

# What are fire safety rules, and why are there compliance challenges? | Explained

*What fire safety compliance is needed in buildings, including multiplexes and hospitals? What does the National Building Code specify? What are the hurdles?*

Updated - May 26, 2024 05:30 pm IST Published - May 26, 2024 05:29 pm IST

SUMEDA



Firefighters carrying out cooling operations at TRP game zone at Rajkot, Gujarat on May 26, 2024. | Photo Credit: Vijay Soneji

**The story so far:** The recent fire tragedies at a gaming zone in Gujarat's Rajkot and a children's hospital in Delhi, claiming the lives of at least 40 people in a span of 24 hours, have shifted the spotlight on fire safety regulations and the need for stringent enforcement of safety measures, particularly in buildings vulnerable to man-made disasters.

According to the latest Accidental Deaths and Suicides in India (ADSI) report, released by the National Crimes Records Bureau (NCRB), as many as 7,435 people were killed in over 7,500 fire accidents in 2022. The data indicates that fire accidents continue to cause heavy casualties, with no lessons learnt from the 1997 Uphaar Cinema tragedy or the Kumbakonam fire that killed 90 schoolchildren in 2004.

As commercial establishments, public buildings, and residential complexes continue to flout basic safety norms, putting lives in danger, a look at precautions, procedures, and measures in place to minimise the risk and ensure the safety of individuals and property in the event of a fire.

### ***Timeline / Fire accidents since Independence***

## **Does India have a model code for fire safety?**

The National Building Code (NBC) serves as the central standard for fire safety in India. It was published by the Bureau of Indian Standards (BIS) in 1970 and last updated in 2016. As a model for adoption for all agencies involved in building construction, the Code mainly provides detailed guidelines regarding the general construction requirements, maintenance and fire safety of buildings. Instructions on fire safety are mentioned in detail under Part 4 of the Code which deals with safety from fire.

The NBC is a “mandatory requirement” for State governments to incorporate the NBC recommendations on minimum fire safety and rescue measures into their local building bylaws. This is because the fire services is a State subject, included as a municipal function in the 12th Schedule of the Constitution.

State governments are responsible for fire prevention and ensuring the safety of life and property by implementing safety measures through the State Fire Services Act or building bylaws.

The ‘Model Building Bye Laws 2016’, issued by the Ministry of Housing and Urban Affairs, guide the States and UTs to frame their respective building bylaws. The Model also prescribes norms for fire protection and safety requirements. Besides these, the National Disaster Management Authority (NDMA) has also laid out guidelines on fire safety at homes, schools and hospitals. Along with elements of the NBC, the NDMA

mentions instructions on maintaining minimum open safety space, protected exit mechanisms, dedicated staircases, and crucial drills to carry out evacuations.

## What fire safety rules say?

The National Building Code mentions that while absolute fire safety is not attainable in practice, specifies measures can be taken to provide the degree of safety from fire which can be “reasonably achieved.”

The Code specifies the demarcation and restrictions on the construction of buildings in fire zones. For instance, residential areas, and educational and institutional buildings fall under Fire Zone 1. This is done to ensure that industrial and hazardous structures do not coexist with residential, institutional and business buildings.

The measures apply to high-rise buildings; special buildings like hotels, educational institutes, businesses, storage and industrial, where any of the structures have a floor area more than 500 square metres on any one or more floors; assembly buildings; buildings with area more than 300 square metres of incidental assembly occupancy on any floor; and those with two basements or more, or with one basement of area more than 500 square metres. Buildings are classified based on occupancy into nine groups. For example: hotels are under Residential ‘Group A’, hospitals are under Institutional ‘Group C’, while ‘Group D’ deals with assembly buildings like marriage halls, night clubs, circus tents, and multiplexes.

It mentions the type of material to be used in construction to reduce the threat of destructive fires and minimise the danger to life before evacuation can take place. “Non-combustible materials should be used for construction of buildings, and the internal walls of staircase enclosures should be of brickwork or reinforced concrete or any other material of construction with a minimum of 120 min rating,” the Code says.

The Code outlines maximum height, floor area ratio, open spaces, and provision of openings in walls and floors to prevent the spread of fire.



