



## Comprehensive Safety Requirements for Thermal Insulation Works of Structure of the Building

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**Abstract:** *The article analyzes the complex requirements for the creation of safe working conditions during thermal insulation of building envelopes.*

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### Introduction

In recent years, much attention has been paid to the thermal insulation of the building structure in construction. At the same time, it is economically advantageous to construct building envelopes with thermal insulation from local effective materials.

According to the constructive solution, thermal insulation consists of a heat-insulating layer, fastening elements, a protective coating and, if necessary, a finishing coating.

Currently, thermal insulation is performed mainly from thermal insulation structures using mats and slabs, which exclude wet construction operations when working with them.

Thin galvanized steel or aluminum sheets, fiberglass, polymer films, etc. are used as protective and at the same time finishing coatings. Fastening elements are wire, steel tapes, self-tapping bolts and other parts.

### Methods and materials

Prior to the start of thermal insulation work, building structures must be fully assembled. At the same time, fasteners for thermal insulation must be installed.

Thermal insulation work is carried out in strict accordance with the project for the production of works. Usually, thermal insulation materials are transported in special containers. Heaters from plate materials are laid on the base tightly to each other and must have the same thickness. When laying slabs in several layers, the seams of the overlying slabs should not coincide with the seams of the underlying slabs. When performing heat-insulating work using soft mineral wool products (mats, felt), it is necessary to ensure a snug fit of the products to the insulated surface and to each other at the joints.

In the process of thermal insulation work, the quality of each element is gradually controlled.

## **Results**

Insulation work must be carried out in compliance with the general rules of labor protection. When working with mineral wool, care must be taken so that its fibers do not enter the respiratory tract, as this can lead to injury. Therefore, insulators must have overalls, helmets, gloves and personal protective equipment: respirators, rubber gloves, goggles and a belt [1-4].

Insulators often have to work at high altitudes, in uncomfortable and cramped conditions. When lifting heat-insulating materials to a height, signals are given only by one person - the foreman or work manufacturer.

The admission of insulators to the roof and interflow overlap is allowed only after all openings are covered with solid flooring and fenced around the entire perimeter. All open holes in the walls must be protected by railings 1 meter high.

Insulators working at height must be equipped with individual boxes or bags for carrying and storing tools and small parts fixtures. Throwing tools and other objects to each other is prohibited.

Thermal insulation work is often carried out near electrical wires. To prevent the insulator from accidentally touching the wires, carry out work with the voltage turned off. Electrical wires in the work area must be insulated and securely fastened at a height of at least 2.5 meters above the workplace, 3.5 meters above the walkways and 6 meters above the driveways.

It is forbidden to hang the wires on various nails, brackets, as well as lay them on wet and hot surfaces.

The insulator must not switch on and off various conductive devices. For this purpose, the insulator must call an electrician.

Thermal insulation materials must be handled with care. For example, some slabs even in the package are very fragile; if handled carelessly, a large amount of breakage is formed. With careless handling of mineral wool and products from it, fibers are destroyed, the quality of materials decreases, and their bulk density increases.

Piece thermal insulation products are lifted to a height in containers. In this case, special attention should be paid to the correct, stable stacking of products in stacks and on vehicles.

During loading and unloading operations performed with the help of lifting machines, the stay of unauthorized persons at the work site is prohibited. Lifting devices for lifting loads must be in good working order, which excludes the possibility of uncoupling the load and ensures its stability during lifting and moving. It is prohibited to stay under the load being lifted or lowered.

Insulators are allowed to perform heat-insulating work in construction sites only after passing special safety instructions [5].

All construction workers should be familiar with safety rules and regulations. For this, mandatory instructions have been introduced at the construction site.

Newly arriving insulators can only be allowed to work after a preliminary medical examination and a positive conclusion about the state of health, passing an introductory safety briefing and briefing directly at the workplace.

The introductory briefing is the first stage of safety training. It acquaints the worker with: the main objects of work, the basic provisions on labor protection and safety, internal regulations and behavior on the territory of the facility; proper organization of the workplace, safe working conditions; general safety rules for servicing machines, mechanisms, tools; personal protective equipment; electrical safety and fire safety rules, the main causes of accidents and diseases; the procedure for notification of an accident and its investigation; liability for violation of safety requirements; first aid rules.

Production briefing is carried out directly at the workplace by the work manager.

The production briefing should cover safe work practices in the implementation of this design; labor protection and safety requirements when performing thermal insulation work directly at the workplace; preparation for work; cleaning and tidying the workplace; rules of industrial sanitation and personal hygiene in relation to the technology of thermal insulation work at the workplace.

Briefing at the workplace is carried out with each change in the conditions and nature of the work.

Repeated briefing is carried out for all workers at least once every three months, as well as in case of violation of safety regulations, accidents, when performing work with increased danger.

In the presence of especially harmful and especially dangerous conditions for the production of work, before their performance, workers are issued a written work permit that determines safe working conditions, indicating in it dangerous zones and the necessary safety measures.

Trade unions and special inspections exercise control and supervision over the safe production of work.

The organization and management of safety work is entrusted to the chief engineers of construction organizations.

The work manufacturer and foremen, as well as engineering and technical workers are responsible for: organization of work in compliance with safety regulations; supervision and responsibility for the good condition of mechanisms, tools, the correct maintenance of workplaces, passages, driveways, the condition of scaffolding, scaffolding, protective devices; providing workers with overalls, protective devices and safety instructions; instructing workers on safety; timely investigation of accidents; first aid in case of accidents.

The safety engineer has the right to demand from the administration the implementation of all safety measures and control their implementation. Safety engineer's instructions are mandatory to follow.

The administrative and technical staff of the department is liable in criminal and administrative proceedings for violation of their duties on labor protection and safety.

### **Conclusions**

The results of the study summarized and analyzed the complex requirements of labor protection and safety measures to create safe working conditions during thermal insulation of building envelopes.

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