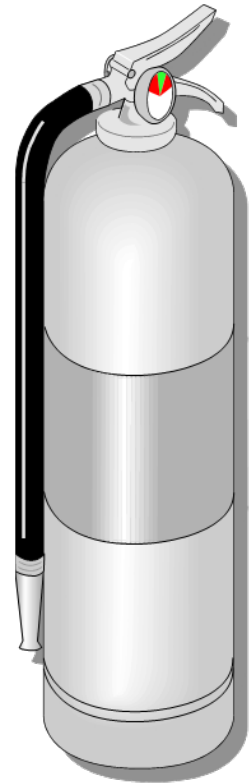




# EXTINGUISHER TRAINING



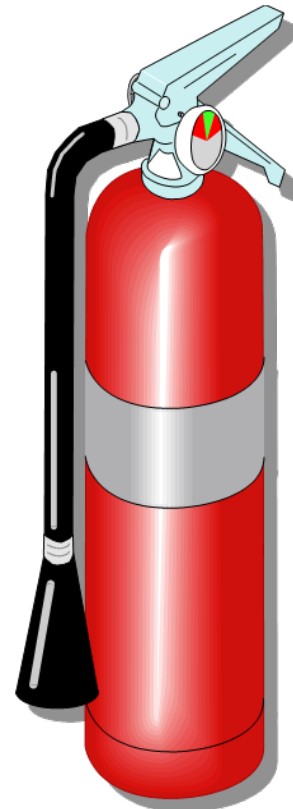
**A**



**B**



**C**





# *Objectives*

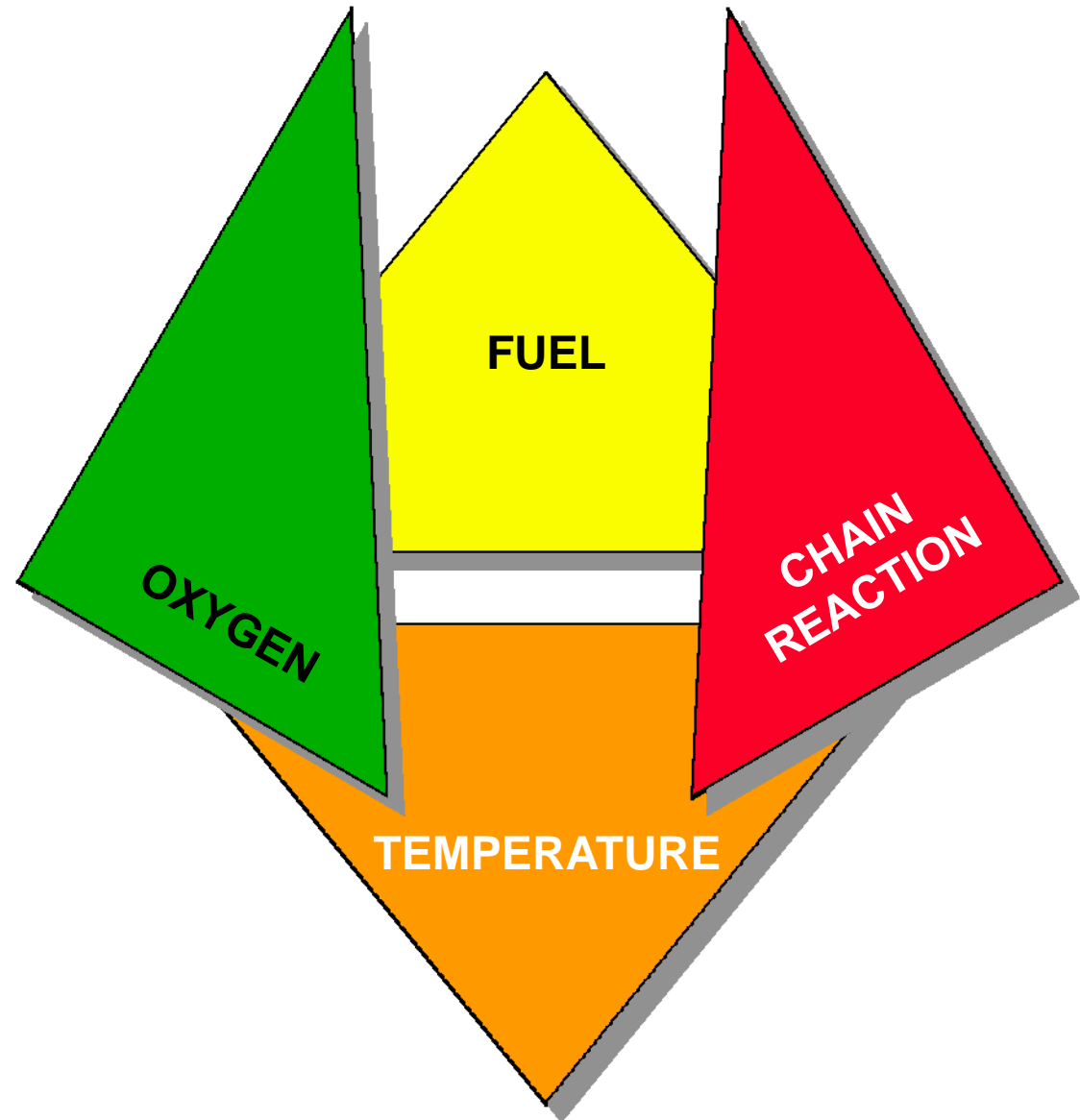
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- **Understand the combustion process and different fire classes.**
- **Understand fire extinguisher types, operating procedures, capabilities, and limitations.**
- **Understand basic firefighting concepts:**
  - ***R.A.C.E.***
  - ***P.A.S.S.***



