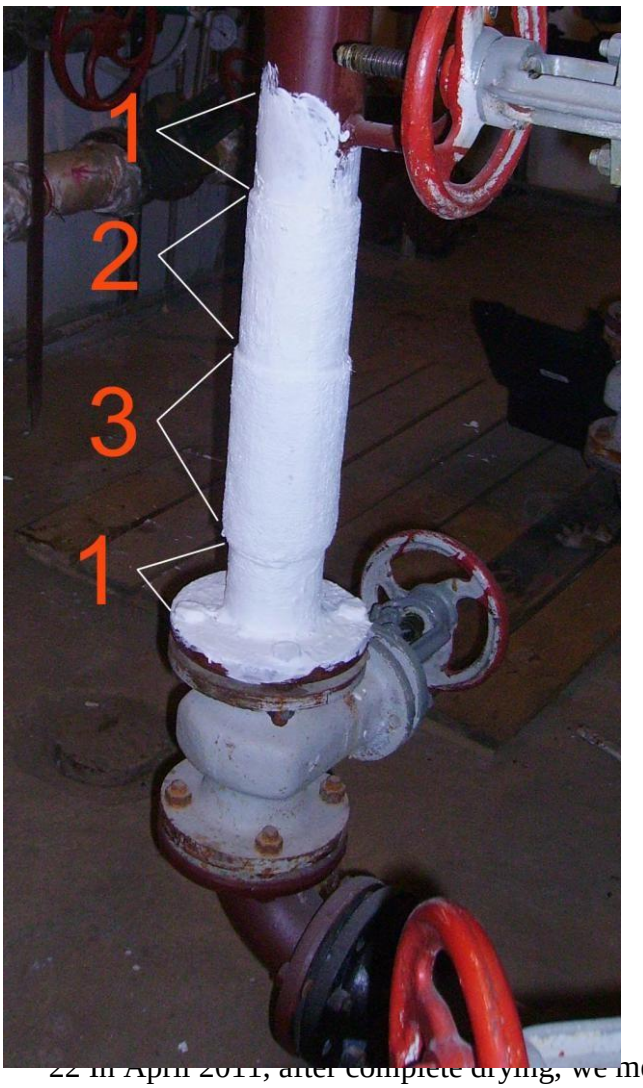
Report on using insulation coating based on Isollat material

21 In April 2011, on the territory of the heating unit of an apartment house at 26, Dachnaya St., Samara, test coating with "Isollat" material was applied onto the test surface of hot water pipes for evaluation of heat-shielding properties of the material. On April 22, 2011, after complete drying, we measured temperature fields of the protective surface of the material.

The coating was applied acc. to **Isollat-Effect** technology under Section 4 of the Album of components of building structures using Isollat liquid ceramic coating ZAO 760-21-AC Volzhsky Design Institute Stroyindustriya (VDI SI).

1. The coating was applied to the hot water supply pipe. Surface temperature of the pipe at the time of application was + 61ºC. Air temperature in the heating unit, at the time of measurement was
+33ºC at floor, +37ºC at ceiling.



To show the material properties, priming layer 1 was applied **(see pic.** 1**)** using Isollat-02 material with a thickness of 0,3-0,4 mm. Then on top priming, geotextile was applied (portion **2**) of type III with an areal density of 300 g/m^2.

Geotextile fabric is eco-friendly material used as reinforcement and separation layer at insulation. Geotextile fabric is resistant to oxidation and thermal ageing, has high levels of chemical resistance, is not subject to decay and effects of any mold, fungi, insects, rodents.

At portion **3**, the second layer of geotextile fabric is used with intermediate and surface coating of **Isollat-02** layer, to provide heat-reflecting barrier between the layers. Thus, a layer of geotextile minimizes the convective component of heat loss, and the layer of **Isollat-02** minimizes the radiant component.

22 In April 2011, after complete drying, we measured temperature fields of the protective surface of the material.

Estimating measurements were carried out using SDS HOTFIND thermal imager, ИППП-2 unit measuring heat flux density, MS6530 infrared thermometer, MS6503 unit measuring moisture and temperature.

