

TCVN 5760 : 1993

**FIRE - EXTINGUISHING SYSTEM
GENERAL REQUIREMENTS OF PROJECT,
INSTALL AND UTILIZE**

(This English version is for reference only)

HANOI –2008

Foreword

TCVN 5760 : 1993 was prepared base on the following standards:

ISO 8421-4 : 1990 Fire extinction equipment. Vocabulary

ISO 3941 : 1977 Classification of fires

CEB 5236 : 1985 Fire extinction means. Terms and definitions

CEB 5637 : 1985 Fire extinction means. Classification of fires

TCVN 5760 : 1993 was prepared by Fire protection and Fire fighting Department – Ministry of Home Affairs, proposed by the Directorate for Standard, Metrology and Quality, and issued by the Ministry of Science, Technology and Environment (now renamed as Ministry of Science and Technology).

This standard was transferred in 2008 from Vietnam standard into Vietnam National standard under the same identifier number, as stipulated in Section 1, Article 69 of the Law on Standards and Technical Regulations and in Point a, Section 1, Article 6 of Decree No 127/2007/ND-CP of the Government dated 01 August 2007 detailing the implementation of a number of articles of the Law on Standards and Technical Regulation.

Fire-extinguishing system – General requirements of design, installation and utilize

This standard applies to design, install and utilize fire-extinguishing systems equipped for works (plants, factories, stores, offices, buildings...)

1. Terms and definitions

1.1 Fire extinguishing system is a combination of specialized technical equipments, pipelines and extinguishing media used to stamp out fires.

1.2 Fixed extinguishing system is a system installed fixedly.

1.3 Semi-fixed extinguishing system is an extinguishing system having a part is installed fixedly and the other part shall be installed when firefighting.

1.4 Automation extinguishing system is an extinguishing system which is automatically control when fire occurring.

1.5 Manual extinguishing system is an extinguishing system that is control by hand.

1.6 Volumetric extinguishing system is an extinguishing system that creates an environment not maintaining fire in the volume need to be extinguished

1.7 Space extinguishing system is an extinguishing system used to vomit extinguishing medium all over the burning materials.

1.8 Water extinguishing system is an extinguishing system using water as extinguishing medium.

1.9 Space extinguishing system is an extinguishing system using foam as extinguishing medium.

1.10 Powder extinguishing system is an extinguishing system using powder as extinguishing medium.

1.11 Gas extinguishing system is an extinguishing system using gas as extinguishing medium.

1.12 Vapour fire extinguishing system is an extinguishing system using vapour as extinguishing medium.

1.13 Sprinkler fire extinguishing system is a system with closed spraying heads always in permanent regime that will be opened when the specified temperature be reached, this system only extinguishes locally on a designated area.

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1.14 Drencher fire extinguishing system is a system with open spraying heads, when having fire all over the area below, the extinguishing medium shall be sprayed from spraying heads.

1.15 Wall fire extinguishing system is a system installed on the wall inside works.

1.16 Control unit is equipments control system's operation

1.17 Extinguishing medium supply and storing unit is the equipments used to contain and transfer extinguishing medium.

1.18 Extinguishing medium distributing unit is a combination of technical equipments used to divide and conduct the extinguishing medium.

2. Classification of fires

2.1 Depend on state of products and material on fire, the fires are classified into 4 categories: Fires involving solid materials are signed with A, fires involving liquids are signed with B, fires involving gases are signed with C and fires involving metals are signed with D. Each kind of fires is also classified into groups in order to ensure high effectiveness when operating a fire extinguishing system.

2.2 Kinds and groups of fires are specified in Table 1.





Table 1

Sign of kinds of fires	Character of kinds	Sign of group of fires	Character of groups
1	2	3	4
A	Fires involving solid materials	A1	Fire involving solid material with smouldering process (Example: wood, paper, dry grass, straw, coal and textile products)
		A2	Fire involving solid material without smouldering process (Example: plastic)
B	Fire involving liquids	B1	Fire involving water insoluble liquids (example: ether petrol, petroleum fuel); fire involving liquefiable solids; (example: paraffin).
		B2	Fire involving water soluble (example: alcohol. Methanol. Glycerin)
C	Fires involving gases (Example: Methane, Hydrogen, Propane...)		

D	Fires involving metals	D1	Fires involving light metals (example: Aluminium, magnesium and their alloys)
		D2	Fires involving alkali and other metals (example sodium, potassium)
		D3	Fires compound containing metals (example: metal organic compound, metal hydrides).

2.3 The symbols of types of fires used to choose the fire extinguishing equipments and tools suitable to each type of fire. Each fire extinguishing equipment and tool shall be attached an appropriate symbol as required. The symbols of types of fire are given in Table 2.

