



# eneva

Energy Engineering

# ENSTEAM SERIES

THREE PASS HIGH EFFICIENT

# STEAM BOILERS

## MATERIAL SPECIFICATIONS

### **Body shell and tube plates:**

EN 10028 / 2  
P265 GH, P295 GH, P355 GH Boiler steel

### **Furnace:**

EN 10028 / 2  
P265 GH, P295 GH, P355 GH Boiler steel

### **Smoke tubes:**

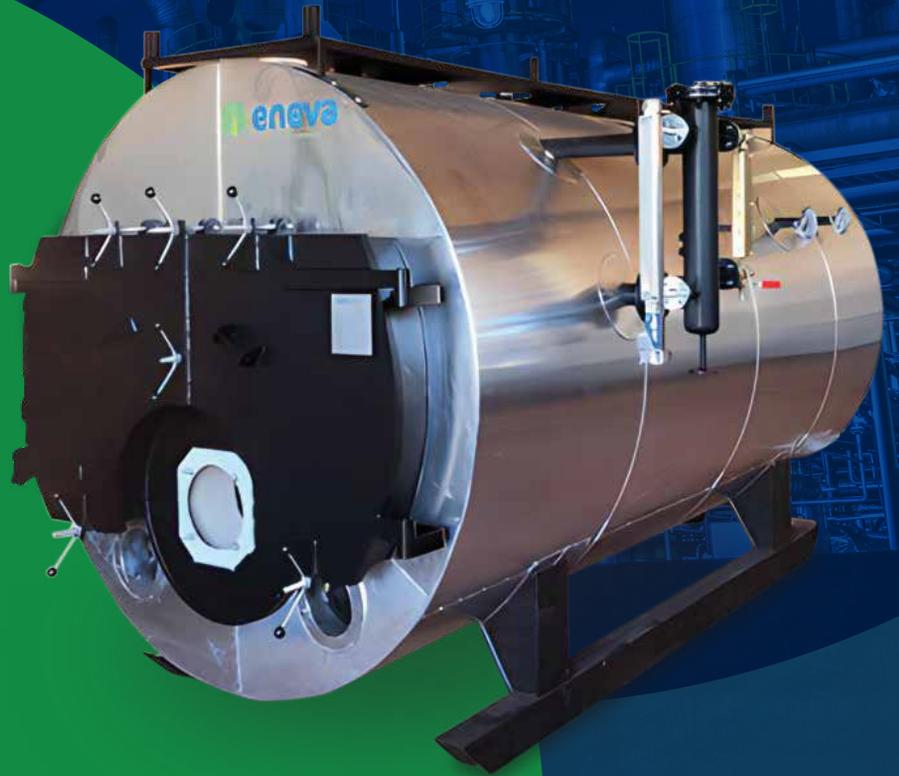
EN 10216 / 2  
P235 GH, TC1, TC2 Seamless boiler tube

### **Thermal insulation:**

100 mm rockwool covered  
with aluminium or galvanized plate

### **Refractory application:**

Ceramic fiber +  
Alumina based high resistant  
castable concrete



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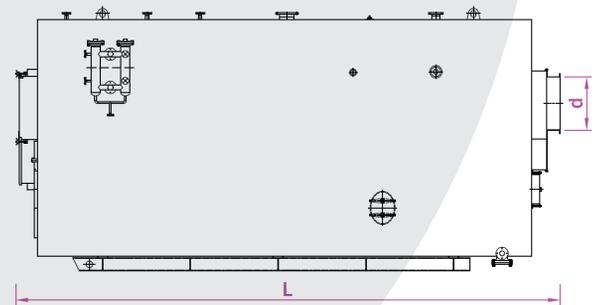
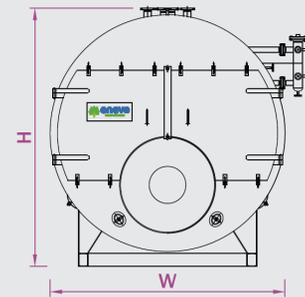
- ENEVA ENSTEAM steam boilers have traditional and well proven three pass design which provides high efficient and reliable steam production to industrial plants.
- Our steam boilers are designed considering all of the critical parameters carefully such as fuel specification, steam capacity, water and steam internal volume, water evaporation surface area, thermal expansions, flue gas side pressure drop and optimized heat transfer surfaces.
- Thanks to large water volume and evaporation surface, plant steam load fluctuations are easily met.
- Our steam boilers are completely welded construction and shop assembled, including all of the manufacturing processes such as cutting, bending, welding and other operations.
- All ENSTEAM boilers are designed according to European shell boiler norm (EN 12953) or American norms (ASME) if required by the customer.
- After maintaining a good combustion in large combustion chamber, flue gases passes second and third smoke tube passes to ensure enough heat transfer for maximum thermal efficiency.
- Combustion chambers (furnaces) are designed considering flame dimensions and volumetric combustion load (heat flux to furnace) not to let form high NOx emission in the flue gases.
- Based on the pressure and capacity of the boiler, combustion chambers could be corrugated type (fox or morrison) to compensate thermal expansions and to maintain stronger structure to external pressure.
- After assembly and welding operations, steam boilers are hydrotested at required pressures with water and painted with two layer of high temperature resistant paint.
- External insulation consists of min. 100 mm rock wool + 1 mm aluminium or galvanized steel depending on the conditions and customer request if any.