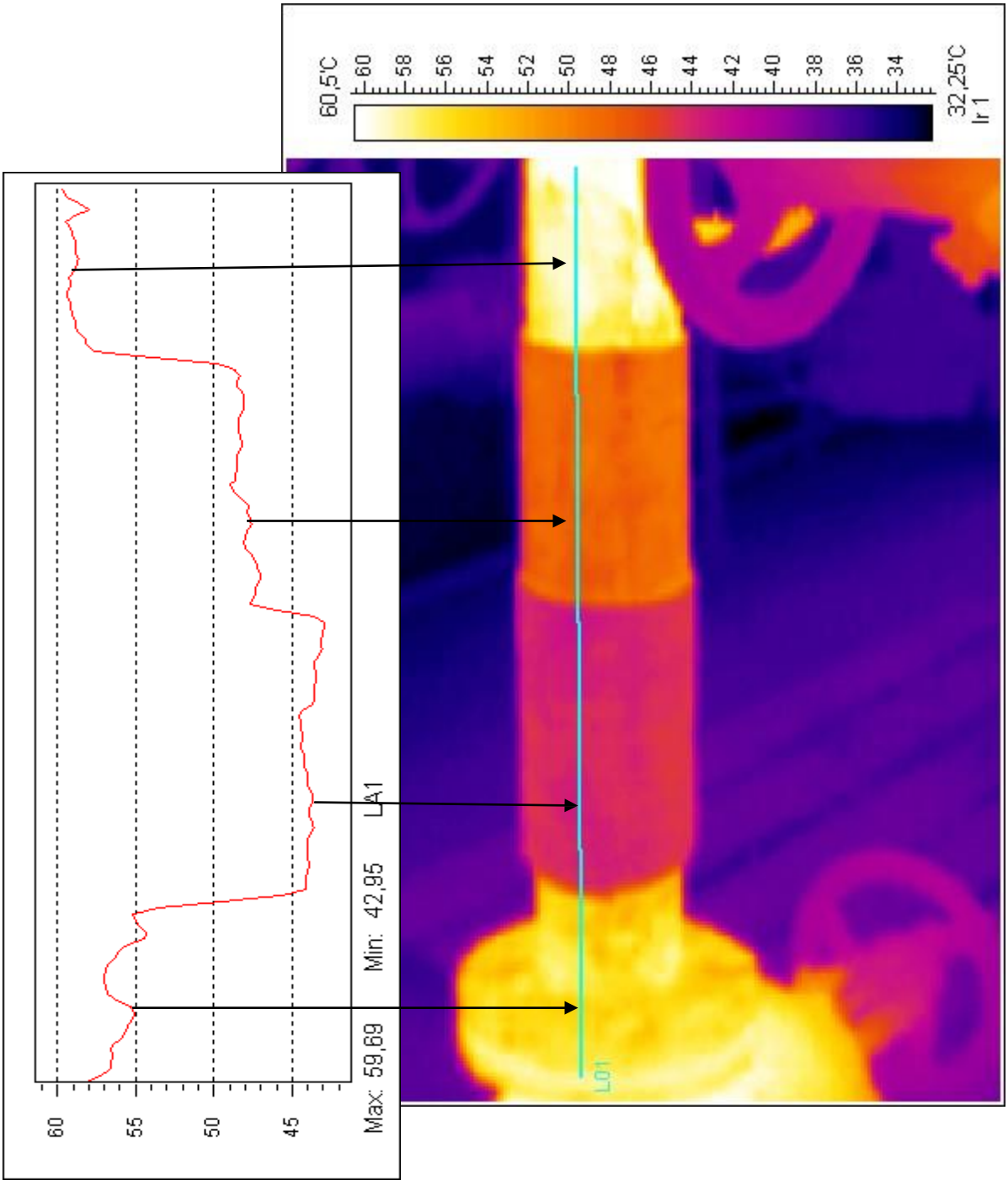


Fig. 2. IR temperatures distribution on the surface of the thermal insulating coating.

Measuring heat flux from the surface of the pipe are shown below.

TABLE 1.

Open pipe.	Surface 1	Surface 2	Surface 3
876 W/m^2	283 W/m^2	184 W/m^2	141 W/m^2

Fig. 3. Measuring heat flux from the surface of the pipe.

