BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

भारतीय मानक **मसौदा**

औद्योगिक जल नलिका बॉयलर — पूर्तिकर्ता के लिए डाटा शीट
भाग 1 प्रस्तावाना स्तर

[आई एस 13445 (भाग 1) का *पहला पुनरीक्षण*]

Draft *Indian Standard*

INDUSTRIAL WATER TUBE BOILERS — SUPPLIER'S DATA SHEET

PART 1 PROPOSAL STAGE

[*First Revision* of IS 13445 (Part 1)]

ICS 27.060

Boilers and Pressure Vessels Sectional Committee, MED 01	**Last date for receipt of comment is 15 02 2025**

FOREWORD

(Formal clause to be added later)

This standard was first published in 1992. The first revision has been taken up with a view to incorporating the modifications found necessary as a result of experience gained in the use of this standard. Provisions such as bag filters, scrubbers, other gas cleaning devices, boiler control systems, terminal points etc. have been added in this revision.

This information given by a manufacturer or a supplier according to this data sheet will help a purchaser to evaluate the product before he finally decides to purchase a particular brand or type. Control systems are not covered in this standard.

This Indian Standard is published in two parts. The other part in this series is:

Part 2 Post order stage

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft *Indian Standard*

INDUSTRIAL WATER TUBE BOILERS — SUPPLIER'S DATA SHEET

PART 1 PROPOSAL STAGE

1 SCOPE

This standard (Part 1) covers the technical data to be supplied by a manufacturer or a supplier of an industrial boiler to a purchaser.

2 SUPPLIER'S DATA SHEET FOR INDUSTRIAL BOILER

2.1 General Information

2.1.1 *Type of Boiler* :

2.1.2 *Maker* :

2.1.3 *Model* :

2.1.4 *Number of Boilers* :

2.1.5 *Overall Dimensions of the Unit and the Total Space Required by the Boiler as Well As Its Accessories* :

2.1.6

a) *Size of the Furnace – $FW \times FD \times FH$* :

b) *Furnace Design Pressure* :

2.1.7 *Design Code* :

2.1.8 *Type of Support* : Top/Bottom/Girth/Others

3 PARAMETERS AT THE BATTERY LIMIT OF THE BOILER

3.1 Steam

3.1.1 *Maximum Continuous Rating (MCR)* : t/h

3.1.2 *Pressure* : Bar (gauge)
NOTE — 1 bar = 10 000 Pa

3.1.3 *Temperature* : °C

3.1.4 *Steam Purity* :

3.1.5 *Steam Temperature Control Load Range* :

3.1.6 *Steam Pressure Control Range* :

3.2 Feed Water

3.2.1 *Total Quantity* : t/h

3.2.2 *Pressure* : Bar (gauge)

3.2.3 *Temperature* : °C

3.3 De-superheating Spray Water

3.3.1 *Quantity for De-superheating* (*Max*) : t/h

3.3.2 *Spray Water Temperature* : °C

3.3.3 *Number of De-superheating Stages* :

4 INSTRUMENT AIR (OIL FREE AND DRY)

4.1 Quantity : m^3/h at NTP

4.2 Pressure : Bar (gauge)

4.3 Temperature : °C

5 COOLING WATER

5.1 Quantity : Inlet..... t/h
Outlet..... t/h

5.1.1 *Pressure* : Bar (gauge)

5.1.2 *Temperature* (*Inlet/Outlet*) : °C

6 SERVICE AIR

6.1 Quantity : m^3/h at NTP

6.2 Pressure : Bar (gauge)

6.3 Temperature : °C

7 FUEL

7.1 Type of Fuel :

7.1.1 *Main Fuel* :

7.1.2 *Auxiliary Fuel* :

7.1.3 *Fuel for Flame Stabilisation* :

7.1.4 *Fuel for Lighting Up* :

7.1.5 *Designed Fuel Combinations* :

7.2 Quantity of Fuel for Various Combinations : t/h or m^3/h at NTP

7.3 Pressure : Bar (gauge)

7.4 Temperature : °C

7.5 Calorific Value of Fuel (Design) :

7.5.1 *GCV* (*Gross Calorific Value*) : kcal/kg or kcal/m^3 at NTP

7.5.2 *NCV (Net Calorific Value)* : kcal/kg or kcal/m^3 at NTP

NOTE — For waste heat recovery boilers, gas composition, gas quantity and temperature are to be mentioned.

