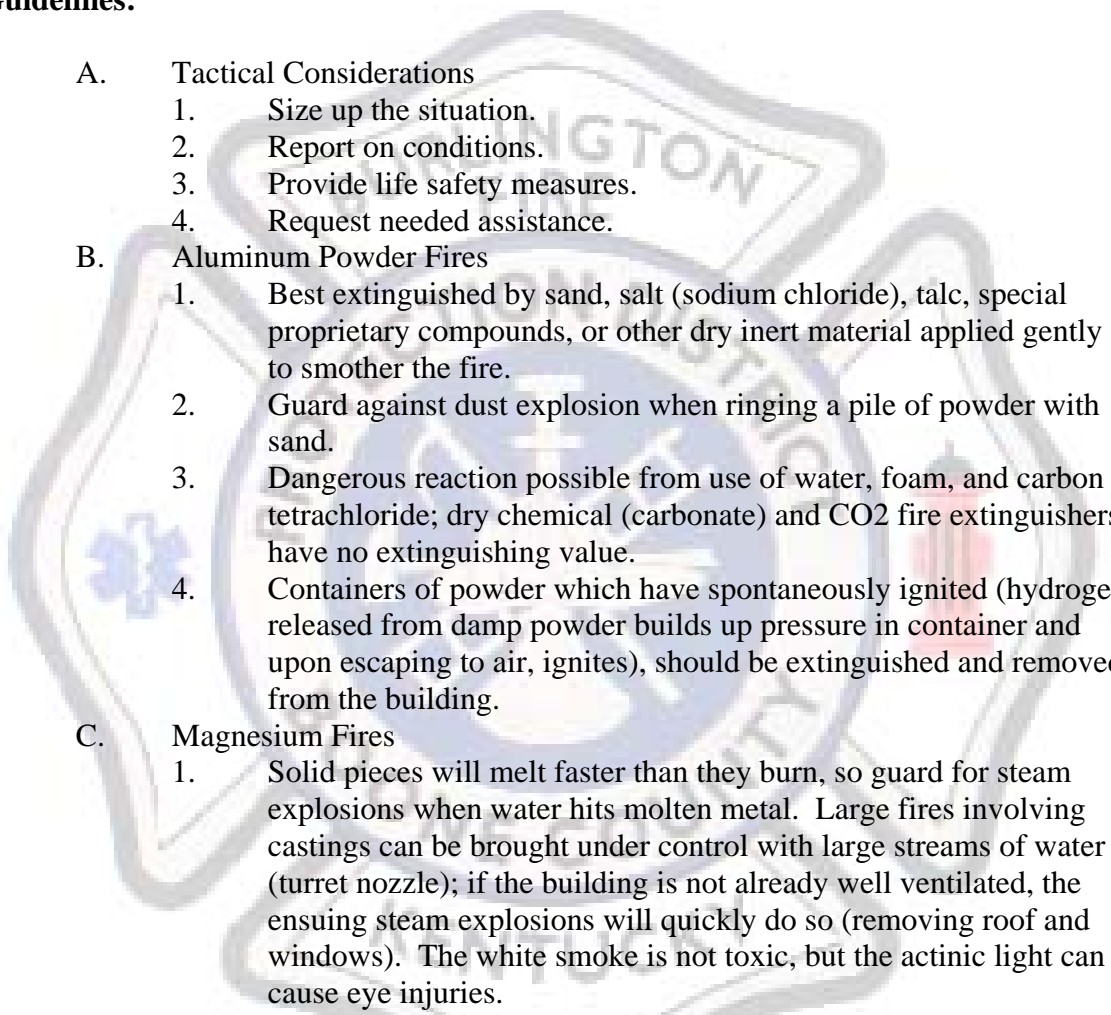


METAL FIRES

Purpose:

To provide a safe and effective method in the handling of metal fires.

Guidelines:

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- A. Tactical Considerations
 - 1. Size up the situation.
 - 2. Report on conditions.
 - 3. Provide life safety measures.
 - 4. Request needed assistance.
 - B. Aluminum Powder Fires
 - 1. Best extinguished by sand, salt (sodium chloride), talc, special proprietary compounds, or other dry inert material applied gently to smother the fire.
 - 2. Guard against dust explosion when ringing a pile of powder with sand.
 - 3. Dangerous reaction possible from use of water, foam, and carbon tetrachloride; dry chemical (carbonate) and CO2 fire extinguishers have no extinguishing value.
 - 4. Containers of powder which have spontaneously ignited (hydrogen released from damp powder builds up pressure in container and upon escaping to air, ignites), should be extinguished and removed from the building.
 - C. Magnesium Fires
 - 1. Solid pieces will melt faster than they burn, so guard for steam explosions when water hits molten metal. Large fires involving castings can be brought under control with large streams of water (turret nozzle); if the building is not already well ventilated, the ensuing steam explosions will quickly do so (removing roof and windows). The white smoke is not toxic, but the actinic light can cause eye injuries.
 - 2. Magnesium Scrap – Cannot usually be put out with water, but produces explosions and spattering of chunks and particles.
 - 3. Sheet Magnesium and Small Diameter Pieces – “TMB” (Trimethoxyboroxine) fire extinguishing fluid applied to a sheet magnesium fire following a cooling with water spray results in complete extinguishment by a glossy coating; TMB is a flammable liquid, and the fumes produced during extinguishing operations are toxic.
 - 4. Small Fires – Resins, graphite, salt (sodium chloride) and special proprietary compounds may be used on small fires, or the burning

material may be picked up on a dry shovel and carried outside. Do not use water or CO₂ on magnesium wheel fires, as the sudden contraction caused by the cooling effect can cause the wheel to be violently blown off the axle. Dry chemical is OK.

5. Magnesium Furnace Fires – Use of sulfur dioxide in the furnace tends to inhibit the fire and boron trichloride gas (also very toxic) can be applied through a fixed inerting system to bring such a fire under control.
6. Magnesium-Thorium Alloys – The fire fighting problems are essentially the same as for magnesium, but give rise to the added danger of toxic and radioactive products of combustion.

D. Alkali Metals

1. These metals burn at low temperatures and some, such as sodium, potassium and rubidium, ignite when moist; all three decompose water violently to produce hydrogen, causing its ignition; caustic fumes are also given off at the same time. These metals cause burns in contact with skin. (Neutralize burns with vinegar and flush with water.)
2. Fine dry sodium chloride (table salt) is a good extinguishing agent for sodium fires; graphite, dry soda ash, and special compounds can also be used, and even sand if it is really dry. Never use water, foam, soda-acid, CO₂ or CC14 on alkaline metal fires, as each will produce a violent reaction.
3. If burning sodium can be submerged in kerosene the sodium fire will go out and the flammable liquid fire can be extinguished with CO₂. (Kerosene tank fires containing stored sodium should never be fought with foam or water, for water sinks to bottom and hits the sodium, resulting in a violent explosion and fire.)