# *The Combustion Process*

## THE FIRE TETRAHEDRON





# Fire Classes

## A Trash Wood Paper



- *wood*
- *cloth*
- *paper*
- *rubber*
- *many plastics*

## C Electrical Equipment



- *energized electrical equipment*

## B Liquids Grease



- *gasoline*
- *oil*
- *grease*
- *tar*
- *oil-based paint*
- *lacquer*
- *flammable gases*

## COMBUSTIBLE



## METALS

- *magnesium*
- *sodium*
- *potassium*
- *titanium*
- *zirconium*
- *other flammable metals*



# ***Fire Classes (cont.)***

## **CLASS K FIRES**

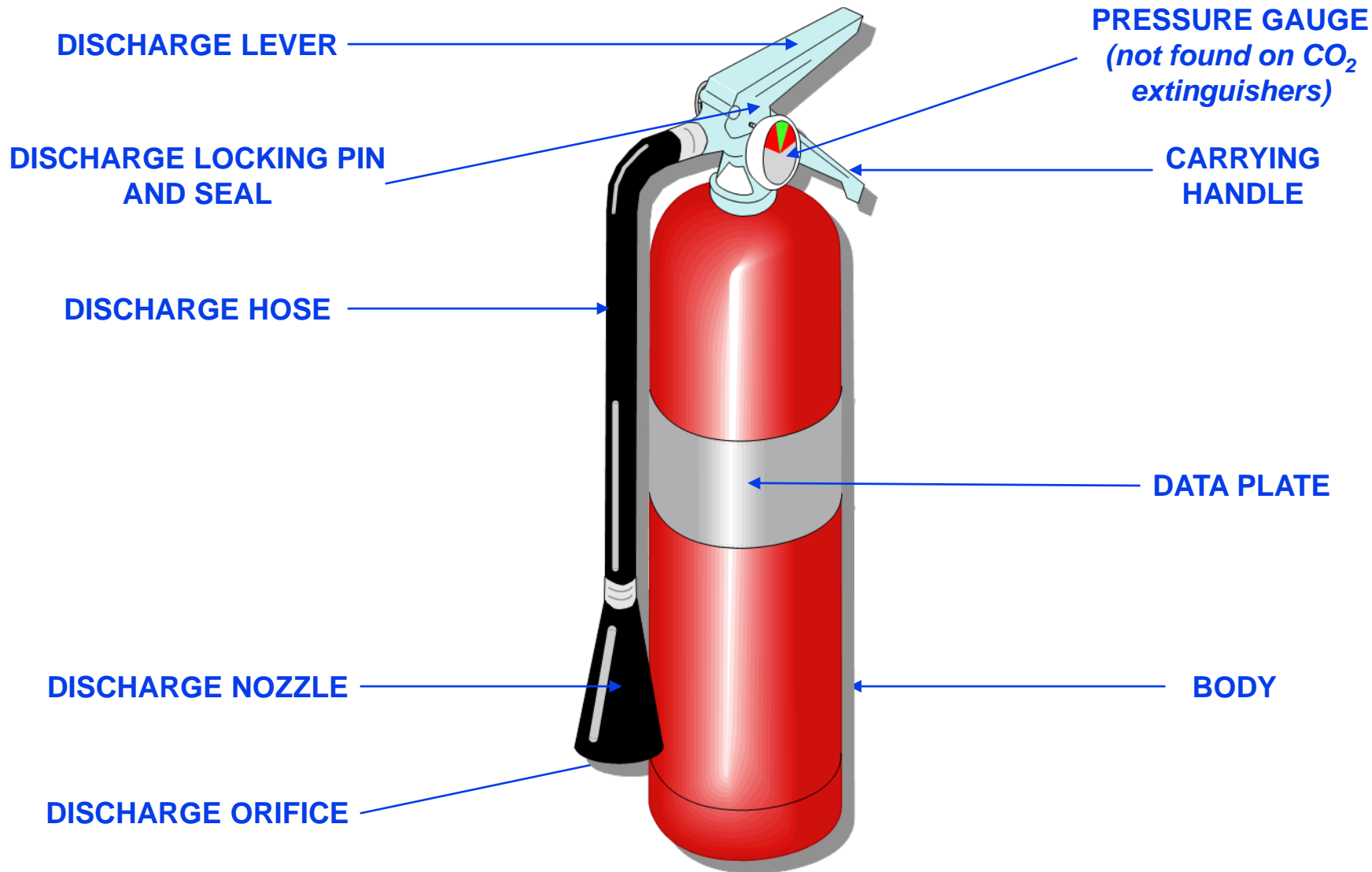
**K** Cooking Media








- ***Recently recognized by NFPA 10.***
- ***Fires involving combustible vegetable or animal non-saturated cooking fats in commercial cooking equipment.***



