

## Fire escapes:



- A **fire escape** is a special kind of emergency exit, usually mounted to the outside of a building or occasionally inside but separate from the main areas of the building.
  - It provides a method of escape in the event of a fire or other emergency that makes the stairwells inside a building inaccessible.
  - Fire escapes are most often found on multiple-story residential buildings, such as apartment buildings.
  - At one time, they were a very important aspect of fire safety for all new construction in urban areas; more recently, however, they have fallen out of common use.
  - This is due to the improved building codes incorporating fire detectors, technologically advanced fire-fighting equipment, which includes better communications and the reach of fire-fighting ladder trucks, and more importantly fire sprinklers.
  - A fire escape consists of a number of horizontal platforms, one at each story of a building, with ladders or stairs connecting them. The platform and stairs are usually open steel gratings, to prevent the build-up of ice, snow, and leaves.
  - Railings are usually provided on each of the levels, but as fire escapes are designed for emergency use only, these railings often do not need to meet the same standards as railings in other contexts.
  - The ladder from the lowest level of the fire escape to the ground may be fixed, but more commonly it swings down on a hinge or slides down along a track.
  - The moveable designs allow occupants to safely reach the ground in the event of a fire but prevent people from accessing the fire escape from the ground at other times (such as a burglary or vandalism).
- **Snorkel Ladder:**
    - A platform or bucket attached onto a mechanically bending arm (or "snorkel") installed onto a fire truck.

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- Can be used for dousing fire and evacuation of people from buildings.



Image showing snorkel ladder on fire engine.

**Dry riser:**



Image showing Dry Riser

- A dry riser is a normally empty pipe that can be externally connected to a pressurized water source by firefighters. It is a vertical pipe intended to distribute water to multiple levels of a building or structure as a component of the fire suppression systems.
- Dry fire main water supply pipe installed in a building for fire-fighting purposes, fitted with inlet connections at fire service access level and landing valves at specified

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points, which is normally dry but is capable of being charged with water usually by pumping from fire and rescue service appliances.

- Dry Riser Systems are installed up to 50m above the Fire Service Access Level
- Dry risers are used when the water pressure of a building wouldn't be enough for fire suppression and in unheated buildings where the pipes could freeze. Dry risers must allow fire engine access within 18 m of the dry riser inlet box.
- Dry risers in occupied buildings must be within a fire-resistant shaft, usually one of a building's fire escape staircase enclosures. The riser is also where the gauges, valves, and alarm devices are located.

