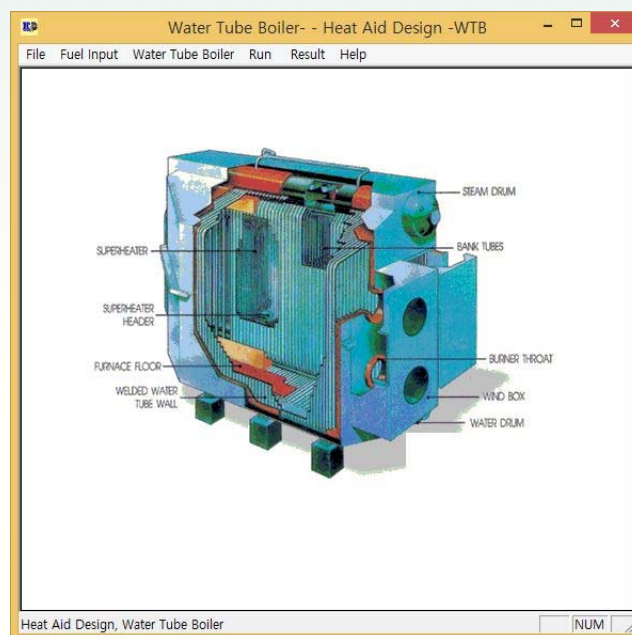


Boiler Design

2-Drum D-type Water Tube boiler (Reference)



Prepared by

Bae Sang-Su

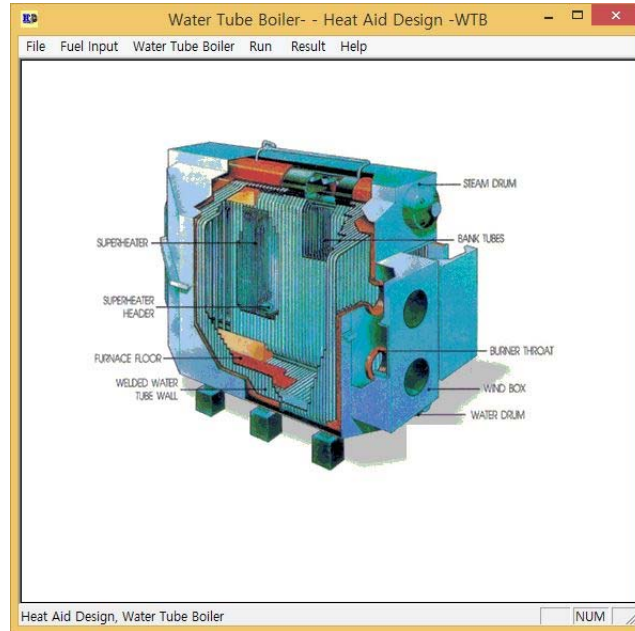


DAEKYUNG ENGINEERING CO., LTD.

Contents

No.	Title	Page
1	2-drum, D-type water tube boiler (with Economizer), Natural Gas, 90 ton/hr x 45 kg/cm²-g x 400 degC	

Boiler Design



Water Tube Boiler, Design 5 -Fuel Oil/Gas-

Overall Geometry	
Boiler Length, m :	7.777
Height(Drum C to Drum C), m :	6.5
Steam Drum Out Dia., m :	1.650
Water Drum Out Dia., m :	1.130
Bank Side Width, m :	3.333
Burner Dia., m :	1.5
Furnace Man Hole Dia., m :	.5000
Up. Drum CL to Div. Wall, W3, m :	0.850
Lo. Drum CL to Div. Wall, W4, m :	0.850
a1, degree :	7
a2, degree :	0
S3, m :	.0000
S4, m :	0.0000

Bank Tube Part		
	2 Pass	3 Pass
Arrang. Type :	SQUARE	SQUARE
No. of Tube in Length, ea :	58	00
No. of Tube in Width, ea :	14	0.0
Tube Pitch in Width, m :	.112	0.0000
Tube Pitch in Length, m :	.095	.0000
Dividing Wall Length, m :	7.070	0.0000
Width, W1/W2, m :	1.700	0.0000
Length, m :	6.5	0.0000
Bending Radius, m :	0.2	
Out Dia., m :	.0508	

Water Tube Boiler, Design 7 -Fuel Oil/Gas-

Superheater Part Input Data

Arrang. Type : SQUARE

No. of Tube in Width, ea :

