CONTAINER ESTABLISHMENT HEATING SYSTEM

Subject: Containers in the camp area,

More Economical Heating by Installing a Combi Boiler

Location: KAHRAMANMARAŞ, Dulkadiroğlu District,

Located in the province of Sivricehöyük Village,

AFAD TEMPORARY ACCOMMODATION CENTER

Year: 2017

Located in Sivricehöyük Village of Dulkadiroğlu District of our province, there are various administrative buildings, prefabricated social buildings and 5000 containers in the Temporary Shelter Center.

The heating process in winter is powered by electrical energy; Air conditioners are made with oil radiators and various other heaters. The most intensive electricity consumption in the camp is oil radiator heaters used to heat 5000 pieces containers. These heaters, each with an installed power of 2.5 kW / hour, consume high electrical energy.

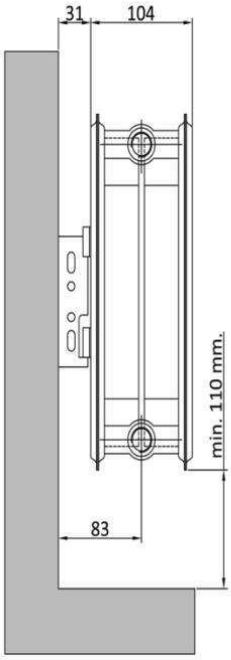
In order to save on electrical energy consumption, a domestically manufactured and electrically powered hydrogen combi boiler was installed and the combi boiler was tested.

Hydrogen Combi Boiler

Installation to the Container

One combi boiler is mounted to be used in a group of 8 units of 20 m2 containers.

In each container, one there are (aka) type 22 – 60cm radiators were used.



-Type 22 radiator photo and side drawing

-An intermediate measurement meter is installed to determine the electricity consumption of the combi boiler.

The daily consumption data of the combi boiler, which is set to 220 C degrees with the room thermostat, is obtained and the consumption table is created. In this regard, the report prepared by our Electrical Engineer and the pictures related to the container group where the combi boiler is applied are attached.

-Container Group where the combi boiler is installed (8 containers)

-Images from the combi boiler

-Combi Boiler View

-Pipes Outgoing from the Outer walls of the container

-Combi Boiler Installed

-Combi Boiler Installed

Reference Data:

- 1 square meter type 22 panels calorie value is between 3000 and 3800 .*

- One Container: 20m 2 x 2,3m=46m3 x 35=1610 kcal (heat loss value 35 for Maraş central plain)

- 90x60 cm dimensions 0,54m2 type22 radiator panel has a kcal value of 1600 to 2000 kcal.*

- The kcal value produced by the combi boiler = 16.000 to 20.000kcal

ATTACHMENTS:

1- Combi Boiler Consumption Report Established in Afad Camp

2- Combi Boiler Technical Specifications

3- Combi CE Certificate

Appendix 1

CONTAINER CITY HEATING SYSTEM (HYDRO-COMBI BOILER SYSTEM)
REPORT

Sivricehöyük Village Temporary Housing Center Infrastructure, various administrative buildings, prefabricated social facilities and 5000 containers located in Dulkadiroğlu District of our province have been examined by technical inspection staff and as a result of the examinations made; The heating function in winter is provided by electric oil radiators. In each container, 1 (one) heating radiator with a label consumption value of 2.5 kW/h is used. The heating radiators used in the containers are used using devices that consume an average of 1.8 kW / hour, and the amount of energy to be consumed is **minimum** 1.8 kW X5000 = 9.000 kW / hour in 5000 containers. This creates a very serious electricity consumption in heating.

When the systems as Hydro-Combi Boilers are examined from a technical point of view; Electricity consumption is low, it is considered to be a healthy and nature-friendly energy system.

One demo Hydro-Combi Boiler was installed and 8 containers were heated. The combi boiler has an installed power of 6 kW / h and when the electricity meter consumption given in the annex is examined, the average consumption is determined as 4.2 kW / h and it was invented as an alternative to classical natural gas combi boilers.

When we calculate the winter period as 5 months in the center of our city, the following table emerges.

One-Hour Consumption (Table 1):

A- (Available Heaters) **X** (Container Quantity) =	**5000 X 1.8 kW** = **9,000 kW/hour**
B- (Lotus Hydro-Combi Boiler, 625 units)	**625 X 4.2 kW** = **2,625 kW/hour**

-With the installation of one Combi Boiler per 8 containers: For 5000 containers/8 = 625 Combi Boilers.

-Hydro-Combi Boiler is **65%** efficient. **Serious** savings arise in the winter period account.

Daily and Winter Consumption (Table 2):

Container/heater	Total kw/hour	kw/day (16-20 hours)	kw/5m(150h)
Available Heater = 5000 X 1.8 kW	9,000 kilowatts	144,000 kilowatts	21,600,000 kilowatts
Hydrocombi 625 X 4,2 kW =	2,625 kilowatts	52,500 kilowatts	7,875,000 kilowatts

As can be seen in the table above, at least 65% savings are achieved with the hydro-combi boiler system.

Hydro-Combi Boilerswi ll have amortized themselves many times in this two-year period with a savings account of **65**%.

These technical inspections were carried out by adjusting the container temperature to 22 °C (Degrees) and it was calculated that when the inside temperature was set to 24-26 °C, Hydro-Combi Boilers would save **40-50**%.

RETURN OF THE PROJECT

Operating Costs.

	Kw/h Year (150 winter days)	TL Year (150 winter days) 1kw=0,35 TL (discounted unit price including VAT)
Current Heater Consumption	21,600,000 kilowatts	7,560,000 TL
Hydro-Combi Boiler Consumption	7,875,000 kilowatts	2,756,250 TL

One unit can be installed in every 8 of the 5000 containers. The approximate cost of installing 625 heating units is 4.375.000TL + VAT.

1- The fire risks from the heating apparatus in the container will be reduced.
2- Electricity overload will be reduced both in the camping area and in the region, especially in the winter period.
3- Better year-round control of the amount of electricity to be used in each Container will be ensured; In addition, there will be no kW demand confusion due to weather conditions in the case of kW loading to be applied in order to limit the electricity to be used in containers, especially in winter.

4- Also in other parts of the camp during the winter months; If the heating issue in schools, hospitals, mosques and other social areas is solved with hydro-combi boilers, savings will increase even more.
5- The renewal of existing heating apparatus every year will also be prevented.

Result:

With hydro-combi boiler system;

1- **Economical, Quiet, Environmental friendly, Fire safe and Domestic Technology will provide heating with a product.**
2- **Hydro-Combi boiler will amortize itself in the warranty process with the savings it provides.**

Adnan GANİDAĞLI
Electrical-Elektronics Engineer