



Choosing & Using the Right Fire Extinguisher

Part 1: Fire Classes & How It Works

Learning Series · fire classes, US vs Indian / European codes and how an extinguisher works

PART

1

of 10

1 Classes

2 ABC

3 CO2

4 Water

5 Wet chem

6 Clean

7 Solar PV

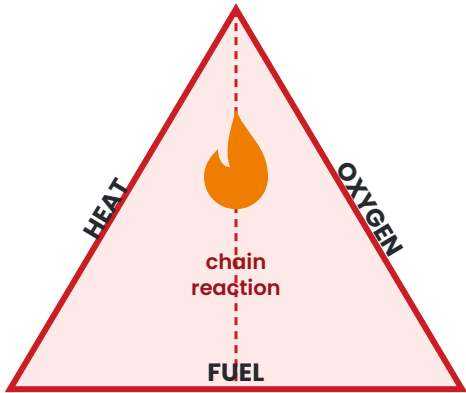
8 Li-ion

9 Placement

10 Use & ITM

1 How a Fire Burns and How an Extinguisher Stops It

- A fire needs **fuel, heat and oxygen**, plus the **chemical chain reaction** in the flame (the fire tetrahedron)
- Every extinguisher removes at least one side: **cooling** (water, wet chemical), **smothering** (foam, CO₂, wet-chemical blanket) or **breaking the chain reaction** (dry powder, clean agents)
- The agent is pushed out by gas: **stored pressure** (gauge on the valve), a separate **cartridge**, or the agent's own pressure (CO₂)
- Portable extinguishers are a **first line of defence** for fires of limited size, so we match the **agent** to the **fuel**



READING THE RATING ON THE LABEL

US (NFPA 10 / UL): e.g. **3-A:40-B:C**. The number before A or B shows relative effectiveness; C, D and K carry no number.

India / Europe (IS 15683 / EN 3): e.g. **13A 75F**. The number is the size of the standard test fire (75F = 75 L of cooking oil). The two systems are **not interchangeable**.

2 Fire Classes: US vs India / Europe

NFPA 10 (2026) · IS 2190:2024 · EN 2

What is burning	NFPA 10 class (US)	IS 2190 / EN 2 class
Ordinary solids wood, paper, cloth, rubber, many plastics	A	A
Flammable liquids petrol, diesel, solvents, paints, wax	B	B
Flammable gases LPG, natural gas, propane, acetylene	B (gases are Class B)	C
Live electrical equipment panels, motors, wiring, IT	C	no class: electrical hazard
Combustible metals magnesium, titanium, sodium, lithium metal	D	D
Cooking oils & fats deep fryers, woks, griddles	K	F
Lithium-ion batteries phones, e-bikes, EVs, battery storage	no class	no class

IS 2190:2024 lists Classes A, B, C (gases), D and F. Neither NFPA 10 nor IS 2190 has a lithium-ion battery class: "Class L" is not an official class (Part 8). Electrical fires are classed by the material burning; the extinguisher must be suitable for live electrical use.

3 Quick Match: Agent vs Fire

Agent	A	B liquids	Gas (EU C)	Live electrical	D metals	K / F oils
Water (jet / spray)	✓	✗	✗	✗	✗	✗
Water mist (listed)	✓	✗	✗	!	✗	!
Foam (AFFF / F-free)	✓	✓	✗	✗	✗	✗
ABC dry powder	✓	✓	✓	✓	✗	✗
CO ₂	✗	✓	✓	✓	✗	✗
Clean agent	!	✓	✓	✓	✗	✗
Wet chemical	✓	✗	✗	✗	✗	✓
Class D powder	✗	✗	✗	✗	✓	✗

✓ suitable ✗ do not use
! only if the label lists it (e.g. a clean agent with an A rating, a water-mist unit tested for electrical use or class F)

GAS FIRES

Shut off the gas supply first. Putting out a gas flame without isolating the leak can lead to an explosive cloud.

General guide from NFPA 10 Annex H and the IS 2190 / BIS selection tables. Always follow the classes and ratings printed on the actual extinguisher.



