ISSN NO: 2770-4491
Date of Publication:22-06-2023

Improvement Of Hydraulic Parameters Of Hot Water Boilers

K.M.Kurbonov,
Teacher
Namangan Engineering - Construction Institute

Annotation. The article provides information on increasing energy saving, taking into account the parameters of thermal conductivity of boiler installations for water heating.

Keywords: boiler device, pipeline, heat exchanger, fins, energy, temperature.

At this time, the enthusiasm for the use of non-traditional energy sources, reducing the use of gas, coal and electricity reserves in the national economy is relevant. Currently, research is being carried out all over the world to create well-defined mode, technological and design parameters that ensure the continuity of hydrodynamic and thermal processes, which will improve the energy efficiency of heat supply devices and the technical characteristics necessary for the development of control schemes. One of the most pressing problems in this area is the development of modern pipeline designs based on the values of the critical velocity of the heat transfer flow, hydraulic resistances and concentrations of solid particles relative to the design parameters along the line and their mathematical models, improvement of calculation methods and modification of turbulizing elements of the heat transfer flow [1,2,3,8].

Heat supply systems make up a large part of the development of the national economy. To understand this, suffice it to say that 25 percent of the fuel extracted and produced in the national economy is spent on heat supply. Efficient use of fuel is one of the tasks of the state at the present time of fuel shortage. Due to the improvement of the details of heating boilers using local raw materials in the design of heat supply systems, large-scale measures are being taken to increase their service life and develop safety criteria. Including preschools, schools, family clinics and other public buildings. These facilities are provided with individual boilers for heating in winter. Heating boilers AKS-15, AKS-30, AKS-50, AKS-80 and AKS-100 are installed for social facilities of Namangan region. The power of these boilers is Q = 15, 30, 50, 80 and 100 kW. These boilers run on solid fuels (coal) and natural gas. The efficiency (COP) of these heating boilers is 70-75%. This reflects the fact that the energy of the fuel is not fully utilized in the combustion process. FIC in heating boilers in European countries is 95-98%. Therefore, the rational and economical use of fuel resources as a result of improving the parts of heating boilers, the creation of improved heating boilers through the use of accurate and economical structural elements remains one of the most pressing problems [4,5,6,7,].

When evaluating the flow behavior in hot water boilers, it is necessary to evaluate two geometric measurements of the surface D/d and the complex Reynolds test. It is known that the geometric dimensions of the device are the characteristics of the material of the D-pipe (roughness); The linear size (diameter) of the d-pipe does not change significantly due to the influence of temperature. The process that occurs in the flow under the influence of temperature is manifested in the Reynolds criterion [10,12,13,18].
If the Reynolds criterion is expressed as;

$$R_e = \frac{\vartheta d}{\nu}; \text{ or } R_e = \frac{\rho \vartheta d}{\mu}; \quad (1)$$

Here: θ is the average velocity;
d is the characteristic diameter of the pipe;
n - коэффициент кнематической вязкости;
ρ is the density of the liquid;
μ is the dynamic viscosity coefficient.

μ ;ρ -values in the expression are parameters that change under the influence of temperature. The change in current strength in heating devices is associated with the heat transfer of the source.

We use unit theory to derive a model of this problem. When determining the heat transfer coefficient -a, the flow parameters and the dimensions of the pipe are taken into account [9,11,14,15,28].

ISSN NO: 2770-4491
Date of Publication:22-06-2023

Flow rate of heat exchange process-θ; density-ρ; specific heat-C; Heat transfer coefficient-α_0; dynamic viscosity coefficient-μ; and is expressed as a function of pipe diameter-D.

Based on the theory of combinations of measurements

$$[\alpha]=\frac{Дж}{м^2кс}; \quad [\vartheta]=\frac{м}{с}; \quad [\rho]=\frac{кг}{м^2}; \quad [C]=\frac{Дж}{кгК};$$

$[\alpha_0]=\frac{Дж}{м*к*с}$; $[\mu]=\frac{кг}{см}$; $[D]=м$; With this in mind, we write down the following ratio:

$$\alpha = A*W^{x_1}*C^{x_2}*\alpha_0^{x_3}*\mu^{x_4}*D^{x_5} \quad (2)$$

Here: A-measure is a dimensionless coefficient;

