Portable Extinguisher Selection and Placement

- Explain inspection and testing requirements for portable extinguishers
- Select the appropriate extinguisher for a given situation
- Specify the appropriate number, location, and separation for extinguisher installation

Standards

- NFPA 10 – *Standard for Portable Fire Extinguishers*
- OSHA 1910.157 (g) - *Incipient Stage Fire Extinguisher Education*
- OSHA 1910.38 - *Emergency Action Plan*

Definitions

“Education”

1910.157(g)(1) Where the employer has provided portable fire extinguishers for employee use in the workplace, the employer shall also provide an **educational program** to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting.

"Education" means the process of imparting knowledge or skill through systematic instruction. It does not require formal classroom instruction.

“Training” for designated employees

1910.157(g)(3) The employer shall provide employees who have been **designated** to use fire fighting equipment as part of an emergency action plan **with training** in the use of the appropriate equipment.

"Training" means the process of making proficient through instruction and hands-on practice in the operation of equipment, including respiratory protection equipment, that is expected to be used and in the performance of assigned duties.

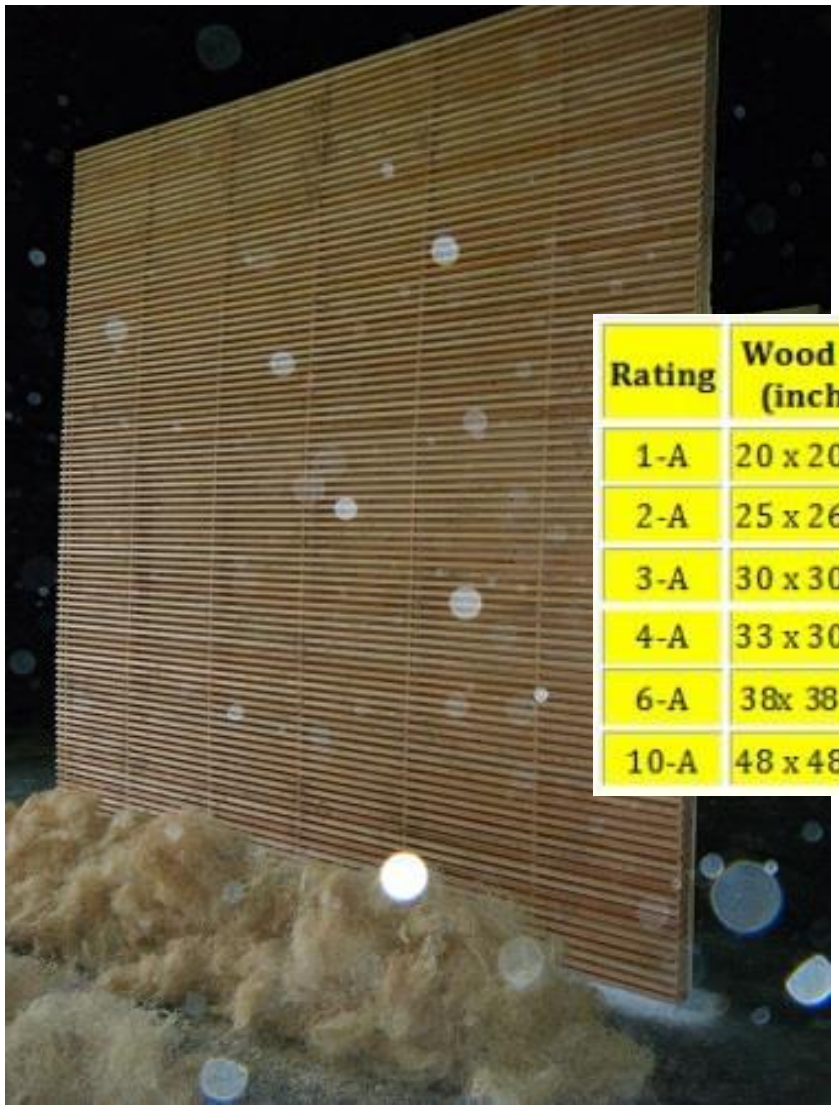
Portable Fire Extinguishers Ratings

- Rated according to
  - Class of fires
  - Fire-fighting capability
- Based on UL711, Standard for Rating and Fire Testing of Fire Extinguishers
  - UL (Underwriters' Laboratories) is one of several companies approved to perform safety testing by the U.S. Occupational Safety and health Administration (OSHA)