**Table 1 Fire Resistance Ratings of Structural and Non-Structural Elements (minutes)**  
(Clauses 3.3.1 and 3.3.2)

SI No.	Structural Element	Fire Resistance Ratings (min) for Type of Construction			
		Type 1 (3)	Type 2 (4)	Type 3 (5)	Type 4 (6)
(1)	(2)				
i)	Exterior walls:				
	a) Fire separation less than 3.7 m:				
	1) Bearing	240	120	120	60
	2) Non-bearing	120	90	60	60
	b) Fire separation of 3.7 m or more but less than 9 m:				
	1) Bearing	240	120	120	60
	2) Non-bearing	90	60	60	60
	c) Fire separation of 9 m or more:				
	1) Bearing	240	120	120	60
	2) Non-bearing	60	60	60	60
ii)	Fire separation assemblies (like fire check doors)	120	120	120	120
iii)	Fire enclosures of exits	120	120	120	120
iv)	Shafts for services, lift hoistway and refuse chutes	120	120	120	120
v)	Vertical separation between adjacent tenant spaces	60	60	60	60
vi)	Dwelling unit separation:				
	a) Load bearing	120	120	60	60
	b) Non-load bearing	60	60	30	30
vii)	Interior bearing walls, bearing partitions, columns, beams, girders, trusses (other than roof trusses) and framing:				
	a) Supporting more than one floor	240	120	120	120
	b) Supporting one floor only	180	90	60	60
	c) Supporting a roof only	180	90	60	60
viii)	Walls supporting structural members	180	90	60	60
ix)	Floor construction	120	90	60	60
x)	Roof construction:				
	a) 5 m or less in height to lowest member	120	90	60	60
	b) More than 5 m but less than 6.7 m in height to lowest member	60	60	60	60
	c) 6.7 m or more in height to lowest member	0	0	0	0

NOTES

1 The above fire resistance rating shall be required to achieve the respective type of construction unless otherwise specified in the respective clauses for different applications/use.

2 In case of lift bank, the partition wall, if any, need not be of fire rating specified in this table.

As far as electrical installation is concerned, the NBC clearly states that it is “desirable that the wiring and cabling are with flame retardant property”. Medium and low voltage wiring running in shafts, and within false ceilings shall run in metal conduit, it adds. “The electric distribution cables/wiring shall be laid in a separate shaft. The shaft shall be sealed on every floor with fire-stop materials having the same fire resistance as that of the floor. High, medium and low voltage wiring running in shaft and in false ceiling shall run in separate shaft/conduits,” the Code reads.

It adds that all metallic items like steel structural members, etc, should be bonded properly to the earthing system.

An emergency power-supplying distribution system should be in place for critical requirements. This includes the provision of exit signage and emergency lighting, a fire alarm system, and a public address system for emergencies.

The Code mentions in detail about types of exit access, exits, escape lighting and exit signage. "Exit access, exits and exit discharge shall be properly identified, with adequate lighting maintained in the elements of the egress systems so that all occupants shall be able to leave the facility safely," it says.

It further recommends technologies that can be incorporated into the system in case of a fire. For example, automatic fire detection and alarm systems, down-comer pipelines connected to a roof tank, dry riser pipelines that fire-fighters can use to douse upper floors, automatic sprinklers and water sprays, fireman's lifts, fire barriers, escape routes and markings.

## The challenges

Fire safety rules exist in all States, with many drawing from the NBC. However, due to the absence of uniform safety legislation and the NBC being a "recommendatory document," its provisions are frequently ignored at the local level. Even mandatory certifications are not complied with. The Code itself mentions that in case of "practical difficulty or to avoid unnecessary hardship, without sacrificing reasonable safety, local head, fire services may consider exemptions from the Code."

Fire safety audits, crucial for ensuring compliance, have been underutilised due to the failure of local bodies to conduct regular checks and enforce compliance. For this, the courts have often pulled up State authorities over their laxity in implementing the fire safety rules. Shortage of staff exacerbates the issue, leading to tragic loss of lives, as in the Rajkot game zone and Delhi hospital fires.

In 2020, the **National Institute of Disaster Management mentioned in a report on 'Fires in India: Learning Lessons for Urban Safety' (2020),** "The apathy of the authorities in taking any action has clearly indicated that little has been learnt from the previous fire outbreaks." "Building community resilience would also have been helpful in avoiding this disaster. Compliance of the building bylaws and planning norms could have easily avoided such a deadly incident and saved many. What we have to ponder here is the state of preparedness we have in terms of fire safety and how seriously the safety norms are being taken," the NIDM report added.

For instance, in the Rajkot case, the accused flouted the norms by setting up the 50-metre wide and 60-metre long structure with the height of around two storey building using metal sheet fabrication. As per the FIR, the accused had not obtained a no-objection certificate (NOC) from the local fire department and did not even have a proper fire-fighting equipment .