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# Causes of Fire in High-Storey Buildings and Measures

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**Annotation:** This article describes the causes of fires in high-rise buildings, fire prevention measures, plans to evacuate people from the affected area, and what needs to be done to prevent fires.

**Keywords:** Flammable gas, balconies, pneumatic tools, stairs, basement, woods.

More than 70% of fires occur in the residential sector. The highest mortality rate in the housing stock is observed in fires, with significant material losses. According to statistics, the main causes of fires in residential buildings are: careless handling of fires, violation of the technology of use of electrical equipment and arson.

***In the event of a fire in a residential building, the following situations may occur:***

1. the threat to people on the floors, including the presence of those who are unable to move and evacuate independently (patients, the elderly, young children, etc.);
2. availability of important cultural and material values;
3. rapid spread of combustion over large areas over combustion structures and materials;
4. smoke pollution of stairs, corridors, halls and other escape routes;
5. high temperature in the basement and indoor buildings without window openings, the presence in them of various materials and substances, electrical, gas and other communication reservoirs;
6. Spreading of grass on the upper floors through leaks and holes in the ceiling, ventilation ducts, shafts, hatches, other communications, as well as by heating reinforced concrete, metal structures or firing through windows and openings;
7. deformation, collapse of building structures;
8. formation and explosion (combustion) of combustible mixtures with air, pyrolysis products and incomplete combustion;
9. Explosions of transport and household cylinders with flammable gases, as well as containers with flammable liquids (flammable liquids) and flammable liquids (flammable liquids);
10. the complexity and laboriousness of the delivery of firefighting equipment to the upper floors of the building;
11. lack of water for firefighting;
12. blocking access to the building and lack of well-maintained roads;
13. Interruption of power supply to the fire site, as a rule, fire-fighting systems and devices, electrical equipment to control the movement of elevators;
14. the complexity of the installation of stairs and cars for the performance of work on the rescue of people, the use of fire rescue and other technical means of extinguishing;
15. Difficulty in destroying combustion centers in ruins due to the presence of air pockets formed as a result of landslides.

Fire brigades arriving at the scene of the fire, at the same time as inspecting the fire, organize the rescue of people and, if necessary, the necessary forces and means to carry out the fire according to the importance and urgency of the implementation. they initiate other types of actions to turn off the in.

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***The following should be taken into account when implementing firefighting measures:***

- Find out where people are, choose safe ways and ways to evacuate them, take measures to avoid panic (set up posters, report through speakers, etc.);
- determine the routes of passage to the source of fire, its size and possible directions of spread;
- identify the possibility of using loggias, balconies, outdoor fire extinguishers, car lifts, car stairs and other means of rescuing people (manual fire extinguishers, canvas, pneumatic tools, etc.) ;
- find out from the administration the location of the unique and most valuable equipment, the degree of fire and smoke hazard, the need for its evacuation, the order, sequence and execution;
- determine the possibility of using stationary systems for extinguishing and extinguishing smoke;
- identification of forces and means necessary to extinguish the fire, rescue people and evacuate property;
- compliance with the rules of labor protection and safety in the performance of assigned tasks.

***Actions to extinguish fires on the floors of the building:***

- Prevention of panic among people on the way to escape from the building (structure), ensuring the conduct of rescue operations;
- implementation of trunk delivery to the floors along the stairs, as well as the use of stairs and cars to feed the trunks to the window openings;
- carry out firefighting in all rooms of the floor at the same time with a lack of power and means, deliver the trunk to the overheated rooms, prevent its spread and extinguish the fire permanently;
- the simultaneous entry of trunks into the heart of the fire, into adjacent floors or tents, buildings where fire can spread through communication channels and gaps in structures;
- use high-velocity water barrels in developed fires;
- to determine the possibility of using the internal fire water supply system;
- use dry pipes and internal fire hydrants with booster pumps to deliver water to the upper floors or roof;
- assessment of the possibility of using smoke from burning and upper floors, as well as forced ventilation of escape routes, smoke-emitting vehicles or portable fans;
- organization of inspection of ventilation lines to prevent the spread of fire;
- protection against spilled water;
- compliance with the rules of labor protection and safety in the performance of assigned tasks.

**EXTINGUISHING FIRE IN BUILDINGS DURING CONSTRUCTION**

***The following should be taken into account when implementing firefighting measures:***

- ensuring the protection of the supporting structures of the building, scaffolding, passages in the delivery of water shafts at high flow rates and preventing the spread of fire inside the building;
- supply of high-flow water shafts in case of fire in the building;
- dismantling (clearing) of forests and other combustible materials, creation of fire breaks, if necessary;
- in some cases feed the trunks for lifting using stairs and articulated elevators.

Special attention should also be paid to safety measures, as new buildings do not have all kinds of barriers and there are open holes in the ceiling and walls.

**FIRE FIGHTING IN HIGHER DEVICES**

***In the event of a fire, the following may occur:***

- rapid spread of fire and toxic combustion products inside and outside the building;
- high temperature and smoke in the escape routes in the area of burning floors;

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- the presence of styrofoam around the perimeter of the building and the lack of entrances, which complicates the installation of firefighting equipment for firefighting;
- the complexity and laboriousness of the delivery of firefighting equipment to the upper floors of the building;
- The need to use a large number of special technical means for conducting ACR and extinguishing fires.

Fire inspections should be carried out by at least two units of the GDZS at the same time, and at the security point one joint of the GDZS should be fully prepared to provide emergency assistance to personnel in a non-breathable environment. should be brought [1-3].

***When taking measures to extinguish fires in multi-storey houses, it is necessary to:***

- sending GDZS offices to search and rescue people;
- the use of self-rescuers to protect the respiratory organs of rescued people;
- use of stationary rescue equipment, outdoor fire and smoke-free ladders, lifting equipment and elastic rescue weapons, tools equipped with special equipment;
- use a warning system, speakers, megaphones and posters to avoid panic;
- determine the availability and operation of stationary fire-fighting and smoke extraction systems;
- to know the possibility of using elevators in fire mode to lift personnel and firefighting equipment;
- Lay hose lines outside the building, installing two branches, if necessary: one - on the main line, at ground level, the other - on 1-2 floors from the burning floor;
- Laying of trunk hose lines with the installation of two branches: one at the beginning of the trunk line (in front of the building), the other directly in the building - 1-2 floors before the fire;
- if necessary, arrange water supply to the upper part of the building using intermediate tanks and portable motor pumps;
- use of helicopters equipped with fire and rescue equipment, if necessary;
- take measures to protect downstream apartments, buildings, loggias, balconies from the occurrence of sparks and new sources of combustion;
- take measures to protect personnel, fire engines and hose lines from falling glass and other objects;
- installation of spare sleeve posts at a single column speed for one clamp of the vertical laying line, as well as, if possible, control and ensure the reliability of the operation of one fire hose line in each branch;
- compliance with the rules of labor protection and safety in the performance of assigned tasks.

***organization of evacuation of people with the help of service personnel;***

- determine the status and possibility of using a stationary firefighting system;
- identification of an effective fire extinguisher;
- supply of overlapping water tips, sprayed water, foam, fire extinguishing powder, inert gases for firefighting;
- firefighting to protect property from spills;
- firefighting and dismantling of structures, protection of exhibits (if necessary, their evacuation) and architectural design of buildings;
- Carefully inspect the gaps in the floors, partitions, architectural structures of ventilation ducts, take measures to prevent the spread of fire along them;
- take measures to reduce smoke pollution in buildings;
- compliance with the rules of labor protection and safety in the performance of assigned tasks.

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