Choosing & Using the Right Fire Extinguisher

Part 2: ABC Dry Powder

Learning Series · multipurpose mono-ammonium phosphate powder: uses, limits, sizes and ratings

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2 ABC

3 CO2

4 Water

5 Wet chem

6 Clean

7 Solar PV

8 Li-ion

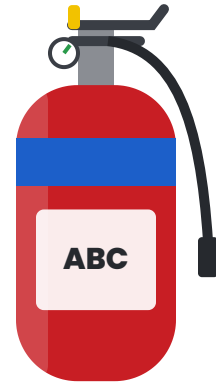
9 Placement

10 Use & ITM

1 What It Is

NFPA 10 · IS 15683 · IS 2190

- A fine powder, usually **mono-ammonium phosphate (MAP)**, driven out by nitrogen or dry air (stored pressure or cartridge)
- It **breaks the flame chain reaction**; on Class A fires the MAP melts and forms a crust over glowing embers
- The most common multipurpose unit: **A + B + electrical** (US: A:B:C), and flammable gas (EU/IS Class C)
- In India it is sold by MAP content (e.g. **40 / 50 / 90 %**); higher content generally gives higher ratings for the same size
- **BC powder** (sodium / potassium bicarbonate) is a separate type: B + C only, **no Class A** rating



Band colour: **blue** (EN 3 / UK convention)

USE IT ON

- Mixed Class A and B areas: offices, stores, workshops, vehicles
- Flammable liquid spills, and gas fires **after** the supply is shut off
- Live electrical equipment where residue is acceptable
- Large-capacity units (≥ 4.54 kg, ≥ 0.45 kg/s) for pressurised-gas and 3-D fires (NFPA 10 5.5.4.1–2)

DO NOT USE IT ON

- **Delicate electronics** (NFPA 10 5.5.4.6.2): the residue can corrode
- Deep-fat fryers / cooking oil: use a **Class K / F** unit
- Combustible metals (Class D) or lithium-ion battery packs
- Stores of **chlorine / bromine pool chemicals**: MAP can react (NFPA 10 5.5.4.7.2)

2 Typical Sizes, Ratings, Range & Discharge Time

US size (NFPA 10 Table H.2)	Range	Discharge	UL rating
1–5 lb (0.5–2.3 kg)	1.5–3.7 m	8–10 s	1–3-A, 2–10-B:C
2.5–9 lb (1.1–4.1 kg)	1.5–3.7 m	8–15 s	1–4-A, 10–40-B:C
9–17 lb (4.1–7.7 kg)	1.5–6.1 m	10–25 s	2–20-A, 10–80-B:C
17–30 lb (7.7–14 kg)	1.5–6.1 m	10–25 s	3–20-A, 30–120-B:C
125–350 lb wheeled	4.6–14 m	30–60 s	20–40-A, 60–320-B:C

NFPA 10 Annex H, multipurpose (ammonium phosphate) dry chemical; ratings vary by listing. **standard**

India (MAP 90)	EN 3	IS 15683
2 kg	13A 55B	3A 70B
4 kg	21A 144B	4A 144B
6 kg	27A 183B	6A 183B
9 kg	43A 233B	6A 233B

One Indian maker's datasheet: same unit, two rating systems. Min. discharge 9–15 s, throw > 2 m (IS 15683 test). **maker data**

3 Using It Well

NFPA 10 Annex D

Keep your distance

Do not open up on a burning liquid from closer than about **1.5–2.4 m** (5–8 ft): the stream can splash it

Liquids

Aim at the base, hit the **near edge** first and sweep quickly side to side towards the back

Solids

Coat the glowing material; deep-seated fires may need breaking apart and soaking

After

Ventilate: the cloud cuts visibility. Clean electronics quickly; the residue corrodes

4 Pros & Cons

- Covers the widest range of fires
- Fast knock-down; good on spill fires
- Low cost, widely available
- Works from -30 to $+60$ °C (typical label)
- Messy, corrosive residue; costly clean-up
- Cloud cuts visibility for minutes in small rooms
- Little cooling: re-ignition of deep-seated Class A
- Short discharge: 8–25 s for hand units

MAINTENANCE (NFPA 10)

Hydrostatic test: 12 years (mild steel / aluminium stored pressure; cartridge type); **5 years** if stainless shell. **6-year** internal examination for stored-pressure units that need a 12-year test.

standard



Choosing & Using the Right Fire Extinguisher

Part 3: Carbon Dioxide (CO₂)

Learning Series · carbon dioxide: electrical and Class B use, limits, sizes and safety

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1 Classes

2 ABC

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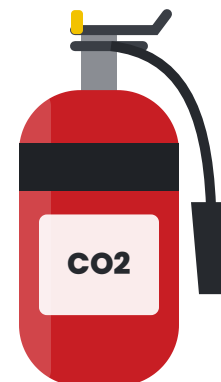
8 Li-ion