8 POWER

8.1 Total Power Required at 100% MCR : kW

8.1.1 *Frequency* :

8.1.2 *Phase* :

8.2 Emergency Power Required : kW

8.2.1 *Voltage* :

8.2.2 *Frequency* :

8.2.3 *Phase* :

8.3 Power Consumed at 100% MCR : kW

9 BOILER PERFORMANCE

9.1 Boiler Performance Test Code :

9.1.1 *Fuel Considered for Performance Guarantee* :

9.2 Efficiency at MCR : %

9.2.1 *Efficiency Based on GCV/ NCV of Fuel* : %

10 TIME REQUIRED TO ATTAIN

10.1 MCR : min

10.2 50% MCR from Cold/Hot : min

10.3 100% MCR from 50% MCR : min

11 BLOWDOWN : %

12 FURNACE HEAT RELEASE RATES

12.1 Effective Protected Radiant Surface : kcal/h.m^2 of BPRS

12.2 Plan Area : kcal/h-m^2 of Plan area

12.3 Volumetric : kcal/h.m^3

13 FLUE GAS VELOCITIES THROUGH TUBE BANKS

13.1 Superheater : m/s

13.2 Boiler Bank : m/s

13.3 Economiser : m/s

13.4 Air Heater : m/s

14 CIRCULATION RATIO :

15 GROSS GENERATION OF BOILER AT MCR : t/h

16 INTERNAL CONSUMPTION OF BOILER AT MCR : t/h

17 PRESSURE DATA

17.1 Pressure in the Furnace :

17.2 Flue Gas Pressure Drops :

17.2.1 *Flue Gas Pressure Drops in Boiler Bank* : mm of WC

17.2.2 *Flue Gas Pressure Drop in Super Heater* I : mm of WC

17.2.3 *Flue Gas Pressure Drop in Super Heater* II : mm of WC

17.2.4 *Flue Gas Pressure Drop in Economiser* : mm of WC

17.2.5 *Flue Gas Pressure Drop in Air Heater* : mm of WC

17.2.6 *Flue Gas Pressure Drop in Dust Collector* : mm of WC

17.2.7 *Other Flue Gas Pressure Drop* : mm of WC

17.2.8 *Total Pressure Drop for the Flue Gas in the Boiler* : mm of WC

18 WATER AND STEAM

18.1 Pressure of Feed Water at Economiser Inlet : Bar (gauge)

18.2 Pressure in the Drum : Bar (gauge)

18.3 Pressure of Steam at Final SH Outlet : Bar (gauge)

19 TEMPERATURE DATA

19.1 Design Ambient Air Temperature :

19.2 Air Temperature Leaving Steam Coil Air Pre-heater (If equipped) :

19.3 Air Temperature at Air Heater Outlet :

20 FLUE GAS

20.1 Temperature of Flue Gas Leaving Lower Furnace : °C

20.2 Temperature of Flue Gas Entering Eco : °C

20.3 Temperature of Flue Gas Leaving Eco : °C

20.4 Temperature of Blue Gas Leaving AH : °C

20.5 Temperature of Flue Gas at ID Fan Outlet : °C

21 BOILER CONSTRUCTION DETAILS

21.1 Steam Drum

21.1.1 *Inside Diameter* : mm

21.1.2 *Thickness for Shell* : mm

21.1.3 *Actual Thickness for Dished End* : mm

21.1.4 *Material Specification of Drum Shell and Dished Ends* :

21.2 Steam Separators :

21.2.1 *Type* :

21.2.2 *Material of Construction* :

21.3 Steam Scrubbers :

21.3.1 *Type* :

21.3.2 *Material of Construction* :

21.4 Water Drum :

21.4.1 *Internal Diameter* : mm

21.4.2 *Thickness of Shell* : mm

21.4.3 *Thickness of Dished End* : mm

21.4.4 *Material Specification of Drum Shell and Dished End* : mm

21.5 Water Wall Tubes

21.5.1 *Area* — Furnace/Enclosure Wall/Cavity/Water/
Steam Cooled Separator Wall for CFBC :

21.5.2 *Thickness* : mm

21.5.3 *Material Specification* :

21.5.4 *Effective Projected Radiant Surface* : m^2

21.6 Boiler Bank/Evaporator

21.6.1 *Tube OD × Thickness* : mm × mm

21.6.2 *Total Heating Surface Area* : mm^2

21.6.3 *Material Specification* :

21.7 Super Heater

	Super Heater I	Super Heater II
21.7.1 *Type*		
21.7.2 *OD × Thickness of Tubes*	mm × mm	mm × mm
21.7.3 *Total Heating Surface Area*	m^2	m^2
21.7.4 *Material Specification*		