# *Fire Extinguisher Anatomy*



# Fire Extinguisher Ratings

<b>NUMERAL</b>	<b>FIRE CLASS</b>	<b>RANGE</b>
<p>DIRECT INDEX OF THE SIZE FIRE THE QUANTITY OF AGENT CAN HANDLE</p>	<p>A Trash Wood Paper</p> 	<p>1-A thru 40-A</p>
<p>INDICATION OF THE SQUARE FOOT AREA OF FLAMMABLE LIQUID THE EXTINGUISHER WILL HANDLE</p>	<p>B Liquids Grease</p> 	<p>1-B thru 640-B</p>
<p>NO NUMERAL IS USED BECAUSE THERE ARE NO DEGREES OF SAFETY WHERE ELECTRICITY IS CONCERNED</p>	<p>C Electrical Equipment</p> 	<p>N/A</p>
<p>NOT APPLICABLE BECAUSE OF THE SPECIALIZED NATURE OF THE BURNING MATERIAL</p>	<p>COMBUSTIBLE D METALS</p> 	<p>N/A</p>
<p>DIRECT INDEX OF THE SIZE FIRE THE QUANTITY OF AGENT CAN HANDLE</p>	<p>K Cooking Media</p> 	<p>1-A:C:K or 2-A:C:K</p>

