

Interior hydrants - approach

Hidranți interiori - mod de abordare

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DOI: 10.37789/rjce.2024.15.4.10

Abstract. *The paper signals aspects regarding the functional efficiency of the interior fire hydrants provided by the whole water source, power supply network and the H_{ii} system/installation.*

Key words: interior hydrants fire range

1. Introduction

Burning [1], also called combustion [benga], is a chemical reaction with heat release (external) between a fuel (solid, liquid, gaseous) and air-oxygen from the air- (oxidizing agent), it can also be light generators (flame).

Fire is a self-maintained burning process, carried out without control (the case of burning controlled “guilty” by human development/progress, energy generator, but also by disputes at present). The causes of a fire, conditioned by the existence of a combustible material of an oxidizing agent (air practice) and a „surse” (external or own) triggering, the, can be (with reference to constructs):

- a) Open fire supervised;
- b) Of a technical nature - short circuits, cooking appliances, stoves, boilers, soldering appliances, cutting, welding, etc;
- c) Self-ignition;
- d) Natural (globular lightning);
- e) Negligence (cigarettes, etc.).

All fires (regardless of their kind/type) are generating danger for:

- a) Man, through burns, asphyxia, poisoning with the products of burning;
- b) Environment, by pollution;

c) Company, through the damages produced for individuals, legal entities, patrimony assets, etc.) due to fire, but also to the restoration/removal of the “tracks”, respectively to interventions.

Preventing fires is a general obligation [2], valid for all (from simple citizen to specialist and decision-making personnel) for all situations where the presence of the material was combustible, the oxidising agent and the trigger source are likely to be met. If, however, the fire is initiated, its extinguishing is the duty of all, depending on „position” of each and/or the duties they have.

2. Content of the paper/approach to the work

For buildings, fire prevention and control is from the moment of conception, respectively of the design to which the architect contributes by providing the functionality of the materials (depending on the destination), then the structurist by ensuring the strength and stabilization and finally (but not after all) the installer by predicting the types of installations and their operation mode, the, Their insurance involves a real collaboration between the three specialists, based on knowledge and compliance of the legislation, technologies and materials available and, only in the end, on the economic and financial aspect, having, constantly in view of the beneficiary/user, that is, the man.

The fire intervention methods are multiple, depending on the needs dictated by the destination and the functionality of the building and the combustible material and/or exposed to fire.

In the work is approached a particular case, that of the interior hydrants (combustible materials „enable”, as water extinguishing agent) to combat/extinguish fires. Fire (complex combustion process as progress and effects due to the factors that determine it) has an evolution characterized by the phases:

- a) Initiation/occurrence of the outbreak;
- b) A slow burning (smoldering);
- c) Development („seize power”);
- d) Intense/generalised/stabilised burning;
- e) Regression/slow extinguishing.

Indoor hydrants are mainly used because water is used in the form of compact jet or spray jet, due to its large heat absorption capacity/reducing the temperature in the burning area and „choking” fire through „curtain” vapor created. The compact jet is used to dislodge some building elements thus isolating part of the building from flame/fire. The provision of installations with internal hydrants [3] is of limitations and localization, fire extinguishing, respectively cooling of the building elements, dilution and dispersion of hot smoke and flue gases) aiming at the protection of people, and, goods in the fire area, as well as intervention personnel.

3. Installations with internal hydrants

Construction/buildings and their fire compartments with their premises and facilities, classified according to fire safety scenarios, when in case of fire, the water is allowed and the interior hydrants are considered, it is necessary to make/exist a specific system/installation.

Indoor fire-fighting installations with internal hydrants [4] can be:

- a) Common to indoor cold water supply facilities, requiring the elimination of stagnation of water in the network by linking the oval end to a water consumer (sanitary object with frequent use, the, idem for an installation, or the creation of a fictitious/recircular consumer); the water source in this case is common, the public network or the own source (drilled well, etc.) of the building;
- b) Separate/unique, the water source may be the public network, fire-fighting water tank (ensuring pumping operating pressure or, less often gravitational) – measures to avoid stagnation of water remain valid.

Basically, the fire-fighting installations with internal hydrants consist of:

- a) Water supply network, branched, ring or mixed, function of concrete/objective situation;
- b) Functional system of interior hydrants, which involves the establishment of:
- c) (each consisting of connecting piece, tap, discharge hose, discharge pipe, hose winding hose reel, metal box/niche) taking into account the protected lens;
- d) (set for known objectives in detail (including „space furnishing”) or only „in principle” (with the possibility of change „furnishing”).

Obs. The H_{ii} number and the R range are taken into account and based on knowledge of situation plans and hydraulic characteristics, hydrant types, etc, that is, taking into account the combustibility characteristics of the materials requiring the number of simultaneous fire fighting/extinguishing jets, as well as the operating time.

The facilities with fire extinguishing/combatting systems have as purpose:

- Preventing/preventing the onset of large fires;
- Ensuring the conditions for the rescue of persons and goods;
- Stopping propagation (protection) in adjacent spaces of incendiils.

The efficiency of the H_{ii} system shall be ensured also taking into account the functional ensemble – water source, network, indoor hydrant system.

The water source has its specific particularities.

