

## NECESSARY CONDITIONS FOR THERMAL IMAGING EXAMINATION

**Jobborov Baxodir Tulqinjon ugli**

Fergana Polytechnic Institute

“Electrical engineering, electrical mechanics and electrical technologies”

department associate

E-mail: [bjobborov@bk.ru](mailto:bjobborov@bk.ru)

### ABSTRACT

Thermal imaging inspection of buildings and structures is a thermographic method for detecting defects present in building structures. Today, it is the most effective way to diagnose the condition of enclosing and other structures at various stages of their operation, from the moment of commissioning to reconstruction. Its relevance and prevalence is due to the reliability and efficiency of obtaining objective data on the main parameters of structures of various types.

**Key words :** Condensation, tightness, defective insulation.

### INTRODUCTION

How to Save on Energy with Thermal Imaging Inspection!

Your building or structure may be losing valuable energy through the building envelope, leading to increased heating and cooling costs. To determine the exact locations of heat leaks and take measures to eliminate them, you need to conduct thermal imaging examination. [1]

Thermal imaging inspection is an effective method for identifying heat loss in buildings and structures. Using a special thermal imager, a qualified specialist will scan the building envelope and detect places where heat escapes outside or penetrates indoors.

Thermal imaging will allow you to: [2]

- Reduce heating and air conditioning costs by eliminating unnecessary heat loss
- Improve indoor comfort by eliminating cold areas and drafts.
- Improve the energy efficiency of your building and meet modern standards.
- Prevent condensation and mold from occurring, helping to maintain the health and longevity of structures.

Thermal imaging inspections and diagnostics are reliable methods for detecting insulation problems, thermal imbalances and other thermal problems. Our specialists

with extensive experience and knowledge in the field of thermal imaging will help you identify problems and offer the most effective solutions. [5]

Don't put it off until later, save on energy today! Contact us for a thermal imaging survey of your building or structure.

Do you want to know about thermal imaging inspection of building envelopes and structures and its cost? We are pleased to offer you our thermal imaging diagnostic services, which is an effective method for identifying heat loss and problems in building envelopes. [3]

Thermal imaging allows you to visualize the thermal radiation of objects and detect hidden defects, heat and cold leaks, moisture and other problems that can lead to energy losses and increased heating and air conditioning costs.

We use modern equipment such as thermal imaging cameras to obtain high quality thermal images. Our experienced specialists conduct a thorough inspection of the building envelope and then analyze the data to identify problem areas and offer recommendations for correcting defects. [6]

## **METHODS**

### **The main areas of application of Thermal Imaging Inspection:**

- construction and industrial thermography ,
- housing and communal services sector.
- control of electrical equipment and electrical networks.
- inspection of refrigerated warehouses and low-temperature chambers.
- flat roof inspection.
- chimney inspection.

### **Examination with a THERMAL IMAGER allows for high accuracy**

• determine the tightness and quality of thermal insulation of the enclosing structures of buildings and structures.

- Identify problems with heating and water supply systems.
- See the quality of commissioning and operation of electrical equipment.
- Find areas of high moisture content and cold bridges in structures.
- Record violations during the installation of window and door units.

**Five main reasons that require a thermal imaging examination immediately!!!**

- The heating is not doing its job. It's cold at home.
- Heating costs are rising unjustifiably. The design calculations were different.
- Water leak. The appearance of condensation and fungus.
- Self-construction. Checking hidden work.

- Purchase of finished housing. The ability to reduce the cost by pointing out the shortcomings of the structure.

**Thermal imaging inspection before starting finishing work will save future nerves and finances. At this stage, if low-quality material, defective insulation, or any other violations are detected, it is easier to correct the problem.**

Checking the operation of heating equipment

Let's look at the example of a heating device using the example of measuring a thermal imaging survey using a thermal imager. [7]