$$W=\rho\upsilon : W=\frac{кг}{м^2с} : \quad (3)$$

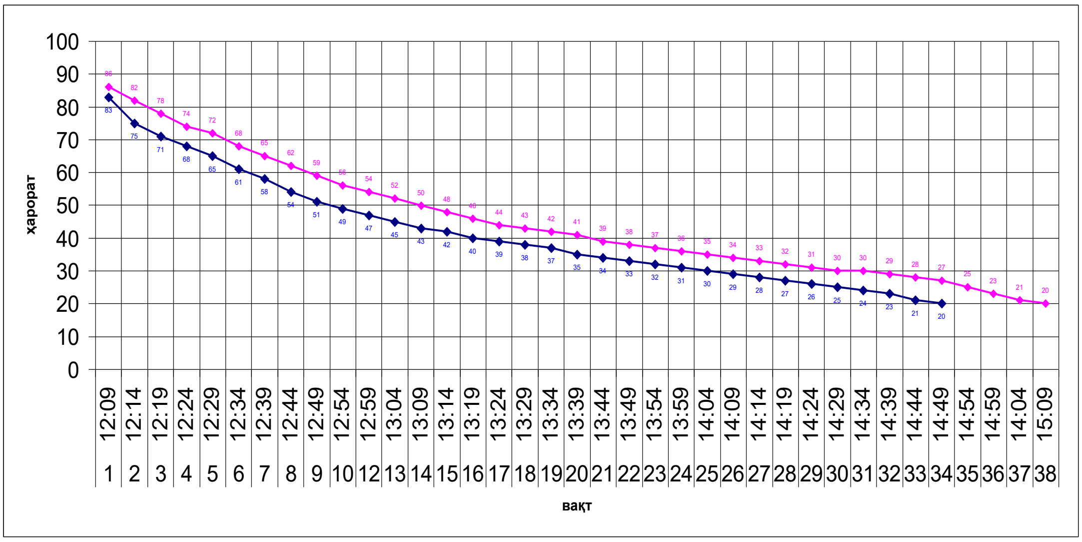
To solve this problem, it is necessary to solve the following problem.

- calculation and refinement of resource-saving dimensions of the cross-section of pipes of domestic boiler houses;
- conducting research to reduce fuel consumption and increase the fic for domestic boilers;
- development of a decentralized heat supply system for multi-apartment housing, social and other facilities through the construction of local boiler houses with high energy efficiency, as well as the installation of an individual internal heat supply system for apartments.

Here, the geometric dimensions of the pipe sample were determined to determine the energy-saving solution of the pipe in the field of efficient use of heat used as secondary energy. From the measurements, it was found that the water capacity of pipes without ribs is greater, but the heat exchange surface in them is smaller.

During the preparation of the experimental installation, the existing heat exchangers were familiarized. For the manufacture of the device, 2 identical steel pipes with a diameter of 50 mm and a length of 1 m were used. The inner part of one of the pipes remained intact, and an inner rib was installed on the other. A piece of pipe was attached to one end at an angle of 120 °, and the other end was firmly attached to the wooden support [4,16,17,22,23].

The temperature inside the pipe is higher than the air temperature outside the room, so it was noticed that the temperature inside it gradually decreases. Two different results were recorded for pipes with different cross-sectional surfaces of the temperature drop inside the pipe. The experiment lasted 3 hours. As a result, we found that finned tube is more efficient than finned tube [5,3,20,21,24].



Graphical representation of the values obtained as a result of the experiment.

Steel pipe (diameter 50 mm) is considered a material that conducts heat well in its physical properties (Fig. 2). If you place the fins on the outside of the steel pipe, the burnt gas will further transfer the heat temperature to the coolant (Figure 3). Due to this, the efficiency of the boiler increases and fuel consumption per boiler decreases. This is a school or preschool educational institution as a whole of district and district significance, saving fuel for travel. To solve this problem, it is necessary to solve the following problem [19,25,26,27].

In conclusion, it was possible to increase the efficiency of the heat supply device by 20-30% by changing the parameters of hot water boilers. This increases the efficiency of hot water boilers used in social facilities. Efficient use of the heat balance can be achieved by efficient use of the heat generated by fuel combustion. A 3-fold increase in the heat receiving surface allows you to further increase the ability to transfer the amount of heat to water.

References.