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10 Use & ITM

1 ✱ What It Is NFPA 10 · IS 15683 · IS 2190

- **Carbon dioxide** stored as a liquid under its own pressure in a high-pressure cylinder; no gauge, so we check it by **weighing**
- Discharges as gas and “snow” through a **horn**; puts the fire out mainly by **smothering** (cutting oxygen), with some cooling
- Electrically non-conductive and leaves **no residue**: the usual choice for panels, switch rooms and IT
- US rating is **B:C only**; in India / Europe it is rated for Class B (and Class C gas under IS 2190) and electrical risks



Band colour: **black** (EN 3 / UK convention)

USE IT ON

- Live electrical equipment: panels, MCCs, UPS, motors
- Small flammable-liquid fires (Class B), indoors
- Labs, IT and plant rooms where powder residue is not acceptable
- Gas fires (IS 2190 Class C) after the supply is shut off

DO NOT RELY ON IT FOR

- Class A fires (paper, wood, fabric): no cooling, they re-ignite
- Outdoors or in wind: the gas blows away; range is only ~1–3 m
- Cooking-oil fires, metal fires or lithium-ion batteries
- Small closed rooms with people: it **displaces oxygen** (NFPA 10 H.2)

2 ↻ Typical Sizes, Ratings, Range & Discharge Time

US size (NFPA 10 Table H.2)	Range	Discharge	UL rating
2.5–5 lb (1.1–2.3 kg)	0.9–2.4 m	8–30 s	1–5-B:C
10–15 lb (4.5–6.8 kg)	0.9–2.4 m	8–30 s	2–10-B:C
20 lb (9 kg)	0.9–2.4 m	10–30 s	10-B:C
50–100 lb (23–45 kg) wheeled	0.9–3 m	10–30 s	10–20-B:C

CO₂ units with **metal horns** carry no C rating and are listed as **obsolete** (NFPA 10 4.4). **standard**

2 KG

34B

EN 3 / IS 15683

4.5–5 KG

55–70B

EN 3 / IS 15683

Common Indian sizes: 2 and 4.5 / 5 kg portable, ~20 kg wheeled. Ratings and min. discharge 8–9 s from Indian makers' datasheets. **maker data**

3 🖐 Using It Well NFPA 10 Annex D

Get close

Short range and easily blown away: start **reasonably close**, out of any draught

Aim at the base

Keep applying **after** the flames go out, for cooling and to stop a re-flash

Liquids

Near edge first, slow side-to-side sweep to the back, or point the horn down at ~45° into the centre

Electrical

Aim at the source of the flames and get the equipment **de-energised** as soon as possible

4 📋 Pros, Cons & Safe Use

- Clean: no residue, no damage to electronics
- Non-conductive
- Nothing to clean up after use
- Simple check: weigh to confirm the charge
- Short range, short discharge
- Heavy cylinder for the agent it holds
- **Cold horn**: hold the handle, not the horn
- Asphyxiation risk in small spaces; ventilate after use

🔧 MAINTENANCE (NFPA 10)

Hydrostatic test: 5 years. Check fullness by **weight**.

Annual electrical conductivity test of CO₂ hose assemblies; replace hoses that fail (7.4). No annual internal examination required. **standard**



Choosing & Using the Right Fire Extinguisher

Part 4: Water, Water Mist & Foam

Learning Series · plain water, water mist and foam: Class A and B, limits, sizes and ratings

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1 Three Water-Based Types

NFPA 10 (2026) · IS 15683 · IS 2190

WATER (JET / SPRAY)

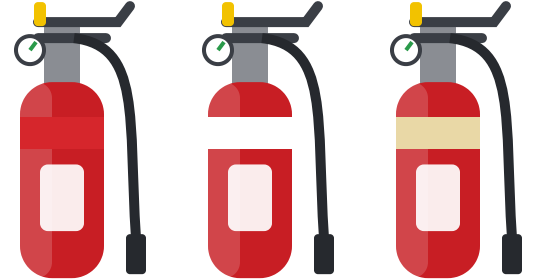
Plain water, **cools** burning solids. Long throw. Class A only. Not for live electrical, liquids or oil.

WATER MIST

Distilled / de-ionised water as a very fine spray: cools and smothers with little water damage. Listed units carry A:C (US); EU units are often rated A + F.