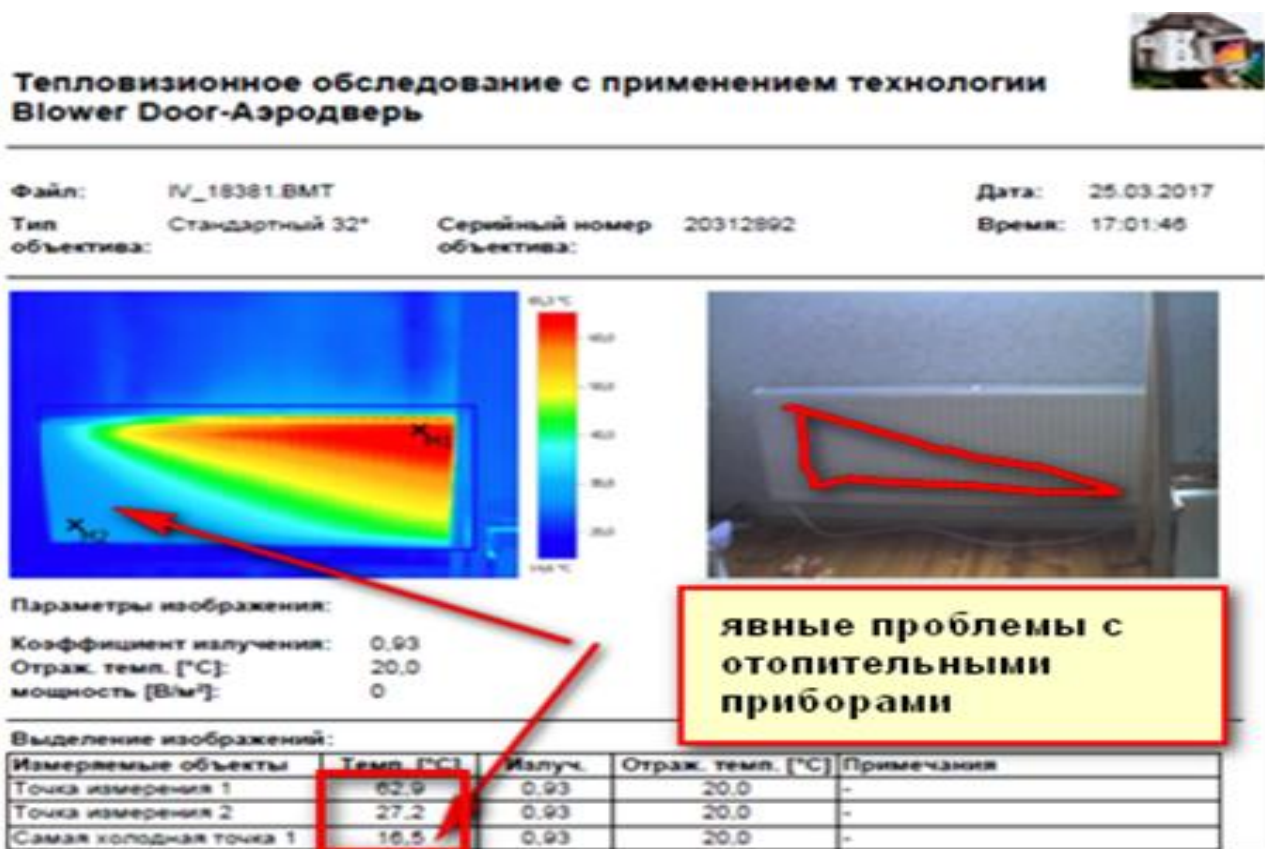


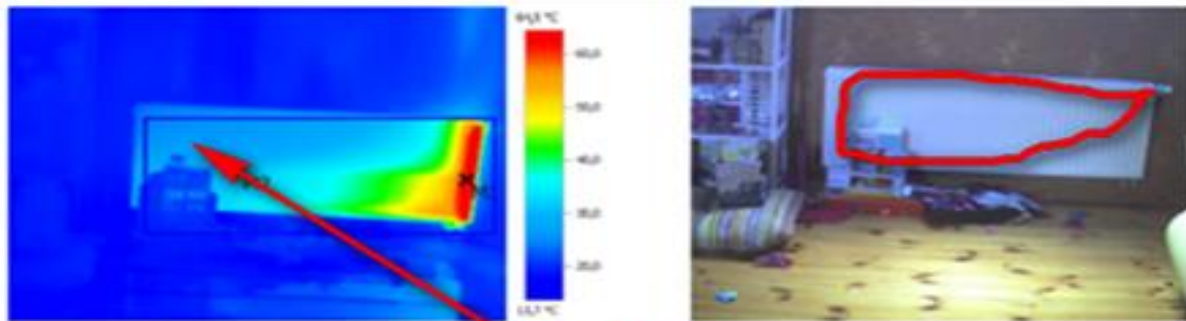
Figure 1. Thermal imaging diagnosing a heating device in the living room