21.8 Economiser

21.8.1 *Type* :

21.8.2 *OD × Thickness* :

21.8.3 *Fin OD × Thickness* :

21.8.4 *Total Heating Surface Area* : m^2

21.8.5 *Material Specification* :

22 AIR HEATER

22.1 Type :

22.2 Number :

22.3 Outside Diameter × Thickness of Tubes : mm × mm

22.4 Total Heating Surface Area : m^2

22.5 Material Specification :

22.6 Bed Coils

22.6.1 *Type* : Plain/Studded/Rifle Tube

22.6.2 *OD × Thickness* :

22.6.3 *Material Specification* :

22.6.4 *Heating Surface Area*

23 ATTEMPERATOR

23.1 Type :

23.2 Location :

23.3 Material Specification :

24 SAFETY VALVES

24.1 Type : Drum/Super heater

24.2 Number

24.3 Set Pressure : Bar (gauge)

25 DEAERATOR

25.1 Number :

25.2 Type :

25.3 Operating Pressure : Bar (gauge)

25.4 Design Pressure/Vacuum : Bar (gauge)

25.5 Temperature : °C

25.6 Oxygen Content After Deaeration : Parts/million

25.6.1 *Vent Losses* : kg/h

25.7 Minimum Steam Pressure Required at the Inlet of the Control Valve : Bar (gauge)

25.8 Effective Storage Capacity of Feed Water Tank : m^3

25.9 Material Specification for

25.9.1 *Shell for Deaerating Head* : m

25.9.2 *Dished Ends for Deaerating Head* :

25.9.3 *Shell for Storage Tank* :

25.9.4 *Dished End for Storage Tank* :

26 AIR AND GAS DUCTS

26.1 Thickness of Air Duct Plate : mm

26.2 Thickness of Flue Gas Duct Plate : mm

26.3 Material of Gas Duct :

26.4 Material of Air Duct :

27 SETTING CASING AND INSULATION

27.1 Design Basis for Insulation and Refractory :

27.1.1 *Design Ambient* :

27.1.2 *Wind Velocity* :

27.1.3 *Skin Casing Temperature on Refractory Lining* :

27.2 Thickness of Cladding Material : mm

27.3 Specification for Refractory Material :

27.4 Maximum Cladding Temperature : °C

28 STRUCTURAL STEEL ROOFING WALKWAYS AND PLATFORMS

28.1 Minimum Width of Platform and Walkways : m

28.2 Type of Roofing Material :

28.3 Number of Stair Ways :

29 CHIMNEY

29.1 Number (Design Code) :

29.2 Type :

29.3 Height : m

29.4 Diameter at Base : mm

29.5 Diameter at Top : mm

29.6 Type, Height and Thickness of Lining : mm

29.7 Type, Height and Thickness of External Insulation :

29.8 Material or Construction :

30 FORCED DRAFT FAN

30.1 Type :

30.2 Number of Fans/Boiler :

30.3 Rating (percentage of 100% MCR)

30.4 Capacity : m^3/s at NTP

30.5 Pressure : mm/WC

30.5.1 *Design Margin on Head* :

30.5.2 *Design Margin on Capacity* :

30.5.3 *Fan Efficiency at 100% MCR* :

30.6 Temperature : °C

30.7 Brake Horse Power Required at Shaft : kW

30.8 Fan Speed : rev/min

30.9 Type of Fan Control :

30.10 Power Consumed at 100% MCR :

30.11 Drive Speed : rev/min

30.12 Type of Drive : Motor/Steam Turbine

30.13 Drive Rating : kW

30.14 Drive Steam Turbine

30.14.1 *Inlet Steam Pressure* : Bar (gauge)

30.14.2 *Inlet Steam Temperature* : °C

30.14.3 *Outlet Steam Pressure* : Bar (gauge)

30.14.4 *Outlet Steam Temperature* : °C

30.15 Steam Consumption at 100% MCR : kg/h

31 INDUCED DRAFT FAN

31.1 Type :

31.2 Number of Fans/Boiler :

31.3 Rating (% of 100% MCR) :

31.4 Capacity : m^3/h at NTP

31.5 Pressure : mm of water Column

31.5.1 *Design Margin on Head* :

31.5.2 *Design Margin on Capacity* :

31.5.3 *Fan Efficiency at* 100% *MCR* :