FOAM

Water + foam concentrate: **blankets** a liquid surface and stops vapour. Class A + B. NFPA 10 (2026) now uses one term, **“foam”**, incl. fluorine-free (SFFF).



Bands (EN 3 / UK convention): water **red** · water mist **white** · foam **cream**

USE THEM ON

- **Water / mist:** Class A solids: paper, wood, textiles, furniture
- **Foam:** Class A + flammable-liquid spills (Class B): garages, fuel stores
- **Mist:** where water damage matters: hotels, hospitals, offices
- **Pool-chemical stores:** only water or foam (NFPA 10 5.5.4.7.1)

DO NOT USE THEM ON

- **Live electrical** with water jet or foam: shock risk (only units listed / tested for it)
- Cooking oil / fryers: water causes a violent flare-up
- Metal fires (Class D): water can react explosively
- **Polar solvents** (alcohols, acetone) unless the foam label lists them (5.5.4.4)

2 Typical Sizes, Ratings, Range & Discharge Time

NFPA 10 Table H.2

Type	Size	Range	Discharge	UL rating
Water, stored pressure	9.5 L (2.5 gal)	9.1–12.2 m	~1 min	2-A
Water mist (distilled water)	6.8–9.5 L	1.5–3.7 m	50–80 s	2-A:C
Foam (AFFF / FFFP)	6 L	6.1–7.6 m	~50 s	2-A:10-B
Foam (AFFF / FFFP)	9.5 L	6.1–7.6 m	~50 s	3-A:20 to 40-B

Plain-water units need antifreeze where they can freeze; water mist only with distilled water (NFPA 10 6.1.4, Annex). **standard**

India	6 L	9 L
Water mist (EN 3)	13A 75F	21A 75F
F-free foam (IS 15683)	3A 113B	4A 183B

From Indian makers' datasheets. Mist and spray-foam units are claimed safe on live equipment up to **1000 V at 1 m** (dielectric test), only if the label says so. **maker data**

3 Using It Well

NFPA 10 Annex D

Water

Start as close as you safely can; base of the flames first, then the smouldering surfaces; soak deep-seated fires

Foam on a vat

Play the stream against the **back wall** just above the surface, or let it fall lightly; never into the liquid

Foam on a spill

Bounce it off the floor just in front of the fire and walk around it for full cover

Water mist

Use it like a water unit; refill only with the **distilled water** charge named on the label

4 Pros & Cons

- Best **cooling** on Class A: low re-ignition
- Cheap, clean (mist), environment-friendly options
- Foam seals liquid surfaces
- Heavy: a 9 L unit weighs ~13–15 kg gross
- Plain water: not below 4 °C (40 °F) unless an antifreeze model
- Water damage (jet); foam clean-up

MAINTENANCE (NFPA 10)

Hydrostatic test: 5 years (water, water mist, foam).

Premixed foam agent replaced as the maker says, **not exceeding 5 years** (7.8.2.3). Internal exam: stored-pressure water 5 yr; AFFF / FFFP 3 yr (Table 7.3.3.1).

standard



Choosing & Using the Right Fire Extinguisher

Part 5: Wet Chemical (Class K / F)

Learning Series · Class K / F cooking-oil fires: how it works, placement, sizes and ratings

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10 Use & ITM

1 What It Is

NFPA 10 · IS 15683 · EN 3

- A water solution of **potassium salts** (e.g. potassium acetate / carbonate / citrate), discharged as a **gentle fine spray**
- On hot oil it reacts with the fat (**saponification**) to form a soapy foam blanket that seals the surface and stops re-ignition
- The water content **cools** the oil below its auto-ignition point
- Class **K** in the US (NFPA 10) = Class **F** in India / Europe (IS 2190, EN 2). Most units also carry a **Class A** rating



Band colour: **yellow** (EN 3 / UK convention)

USE IT ON

- Deep-fat fryers, woks, tilting pans and griddles with oils and fats
- Commercial kitchens, canteens, hotels, food courts
- Class A fires nearby (wood, paper) where the unit is A-rated
- Solid-fuel cooking appliances: a 6 L K-listed unit is one permitted option (NFPA 10 6.7)

DO NOT

- Use powder, CO₂ or water as the kitchen's cooking-oil unit: non-K units must be removed (5.5.4.5.2)
- Use it on live electrical equipment unless the label says it is tested (the agent conducts)
- Spray hard from close range: hot oil can splash
- Use it **instead of** the hood system: operate the fixed system first