**If an inspection is refused during construction, thermal insulation violations not detected in time can be equated to the devastating consequences that arise from leaks in heating and water supply systems. Condensation accumulates, thermal insulation and structural elements are destroyed. All this manifests itself during operation. Up to the appearance of mold and mildew.**

Тепловизионное обследование с применением технологии  
Blower Door-Аэродверь



Файл: IV\_19400.BMT      Дата: 25.03.2017  
 Тип: Стандартный 32°      Серийный номер объектива: 20312892  
 объектива:      Время: 17:11:01



Параметры изображения:

Коэффициент излучения: 0,93  
 Отраж. темп. [°C]: 20,0  
 мощность [Вт/м²]: 0

**Отопительные приборы  
не работают**

Выделение изображений:

Измеряемые объекты	Темп. [°C]	Излуч.	Отраж. темп. [°C]	Примечания
Точка измерения 1	63,2	0,93	20,0	-
Точка измерения 2	30,9	0,93	20,0	-
Самая холодная точка 1	15,4	0,93	20,0	-

**Figure 2. Thermal imaging diagnostics in a children’s room**

A wide range of areas in thermal imaging examination.

Search and detection of leaks in heating systems

We often have to solve problems related to finding and identifying leaks in heating and water supply systems. Thermal imaging technology allows you to detect even small defects at an early stage, when they cannot be detected visually. In this case, there is no need to turn off the technological equipment. Such an examination provides a quick search for hidden communications, helps to conduct a high-quality leak test of shut-off valves and make an objective analysis of the operation of the equipment[8]

The optimal time is autumn and winter. During the heating season, the temperature difference between indoor and outdoor air becomes more than 15 degrees . This creates a natural thermal pressure and intense air currents appear. At the same time, cold air, falling on a warm surface, creates a kind of temperature picture, which can be seen by thermographic photography with a Thermal Imager. As a result, we obtain a visualization of the temperature distribution on the surface of the object being examined.

## CONCLUSION

**Afterwards** an objective, professional analysis is carried out.

Indicating any deficiencies found. With an explanation of the reasons for their occurrence. With possible consequences. And with recommendations for taking the necessary measures to eliminate them. The detected defects were identified and recommendations were given to eliminate the defects.

## REFERENCES:

1. A.I. Khalyasma. "Diagnostics of electrical equipment of power stations and substations." Tutorial. Ekaterinburg: Ural Publishing House, 2015–64 p.
2. Afonin A.V., Tadzhibaev A.I., Sergeev S.S. "Infrared thermography in the energy industry. Technical means for receiving infrared radiation." Textbook. – St. Petersburg: Publishing house. PEIPK, 2000–60 pp.
3. A.I.Tadzhibaev. "Methods and means for assessing the condition of energy equipment, buildings and structures based on the reception of radiation in the infrared spectrum, edited" – St. Petersburg, 2002 – No. 17–128 p.
4. A.I.Tadzhibaev "Automated systems for recognizing the states of electrical installations" – St. Petersburg: Energoatomizdat, 2001–175 p.
5. A.I.Tadzhibaev. "Methodological foundations of non-destructive testing of insulation of electrical installations." edited by A.I. Tadzhibaev et al. – St. Petersburg, 2011. No. 37–120 p.
6. E.N.Topilskaya, O.V.Inzhelevskaya, N.M.Topilsky Economic aspects of thermal imaging inspection of elements of power supply systems of mining enterprises // High-tech technologies for the development and use of mineral resources: international scientific and practical conference: collection of scientific articles. – Novokuznetsk : SibGIU, 2015–p. 260–263.