31.6 Temperature : °C

31.7 Brake Horse Power Required at Shaft :

31.8 Fan Speed : rev/min

31.9 Drive Rating : kW

31.10 Drive Speed : rev/min

31.11 Type of Fan Control :

31.12 Material Specification for Shaft Impeller and Liners for Fan Blades :

31.13 Type of Drive : Motor/steam Turbine

31.14 Rating of Drive : kW

32 BOILER FEED PUMPS

32.1 Number

32.1.1 *No. of Fans/Boiler* :

32.1.2 *No. of Fans Normally Working/Boiler* :

31.2 Type :

32.3 Capacity : m^3/h

32.4 Suction Pressure : Bar (gauge)

32.5 Discharge Pressure : Bar (gauge)

32.6 Pump Suction Temperature : °C

32.7 Shut Off Head : mm of WC

32.8 NPSH (Net Positive Suction Head) Required : mm of WC

32.9 Pump Speed :

32.10 Drive Motor Speed : rev/min

32.11 Driver : Electric Motor/**S**team Turbine

32.12 Type and Number

32.13 Brake Horse Power at Shaft : kW

32.14 Rating

32.15 Material Specification :

32.15.1 *Body* :

32.15.2 *Impeller* :

32.15.3 *Seal* :

33 CHEMICAL FEED SYSTEM

33.1 Chemical Used Category : HP/LP

33.2 Number of Pumps :

33.3 Type of Pump :

33.4 Capacity of Pump :

33.5 Number of Tank :

33.6 Capacity of Each Tank :

34 SOOT BLOWERS

34.1 Location Furnace Boiler SH Economiser AH

34.2 Type

34.3 Make

34.4 Number

35 FLASH TANK

35.1 Type **:** Continuous Blow Down (CBD)/Intermittent Blowdown (IBD)/Common Blowdown Tank

35.2 Number

35.3 Capacity : m^3

35.4 Operating Pressure : Bar (gauge)

35.5 Design Pressure : Bar (gauge)

36 TRAVELLING COMBUSTION SYSTEM

36.1 Type :

36.2 Number of Sections :

36.3 Capacity of Each Section : t/h

36.4 Drive :

36.5 Power Consumption at MCR of Boiler : kW

36.6 Rating of Motor : kW

36.7 Speed of Motor : rev/min

36.8 Grate Speed Range :

36.9 Turned Down Ratio :

36.10 Total Grate Area : m^2

37 FUEL FEEDER

37.1 Location :

37.2 Type :

37.3 Number :

37.4 Capacity of Each Feeder : t/h

37.5 Type of Motor :

37.6 Power Consumption at MCR of Boiler : kW

37.7 Turned Down Range :

37.8 Motor Rating : kW

37.8.1 *Speed of the Motor* : rev/min

38 PRIMARY AIR FAN FOR PF FIRING

38.1 Type

38.1.1 *Number of Fans/Boiler* :

38.1.2 *No. Normally Working/Boiler* :

38.1.3 *Capacity of Each Fan* : m^3/s at NTP

38.2 Pressure : mm of WC

38.2.1 *Design Margin on Head* :

38.2.2 *Design Margin on Capacity* :

38.2.3 *Fan Efficiency at 100 % MCR* :

38.3 Temperature : °C

38.4 Drive :

38.5 Power Consumption : kW

38.6 Rating of Drive : kW

38.7 Speed of Drive :

38.8 Speed of Fan :

38.9 Type of Fan Control :

39 COOLING AIR FAN

39.1 Type :

39.1.1 *Number of Fans/Boiler* :

39.1.2 *No. of Fans Normally Working/Boiler* :

39.2 Capacity of Each Fan : m^2/s at NTP

39.3 Pressure : mm of WC

39.3.1 *Design Margin on Head* :

39.3.2 *Design Margin on Capacity* :

39.3.3 *Fan Efficiency at 100 % MCR* :

39.4 Temperature : °C

39.5 Drive :

39.6 Power Consumption : kW

39.7 Rating of Drive : kW

39.8 Speed of Drive : rev/min

39.9 Speed of Fan : rev/min

39.10 Provisions for other Fans such as

39.10.1 *Seal Air Fan - Door and Damper Sealing* :

39.10.2 *Fresh Air Fan - Dilution in WHRB* :

39.10.3 *Augment Air Fan - Additional Combustion Air in Staged Burners* :

39.10.4 *Fan for Fuel Pushing/Spreading or Grit Injection* :