# Fire Extinguisher Applications

## FIRE CLASS

## EFFECTIVE EXTINGUISHER TYPES

A Trash Wood Paper



PRESSURIZED WATER, MULTIPURPOSE DRY CHEMICAL, LARGER SIZE HALON, WET CHEMICAL

B Liquids Grease



MULTIPURPOSE DRY CHEMICAL, CARBON DIOXIDE, HALON

C Electrical Equipment



MULTIPURPOSE DRY CHEMICAL, CARBON DIOXIDE, HALON, WET CHEMICAL

COMBUSTIBLE



COMBUSTIBLE METAL

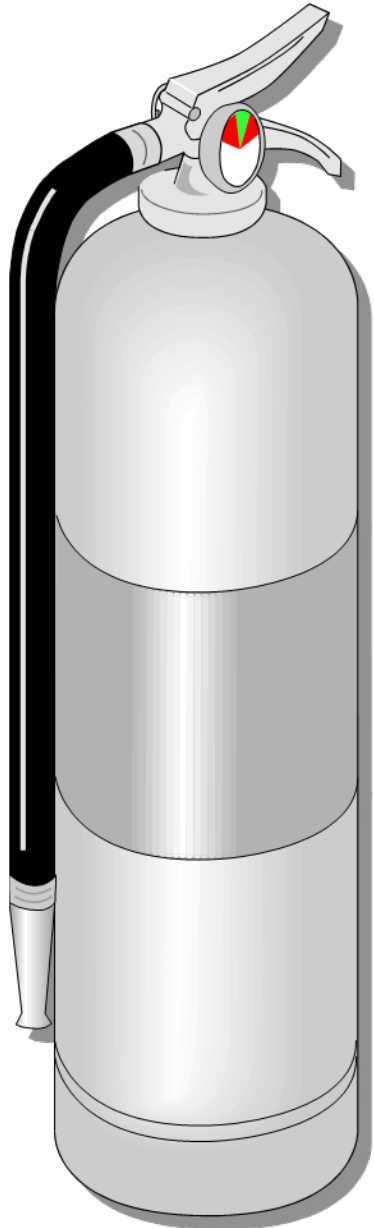
K Cooking Media



WET CHEMICAL

# Fire Extinguisher Types

## PRESSURIZED WATER



**A. Trash Wood Paper**  
A Trash Wood Paper



**B. Liquids Grease**  
B Liquids Grease



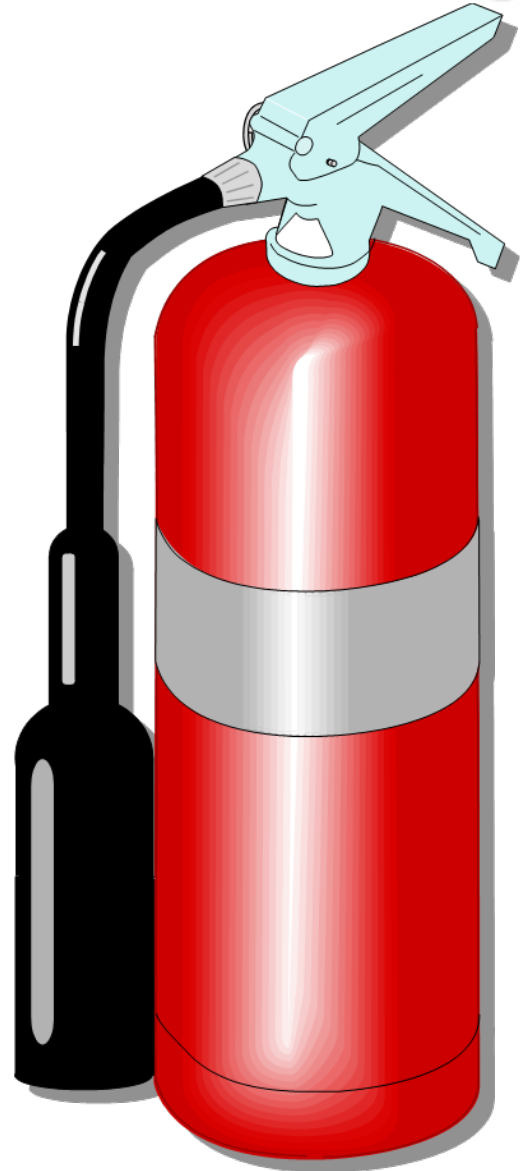
**C. Electrical Equipment**  
C Electrical Equipment