### **Wet riser:**

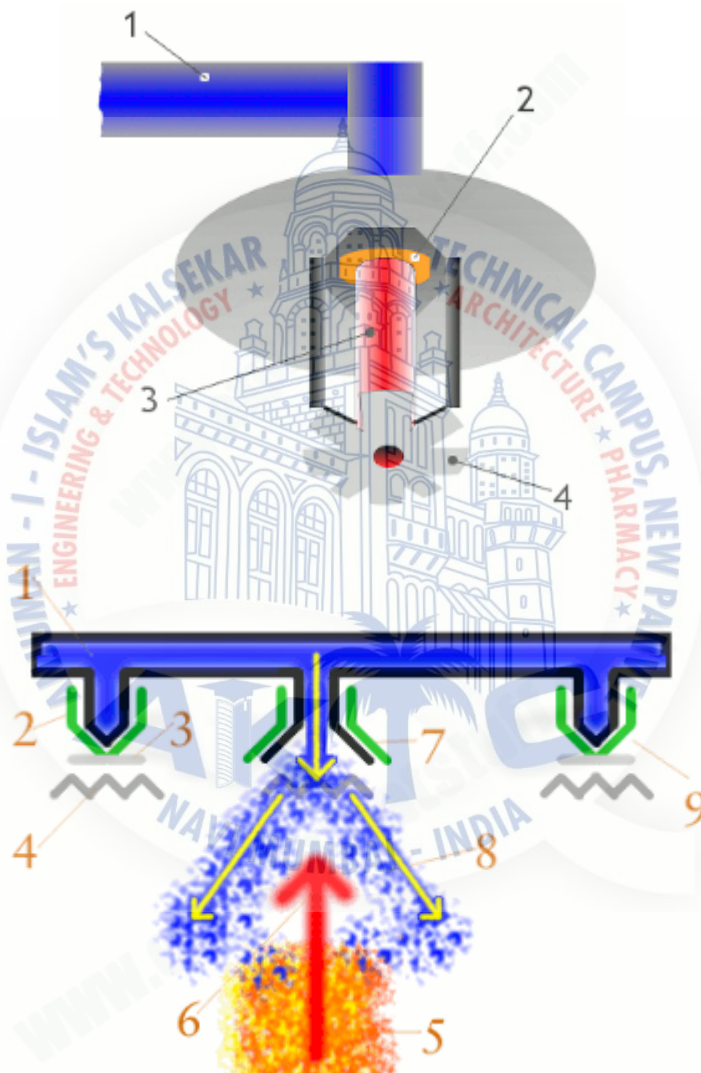
- The only difference between wet and dry riser is that, wet risers are permanently charged with water. This is as opposed to dry risers which do not contain water when they are not being used, but are charged with water by fire service pumping appliances when necessary.
- Wet risers are used to supply water within buildings for firefighting purposes. The provision of a built-in water distribution system means that firefighters do not need to create their own distribution system in order to fight a fire and avoids the breaching of fire compartments by running hose lines between them.
- Generally, a wet riser supply system should be capable of maintaining a minimum running pressure at top outlet at roof level of 4 bar at a flow rate of 22.7 liters/s. The maximum running pressure permitted with only one outlet in operation is 5 bar.
- Wet risers should be within fire-fighting shafts, and where necessary in protected escape stairs. Wet riser outlets, or 'landing valves' may be within in protected lobbies, stairs or enclosures where these are available.
- Wet and dry risers should be inspected and tested regularly to ensure equipment is functioning correctly and ready for use. Problems can be very serious in the event of a fire, and are typically caused by vandalism or theft, blockages or pipework failure or by connection failure or outlets being open.

### **Automatic sprinklers:**



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- A fire sprinkler system is an active fire protection method, consisting of a water supply system, providing adequate pressure and flowrate to a water distribution piping system, onto which fire sprinklers are connected.
- Although historically only used in factories and large commercial buildings, systems for homes and small buildings are now available at a cost-effective price.
- Fire sprinkler systems are extensively used worldwide, with over 40 million sprinkler heads fitted each year. In buildings completely protected by fire sprinkler systems, over 96% of fires were controlled by fire sprinklers alone.



- The array of sprinklers is fed by water pipes in the ceiling (1). Each sprinkler has two spring-like metal arms (2) held together by a slug of the Wood's metal (3). When the Wood's metal is intact, the spring arms are locked together and clamp the water pipe closed so no water can escape. Directly beneath each sprinkler, you'll notice there's a flower-shaped piece of metal called a deflector (4), but it doesn't do anything useful at this stage.

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- If a fire breaks out beneath a sprinkler (5), hot gases swirl upward toward the ceiling (6). When the temperature reaches about 70°C (160°F), the Wood's metal melts, allowing the two metal arms to spring open (7). Water can now escape from the pipe just as it does from an open faucet. It pours down from the pipe in the ceiling, hits the flower-shaped deflector head directly beneath, and falls to the ground in a gentle spray (8) extinguishing the fire.
- In a normal faucet, you turn a screw to open up a valve that allows water to escape. In a sprinkler, the hand-operated faucet is replaced by a heat-sensitive plug designed to open automatically when fire breaks out.
- In some sprinklers, the plug is made of an alloy called Wood's metal, a mixture of bismuth, lead, tin, and cadmium that melts at a relatively low temperature.
- In other sprinklers, the plug is a small glass bulb full of a glycerin-based liquid designed to expand and shatter when it gets hot.
- The basic idea is the same in both cases: the plug is meant to break and open the sprinkler as soon as a fire breaks out.