Ratings

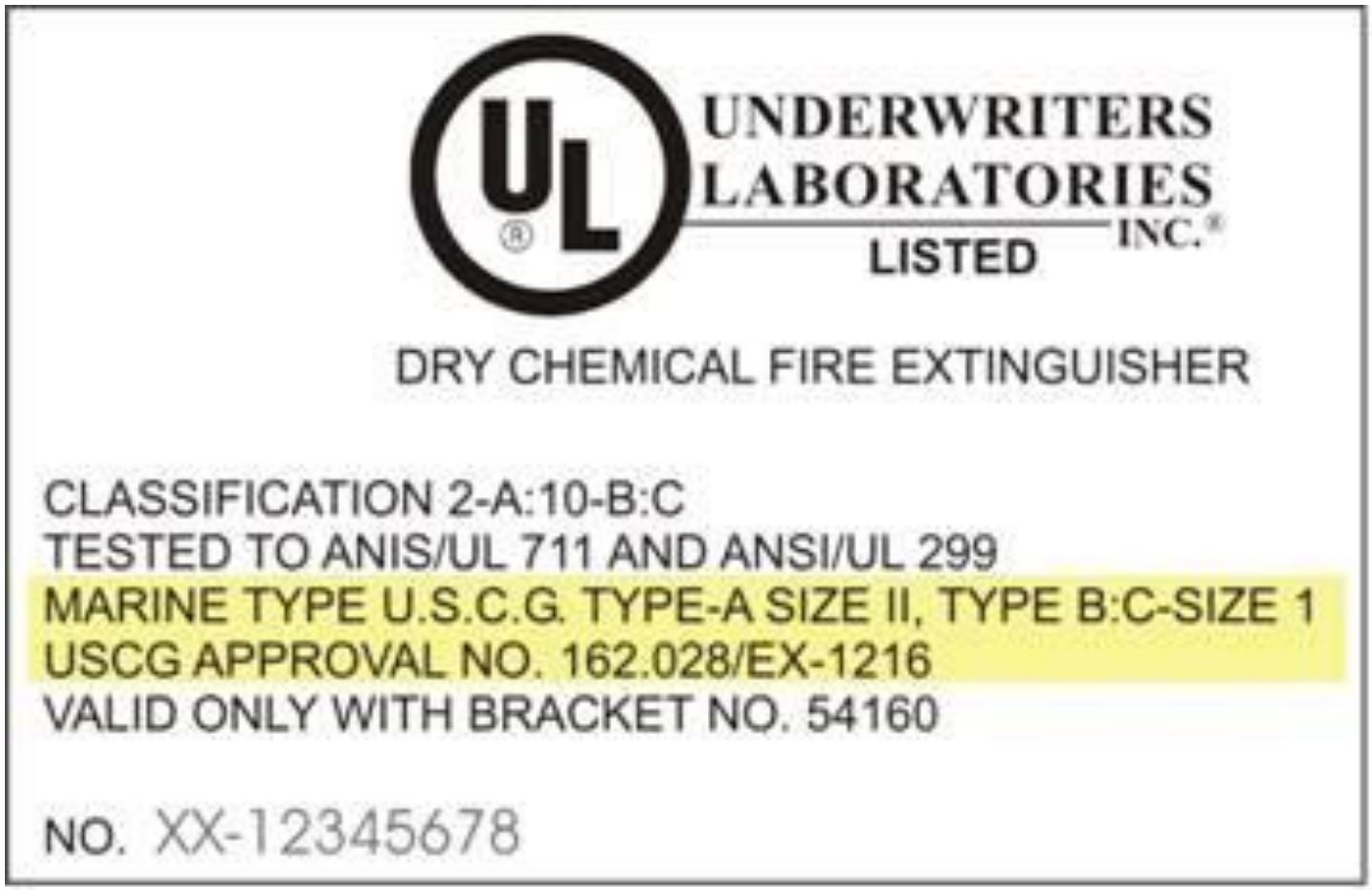
- Class A: 1-A through 40-A
  - Wood Cribs, Wood Panels, Excelsior
- Class B: 1-B through 640-B
  - Approximate Area in Square Feet
    - 2 inch layer of flammable liquid (usually heptane)
    - 10-B: 10 square feet (one unit of B for every square foot)
- Class C: Electrical Non-Conductivity
- Class D: Specific Combustible Metals
  - No numerical rating
- Class K: 2A:K or Kitchen / Restaurant
  - New vegetable oil

