



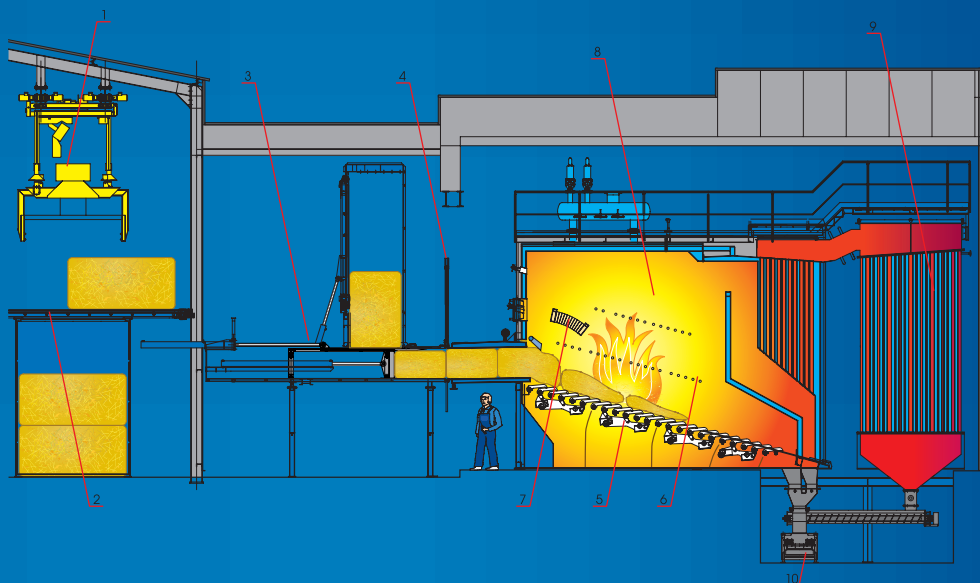
VESKO - S WARM-WATER BOILERS

Energy from biomass

Within the framework of its ecological program, TTS concerns itself with the utilization of energy that arises from the combusting of biomass. The basic criterion from comparing this alternative source of energy with the classically used energy system based on the combusting of fossil fuels is decreasing of greenhouse gases production. Whereas the burning of coal, petroleum and natural gas releases carbon dioxide into the atmosphere, which is one of the most significant „greenhouse“ gases, the emission of carbon dioxide isn't increased by the combusting of organic fuels, as practically the same amount the carbon dioxide released in the burning is consumed from the atmosphere during the photosynthetic processes when the organic biomass is created. By the substituting the burning of fossil fuels with the burning of biomass, the emission of carbon dioxide is eliminated.

Main parts of the boiler

- 1 Fuel stacker
- 2 Straw conveyor line
- 3 Cutting device
- 4 Gate
- 5 Sloping reciprocal grate
- 6 Combustion air intake
- 7 Ignition arch
- 8 Combustion chamber
- 9 Separate exchanger
- 10 Ash conveyor



Description and purpose

The VESKO-S boiler is independent with entirely welded box construction. The lower part of the boiler forms grate case, walls of combustion chamber are cooled by water. Grate is cooled by combustion air and it is controlled by hydraulic gear.

Waste gases go trough first draft of conventional exchanger, then they continue into double draft separate water exchanger. Waste gases are sucked away from boiler through dust off system by flue exhauster and they are leaded into the chimney. Fuel (trusses) is supplied by fork lift truck into area under stacker. Then stacker gives trusses on the conveyor which is moving them into cutting device. Here are trusses hoisted into vertical chamber, separated by means of knife and pushed by piston via cooled tunnel on the boiler grate. The fuel way is blocked by gate (water cooled shutter) when piston moves back so that recombustion would not occur.

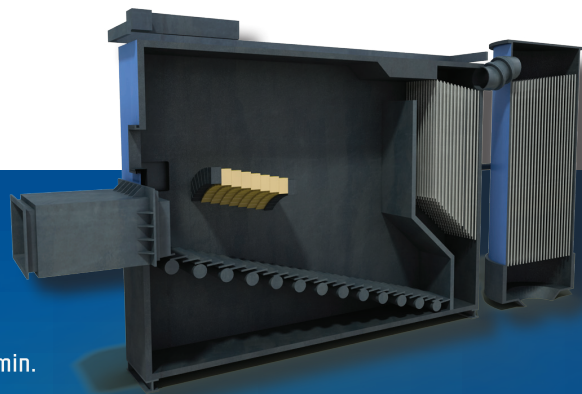
VESKO-B boilers are designed for heating plants of a central heating supply and industrial plants.

They are produced in following sizes:

Thermal output	2,0 ÷ 5,0 MW
Operating over-pressure	0,3 ÷ 0,6 MPa
Operating temperature	90 ÷ 110 °C

Environment

Waste gases exhausted from the boiler into the atmosphere comply with emission limits and they are in accordance with act about atmosphere protection No. 86/2002 Col.



Fuel

Grain straw, rape straw, triticale, flax about moisture max. $W^r = 17\%$, calorific power min.

$Q_i^r = 13,9$ MJ/kg,

ash content max. $A^r = 5,3\%$, in the form square truss of sizes:

- width 1,2 m, height 0,7 to 1,2 m, length 2,2 to 2,5 m
- Truss weight from 200 to 350 kg

Guaranty fuel for reaching of the power:

Grain straw of the parameters: Moisture max. $W^r = 15\%$
 Calorific power min. $Q_i^r = 14,2$ MJ/kg
 Ash content max. $A^r = 5,3\%$



Parameters	WARM WATER BOILERS „VESKO-S“				
Nominal output of boiler	MW	2,0	3,0	4,0	5,0
Maximum working over-pressure	MPa	0,6			
Maximum temperature of output water	°C	110			
Water quality according		to ČSN 077401			
Under-pressure in combustion chamber	Pa	200			
Output temperature of wastes	°C	150			
Efficiency of boiler	%	87			
Fuel consumption in nominal output	kg.hod ⁻¹	594	891	1 188	1 485
Basic dimensions of boilers					
Height of boiler	mm	4 400	4 800	4 800	5 400
Length of boiler	mm	6 300	6 500	7 000	7 300
Width of boiler	mm	2 200	2 200	2 200	2 200
Dead weight (dry)	kg	60 000	70 000	80 000	85 000
Water volume	m ³	18,5	19	21	23,5
Service weight	kg	78 500	89 000	101 000	108 500

Notes: The producer reserved the right to change data in association with the development of the products.

Technology
Place
Investor

VESKO-S 5,0 MW
Teplárna Sever, Třebíč
EKOBIOENERGO

Advantages of the conception

Fuel feeding

Stacking trusses by forklift truck into the columns under the crank stacker minimize necessary area for storage and handling with straw. Dividing of straw truss in the cutting device has a minimal energy demands and there is not necessary any other adjustment of the truss before entering the boiler (for example removing a rope), load of the knife is minimal there is no need to change it often.

Combustion chamber

Combustion chamber is completely cooled by heat transfer fluid, walls of the combustion chamber creates exchanger. Combustion chamber cooling minimizes inherent ash sintering.

Perfect automation of the boiler

Boiler runs in full-automatic operation, the combustion is optimised on the basis of under-pressure in the combustion area and through a surplus of oxygen in the combustion products. The fuel feed and the movement on the grate is regulated in accordance with the fuel's characteristics. All measured quantities, interventions of the safety equipment and defects are transmitted to the dispatching system.