- If the water source is public network, the pressure is not known, is „assumed” (value given „cover” by the water distributor);

When the water source is a water tank from which, by pumping, the internal hydrants are fed, the variation of the flow and pressure (in the end, the water supply, la H_{ii}) is influenced by the characteristics of the pump and the grid (the intersection of the two determines the finishing point). It is important to know how to ensure water in the tank.

The stagnation of water leads to the degradation of qualitative characteristics (physical, chemical, biological, bacteriological and organoleptic sensibles). For recirculation it is recommended to know the whole of the water consumers of the general objective (building, building etc.).

The network has its route „forced” of objective/beneficiary (arrangement of premises, space, the nature of the materials, equipment, installations, activities related to them and the size of the fire compartment can be branched, ring or mixed). Changes/changes (imposed to change the space destination) of the flow will proceed, as appropriate, to the corresponding modification of the parameters.

For the H_{ii} installation of special importance, in the functional context, it must be given to the determination of the range, defined by the length of the compact water jet and the horizontal protection of the length of the hose „unfolded” [5]. The length of the compressed jet is chosen/set according to the flammability and the calorific value of the materials that can generate the fire (not from the „generosity” the designer. Horizontal hose projection ($L_{fc}=\alpha L_f$; $\alpha=0,5\div 0,9$; account shall also be taken of „obstacles” technology/furniture positioning).

Positioning/placement of the H_{ii} requiring two jets may have, depending on the size and shape of the protected fire space/compartment and its furnishing, solution:

- a) in series or in doubling (Fig. 1)

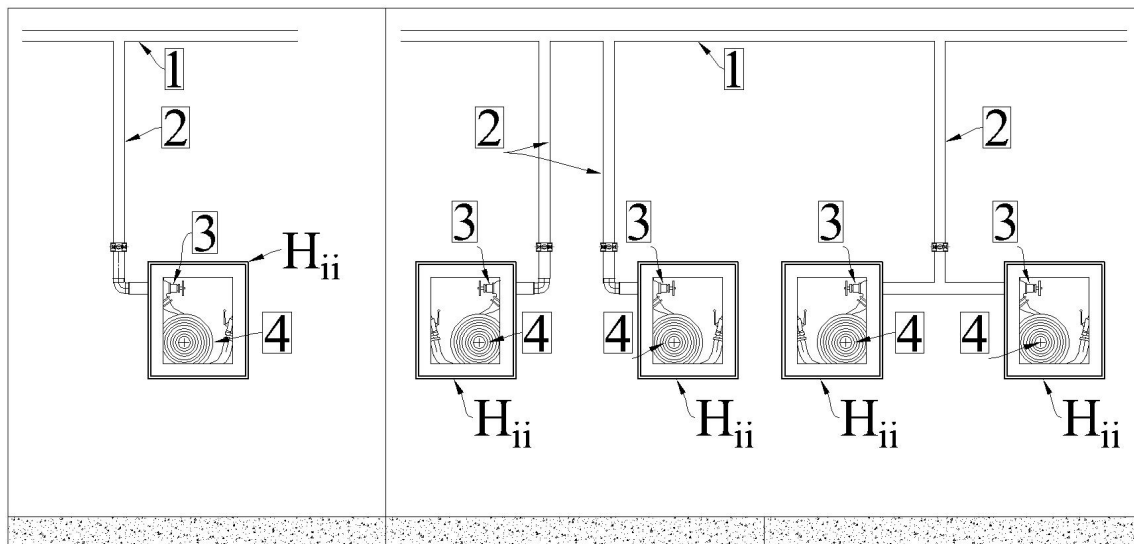


Fig. 1. Solution in series or in doubling
1-network/column; 2-connection; 3-valve; 4-hose

In the design it is indicated to take into account the most unfavorable situations and data, namely the type of interior hydrant (hose connection part, hose type – flat/semi-rigid – discharge pipe, the type of the interior hydrant (hose connection, the type of the hose flat/semi-rigid, specifying nominal diameters, minimum and maximum debits, minimum/working pressures, maximum/breaking), by researching the

manufacturer's declaration of conformity (received from the certified distributor of products).

In case of interventions in existing networks (change of space destination and/or of the beneficiary with specific activities) there may be situations of changing the mounting position, a supplementing or reducing the number of H_{ii} and requiring a comparative analysis of the existing situation with the new one required, which will decide on the chosen variant (newly needed).

It is recommended to inform on the maintenance of the existing installation – maintenance, revisions, repairs [6].

4. Conclusions

The first and most important measure to combat fire is its prevention, In the case of buildings follows the rapid intervention of extinguishing/locating the fire by calling – as appropriate/endowment – to foam extinguishers or interior fire hydrants.

Preventing fires through measures/actions to prevent the initiation and spread of fire also means ensuring conditions for saving people and goods. The first step in fire prevention is made by the entrepreneur (be it how „simple”) followed by the designer and the executor of the building who must comply with the principles and regulations in force, helped by the certified bodies in whose duties are (and) market surveillance of equipment, installations, materials. The next step (maybe the most important) is fire prevention education, but also first intervention in case of outbreaks.

Interior hydrants, when they can be used, it is desired to provide the necessary extinguishing intensity, at the site of the fire, and, this is achieved through a well-defined functional system with a (safe) water supply network and a hydrant system that meets the requirements (number, number, range extinguishing flow) efficiency.

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