Class A Rating



Rating	Wood Crib (inches)	Wood Panel (Feet)	Excelsior (lbs)
1-A	20 x 20 x 20	8 x 8	6
2-A	25 x 26 x 26	10 x 10	12
3-A	30 x 30 x 30	12 x 12	18
4-A	33 x 30 x 30	14 x 14	24
6-A	38x 38 x 38	17 x 17	36
10-A	48 x 48 x 48	17 x 17	36


UNDERWRITERS
LABORATORIES
INC.
LISTED
DRY CHEMICAL FIRE EXTINGUISHER
CLASSIFICATION 1-A:10-BC
TESTED TO ANSI/UL 711 AND ANSI/UL
MARINE TYPE U.S.C.G. TYPE B:C SIZE
ROVAL NO. 162.028/EX-1009
WITH BRACKET NO.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UNDERWRITERS
LABORATORIES
INC.®
LISTED
DRY CHEMICAL FIRE EXTINGUISHER
CLASSIFICATION 2-A:10-B:C
TESTED TO ANIS/UL 711 AND ANSI/UL 299
MARINE TYPE U.S.C.G. TYPE-A SIZE II, TYPE B:C-SIZE 1
USCG APPROVAL NO. 162.028/EX-1216
VALID ONLY WITH BRACKET NO. 54160
NO. XX-12345678

Selection and Distribution of Extinguishers

- Number and distribution of extinguishers depends on:
  - (1) Occupancy or building contents (hazards classification)
  - (2) Size and arrangement of building
- Different rules for different types of fires
- Requirements in NFPA 10

How Many are Needed?

- Step 1 – determined hazard classification
  - NFPA 10 classifications
    - Light-hazard occupancy
    - Ordinary-hazard occupancy
    - Extra-hazard occupancy

Light (Low) Hazards

- Few combustibles
- Class A materials
- Small amount of Class B liquids
  - Closed containers and safely stored
- Items arranged so fire not likely to spread rapidly
- Examples
  - Classroom
  - Office building

Ordinary (Medium) Hazards

- Combustibles present are
  - Substantial
  - Ordinary or small quantities capable of rapid fire growth
- Example
  - Manufacturing plants

Extra (High) Hazard

- Substantial quantities of combustibles
  - Readily support rapid fire growth and large fire size
  - Quantities over and above ordinary hazard
- Examples
  - Flammables manufacturer
  - Ammunitions depot

How Many are Needed?

- Step 1 – determined hazard classification
  - NFPA 10 classifications
    - Light-hazard occupancy
    - Ordinary-hazard occupancy
    - Extra-hazard occupancy
- Step 2 – calculate area of space
- Step 3 – calculate required number of extinguishers for the space
- Step 4 – determine extinguisher placement

Class A

Table 6.2.1.1 Fire Extinguisher Size and Placement for Class A Hazards

Criteria	Light Hazard Occupancy	Ordinary Hazard Occupancy	Extra Hazard Occupancy
Minimum rated single extinguisher	2-A	2-A	4-A
Maximum floor area per unit of A	3000 ft^2	1500 ft^2	1000 ft^2
Maximum floor area per extinguisher	11,250 ft^2	11,250 ft^2	11,250 ft^2
Maximum travel distance to extinguisher	75 ft	75 ft	75 ft

For SI units, 1 ft = 0.305 m; 1 ft^2 = 0.0929 m^2.

