

FIRES IN TECHNOSPHERE AND PRINCIPLES OF PROTECTION AGAINST THEM

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***Annotation.** The article describes fires in the technosphere and their causes, preventive and technical measures against fires, factors affecting the human body, and fire suppression methods. Fire-resistant materials are analyzed, ways to increase the level of fire resistance of buildings and structures are shown. The main problems of fire detection in high-rise residential buildings, the procedure for using automatic fire detection devices and fire extinguishing equipment and their use are presented.*

***Key words:** technosphere, fire, harmful and dangerous factors, fire prevention, technical measures, heat energy.*

INTRODUCTION

Fire substances, materials and gas-air mixtures are characterized by uncontrolled, unauthorized burning outside of a special source and cause significant material damage, damage to people, objects and traffic. The presence of combustible materials, synthetic products and various household appliances in the elements of the technosphere, on the one hand, increases the probability of fire, and on the other hand, makes even the smallest fire dangerous for people's lives and health. Synthetic materials emit toxic gases during combustion. Nearly 90 percent of fire deaths across the country occur in residential buildings. 76% of them were poisoned by combustible products, and 19% suffered thermal injuries from high temperatures. 32.4 percent of all fires occurred due to violations of the rules for the use of electrical appliances and household appliances. Arson accounts for 10.2 percent of all fires in public buildings. The risk of death due to fires is approximately 8×10^{-5} people per year, and the probability of death is observed up to 10^{-6} [11]. Statistics show that in a fire, people suffer from thermal burns, carbon monoxide poisoning, bleeding, and mechanical injuries as a result of not knowing how to start a fire and how to protect themselves in the initial phase. For this reason, every citizen should know what to do in the event of a fire and know the simplest and most basic ways to start a fire. (water, sand, any dense fabric, special fire-fighting agents). From this point of view, the relevance of the information presented in this article is important for the population.

RESEARCH METHODS

In the research process, the analysis of scientific and teaching-methodical literature, pedagogical observation, comparative analysis, generalization, pedagogical experiment-test and foresight methods were used.

RESEARCH RESULTS AND DISCUSSIONS

Fires cause various accidents due to their dangerous and harmful factors. These factors include open fire, high temperature of the environment and objects, burning of toxic substances, smoke, reduction of oxygen in the air, collapse of building structures; Examples include shock waves, projectiles, and debris from an explosion.

The following factors can cause fires to spread widely.

- negligence of fire safety regulations;
- not being careful with open fires;
- non-compliance with the rules of use of production equipment;
- spontaneous combustion or ignition of materials due to non-observance of technical safety rules in the storage of substances and materials;
- lightning discharge from static electric charges;
- lightning currents caused by electric charging of the atmosphere;
- low-quality design, construction and use of buildings and structures;
- cases of intentional arson.

In addition, there is still a risk of fires in residential buildings caused by children leaving them unattended and smoking in apartments. In general, 52 percent of the fires that occurred in residential areas are external. Therefore, young children should not be left unattended, they should not be allowed to light matches, turn on electric heaters, and turn on gas. The area covered by fires is conditionally divided into 3 zones: active combustion (fire source): heat effect: smoke generation. [8]. External signs of an active fire zone include the presence of fire in the area, as well as burning or hot materials. The fatal effect of this is the temperature that occurs during combustion. At this time, the internal temperature for buildings is up to 800-900°C, external fires: 1200-1350°C for flammable gases, 1100-1300°C for liquids and 1000-1250°C for solids, the maximum temperature during combustion of electrons, magnesium is 2000 It can rise to -3000 °C.[9].

Intensity of heat flux and increase in air temperature have a toxic effect on people as a result of skin, respiratory tract burns, release of chemical compounds (from 50 to 100) from their products. Carbon monoxide (SO) and carbon dioxide (SO₂) are the most toxic and common substances in a fire [6]. The danger of carbon monoxide (SO) is that it dissolves 200-300 times better than oxygen in blood hemoglobin and forms carboxyhemoglobin HbCO. As a result, there is a lack of oxygen in the body.

