Calculation and Selection - Solid Fuel Boiler

Initial data

15.00 [kW]	Thermal power of the heat consumer	**coal**	Fuel

Calculation results

1.05	With fuel [coal] accepted boosting coefficient for boiler power, as the power indicated by the manufacturer is usually obtained during burning of anthracite coal with high calorific value
15.00 *1.05 *1.3 = 20.5 [kW]	Estimated thermal power of the boiler, taking into account the recommended coefficient of exceeding the boiler power over the heat load of the consumer [1.3]
800 [kg/m3] *22 [MJ/kg] /3.6 = 4889 [kW*h/m3]	The amount of heat released when burning 1 m3 [coal] with density 800 [kg/m3] and heat of combustion 22 [MJ/kg]
70% *0.01 *0.031 [m3] *4889 [kW*h/m3] = 106 [kW*h]	The amount of heat that is released when burning one full load of the firebox with fuel [coal] with an efficiency of 70%
106 [kW*h] /15.00 [kW] = 7.1 [hours]	Operating time of the boiler from one fuel loading [coal] at maximum thermal load of 15.00 [kW], but not exceeding 12 hours

Selection result

Solid fuel boiler

Protherm : Solitech Plus 4

Czechia

25 [kW]	Boiler rated output
Coal : Wood :	
70 %	Efficiency
Pmax 3.0 [bar]	Maximum water pressure in the boiler
Tmax 90°C	Maximum water temperature at the boiler outlet
Tmin 50°C	Minimum water temperature at boiler inlet
DN 40 [mm]	Nominal diameter of pipes, at the inlet and outlet
28 [liters]	Volume of water in the boiler
0.031 [m3]	Maximum volume of one-time fuel loading
15 [Pa]	Minimum vacuum in the boiler chimney
160 [mm]	The size of the chimney connecting pipe
cast iron	Firebox material
235 [kg]	Weight of the boiler
1070 x520 x470 [mm]	Overall dimensions of the boiler, Height : Width : Depth