Table 2

Type of fire	Fire type symbol (black figure, white letters)
A	
B	
C	
D	

NOTE: It is needed to stamp up all specified adequately to equipments and tool used for different kinds of fires.

3 Requirements of design

3.1 When design a fire extinguishing system, it need to base on kinds of fires, fire dangerousness and weigh of material in the work and fire-extinguishing effectiveness of the systems.

Fire-extinguishing effectiveness when design a system is given in Table 3.

Table 3

Extinguishing medium	System	Effectiveness when extinguishing kinds of fires							
		A		B		C	D		
		A1	A2	B1	B2		D1	D2	D3
Water	Wall Sprinkler Drencher	++		-		-	-		
Foam	Light foam	++		+	-	-	-		
	Heavy foam Average foam	+		++	+	-	-		
Gases	CO ₂	-		++		+	-		
Powder	BC powder	-		++		+	-		
	ABCD powder	+				++	++	-	

- NOTE: “++” - Very effective
 “+” - Suitable for extinguishing
 “-“ - Not suitable for extinguishing
- Light foam - Foam with high expansion ratio
 Average foam - Foam with average expansion ratio
 Heavy foam - Foam with low expansion ratio
 BC powder - Powder used for extinguishing of fires singed B, C
 ABCD powder - Powder used for extinguishing of fires singed A, B, C and D.

3.2 A fire extinguishing system consists of:

- Alarm unit
- Control unit
- Firefighting agent supplying and storing unit
- Firefighting agent distributing unit, discharger
- Piping system
- Power supply

Manual fire extinguisher and semi-fixed fire extinguishing system can be equipped with fewer components if considered not necessary

3.3 It is required to ensure flow of firefighting agent which depends on kind of that agent itself, inflammable material, area and volume of fire.

3.4 Fire extinguishing system should be ensured to provide enough pressure into firing area.

3.5 Extinguishing medium supplying and storing unit should be ensured to work consistently and have proper storage for each kind of fire extinguishing system as in TCVN 2622-78 and TCVN 5307-1991.

3.6 Extinguishing medium distributing unit and discharger should be ensured to discharge evenly and fully expellant and firefighting agent on firing surface and discharge with proper ratio for firing volume.

3.7 It is required to use discharger suitable with each fire extinguishing system.

3.8 Alarming system should be ensured to work normally and should be in operation when there is a fire.

3.9 Power supplier should be ensured to provide enough power for the system. It is required to have a backup power supplying system to use in case the main supplier is stopped.

3.10 When designing a fire extinguishing system for a work, it is required to have following items:

- Description of structure and operating principle of the system;
- Specifications;
- Documents for estimating and defining technical specifications;
- Instructions for monitoring and checking of the system function and instruction for technical maintenance;
- Technical drawings.

3.11 It is required to consider all structure characteristic of the construction work when designing the fire extinguishing system to ensure for the effectiveness of the system.

3.12 SPRINKER fire extinguishing system is only designed for those constructions of which the ceiling or roof height is equal or less than 10m. It must be sure that the distance from nozzle and discharger to firing surface or firing material is equal or over than 0.5m.

3.13 DRENCHER fire extinguishing system can be applied for constructions with unlimited height of ceiling or roof. It is required to divide firing surface into different areas when designing DRENCHER system.

3.14 When designing fire extinguishing systems using foams or gas, ability to discharge excessive foam or gas should be put into consideration to decrease odd pressure for the construction.

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3.15 Firefighting agent storing and supplying unit can be designed indoor or outdoor depending on specific condition of the construction.

4 Requirement of install

4.1 Installation or change of the system is only made under instructions specified in designing document which is approved by the firefighting department.

4.2 During installation of the system, it is required that all equipments are tight and solid especially those in systems already containing pressure.

4.3 Outdoor firefighting agent supplying and storing unit should be covered from rain or sun.

4.4 Once completion of the system, it is required to test and assess the system quality and all specifications should be noted in documentation.

5 Requirement of utilize

5.1 It is only permitted to use those fire extinguishing systems having sufficient quality and specifications as in designing documents

5.2 There should be a working diary for each system and this document should only managed by the operator.

5.3 All fire extinguishing systems should be periodically maintained as instructed by the manufacturer. Fixing and replacing of any components of the system should only be implemented as instructed.

5.4 Fixing and replacing should also be implemented quickly after the system is used in real fire or in practicing activities if the manager consider necessary.

5.5 Operator of the system should have certain knowledge and should learn carefully about the operation procedure of the system.

5.6 It is responsibility of the operator to regularly check and test the system as specified in guiding documents of the manufacturer and other related documents. He/she should immediately inform relevant authority about damages or detects of the system to have timely solution.

5.7 Those in charge of maintaining, fixing or replacing any parts of the extinguishing system should be skilled and selected by relevant authority.