Fire-resistant materials (brick, reinforced concrete) are the least dangerous in terms of fire, but buildings made of wooden structures pose the greatest risk. In addition, the use of combustible heat and soundproof materials, especially polymer materials, is extremely dangerous. According to statistics, it is found that about every tenth fire in residential buildings, especially in private and additional buildings, occurs as a result of improper use of stoves. For this reason, the implementation of legal, technical and preventive measures on fire safety in economic sectors and among the population is one of the country-level issues. Fires can be prevented or significantly reduced with the help of effective preventive measures, first of all, such work should be carried out among children and young people. Fire is cruel, but people who are prepared for this natural disaster, even with simple fire extinguishers, can fight it and win. It is not for nothing that our ancestors did not ask for the assumption that the fire can be extinguished in the first minute with a glass of water, in the second with a bucket, and in the third with a reservoir.

Special liquids are used for fire protection, with which wood and fabrics, heat-resistant paints, plasters, etc. are impregnated. The action of fire-resistant compounds is based on the isolation of the protected object from the effects of high temperatures. Usually, such measures do not prevent fire in fire conditions, but protected materials increase fire resistance. Even the use of steel load-bearing structures does not prevent fire damage under conditions of prolonged exposure to high temperatures [4]. For example, wood is protected from fire by flame retardants (fire-resistant substances such as aluminum hydroxide, magnesium; phosphate, polyphosphate ammonium; salt molybdenum, vanadium, germanium) and the outside is covered with a matte coating (alibaster, cement, etc.). To prevent short circuits that can cause fire, the electrical wires are insulated and the wires are laid only on non-combustible substrates. It is not allowed to create stocks of flammable and combustible liquids, as well as substances prone to spontaneous combustion and explosive. Existing ones should be stored in closed containers, away from heating devices, not shaken, not affected by impact, especially when using household chemicals, you should be careful not to throw them in the garbage, not to heat mastics, varnishes and aerosol cans on an open fire, not to wash clothes in gasoline and follow other simple rules. required to do. It is not recommended to install electric heating devices near flammable objects. It is forbidden to overload the electrical network or leave switched-on electrical equipment unattended; Their operation must be carried out in strict accordance with the requirements of the instructions and manuals.

It is prohibited to block entrances to buildings, roads to fire hydrants, and lock common corridors and doors of multi-story buildings (administrative buildings). Fires

can be prevented or their consequences minimized by monitoring the operation of fire automatic devices and fire fighting equipment, keeping smoke removal systems and fire fighting equipment in good condition [2,3].

The fire curtain has a fire resistance limit of at least 1 hour, the curtain is made of heat-insulated, non-combustible materials that do not emit harmful decomposition emissions. Covered halls of auditoriums and sports facilities with a seating capacity of up to 1,500, conference halls, walls and ceilings are decorated with non-flammable materials, in these halls with a seating capacity of more than 1,500, library and archive storage rooms, as well as service catalogs and inventories in archives, finishing is made only with non-combustible materials is carried out [11]. Fire-resistant roofing tiles are divided into three types: if the degree of fire resistance is not less than 2.5 hours, it is type 1, if it is 1 hour, it is type 2, and if it is equal to 0.75 hours, it is type 3. They are made of non-combustible materials and serve to ensure that the fire does not spread through the floors of the building during the period of fire resistance required by the standard [10]. The increase in the volume of construction of extremely high residential buildings and their fire protection issues are becoming even more urgent. Fire hazard of high-rise residential buildings. buildings used for other purposes are created in them. (trade establishments, communications, communal services, public catering, etc.). In high-rise buildings, fire moves rapidly vertically toward stairwells and elevator shafts. For this reason, rescue operations are characterized by complexity. The speed of their vertical spread can be 10 m per minute or more. Within a few minutes, the building will be completely covered with smoke and it will be difficult to breathe. The heaviest smoke occurs on the upper floors. It should also be added that the factor that significantly increases the risk of fire in high-rise residential buildings is that the fire is detected too late due to the lack of appropriate fire automatic systems. The group of public buildings includes many cross-sectoral buildings that differ in the number of people they have, the amount of fire load, as well as the nature (mode) of operation. In addition, the listed characteristics require a differentiated approach to solving fire safety issues in each of them.