No. of Tube in Length, ea :

Bank Tube Width, m : 5.1

Bank Tube Length, m : 1.35

Tube Pitch in Width, m : 0.085

Tube Pitch in Length, m : 0.135

Tube Length, m : 1.5

Tube Out. Dia., m : 0.045

Tube Thickness, m : 0.0032

Bending Radius(R/OD), : 1.50

Required Steam Temp, deg C : 385

Steam Flow Pass, Pas : 1

NS1, ea : 0

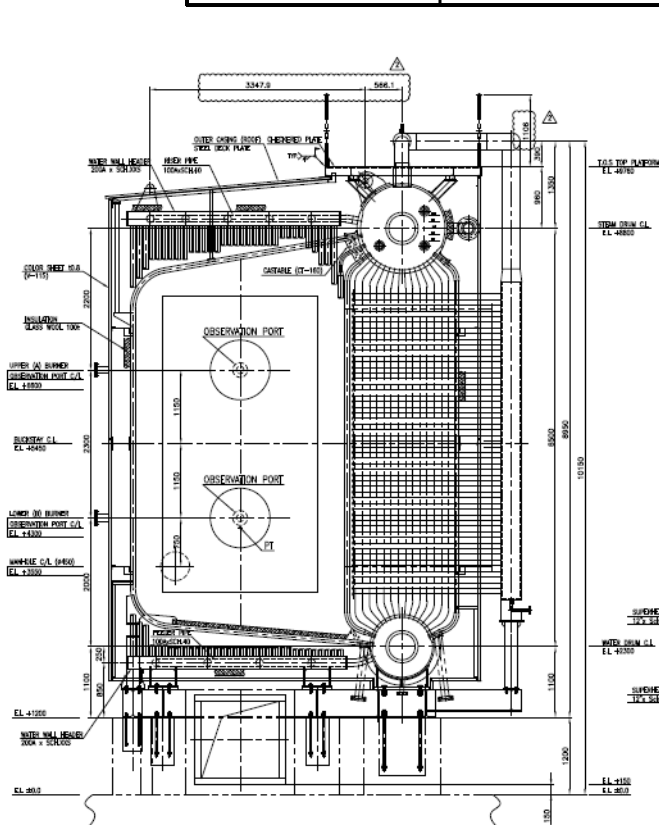
Position after row, row : 0

Flow Direction : Horizontal Flow

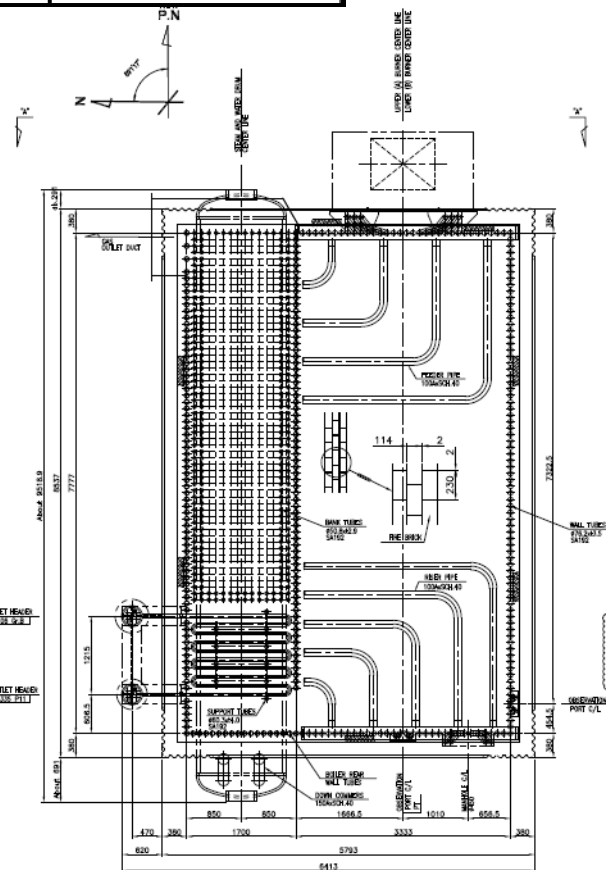
If superheater use inter-stage attenuation, you have to write its blank which NS1 is tube No. of length direction of 1st superheater(ea).