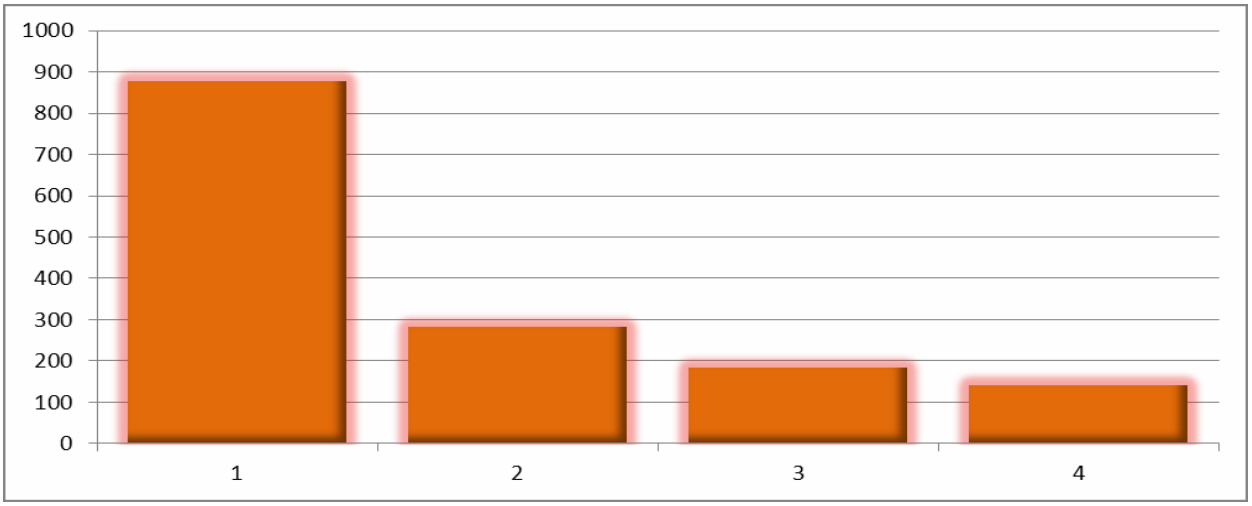


Fig.4 Heat emission W from 1 m2 of surface: **1**- pipe without heat insulation, **2**- Isollat-02 (0,5 mm), **3**- surface-2, **4** - surface-3. (see Fig. 1)

Fig. 5. Contact measurement of the pipe surface.

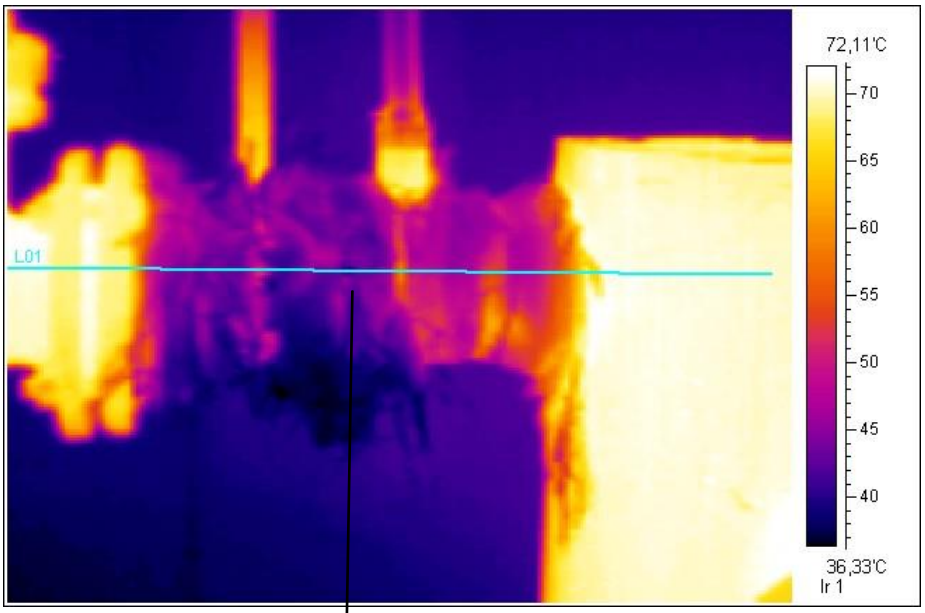
Fig. 6. Humidity measurement.