Factors that cause people's death include the fact that public buildings are saturated with materials that emit extremely dangerous substances (H1, HN, etc.) during combustion, as well as the increase in the number of different energy sources. In terms of the causes of fires in public buildings, in recent years, on average, the main place is occupied by fires caused by careless handling of fire (36.5 percent).

In terms of ensuring the protection of material assets located in the building, it is necessary to take into account not only the amount of expected material damage, but also the social significance of losses that may occur as a result of fire. This applies

primarily to buildings of museums, archives, libraries, as well as historical and architectural monuments. Undoubtedly, the methods of quantitative assessment of the fire risk of public buildings should take into account the combustion processes in the building and the methods of evacuation of people, as well as the factors describing the probability of emergency situations. Smoke poisoning is still the leading cause of death.

In case of fire, it is necessary to immediately leave the building using the main and emergency (fire) exits or stairs, and report to the fire service as soon as possible. If there is an opportunity, it is necessary to try to extinguish the fire at the initial stage using available means (fire extinguishers, internal fire hydrants, blankets, sand, water, etc.). It should be remembered that the fire in the elements of the electrical supply cannot be extinguished with water. For this, first of all, it is necessary to remove the existing tension, and then try to start the fire. If all efforts are in vain and the fire has spread, it is necessary to take measures to leave the building immediately after taking all safety measures.

When rescuing victims from a burning building, it is recommended to cover the head with a wet blanket (coat, raincoat, thick piece of cloth) before entering it. A fire can be extinguished by carefully opening the door, crawling or crouching in a very smoky room and breathing with a wet cloth, throwing a blanket (coat) over a person whose clothes are on fire, and stopping the air flow to prevent the flash of flames from the rapid influx of fresh air into smoky rooms. After removing the victim, it is necessary to give him first aid and bring him to the nearest medical facility [5].

Fire extinguishers play a key role in fire protection of buildings and structures. Firefighting equipment includes (sand, water, blankets, blankets, etc.) and standard (fire extinguisher, ax, hook, bucket). Designed for fire extinguishing with fire extinguishing foam: chemical (OP fire extinguishing agents) or air-mechanical (OVP fire extinguishing agents). They are not used to extinguish various substances and materials that burn without air and electrical installations under voltage.

A fire alarm system is a set of technical tools designed to detect fire factors, fire alarms and create, collect, process, register and transmit other information in a certain form. Fire alarm system, depending on the type of active substances, automatic fire extinguishing systems can be gas, powder, foam, aerosol. For example, "bubble" - water supply under high pressure. It is ideal for the protection of oil product warehouses. "Powder" is represented by spraying a special powder in enterprises with high-tech electrical equipment. The aerosol is easy to use. autonomous, does not require additional devices, is easy to assemble and is safe for people.

CONCLUSION

It follows from the presented material that fires are not limited to the destruction of material wealth, they cause serious damage to human life and health and pollute the environment. The faster society, science and technology develop, the more relevant the problem of fires and fire safety remains. Just as man is not completely protected from dangers, he is also not completely protected from fire. Because, as long as a person manages any technique and technology, he makes some mistakes that cause fires. Only we can minimize the risk of fires in the technosphere and reduce its losses. It is the duty of every citizen to observe the rules of fire safety, to fight against fire, to take precautionary measures and to know fire protection measures, to take care of one's own life and that of others.

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