Note: For maximum floor area explanations, see E.3.3.

Class A Extinguisher Distribution

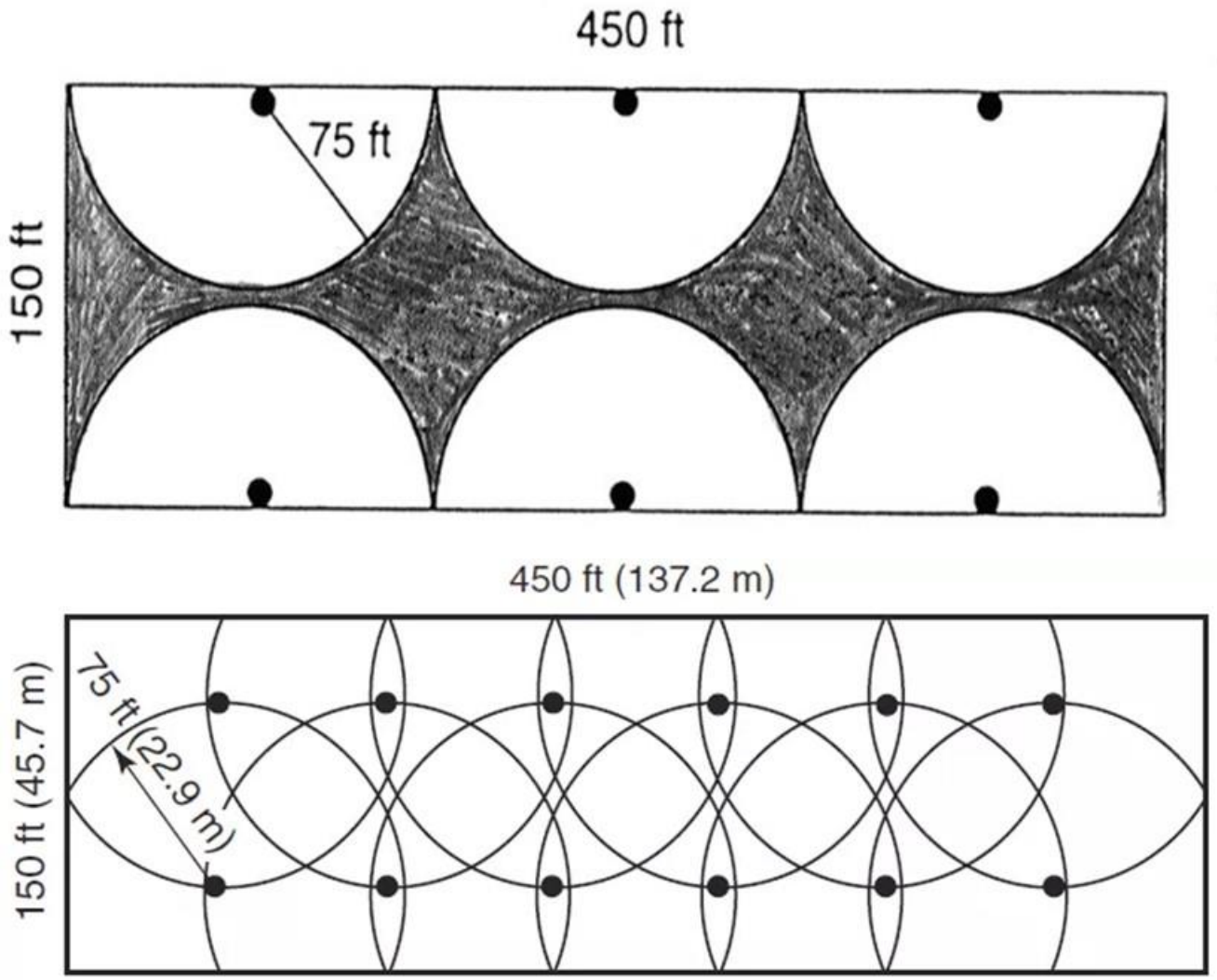
- At least 1 per floor
- May substitute extinguishers of higher ratings but travel distance may not exceed 75 ft
- Can substitute with multiple extinguishers of lower rating
- Maximum extinguisher-protection area
  - 11,250 ft^2