- Class “A” fires only.
- 2.5 gal. water at 150-175 psi (*up to 1 minute discharge time*).
- Has pressure gauge to allow visual capacity check.
- 30-40 ft. maximum effective range.
- Can be started and stopped as necessary.
- Extinguishes by cooling burning material below the ignition point.

# Fire Extinguisher Types (cont.)

## CARBON DIOXIDE (CO<sub>2</sub>)



A Trash Wood Paper  
A Trash Wood Paper



B Liquids Grease  
B Liquids Grease



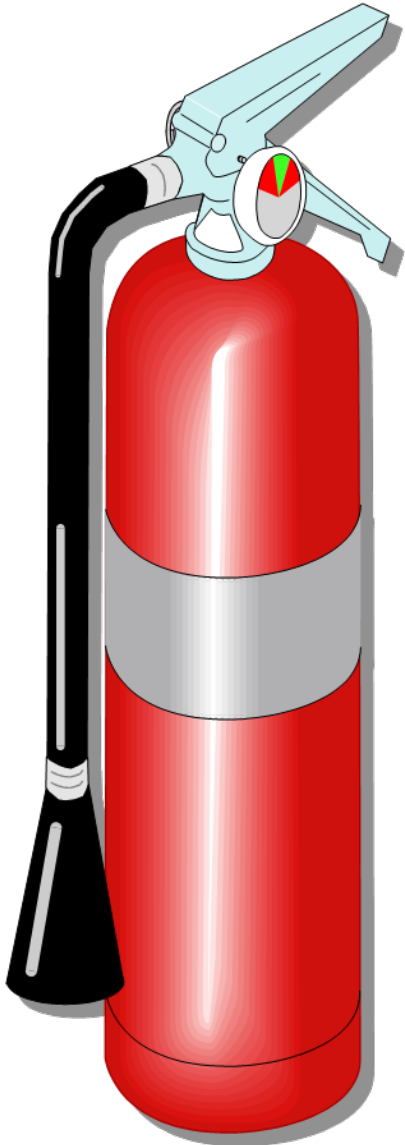
C Electrical Equipment  
C Electrical Equipment



- Class “B” or “C” fires.
- 2.5-100 lb. of CO<sub>2</sub> gas at 150-200 psi (8-30 seconds discharge time).
- Has NO pressure gauge--capacity verified by weight.
- 3-8 ft. maximum effective range.
- Extinguishes by smothering burning materials.
- Effectiveness decreases as temperature of burning material increases.