## PRODUCT SPECIFICATION

- Design and manufacturing up to 20 tph capacity depending on pressure
- Liquid, gas and biogas / hydrogen fuel options
- High efficiency with low thermal losses from stack and external surfaces
- Perfect design for optimal heat transfer and flue gas pressure drop
- Low NOx formation with well designed large combustion chamber
- High strength and thermal compensation with corrugated furnace
- Large steam volume and evaporation surface for dry steam supply
- Easy reachable combustion chamber and smoke tubes for maintenance
- Design acc. to EN 12953 and CE certification acc. to 2014/68 EU PED
- Boiler efficiency up to %100 with additional economizers

## DELIVERY OPTIONS

- Armature, pump unit, burner and all instruments in accordance with EN 12953
- 72 Hour / 24 Hour operation without guard
- Feed water economizer, condensing economizer or air preheater (recuperator) up to request
- Deaerator package or condensate tank
- Automatical blowdown systems
- Multi fuelled designs on demand



## THREE PASS STEAM BOILER TYPICAL DIMENSIONS

MODEL		EST-0.5	EST-1	EST-1,5	EST-2	EST-3	EST-4	EST-5	EST-6	EST-8	EST-10	EST-12	EST-15	EST-20
Steam Output	t/h	0,5	1,0	1,5	2,0	3,0	4,0	5,0	6,0	8,0	10,0	12,0	15,0	20,0
Thermal Output	kW	326	651	977	1.302	1.953	2.605	3.256	3.907	5.209	6.512	7.814	9.767	13.023
Fuel Consumption	kW	370	740	1.100	1.480	2.220	2.960	3.700	4.440	5.920	7.400	8.879	11.099	14.799
Flue Gas Back Pressure	mbar	4,0	4,5	5,0	6,0	7,0	8,0	8,5	9,0	10,0	11,0	12,0	13,0	15,0
Water Volume, Nominal	m <sup>3</sup>	1,5	2,5	3,5	5,0	5,5	7,0	8,5	10,0	13,0	15,0	18,0	26,0	34,0
Overall Length, L	m	2,7	3,2	3,8	4,0	4,2	4,8	4,9	5,2	5,5	6,0	6,5	7,5	8,5
Overall Width, W	m	1,6	1,8	2,1	2,2	2,4	2,5	2,6	2,8	3,0	3,2	3,3	3,5	3,7
Overall Height, H	m	1,8	2,1	2,3	2,4	2,6	2,8	2,9	3,0	3,3	3,5	3,6	3,8	4,0
Steam Outlet Flange, PN16	DN	40	50	65	80	100	125	125	150	150	200	200	200	250
Safety Valve Flange, PN16	DN	25	25	25	32	40	40	50	50	65	65	80	80	100
Flue Gas Outlet Diameter, d	mm	250	300	350	400	450	500	600	650	750	800	850	950	1.100
Shipping Weight	t	2,0	3,5	4,0	5,0	6,5	8,0	10,0	12,0	15,0	19,0	22,0	26,0	32,0

**Note:** Values are valid for 8 barg operation pressure, 102°C feed water temperature, natural gas fuel and operation with out economizer. All data is subject to technological developments. For different pessure and steam capacities consult us.