2 Typical Sizes, Ratings, Range & Discharge Time

US size (NFPA 10 Table H.2)	Range	Discharge	Rating
3 L (0.75 gal)	2.4–3.7 m	~30 s	K
6 L (1.5 gal)	2.4–3.7 m	35–45 s	K
9.5 L (2.5 gal)	2.4–3.7 m	75–85 s	K

Class K units made after 1 Jan 2002 may not have extended wands (5.5.4.5.1). **standard**

3 L 8A 40F EN 3	6 L 13A 75F EN 3	9 L 21A 75F EN 3
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75F = put out a test fire of 75 L of cooking oil (EN 3–7). Ratings from an Indian maker's datasheet; throw ~3 m. **maker data**

3 Using It Well

NFPA 10 Annex D

Isolate first

Switch off the appliance's gas or power, if safe, and operate the hood system (placard)

Gentle spray

Apply the fine spray from the distance on the label, slowly, so the hot oil does not splash

Use it all

Keep discharging to build a full foam blanket over the oil surface

After

Do not move the pan or break the blanket; let the oil cool. Watch for re-ignition

4 Placement & Pros / Cons

- Max. **9.1 m (30 ft)** travel from the cooking hazard to the K unit (NFPA 10 6.6.2) **standard**
- Where a hood system protects the appliance, a **placard** must say: **activate the fixed system first** (5.5.4.5.3)
- + Stops re-ignition; gentle spray, low splash; A-rated too - Conductive agent; limited range; needs annual service

MAINTENANCE (NFPA 10)

Hydrostatic test: 5 years. Monthly check of gauge, seal and nozzle (grease can block it). Recharge only with the agent named on the label. **standard**



Choosing & Using the Right Fire Extinguisher

Part 6: Clean Agent

Learning Series · halocarbon clean agents for electronics and sensitive areas: uses, limits, ratings

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4 Water

5 Wet chem

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7 Solar PV

8 Li-ion

9 Placement

10 Use & ITM

1 What It Is

NFPA 10 · IS 15683

- A **halocarbon** agent stored as a liquid, discharged as a gas / mist that leaves **no residue** and does not conduct electricity
- Common agents in India: **HFC-227ea** and the fluoroketone **FK-5-1-12**; they cool the flame and break the chain reaction
- The replacement for **halon** portables: NFPA 10 limits halon to places where a clean agent is truly needed
- Small units are B + electrical only; **larger units** also carry a **Class A** rating: read the label



Band colour: **green**
(common UK convention)

USE IT ON

- **Delicate electronics:** server rooms, control rooms, telecom (NFPA 10 5.5.4.6: C-listed types)
- Labs, museums, archives, aircraft and vehicle cabins
- Live electrical panels and small flammable-liquid fires
- Anywhere powder residue or water would cause more damage than the fire

WATCH OUT FOR

- **Room size:** follow the minimum room-volume warning on the nameplate (5.3.2.6.1)
- Hot fires make **decomposition products** (e.g. HF): ventilate, avoid breathing them (H.2)
- Oxidisers: halogenated agents can react (H.2)
- Deep-seated Class A fires, cooking oil, metals and lithium-ion packs

2 Typical Sizes, Ratings, Range & Discharge Time

Source	Size	Range	Discharge	Rating
NFPA 10 Table H.2 (halocarbon) standard	0.6–68 kg	1.8–10.7 m	9–38 s	1–B:C to 10–A:120–B:C
India, HFC-227ea (IS 15683) maker data	2 / 4 / 6 kg	> 2 m	≥ 6 s	1A 21B / 1A 34B / 2A 55B
India, FK-5-1-12 (EN 3) maker data	2 / 4 / 6 / 9 kg	3–4 m	n/a	21B / 34B / 34B / 55B

Indian figures from makers' datasheets (min. throw and min. discharge per IS 15683 test). Ratings differ by agent and make.