Boiler Assembly

DESIGN DATA		
CODE & STANDARD	ASME SEC. I 2017 (WITH STAMP)	
LOCAL REGULATION	DOSH	
TYPE	NATURAL CIRCULATION	
MODEL NO.	DK-DU TYPE BOILER	
EVAPORATION PER BOILER	AT 100% MCR. LOAD	90,000 kg/hr
PRESSURE	DESIGN	52.0 kg/cm ² g
	OPERATING (at T.P.)	45.0 kg/cm ² g
DESIGN TEMPERATURE (FOR BOILER DRUM & TUBE)	290	°C
STEAM TEMPERATURE	400	°C
FEED WATER TEMPERATURE (AT ECONOMIZER INLET)	135	°C
HYDROSTATIC TEST PRESSURE (PRESSURE PART)	78	kg/cm ² g
INSULATION (DRUM & WALL PANEL)	GLASS WOOL, 100t	
WEIGHT	EMPTY	120 TON
	FULL	160 TON



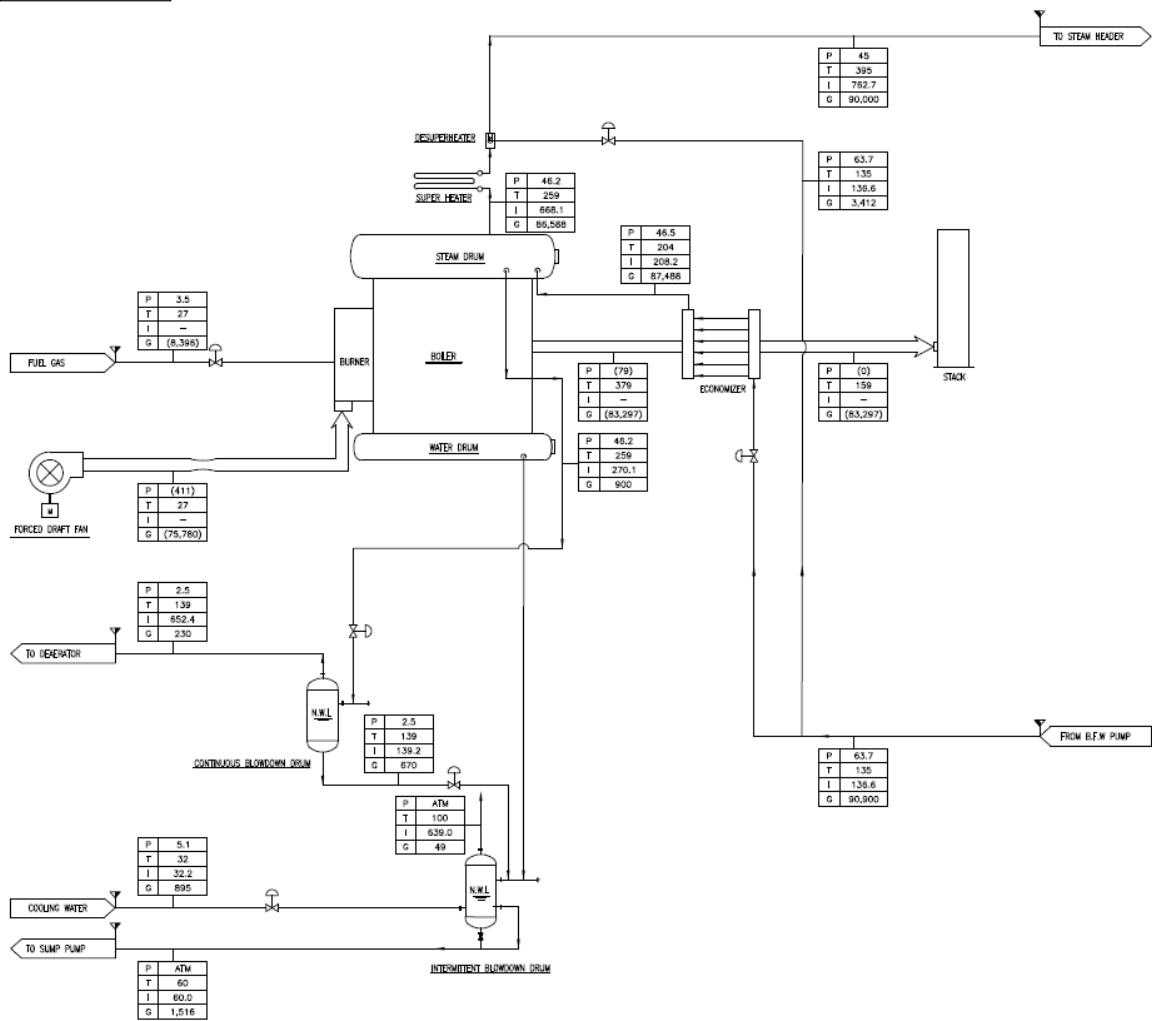
ELEVATION VIEW "A-A"