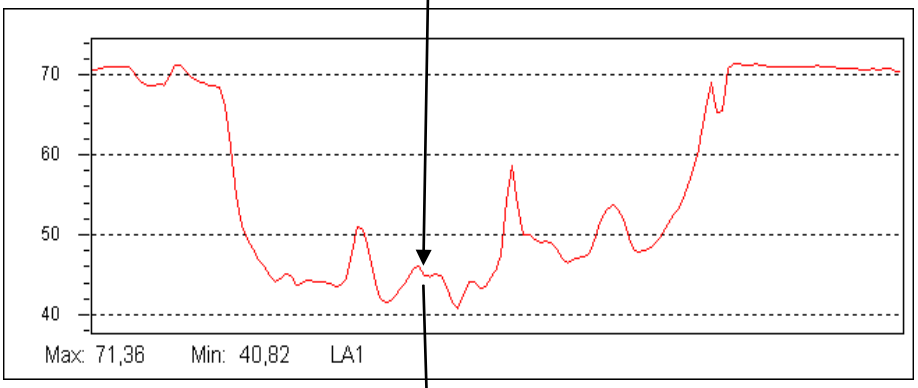
At a temperature of 33,5°C, relative humidity in the heating unit room is 17.2%.

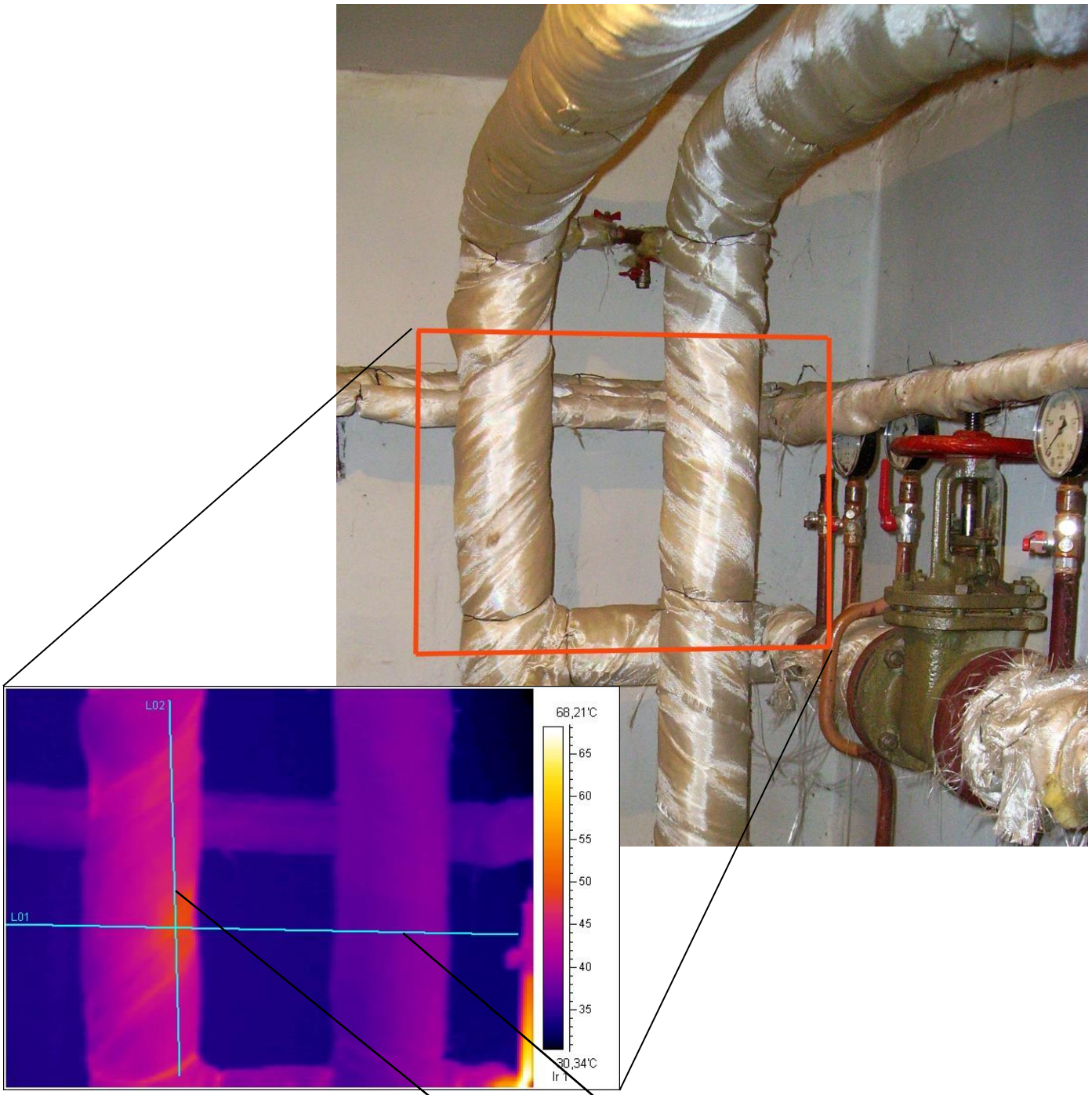
For reference:

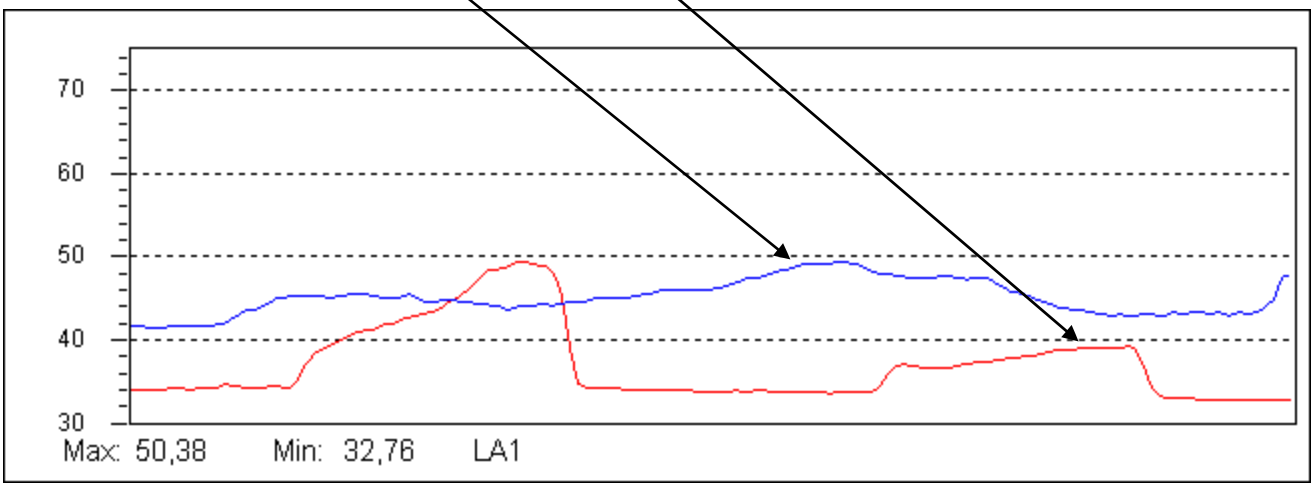
According to SNiP 2.04.14-88, for insulated surfaces located in the working or service area with temperatures above 100°C, a requirement for the surface temperature to be below 45°C should be met for safety reasons.