Class B Extinguisher Distribution

- Fires reach maximum intensity almost immediately
  - Extinguishers closer
- Maximum travel distances vary between 30 and 50 ft
- Typically, may not combine multiple extinguishers with lower ratings
- Open process tanks of flammable liquids greater than 10 ft^2 require fixed protection

Class C, D, and K Extinguisher Distribution

- Class C:
  - Based on Class A or B
- Class D:
  - Based on Specific metal
  - Maximum travel distance 75 ft
- Class K:
  - Maximum travel distance 30 ft


450 ft
75 ft
150 ft
450 ft (137.2 m)
150 ft (45.7 m)
75 ft (22.9 m)

Installation and Placement

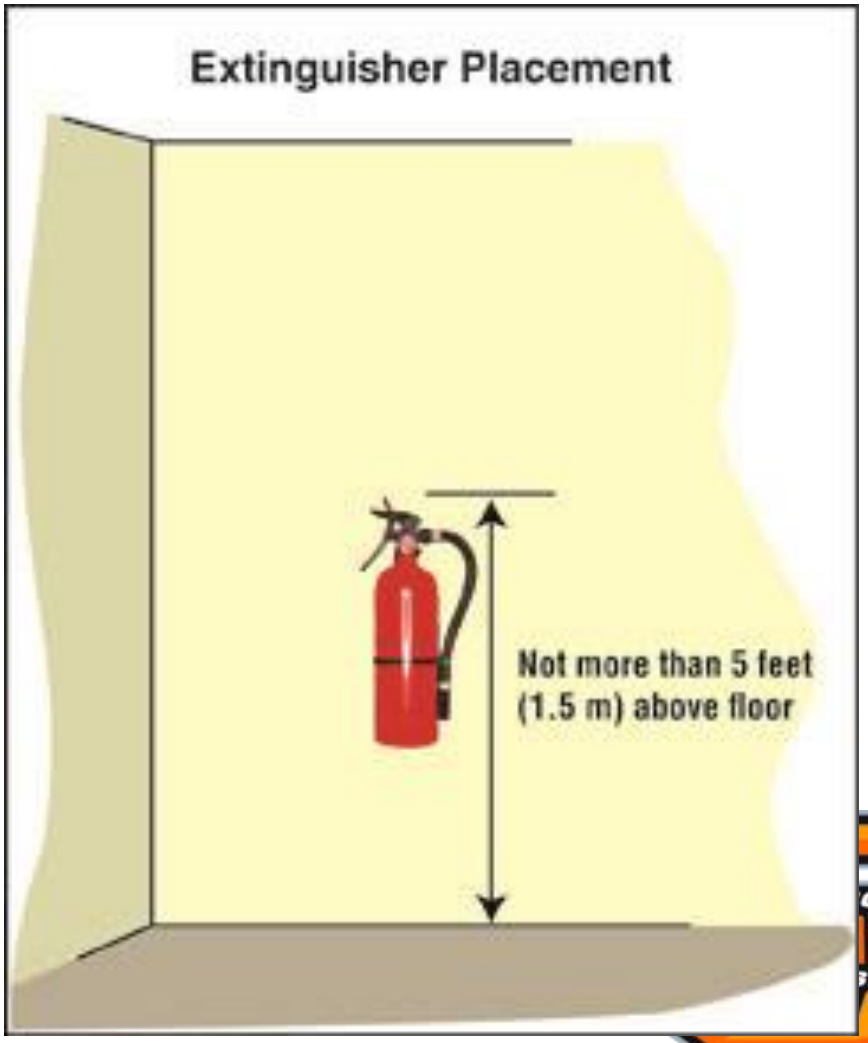
- Visible and good signage
- Accessible
- Near exits
- Near normal path of travel