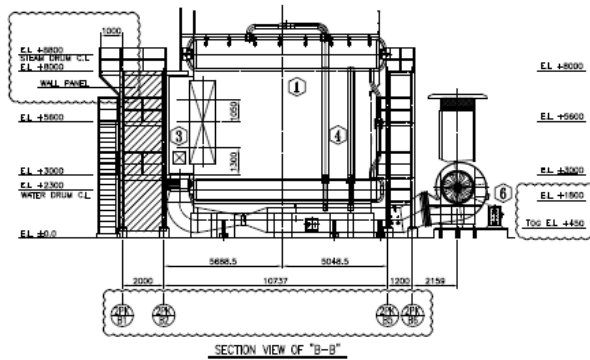
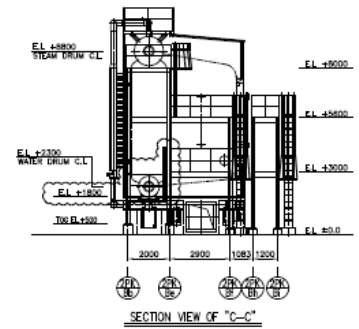
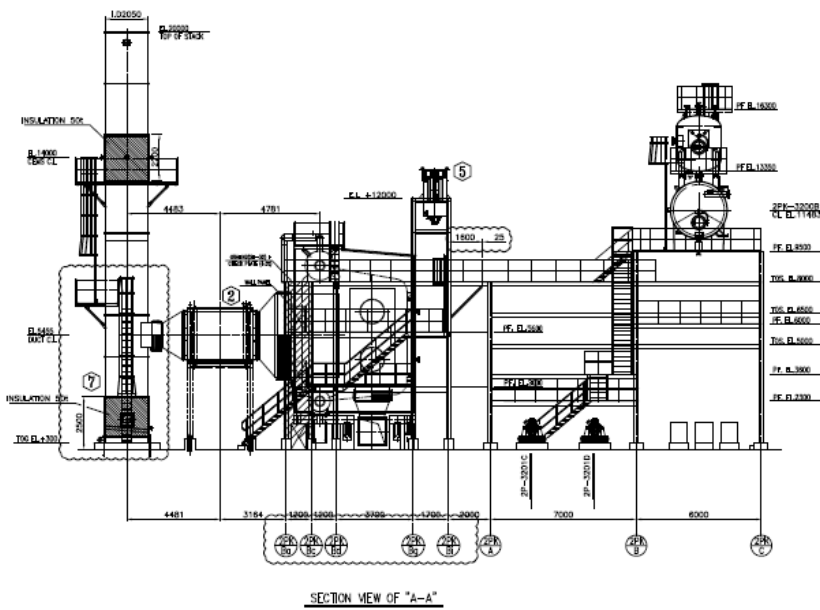
PLAN VIEW

Heat & Mass Balance

P	PRESSURE	kg/cm2g (mmH2O)
T	TEMPERATURE	°C
I	ENTHALPY	kcal/kg
G	FLOW RATE	kg/hr (mm3/hr)



Layout



NO.	EQUIPMENT NAME	EQUIPMENT NO.
①	STRAM BOILER	2PK-3202I-B01
②	ECONOMIZER	2PK-3202I-B01
③	BURNER	2PK-3202I-BNR01 & BNR02
④	SUPERHEATER	2PK-3202I-B02
⑤	START-UP VENT SILENCER	2PK-3202I-Z01
⑥	F.D FAN	2PK-3202I-C01
⑦	STACK	2PK-3202I-Z02
⑧	INTERMITTENT BLOWDOWN DRUM	2PK-3202I-V01
⑨	CONTINUOUS BLOWDOWN DRUM	2PK-3202I-V02
⑩	SAMPLING SYSTEM	2PK-3202I-Z03