3 Using It Well

NFPA 10 Annex D

Liquids

Sweep the flame off the surface: **near edge** first, slowly side to side, towards the back

Electrical

Aim at the source of the flames; de-energise the equipment as soon as possible

Small rooms

Avoid breathing the agent and its decomposition gases; ventilate before staying in

Not for

Pressurised gas or fuel jets and cooking-grease fires (NFPA 10 Annex D)

4 Pros & Cons

- No residue, no clean-up, no corrosion
- Non-conductive; penetrates racks and grilles
- Usable in occupied rooms within the nameplate volume limit
- Zero ODP options (HFCs, FK)
- Highest cost per rating
- Low Class A capability in small sizes
- Short discharge time
- HFCs have high GWP; phase-down rules apply

MAINTENANCE (NFPA 10)

Hydrostatic test: 12 years (halogenated agents). **6-year** internal examination for stored-pressure units; recover the agent with a listed closed recovery system, never vent it. **standard**



Choosing & Using the Right Fire Extinguisher

Part 7: Solar PV Installations

Learning Series · live DC hazards, what to place at inverters, combiner boxes and roofs

PART

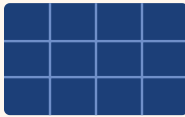
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1 Why Solar PV Is Different IS 17963:2024 (PV fire risk on buildings)

- PV modules make **DC power whenever light falls on them**, so switching off the AC side or the inverter does **not** make the array safe
- String voltages of **several hundred volts up to 1,500 V DC** are common; DC arcs do not self-extinguish like AC arcs
- Fires start at **connectors, combiner boxes, cables and inverters**; burning back-sheets and cables give toxic smoke
- Roof fires add **fall, collapse** and **shock** hazards for anyone who goes up



PV array

AC switched off

Array + DC cables stay live while there is light

IS THERE A "SOLAR EXTINGUISHER"?

No standard class or rating for PV fires exists in NFPA 10 (2026) or IS 2190:2024. What we found marketed in India:

- **Multi-class water-based special-agent units** promoted for "EV charging stations and solar plants", with Class A, B, electrical and lithium-ion claims maker data
- Standard **electrically-rated** CO₂, clean agent and ABC powder units, used at inverters and panels
- **Light-blocking polymer sprays** that coat panels to stop generation: a responder tool, not a certified extinguisher

⚡ CHECK THE VOLTAGE ON THE LABEL

Water-based units that claim electrical use typically state "**up to 1000 V at 1 m**" maker data. Many PV strings run **above 1000 V DC**, so that claim may not cover them. Keep the distance; never touch or cut DC cables.

2 What We Place, Where

Location	Suitable portable type (sizes from Parts 2–6)
Inverter / PCU room, LT panels	CO ₂ or clean agent (electronics); ABC where residue is acceptable
Combiner / string boxes, cable trenches	ABC dry powder or an electrically-rated unit; keep the safe distance on the label
Rooftop array (buildings)	ABC near the roof access point; do not climb onto panels to fight a fire
Battery storage at the plant	see Part 8; portable units only for very small fires
Transformer / oil areas	Class B units: foam or ABC, sized per Part 9; fixed systems per design

3 If a PV System Is on Fire

1. Alarm

Call the fire service; tell them it is a PV system and where the isolators are

2. Isolate

Open AC and DC isolators / emergency shutdown, if it is safe to reach them

3. Small fire only

Use a suitable, electrically-rated unit from the safe distance on its label

4. Stay back

No water jets on live arrays; do not walk on modules; beware falling parts

4 Good Practice at PV Sites

WHAT WE DO

- Place units at ground level near the inverter room and the roof access point, not out on the array
- Label AC and DC isolators and keep a site layout at the entrance for responders
- Train site staff that the array and DC cables stay live in daylight
- Follow the electrical-use limits printed on each unit

WHAT WE AVOID

- Relying on a portable unit for a roof or array fire: that is a fire-service job
- Treating a light-blocking spray or a "solar" label as a rated extinguisher
- Assuming a 1000 V claim covers higher-voltage strings
- Water jets near live DC equipment

Usual choice (CO₂ / clean agent / ABC): + proven ratings, widely serviced – they do not de-energise the array; re-ignition is possible while the panels stay live.



1 ⚡ Why Battery Fires Are Different

- **Thermal runaway:** a damaged or overheated cell heats itself and its neighbours; it needs no outside air to keep reacting
- Cells vent **flammable and toxic gases**, can jet flame, and may **re-ignite hours later**
- **Cooling** is what slows the spread: CO₂, powder and clean agents may knock flames down but give little cooling
- Li-ion is **not a Class D** metal fire; Class D powders are not the answer for battery packs

⚠ WHAT THE STANDARDS SAY

NFPA 10 (2026) classes: A, B, C, D, K. IS 2190:2024: A, B, C, D, F. **Neither has a lithium-ion class**; “Class L” is not official. The only test we found is the Dutch NTA 8133:2021+A1:2025 for portable units of up to 9 L.