Installation

- Must be readily visible and accessible
- Extinguishers should be mounted securely to structure
- Extinguisher cabinets
- Proper placement

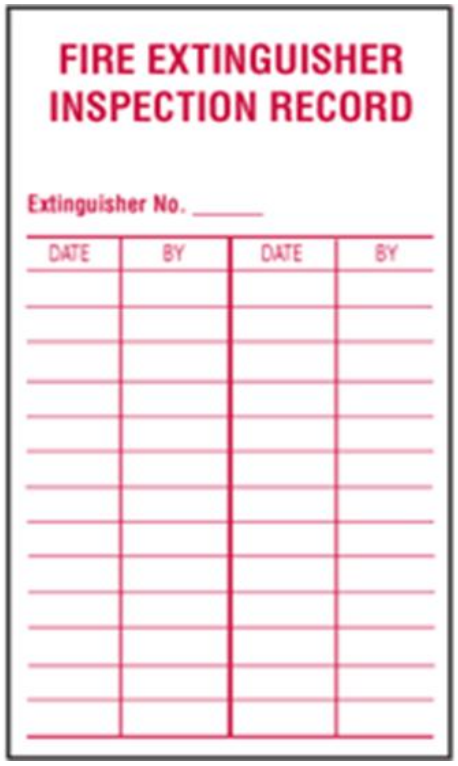
Installation

- Gross weight not exceeding 40 pounds (18 kg) — Top of extinguisher not more than 5 feet (1.5 m) above floor
- Gross weight greater than 40 pounds (18 kg), except wheeled — Top of extinguisher not more than 3½ feet (1 m) above floor
- Not less than 4 inches from floor



Inspection

- Quick
- Required Monthly inspections
- Tag with Name and Date

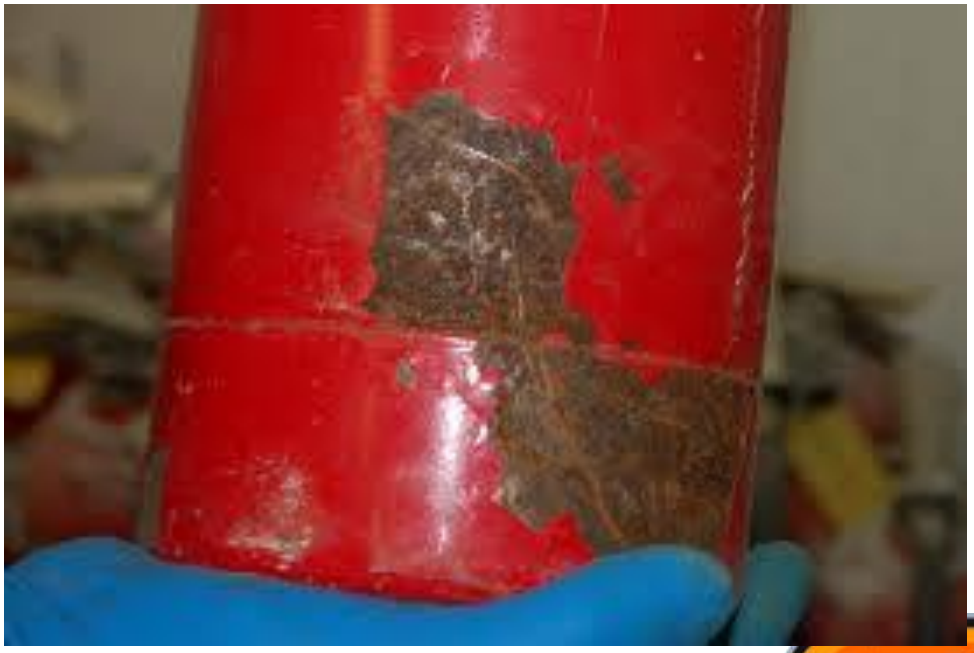


Quick Inspection

- Proper location
- Access (visible and accessible)
- Inspection tag (check for annual inspection)
- Horn or nozzle (look for obstructions)
- Lock pins and tamper seals (ensure they are intact)
- Signs of physical damage
- Pressure gauge indicating operable range (ensure extinguishers is fully charged)
- Applicability of extinguisher for hazard classification