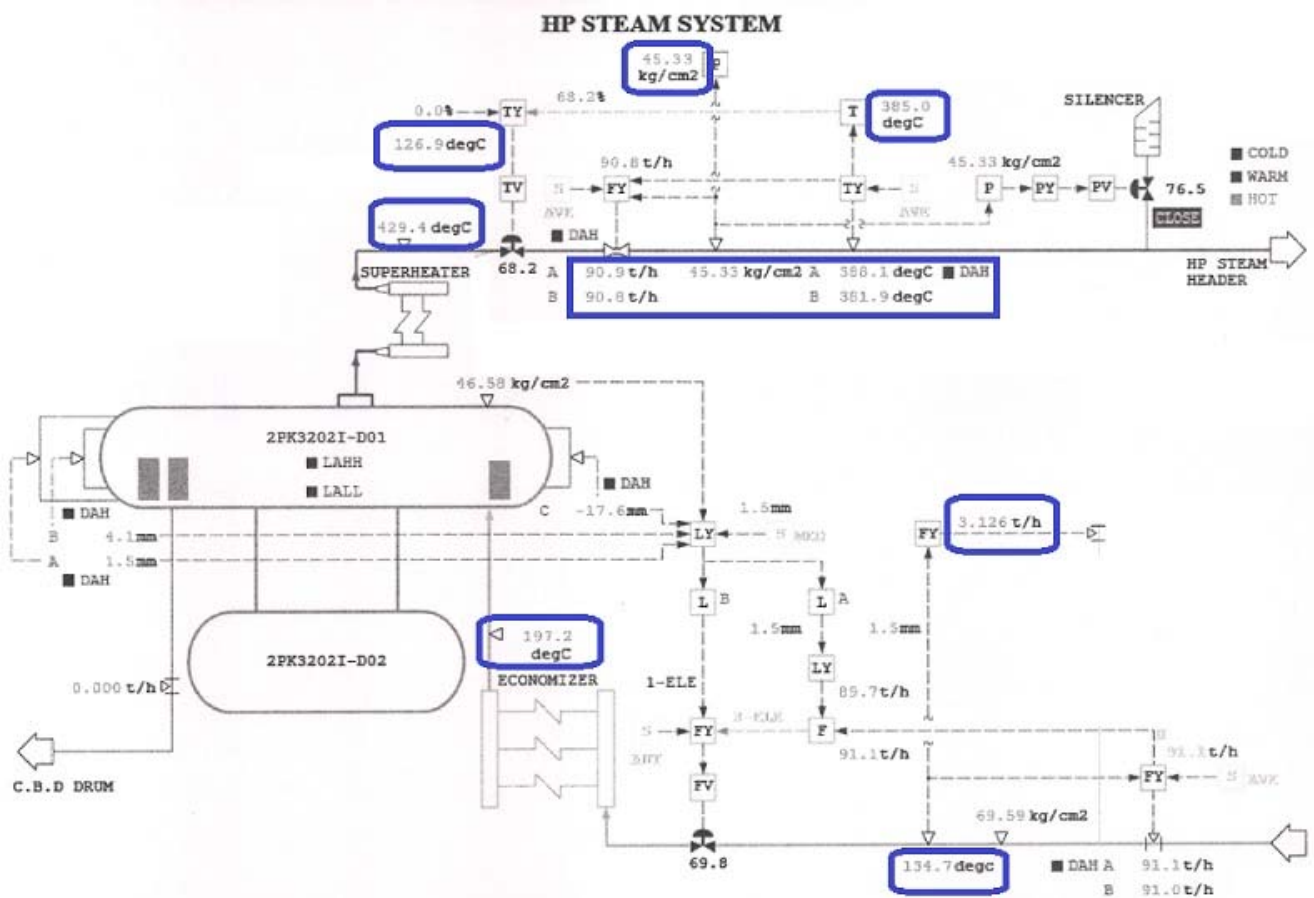
Boiler Erection



Boiler Start-up



Boiler DCS Screen



Boiler Performance

100% Steam generation load

Description	unit	Guarantee	100%	Result
Steam Flow	Ton/hr	90	90.76	OK
Steam pressure	kg/cm ² g	45	45.332	OK
Steam temperature	°C	385±5	385.04	OK
Efficiency(LHV base)	%	>92.7	>92.7	OK