1. Arifjanov, A., Xodjiyev, N., Jurayev, S., Кurbanov, К., & Samiev, L. (2020, June). Increasing heat efficiency by changing the section area of the heat transfer pipelines. In IOP Conference Series: Materials Science and Engineering (Vol. 869, No. 4, p. 042019). IOP Publishing.
2. Xodjiev, N., Juraev, S., Kurbanov, K., Sultonov, S., Axatov, D., & Babayev, A. (2022, June). Analysis of the resource-saving method for calculating the heat balance of the installation of hot-water heating boilers. In AIP Conference Proceedings (Vol. 2432, No. 1, p. 020019). AIP Publishing LLC.
3. Parpiev, O. T., Kurbonov, K. M., & Turgunov, I. B. (2021). Educational educational technologies in pedagogical activity. Economics and Society, (5-2), 168-171.
4. Parpiev, O. T., & Sultonov, S. S. (2021). Ways to achieve educational effectiveness in improving pedagogical processes. Economics and Society, (9 (88)), 623-626.
5. Parpiev, O. T., & Akhatov, D. N. (2021). The use of pedagogical tasks in the process of training future specialists. Economics and Society, (11-2 (90)), 287-290.
6. Imamnazarov, O. B., Qurbonov, K. M., Pulatova, M. M., Khayitova, M. S., Numonjon, U. A., & Malikov, E. N. (2020). Ground water modes regulation during irrigation by the water-saving method. Journal of Critical Reviews, 7(12), 924-927.
7. Khodzhiev, N., Kurbonov, K., & Khoshimov, S. (2019). Issiqlik almastirgich kurilmasida kuvur kesim yuzasini uzgartirish orkali samaradorligini oshirish usullari. FarPI Ilmiy Technics Magazine, (2).
8. Melikuziyev, S., Mirnigmatov, S., Elmuratova, A., Ibragimova, Z., Juraev, S., & Kurbanov, K. (2022, June). New technology for protecting agricultural products from pests. In AIP Conference Proceedings (Vol. 2432, No. 1, p. 040015). AIP Publishing LLC.
9. Dadakhozhaev, A., Mamadzhonov, M. M., Khaydarov, S. E., & Kurbonov, K. M. (2019). Features of calculating the economic efficacy of countermeasures. Innovative Science, (11), 34-38.
10. Arifzhanov, A., Khodzhiev, N., Zhuraev, S., Kurbonov, K., & Olimov, I. (2020). Issiqlik taminoti kuvurlarining resource tejamkor parametrlarini hsoblash usulini tacomillashtirish. FarPI Ilmiy Technics Magazine, (2).
11. Kurbonov, K. M. (2022). Increasing the thermal efficiency of hot water boilers by improving the design parameters. Energy Conservation and Water Treatment, (2), 136.
12. Arifjanov, A., & Kurbonov, K. (2021). Improvement of hydraulic parameters of heat supply devices. European Journal of Agricultural and Rural Education (EJARE) Available Online at: https://www. scholarzest. com, 2(12).
13. Parpiev, O. T., & Kurbonov KM, S. S. (2022). Installation of air cooling due to partial evaporation. Economics and Society, (4), 95.
14. Yuldashev, J., & Kurbonov, K. (2016, June). Preference and disadvantages of solar water heaters providing hot water. In Took part in the XIV International Scientific Conference "Actual Scientific Research in the Modern World (pp. 26-27).
15. Khodzhiev, N., & Kurbonov, K. (2014). Voidalanilgan energiyadan ikkilamchi energy syphatida foidalanish uchun yaratylgan gurylmans takomillashtyrysh usullarins tadgyk gilish. Ўзбекистон архитектураси ва қурилиш журнали" Toshkent, 2.
16. Arifzhanov, A. M., Muhammadrashitovich, K. K., & Parpiev, O. T. (2022). At the same time, the hydraulic parameters of the hydraulics are used. Mechanics and Technology, 4(9), 157-161.

ISSN NO: 2770-4491
Date of Publication:22-06-2023

17. Kurbonov KM, A. D. (2022). The role of training workshops in the organization of practical training. Economics and Society, (4), 95.
18. Arifjanov, A. M., & Xodjiev, N. R. Jo'rayev Sh. Sh., Kurbonov KM, Sultonov SS Analysis of the resource-saving method for calculating the heat balance of the installation of hot-water heating boilers. NamMTI Ilmiy texnik jurnali, (6).
19. Mazhidov, N. N., & Kurbonov, K. M. (2022). The role of seasonal solar batteries in saving fuel resources. Central Asian Journal of Theoretical and Applied Science, 3(12), 172-177.
20. Mazhidov, N. N., Atamov, A. A., Kurbanov, K. M., & Yunuskhonov, A. A. (2022). Prospects for the use of solar energy, advantages and disadvantages. Central Asian Journal of Theoretical and Applied Science, 3(11), 49-56.
21. Parpiev, O. T., Kurbanov, K. M., & Kurbanova, Z. M. (2022). Systems of organization of pedagogical processes. Economics and Society, (10-2 (101)), 513-516.
22. Kurbonov, K. M., Mamatov, A. A., & Kosimov, J. O. (2022). Improvement of the method of research of the created installation for the secondary use of used energy. Central Asian Journal of Theoretical and Applied Science, 3(12), 235-240.
23. Kurbonov, K. M., & Mazhidov, N. N. (2023). EFFECTIVE USE OF ENERGY-SAVING METHODS OF HEAT SUPPLY SYSTEM FOR RESIDENTIAL BUILDINGS. European Journal of Interdisciplinary Research and Development, 12, 195-200.
24. Parpiev, O. T., Kurbonov, K. M., & Kurbanova, Z. M. (2023). FORMATION OF PROFESSIONAL QUALITIES OF STUDENTS THROUGH THE USE OF PROBLEM SITUATIONS IN THE EDUCATIONAL PROCESS. Economics and Society, (1-2 (104)), 435-438.
25. Kurbonov, K. M. (2023). USE OF RENEWABLE ENERGY SOURCES FOR HEATING BUILDINGS. Open Access Repository, 4(03), 349-354.
26. Sultonov-teacher, S. S., & Kurbonov-teacher, K. M. PARTIAL EVAPORATION AIR COOLING UNIT.
27. Arifzhanov, A., Hodjiev, N., Kurbonov, K. Issiқlik tahaminoti қurilmalarining гidravlik параметрларгіni тakomyllashtyrish // FarPI Ilmiy technica journals. – 2022. – Vol.26, No2. – 110-114 b.
28. Zhiraev, Sh., Kurbonov, K., Akhatov, D. Suv isitish gozon gurylmalarini energiya tezhamkor parameterlariny takomillashtyrish // FarПИ Илмий техника журнали. – 2021. – V.25, No1. – 131-135 b.