Furnace

Definition: Box or tank type container using high temperature to melt and separate or purify (usually) non-ferrous metals.

Potential Hazards:
- Aerosolized particles
- Burns/ Extreme Heat
- Explosive atmosphere
- Fire
- Hazardous fumes
- Ash

Guarding/Shielding:
- Point-of-operation guards must prevent a worker from placing any body part into the machine’s danger zone during the operation cycle. Danger zone includes moving parts, and hot surfaces.
- Fuel lines must be guarded to prevent damage.
- Power transmission parts must be adequately guarded.
- Loaders or forklifts used to charge furnace should have safety glass or expanded steel in front of operator with a solid roof.

Protective Equipment:
- Hard hats*
- Safety glasses*
- Face shield*
- Steel toe/steel shank foundry boots with metatarsal guards*
- Leather foundry gloves*
- Fire resistive clothing*
- Respirator as needed
- Hearing protection as needed
*minimum requirements

Safety Procedures:
• Lockout/Tagout procedures must be developed, followed, and enforced for equipment maintenance/servicing.
• Designate a safe zone around furnace to prevent burns to pedestrians.
• Keep flammables & combustibles away.
• Floor areas adjacent to furnace must be maintained clean and dry and free of trip hazards.
• If indoors, furnace should have forced air ventilation to outside or to bag house or other emission control device. Exhaust ducts should not discharge near doors, windows, or other air intakes.
• Determine, through air monitoring, whether use of respirators is required.
• Fire extinguishers should be appropriately placed, well labeled, with unobstructed access.
• Post emergency shut-down procedures.
• Regularly check for fuel gas leaks.
• Main fuel shut-off must be located away from furnace, easily accessible and labeled.
• Post type of fuel in use at building entrance.
• Regularly monitor temperature readings.
• Train workers on unacceptable materials in furnace including closed containers, magnesium, nitrates, and volatile materials.
• Gas-fired units must have an auto safety shut-off valve that cuts fuel glow if pilot it extinguished.
• High volume water supply and hose should be near furnace and inspected regularly.
• Stacks or ducts passing through walls must be properly insulated or clearance provided.
• Post warning signs indicating area of hazardous operation.
• Make sure skimmers, rakes, ladles and other tools are hot and dry before each use.
• Make sure molds are dry and preheated before pouring molten metal in them.
• Furnace should have automatic or manually controlled ventilating fan.
• Workers should have access to adequate supply of drinking water.
• When melting flammable metals such as magnesium a Class D fire
extinguisher should be immediately available. Do not use water on flammable metals.