40 BURNER

40.1 Number

40.2 Type :

40.3 Location :

40.4 Capacity Each : kg/h

40.5 Type of Atomisation : Pressure/Air/Steam

40.6 Pressure of Atomising Air : Bar (gauge)

40.7 Pressure of Atomising Steam : Bar (gauge)

40.8 Temperature of Atomising Steam : °C

40.9 Turn Down Ratio :

40.10 Support Fuel Requirement : Yes/No

40.11 Support Fuel Quantity : kg/h or percent

41 PULVERISER

41.1 Type :

41.2 Number Per Boiler :

41.2.1 *Capacity* : t/h

41.3 Percentage of Load Taken by Each Mill : %

41.4 Maximum Feed Size : mm

41.5 Drive :

41.5.1 *Power Consumption* : kW

41.5.2 *Drive Rating* : kW

41.5.3 *Drive Speed* : rev/min

41.6 Speed of the Mill : rev/min

41.7 Outlet Product Size (% Through 150 Mesh) :

41.8 Life of Grinding Elements : h

41.9 Bearing and Gear Box Sealing Arrangement :

42 HEAVY OIL SYSTEM

42.1 Pump Type

42.1.1 *Number of Pumps/Boiler* :

42.2 No. of Fans Normally Working/Boiler :

42.3 Capacity Each : l/s

42.4 Delivery Pressure : Bar (gauge)

42.5 Drive :

42.6 Number of Steam Heaters :

42.7Capacity of Each Heater :

42.8 Inlet Oil Temperature : °C

42.9 Outlet Oil Temperature : °C

42.10 Electrical Heater Rating : kW

43 LIGHT OIL SYSTEM

43.1 Pump Type

43.2 Number of Pump/Boiler :

43.3 No. of Fans Normally Working per Boiler :

43.4 Capacity Each : 1/s

43.5 Delivery Pressure : Bar (gauge)

43.6 Brake Horse Power : kW

43.7 Driver Speed and Rating : kW

44 MECHANICAL DUST SEPARATOR

44.1 Type

44.2 Overall Dimensions :

44.3 Material of Cyclone Tubes :

44.4 OD × Thickness of Tubes : mm × mm

44.5 Efficiency : %

44.6 Dust Concentration before Separator :

44.7 Dust Concentration after Separator :

45 ELECTROSTATIC DUST PRECIPITATOR

45.1 Number of Fields :

45.2 Total Collecting Area : $m^2/m^3/s$

45.2.1 *Specific Collecting Area (SCE)* :

45.3 Collector Rapping Equipment :

45.4 Make :

45.5 Type :

45.6 Number :

45.7 Thickness of Casing and Hopper Plate :

45.8 Total Hopper Storage Capacity : Number of hours at MCR

45.9 Electrical Energy Consumed for Hopper Heating : kW

46 BUS SECTION :

46.1 Number per Precipitator :

46.2 Ratio of Bus Section to Gas Quantity :

46.3 Treatment Time :

46.4 Dust Concentration before ESP :

46.5 Dust Concentration after ESP :

46.6 Height of Hopper Outlet from Ground Level : mm

47 BAG FILTERS

47.1 Number of Sections :

47.2 Numbers of Bags/Section :

47.3 Air to Cloth Ratio :

47.4 Bag Material :

47. 5 Inlet Dust Concentration :

47. 6 Outlet Dust Concentration :

47. 7 Design Temperature for Bags :

47. 8 Bypass for Low Temperature : Yes/No

48 SCUBBERS

48.1 Type :

48.2 Inlet Duct Concentration :

48.3 Outlet Duct Concentration :

49 OTHER GAS CLEANING DEVICES

49.1 Type :

49.2 Inlet Gas Quantity :

49.3 Outlet Gas Quantity :

50 EMISSION GUARANTEES

50.1 Dust :

50.2 NO_x :

50.3 SO_x :

51 BOILER CONTROL SYSTEM

51.1 Type :

51.2 Number of IO's :

51.3 Terminal Points :

51.3.1 *Steam* :

51.3.2 *Water* :

51.3.3 *Air* :

51.3.4 *Flue Gas* :

51.3.5 *Flue* :

51.3.6 *Vents and Drain* :

51.3.7 *Instrument Air/Service Air/Plant Air* :

51.3.8 *Cooling Water Inlet and Outlet* :

51.3.9 *Auxiliary Steam* :

51.3.10 *Waste Gas Inlet and Outlet* :

51.3.11 *Electric Power* :

51.3.12 *Control Power* :

51.3.13 *UPS Power* :

51.3.14 *Instrument Controls* : JB/DCS

NOTE — If the supplier wants to include any special item which is not included above, a separate sheet may be attached for the same.