# Fire Extinguisher Types (cont.)

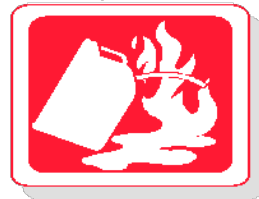
## MULTIPURPOSE DRY CHEMICAL



A. Trash Wood Paper  
A. Trash Wood Paper



B. Liquids Grease  
B. Liquids Grease



C. Electrical Equipment  
C. Electrical Equipment

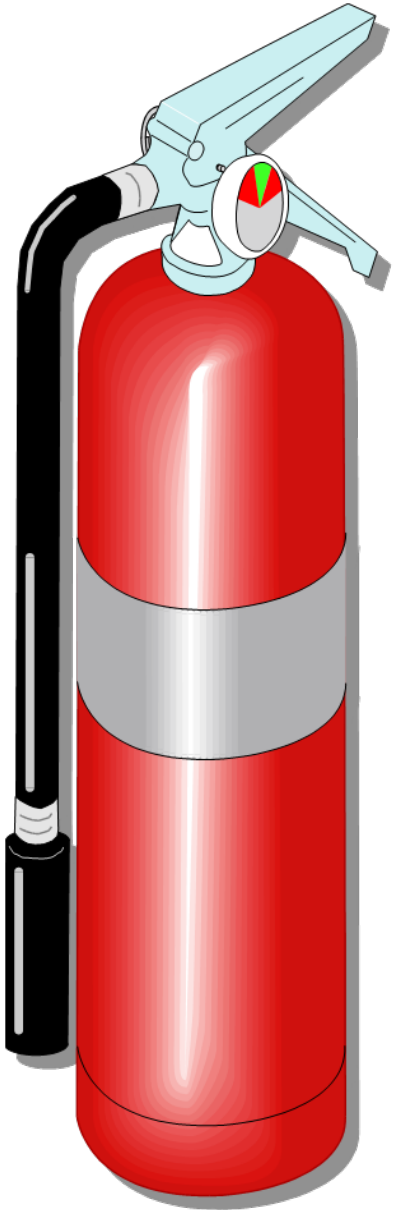


- Class “A”, “B”, or “C” fires.
- 2.5-20 lb. dry chemical (*ammonium phosphate*) pressurized to 50-200 psi by nitrogen gas (*8-25 seconds discharge time*).
- Has pressure gauge to allow visual capacity check.
- 5-20 ft. maximum effective range.
- Extinguishes by *smothering* burning materials.

# Fire Extinguisher Types (cont.)

## HALON

- Class “A”, “B”, or “C” fires (*smaller sizes ineffective against Class “A”*).
- 9-17 lb. Halon 1211 (pressurized liquid) released as vapor (*8-18 seconds discharge time*).
- Has pressure gauge to allow visual capacity check.
- 9-16 ft. maximum effective range.
- Works best in confined area--ideal for electronics fire due to lack of residue.
- Extinguishes by *smothering* burning materials.
- Fumes toxic if inhaled.
- Halon is ozone depleting chemical--production halted in Jan '94.