Monthly Visual Inspection

- Cylinder Shell
  - Corrosion
  - Mechanical Damage (dent abrasion)
  - Paint Condition
  - Presence of repairs (welds, soldering)
  - Damaged Threads
  - Broken Hanger attachment
  - Broken Handle Lug



Monthly Visual Inspection

- Name Plate, Instructions and Pull Ring
  - Illegible Wording
  - Corrosion or loose plate
  - Verifying operating instructions on nameplates are legible and face outward.
  - Broken, missing safety seals and tamper indicators


JAN. FEB. MAR. APR. MAY JUNE
6 YR. MAINT.
HYDRO. TEST
G 7
7 0
UTAH FIRE EQUIPMENT, INC.
JULY AUG. SEPT. OCT. NOV. DEC.

Monthly Visual Inspection

Nozzle or Horn

- Deformed, Damaged or Cracked
- Blocked opening
- Damaged threads
- Hose obstruction
- Hydrostatic test date

Monthly Visual Inspection

Pressure Indicating Device

- Immovable, jammed, missing pointe
- Deformed, or broken crystal
- Illegible or faded dial
- Corrosion
- Dented case or crystal retainer
- Immovable or corroded pressure indicating stem

Monthly Inspection

- Is the Fire Extinguisher in its designated place?
- No obstruction to access or visibility?
- Pressure gauge reading or indicator in operable range or position?


TENNANT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OSHA Requirements

- **1910.157(e)(1)** The employer shall be responsible for the inspection, maintenance and testing of all portable fire extinguishers in the workplace

- **1910.157(e)(2)** Portable extinguishers or hose used in lieu thereof under paragraph (d)(3) of this section shall be visually inspected monthly

Annual Maintenance Check

Annually

- Utilize a 3rd party for Annual maintenance check.
- Ensure you have adequate protection when fire extinguishers are removed for maintenance or recharging.

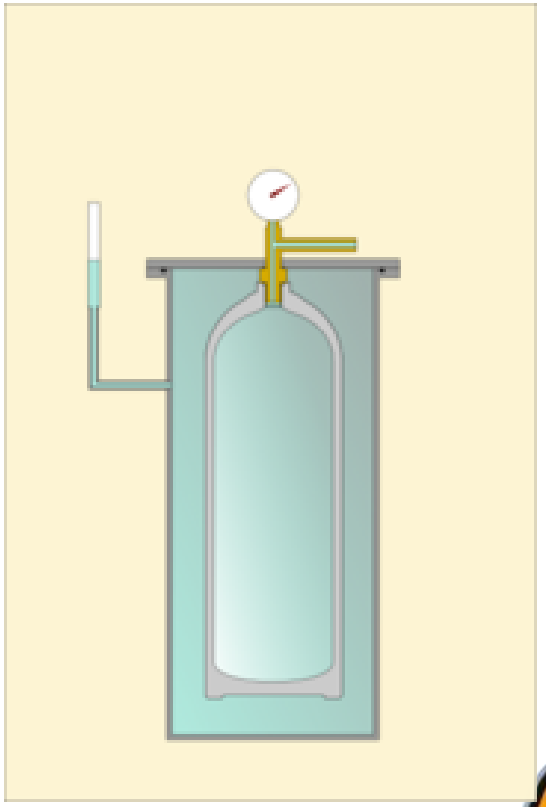
Hydrostatic Testing

- Refer to regulation for hydrostatic testing interval dates.
- Testing must be performed by someone with suitable testing and equipment facilities.
- Retain certification record for all testing.

Hydrostatic Testing

- Test uses pressurized Water to check integrity

- https://www.youtube.com/watch?v=5Yowwhg689w



Records

- Inspection tag
- Maintenance file
  - Should include inspection schedule
  - Repairs
  - Actions taken
  - Individual who performed actions
- Responsible party
  - Building Owner
  - Sometimes occupant