



# Fire Protection Training

Procedures Handbook 4300

SPECIAL FIRES

---

**TOPIC:** Combustible Metal Fires

**TIME FRAME:** 30 Minutes

**LEVEL OF INSTRUCTION:**

**BEHAVIORAL OBJECTIVE:**

*Condition:* A written quiz

*Behavior:* The student will describe a Class "D" fire, describe the proper extinguishing agent and list the methods of applying those extinguishing agents.

*Standard:* With a minimum of 70% accuracy

**MATERIALS NEEDED:**

- Various extinguishing agents
- Appropriate visual aids
- Audio visual equipment

**REFERENCES:**

- IFSTA, Essentials of Fire Fighting, 2nd Edition, Chapter 2

**PREPARATION:** High intensity fires may occur in certain metals. The greatest hazard exists when these metals are in a molten or dust-like state. To minimize the risk to firefighters, they must be able to identify fires involving combustible metals and determine what extinguishment action, if any, is appropriate.



# Fire Protection Training

Procedures Handbook 4300

COMBUSTIBLE METAL FIRES

PRESENTATION	APPLICATION
<p><b>I. CLASS "D" FIRE EXTINGUISHMENT</b></p> <p>A. General Rules</p> <ol style="list-style-type: none"><li>1. Common extinguishing agents should not be generally used</li><li>2. A given agent will not extinguish all combustible metal fires</li><li>3. Must be applied in sufficient depth to adequately cover fire area and to provide smothering blanket</li><li>4. Must apply gently to avoid scattering or splashing</li><li>5. Must leave the extinguishing agent undisturbed until cool</li><li>6. Reference must be made to manufacturer's recommendations for use, and special techniques for extinguishing fires in various metals</li></ol> <p>B. Extinguishing Agents</p> <ol style="list-style-type: none"><li>1. "Pyrene" G-1 powder<ol style="list-style-type: none"><li>a. Stored in cardboard tubes or metal pails<ol style="list-style-type: none"><li>(1) Powder is non-toxic</li><li>(2) Non-combustible</li></ol></li><li>b. Use on</li></ol></li></ol>	<p>Information sheet #1</p> <p>The label on each extinguisher will list which metal fires it is effective against</p>



# Fire Protection Training

Procedures Handbook 4300

## COMBUSTIBLE METAL FIRES

PRESENTATION	APPLICATION
<ul style="list-style-type: none"><li>(1) Mg - Magnesium</li><li>(2) Na - Sodium</li><li>(3) K - Potassium</li><li>(4) Ti - Titanium</li><li>(5) Li - Lithium</li><li>(6) Zr - Zirconium</li><li>(7) Ca - Calcium</li><li>(8) Hf - Hafnium</li><li>(9) Th - Thorium</li><li>(10) U - Uranium</li><li>(11) Pu- Plutonium</li><li>c. Special application on powder fires in<ul style="list-style-type: none"><li>(1) Al - Aluminum</li><li>(2) Fe - Ferrous Sulfate (Iron)</li><li>(3) Zn - Zinc</li></ul></li><li>d. Apply with hand scoop or shovel, spread evenly over fire</li><li>2. Met-L-X powder<ul style="list-style-type: none"><li>a. Stored in sealed containers or extinguishers.<ul style="list-style-type: none"><li>(1) No known health hazard</li><li>(2) Non-combustible</li></ul></li><li>b. Use on</li></ul></li></ul>	



# Fire Protection Training

Procedures Handbook 4300

## COMBUSTIBLE METAL FIRES

PRESENTATION	APPLICATION
<ul style="list-style-type: none"><li>(1) Magnesium</li><li>(2) Sodium</li><li>(3) Potassium</li><li>(4) Sodium-Potassium</li><li>(5) Zirconium</li><li>(6) Uranium</li><li>(7) Titanium</li><li>(8) Powdered Aluminum</li><li>c. Apply by applying thin layer from a distance</li><li>3. Na-X powder<ul style="list-style-type: none"><li>a. Stored in pails and extinguishers.<ul style="list-style-type: none"><li>(1) No known health hazard</li><li>(2) Non-combustible</li></ul></li><li>b. Use on Sodium</li><li>c. Apply by cautiously making a thin layer application from a distance</li></ul></li><li>4. T.E.C. powder (Ternary Eutectic Chloride)<ul style="list-style-type: none"><li>a. Powder is toxic</li><li>b. Use on<ul style="list-style-type: none"><li>(1) Sodium</li><li>(2) Potassium</li><li>(3) Sodium-Potassium</li></ul></li></ul></li></ul>	



# Fire Protection Training

Procedures Handbook 4300

## COMBUSTIBLE METAL FIRES

PRESENTATION	APPLICATION
<ul style="list-style-type: none"><li>(4) Plutonium</li><li>c. Expel from extinguisher or use scoop/shovel</li><li>5. Foundry flux<ul style="list-style-type: none"><li>a. Causes severe rusting of equipment</li><li>b. Use on Magnesium</li><li>c. Apply with hand scoop or shovel</li></ul></li><li>6. Lith-X powder<ul style="list-style-type: none"><li>a. Use on Lithium<ul style="list-style-type: none"><li>(1) Magnesium</li><li>(2) Zirconium chip fires</li><li>(3) Sodium</li><li>(4) Sodium-Potassium</li></ul></li><li>b. Apply by cautiously applying thin layer from a distance</li></ul></li><li>7. TMB liquid<ul style="list-style-type: none"><li>a. Classified as a flammable liquid for shipping purposes</li><li>b. Stored in a pressurized extinguisher</li><li>c. Boric oxide smoke produced by TMB</li><li>d. Use on<ul style="list-style-type: none"><li>(1) Magnesium</li><li>(2) Zirconium</li><li>(3) Titanium fires</li></ul></li></ul></li></ul>	



# Fire Protection Training

Procedures Handbook 4300

## COMBUSTIBLE METAL FIRES

PRESENTATION	APPLICATION
<p>8. Pyromet powder</p> <ul style="list-style-type: none"><li>a. Stored under pressure generally in 25 lb. fire extinguisher</li><li>b. Use on<ul style="list-style-type: none"><li>(1) Sodium</li><li>(2) Calcium</li><li>(3) Zirconium</li><li>(4) Titanium</li><li>(5) Magnesium</li><li>(6) Aluminum</li></ul></li></ul>	



# Fire Protection Training

Procedures Handbook 4300

COMBUSTIBLE METAL FIRES

---

## **SUMMARY:**

Class "D" combustible metals require special consideration when involved in fire. Ordinary extinguishing agents can create a problem and represent a danger to the firefighter. There are several specialized agents that have been developed to combat fires in various metals. Technique is also important when applying these agents to Class "D" fires.

## **EVALUATION:**

A written quiz.

## **ASSIGNMENT:**

To be determined by instructor(s).