A Trash Wood Paper



B Liquids Grease



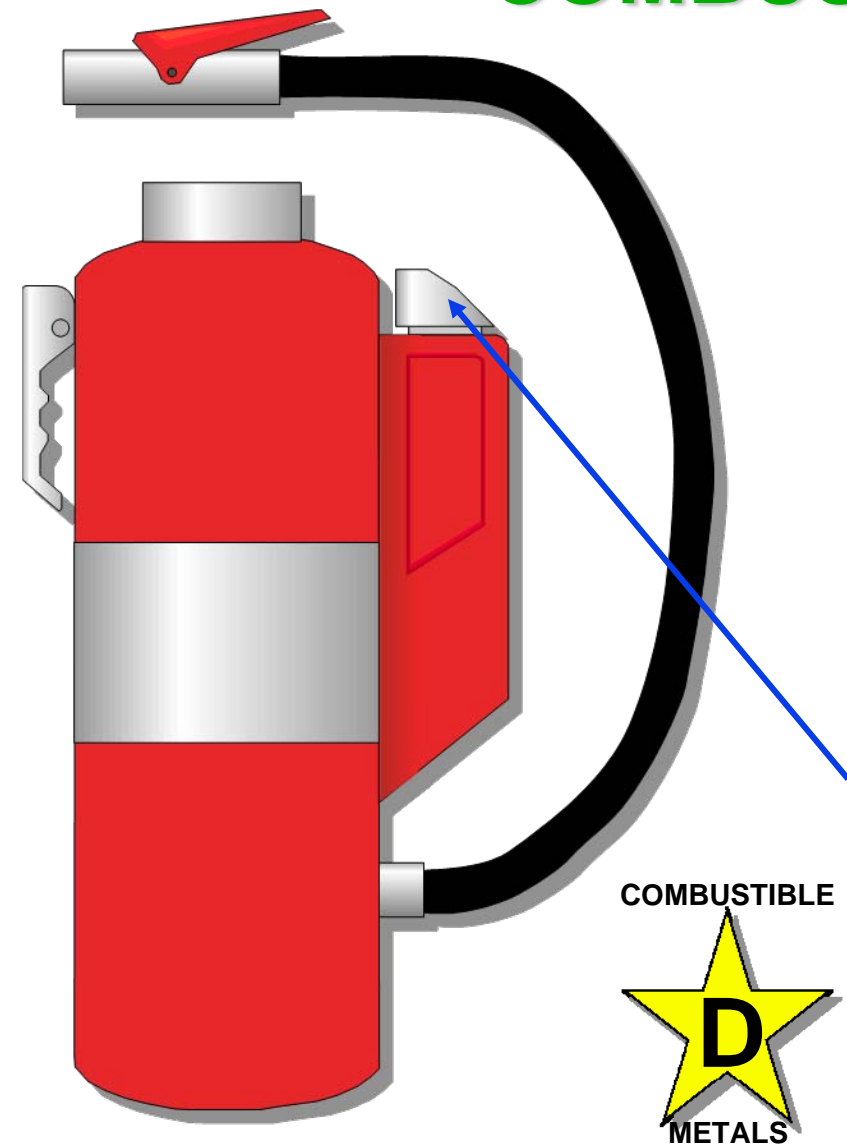
C Electrical Equipment





# Fire Extinguisher Types (cont.)

## COMBUSTIBLE METAL



- Class “D” combustible metal fires only.
- 30 lb. pressurized dry powder optimized for specific combustible metal (*also available in bulk containers for hand scooping onto fire to extinguish*).
- 6-8 ft. maximum effective range.
- To activate, must first open nitrogen cylinder on back to pressurize body.
- Extinguishes by *smothering* burning materials.

# Fire Extinguisher Types (cont.)

## WET CHEMICAL



A Trash Wood Paper



C Electrical Equipment



K Cooking Media
















- Class “A”, “C”, and “K” fires.
- 1.5 gal. of stored pressure PRX wet chemical extinguishing agent (*40 sec. discharge time*).
- 10-12 ft. maximum effective range.
- On Class “K” fires, don’t use until **after** fixed extinguishing system has activated.
- Extinguishes by **cooling** and forming foam blanket to prevent reignition.

### ⚠WARNING

IN CASE OF APPLIANCE FIRE, USE THIS EXTINGUISHER ONLY AFTER FIXED SUPPRESSION SYSTEM HAS BEEN ACTUATED

# Fire Extinguisher Summary

EXTINGUISHER TYPE	WORKS BY	EFFECTIVE AGAINST
PRESSURIZED WATER	COOLING	
CARBON DIOXIDE	SMOTHERING	 
MULTIPURPOSE DRY CHEMICAL	SMOTHERING	  
HALON	SMOTHERING	  
COMBUSTIBLE METAL	SMOTHERING	
WET CHEMICAL	COOLING/ SMOTHERING	  



# *Fire Emergency Response*

***R***

**Rescue**



***A***

**Alarm**

***C***

**Contain**



***E***

**Extinguish**



# Firefighting Decision Criteria

- **Know** department emergency procedures and evacuation routes.
- **Know** locations of extinguishers in your area and how to use them.
- **Always** sound the alarm **regardless** of fire size.
- **Avoid** smoky conditions.
- **Ensure** area is evacuated.
- **Don't** attempt to fight unless:
  - Alarm is sounded.
  - Fire is **small** and **contained**.
  - You have safe egress route (can be reached **without** exposure to fire).
  - Available extinguishers are rated for size and type of fire.
- If in doubt, **evacuate!**



# Fighting the Fire

**P**

**Pull the pin**

**A**

**Aim low at the  
base of flames**

**S**

**Squeeze the  
handle**

**S**

**Sweep side to side**





# Summary

- **Combustion process (*Fire Tetrahedron*).**
- **Class A, B, C, D, K fires.**
- **Types of portable fire extinguishers:**
  - *Operating procedures.*
  - *Capabilities and limitations.*
- **Basic firefighting concepts:**
  - ***R.A.C.E.***
  - ***P.A.S.S.***