2 🧯 Lithium-ion Battery Extinguisher Types in India (Agent Verified From Makers’ Sites)

Agent type	How it works	Typical data (maker claims)
Aqueous vermiculite dispersion (AVD)	Water carrying fine vermiculite mineral platelets, applied as a mist: cools, then coats cells with a mineral film that limits spread and re-ignition	Sold in India in MS and SS bodies; sizes vary
Water-based special agent (fluorine-free additive)	Water with a biodegradable, fluorine-free additive; cools and wets the pack; also rated A, B, F	6 L: 4A 144B 25F · 9 L: 6A 183B 75F (IS 15683); NTA 8133 600 Wh claimed; ≥ 15 s; 2 m
Water + lithium foam additive	Water with a foam concentrate for battery fires; cooling plus a foam film	9 L: 3A 189B 75F (EN 3-7); ~43.5 s; throw 2 m; 0–60 °C

All figures are manufacturer data **maker data**, not requirements of NFPA 10 or IS 2190. No standard EN 3 / UK band colour exists for these units.

3 ✅ NTA 8133: What a “600 Wh” Claim Means

- Test fire: **24 pouch cells** in 6 blocks of 4, set off by **overcharging**
- Pass: fire out within **3 min**, **no re-ignition** for 20 min, at least one cell with measurable voltage
- Covers batteries up to **600 Wh**: phones, laptops, tools, e-bikes. An EV pack is **tens of kWh**, roughly 100 times more
- Ask for the **test report**: standard, Wh rating, test lab

TESTED UP TO
600 Wh
NTA 8133 max.

EV PACK
tens of kWh
beyond portables

Pros: strong cooling, less re-ignition, most also A / B rated. **Cons:** no standard class, claims vary, small units only control small packs.

● USE IT FOR

- Phones, laptops, power banks, tools, e-bike / e-scooter batteries
- Battery charging rooms and UPS rooms, as a first response
- Then move the device (if safe) to a non-combustible area outdoors and keep watching

● DO NOT

- Fight an **EV or battery-storage (BESS)** fire with a portable unit: evacuate and call the fire service
- Breathe the smoke, or stand in line with venting cells
- Assume it is out: re-ignition can happen hours later



Choosing & Using the Right Fire Extinguisher

Part 9: Selection & Placement

Learning Series · hazard levels, ratings, travel distances and mounting heights (NFPA 10)

PART

9

of 10

1 Classes

2 ABC

3 CO2

4 Water

5 Wet chem

6 Clean

7 Solar PV

8 Li-ion

9 Placement

10 Use & ITM

1 Step 1: Classify the Hazard NFPA 10 (2026) 5.4

Hazard	Typical spaces	Class B liquids per room
Light	offices, classrooms, churches, hotel rooms	< 3.8 L (1 gal)
Ordinary	shops, light manufacturing, parking-type storage, workshops	3.8–18.9 L (1–5 gal)
Extra	woodworking, vehicle repair, painting / dipping, flammable-liquid handling	> 18.9 L (5 gal)

2 Step 2: Size & Space for Class A Table 6.2.1.1

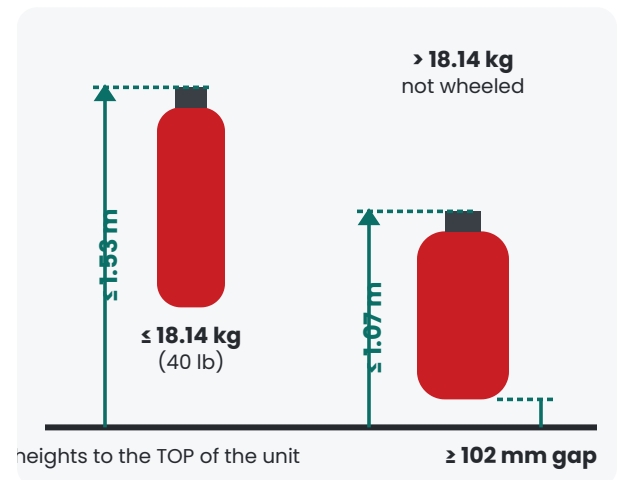
Criterion	Light	Ordinary	Extra
Min. single extinguisher	2-A	2-A	4-A
Max. floor area per unit of A	279 m ²	139 m ²	92.9 m ²
Max. floor area per extinguisher	1,045 m ² (11,250 ft ²)		
Max. travel distance	22.9 m (75 ft)		

