	427.5	8.5	8.5
70	4182	501.4	10.0	10.0
80	4806	576.3	11.5	11.5
100	5864	703.1	14.1	14.1
125	7314	877.0	17.5	17.5
150	8788	1,053.7	21.1	21.1
175	8772	1,051.8	21.0	21.0
200	11079	1,328.4	26.6	26.6
225	11079	1,328.4	26.6	26.6
250	15186	1,820.9	36.4	36.4
300	18143	2,175.4	43.5	43.5
350	21017	2,520.0	50.4	50.4
400	23,470	2,814.1	56.3	56.3
500	28738	3,445.8	68.9	68.9
600	32964	3,952.5	79.1	79.1
700	39400	4,724.2	94.5	94.5
800	41942	5,029.0	100.6	100.6

Table 1. Typical chemical requirements per boiler horsepower.