



The following are specified limit for high pressure boiler from different organization:-

ASME Guidelines for Water Quality in Modern Industrial Water Tube Boilers for Reliable Continuous Operation:-

Boiler Feed Water				Boiler Water		
Drum Pressure (psi)	Iron (ppm Fe)	Copper (ppm Cu)	Total Hardness (ppm CaCO ₃)	Silica (ppm SiO ₂)	Total Alkalinity** (ppm CaCO ₃)	Specific Conductance (micromhos/cm) (unneutralized)
0-300	0.100	0.050	0.300	150	700*	7000
301-450	0.050	0.025	0.300	90	600*	6000
451-600	0.030	0.020	0.200	40	500*	5000
601-750	0.025	0.020	0.200	30	400*	4000
751-900	0.020	0.015	0.100	20	300*	3000
901-1000	0.020	0.015	0.050	8	200*	2000
1001-1500	0.010	0.010	0.00	2	0***	150
1501-2000	0.010	0.010	0.00	1	0***	100



ABMA Standard Boiler Water Concentrations for Minimizing Carryover

Drum Pressure (psig)	Boiler Water		
	Total Silica* (ppm SiO ₂)	Specific** Alkalinity (ppm CaCO ₃)	Conductance (micromhos/cm)
0-300	150	700	7000
301-450	90	600	6000
451-600	40	500	5000
601-750	30	400	4000
751-900	20	300	3000
901-1000	8	200	2000
1001-1500	2	0	150
1501-2000	1	0	100

This value will limit the silica content of the steam to 0.25 ppm as a function of selective.

Feed Water & Boiler water Characteristics as per IS:10392-1982

1.FEED WATER

Parameters	Upto 20 Kg/cm ²	21 Kg/cm ² to 39 Kg/cm ²	40 Kg/cm ² to 59 Kg/cm ²	Unit
Total Hardness	<10	<1.0	<0.5	ppm as CaCO ₃
pH Value	8.5-9.5	8.5-9.5	8.5-9.5	
Dissolved Oxygen	0.1	0.02	0.01	As ppm
Silica		5	0.5	As ppm SiO ₂



2. BOILER WATER

Parameters	Upto 20 Kg/cm ²	21 Kg/cm ² to 39 Kg/cm ²	40Kg/cm ² to 59Kg/cm ²	Unit
Total Hardness	Not Detectable	Not Detectable	Not Detectable	
Total Alkalinity	700	500	300	As ppm CaCO ₃
Caustic alkalinity	350	200	60	As ppm CaCO ₃
pH Value	11.0 o 12.0	11 to 12	10.5 to 11.0	
Residual Sodium Sulphite	30 to 50	20 to 30	--	ppm as Na ₂ SO ₃
Residual Hydrazine	0.1 to 1.0	0.1 to 0.5	0.05 to 0.3	ppm as N ₂ H ₄
Ratio Na ₂ SO ₄ /Caustic Alkalinity (as NaOH)	Above 2.5	Above 2.5	Above 2.5	
Ratio Na ₂ SO ₄ /Total Alkalinity(as NaOH)	Above 0.4	Above 0.4	Above 0.4	
Phosphate	20 to40	15 to 30	5 to 20	ppm as PO ₄
Total Dissolved Solids	3500	2500	1500	ppm
Silica	<0.4 of Caustic Alkalinity	<0.4 of Caustic Alkalinity	15	As ppm SiO ₂



Boiler water Limit:-

Boiler Pressure psig	TDS	Alkalinity	Suspended Solids	Silica*
0 to 300	3500	700	300	125
301 to 450	3000	600	250	90
451 to 600	2500	500	150	50
601 to 750	2000	400	100	35
751 to 900	1500	300	60	20
901 to 1000	1250	250	40	8.0
1001 to 1500	1000	200	20	2.5
1501 to 2000	750	150	10	1.0
Over 2000	500	100	5	0.5

***Based on limiting Silica in steam from 0.02 to 0.03 ppm and also based on SiO₂/ Total Anion ratio.**



TYPICAL TESTING SCHEDULE

TEST	Raw water	Externally treated water	Boiler feedwater	Boiler water
PH	Occasionally	Frequently when water is treated by Cation H+ Resin.	Once a day	Daily/ Shift Every
Total hardness	Once every two weeks	Daily if softener is used.	Daily	Daily
Total Alkalinity	Once every two weeks	Daily dealkalizer if is used	Daily	Daily/ Shift Every
Sulfate	Depends on variability	Depends on variability	Occasionally to check Na ₂ SO ₄ /NaOH ratio	When sodium sulfate is used for caustic cracking.
Chloride	Weekly blowdown if is done by chloride	Weekly blowdown if is done by chloride	Weekly Daily for DM or Dealkalized water	Daily
Dissolved oxygen	--	--	Daily	
Conductivity or TDS		Daily	Daily	Daily
Residual Treatment level PO ₄	--	--	--	Once in a Day
Residual Hydrazine				Once in a shift Hydrazine used as a oxygen scavenger

Compiled By : **Mr.Zakir Shaikh**

Source :
IS Standard
IBMA
ASME
Boiler Water Guide line
Altret Handbook