3 Step 3: Class B, C, D, K Table 6.3.1.1, 6.4–6.6

Hazard	Min. rating	Max. travel
Light	5-B / 10-B	9.14 / 15.25 m
Ordinary	10-B / 20-B	9.14 / 15.25 m
Extra	40-B / 80-B	9.14 / 15.25 m
Class C	by the A or B hazard present	
Class D	≤ 22.9 m (75 ft)	
Class K	≤ 9.1 m (30 ft)	

4 Step 4: Mount It Right NFPA 10 6.1.3

- Gross weight ≤ 18.14 kg (40 lb): top at ≤ 1.53 m (5 ft) above the floor
- Heavier (not wheeled): top at ≤ 1.07 m (3.5 ft)
- Bottom at least 102 mm (4 in) clear of the floor
- Visible and along normal paths of travel, incl. exits; signs where hidden; instructions face out
- Cabinets not locked (unless emergency access); within the label's temperature range



5 Quick Picks by Space

Space	Our usual pick
Office, school, hotel	ABC powder or water / water mist + CO ₂ near panels
Server / control room	CO ₂ or clean agent; no dry powder on delicate electronics
Commercial kitchen	Class K / F wet chemical + placard; ABC for the rest
LPG, pressurised gas, 3-D fires	Dry chemical ≥ 4.54 kg (10 lb), ≥ 0.45 kg/s

INDIA

IS 2190:2024 has its own selection and distribution rules, and local fire-service / NBC requirements apply. We could not check its tables from a public copy, so use the standard text and the AHJ for Indian projects.



Choosing & Using the Right Fire Extinguisher

Part 10: PASS, Inspection & Testing

Learning Series · PASS technique, monthly inspection, annual maintenance and hydro testing

PART
10
of 10

1 Classes

2 ABC

3 CO2

4 Water

5 Wet chem

6 Clean

7 Solar PV

8 Li-ion

9 Placement

10 Use & ITM

1 Using It: PASS

P

Pull

Pull the pin, breaking the tamper seal

A

Aim

Aim low, at the base of the fire

S

Squeeze

Squeeze the handle slowly and evenly

S

Sweep

Sweep side to side until it is out

Before you start: raise the alarm, make sure the fire is small, keep the **exit behind you**, and start from the distance shown on the label. Hand units empty in about **8–60 s** (NFPA 10 Annex). If it is not out quickly, **leave**.

2 Inspect: Monthly NFPA 10 7.2

- At intervals of **no more than 31 days**, at least once per calendar month (manual or electronic)
- Check: in place, visible, accessible; gauge in the green; full (weigh / heft); seal and pin intact; no damage, corrosion or blocked nozzle
- Record month, year and initials; keep the **last 12** monthly records
- New in 2026:** an optional AHJ-approved **performance-based** programme, with inspections at least every **90 days**

3 Maintain: Annually + 6-Year NFPA 10 7.3

- Maintenance by a **certified** person at intervals of **no more than 1 year**, at hydro test, or when an inspection shows a problem
- New tamper seal and service tag after each service
- Every 6 years:** empty and internally examine stored-pressure units that need a 12-year hydro test
- CO₂ hoses:** electrical conductivity test every year

4 Hydrostatic Test Intervals NFPA 10 Table 8.3.1

Extinguisher type	Years
Water, water mist, loaded stream, antifreeze	5
Wetting agent, foam (AFFF / FFFP)	5
Wet chemical	5
Carbon dioxide	5
Dry chemical, stainless steel shell	5
Dry chemical, stored pressure (mild steel, brazed brass, aluminium)	12
Dry chemical / dry powder, cartridge or cylinder operated (mild steel)	12
Halogenated agents (clean agents)	12

The test is due within the calendar year of the interval. Nitrogen / CO₂ expellant cylinders on wheeled units: 5 years (8.3.2).

INDIA

IS 2190:2024 sets its own inspection, maintenance and hydraulic-pressure-test schedule, which differs from NFPA 10. We could not check its tables from a public copy, so follow the standard text and the AHJ.

REMOVE FROM SERVICE

Obsolete types (e.g. soda-acid, inverting types, CO₂ with metal horns), failed hydro tests and damaged shells: mark “CONDEMNED” and dispose of them as NFPA 10 Chapter 8 requires.