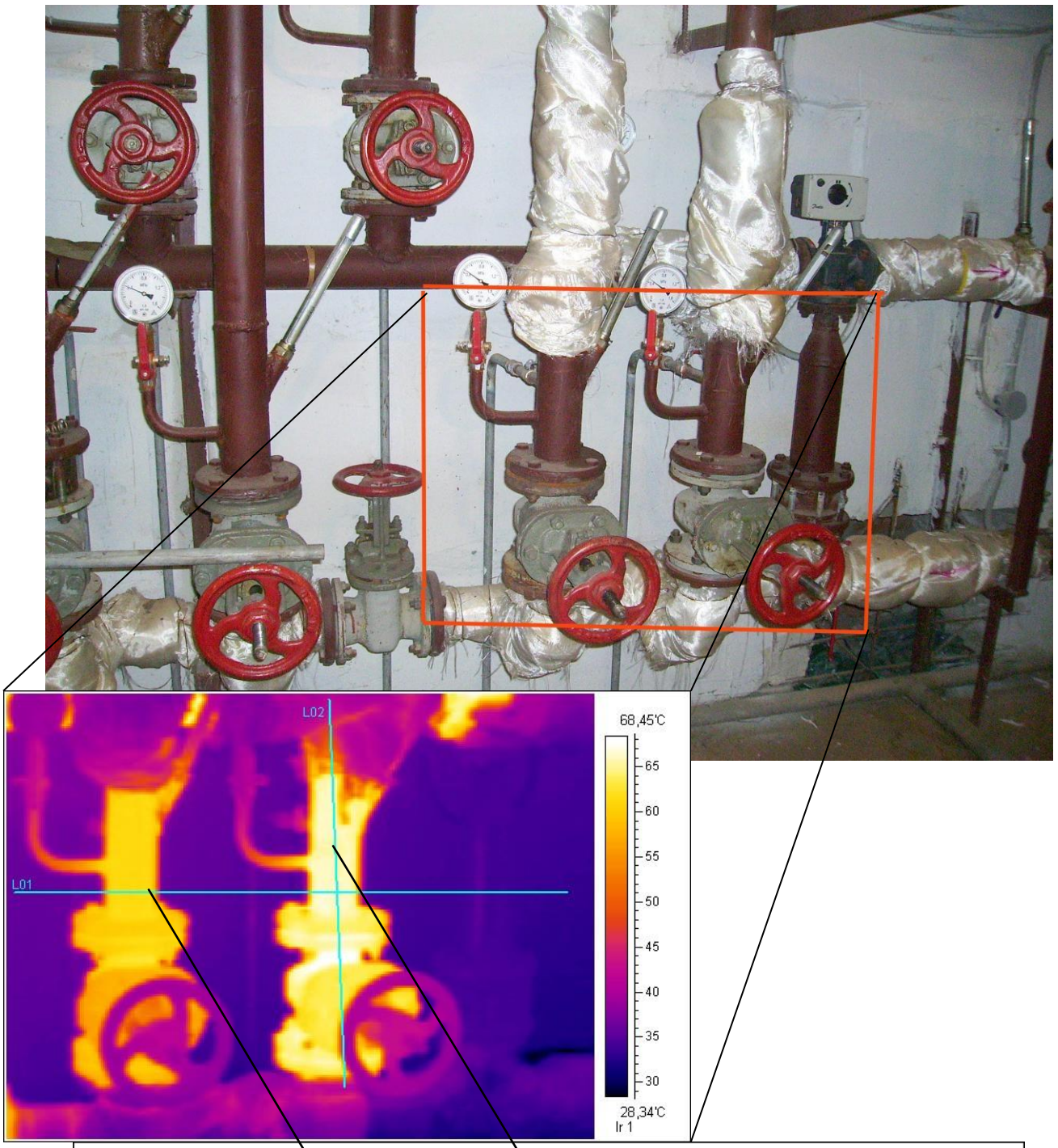
For information, some measurements of sections with insulation used are shown below.






L02
L01
68,21°C
65
60
55
50
45
40
35
30,34°C
Ir 1


70
60
50
40
30
Max: 50,38
Min: 32,76
LA1


L02
L01
68,45'C
65
60
55
50
45
40
35
30
28,34'C
Ir 1
70
60
50
40
30
Max: 67
Min: 33,83
LA1

Sketches on the saving scheme:
876 W/m^2 – 141 W/m^2 = **735 W/m^2**. Saving heat in 1m2. Let's transfer
Watts into thermal energy: 735 Watts is 631 kcal per hour.
If we assume that a heating season is 200 days, then heat savings in 1 m^2 will be: 631 kcal per hour x 24 hours x 200 days = **3,028 Gcal**.
At a cost of 1 Gcal = 760 rubles (excluding VAT), saving will make: ***2301,89 rubles.***

What kind of insulation do you chose for your heating system - like

this?:

or like this?:

You decide!