

**OSHA's
Primary Metal Industry
Local Emphasis Program
(LEP)**

OSC | 09
Ohio Safety Congress & Expo

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Why Are We Here?

20% of all manufacturing fatalities in the State of Ohio between 2000 and 2006 occurred in Primary Metals Industry SIC codes 331,332,335, and 336.

2004 BLS data - 5 of the top 20 high injury/illness rate industries were in the PMI SIC codes

2005 ODH data - PMI accounts for 26% of the establishments in Ohio having at least one employee with blood lead levels of 30ug/dL or greater

Primary Metal Industry Targeting

- State of Ohio has over 1000 PMI establishments
- Focus resources on SICs having:
 - Highest injury and illness rates based on 2004 BLS data
 - Elevated blood lead levels bases on 2005 Ohio Dept. of Health (ODH) information
 - A Fatality based on OSHA data from January 2000 through February 2006

Primary Inspection List

- Contains all establishments with SICs where a fatal event is listed in the Ohio Fatality data period of January 1, 2000 to February 23, 2006 and where their NAICS code appeared on BLS table (Highest Incidence Rates of Nonfatal Occupational Injury and Illness Cases, Private Industry 2004)

Primary Inspection List

- 3317 – Steel Pipe and Tubes
- 3321 – Grey and Ductile Iron Foundries
- 3222 – Malleable Iron Foundries
- 3225 – Steel Foundries, Not Elsewhere Classified
- 3351 – Rolling, Drawing and Extruding Copper
- 3365 – Aluminum Foundries

Secondary Inspection List

- Contains all establishments within SICs not included on primary list which had
 - A fatality in the Ohio data period of January 1, 2000 to February 23, 2006 or
 - Where their NAICS code appeared on the BLS Table (Highest Incidence Rates of Nonfatal Occupational Injury and Illness Cases, Private Industry 2004) or
 - ODH noted an elevated blood lead level in 2005

Secondary Inspection List

- 3312 – Steel Works, Blast Furnace and Rolling Mills
- 3313 – Electrometallurgical Products, except Steel
- 3316 – Cold-Rolled Steel Sheet, Strip and Bars
- 3334 – Primary Production of Aluminum
- 3341 – Secondary Smelting and Refining of Non-Ferrous Metals
- 3354 – Aluminum Extruded Products
- 3366 – Copper Foundries
- 3369 – Non Ferrous Foundries, except Aluminum and Copper

Inspection Deferrals

- OSHA Strategic Partnership (OSP): may be carried over to a future cycle to allow the inspection to be deferred for up to 6 months from the signing of or entry into the partnership
- OSHA Consultation: may be deferred from the inspection for 90 days from the date of notification by the State Consultation Program to the Area Office

Inspection Deferrals

- VPP Applicant: Deferred starting no more than 75 calendar days prior to the commencement of its scheduled pre-approval on-site review
- Pre-SHARP: Deferred up to 18 months while the employer is working to achieve recognition and exemption status

Deletions

- Partnerships: If participating in an OSP it may be deleted from the inspection list in accordance with CSP 03-02-002
- VPP or SHARP Participant: deleted from inspection list
- If the establishment received a comprehensive safety and health inspection within the previous 24 months will be deleted from inspection list

Inspection Procedures

- Scope
 - Comprehensive safety and health inspection will address the following at a minimum:
 - Material Handling and Storage, including but not limited to the use of cranes, forklifts and rail yards
 - Machine Guarding
 - Hazard Assessments
 - Air Contaminants
 - Review of all safety and health programs
 - Ergonomic hazards

Inspection Procedures

- Sampling
 - Will be performed on all inspections, unless the facility has recent (no more than past 6 months) representative sampling performed by Ohio On-site Consultation showing no overexposures for all processes
- Ergonomics
 - All PMI inspections will include an ergonomics program evaluation

Inspection Results

PMI LEP – Ohio - FY-2006 through FY-2008

- 123 Inspections conducted
 - 106 (86%) had violations
 - 1002 citations issued
 - \$1,399,693 total penalties
 - 10.3 citations per inspection
 - 76% Serious, Willful or Repeat citations
 - \$1,160 per Serious citation

FY 08 Top 10 Most Cited Standards (PMI – SICs 3200-3300)

Nationwide Fed OSHA

- | | |
|---|--|
| 1. Respiratory Protection
(\$ 647 per violation) | 6. Machine Guarding
(\$1,540 per violation) |
| 2. Lockout / Tagout
(\$1,151 per violation) | 7. Electrical, General Requirements
(\$ 727 per violation) |
| 3. Hazard Communication
(\$ 282 per violation) | 8. Noise Exposure
(\$ 581 per violation) |
| 4. Powered Industrial Trucks
(\$ 517 per violation) | 9. Personal Protective Equipment
(\$ 839 per violation) |
| 5. Electrical, Wiring Methods
(\$ 601 per violation) | 10. Guarding Floor/Wall Openings and
Holes
(\$1,068 per violation) |

Common PMI (Foundry) Hazards

- Melting and Pouring
- Molding
- Core Making
- Finishing
- Material Handling
- Maintenance

Melting Operations

- Employees are exposed to molten metal eruptions and molten metal splashes from furnaces due to scrap falls; wet, oily, and/or cold scrap; compressed gas cylinders; ice balls; voids in scrap; refractory liner failures; and unknown causes.

Melting Operations Other Hazards

- Fall hazards from the pouring deck to the furnace pit while the furnace is tipped up to pour
- Carbon monoxide and heavy metal exposures
- Fall hazards from the pouring deck into scrap and alloy storage pits
- Fall hazards from the furnace deck or the top of the furnace while relining the furnace and repairing the furnace pour spout
- Combustible material such as bags and debris on the furnace deck

Melting Operations Induction Furnace Hazards

- Water cannot accumulate under the furnace
- Induction heating coils must be protected by refractory on lift swing crucible furnaces
- Scrap and other charging material must be free of oil and water
- Furnace power must be deenergized before any unguarded metallic tool is introduced into the molten metal bath

Melting Operations

Protective Equipment for Melt Deck Employees

- Flame Retardant Clothing
- Spatz, kick-off boots, molders boots, or foundry boots
- Leggings must be worn if the pant leg does not cover the top of the boot
- Leather Gloves (Gauntlet Gloves Prohibited) Be aware of elastic cuffs which can trap molten metal

Melting Operations

Protective Equipment for Melt Deck Employees
(cont.)

- Hard Hat
- Face Shield (acrylic or steel mesh)
- Safety glasses
- Hearing protection
- Synthetic fabrics, baseball hats, ski masks, and synthetic gloves are prohibited

Pouring Operations

Metal pourers, pourer helpers, weight setters, mold pushers, and quality control employees are exposed to furnace eruptions and molten metal splashes

Pouring Operations

Protective equipment for pouring area employees:

- Flame Retardant Clothing
- Spatz, kick-off boots, molders boots, or foundry boots
- Leggings must be worn if the pant leg does not cover the top of the boot
- Leather Gloves (Gauntlet Gloves Prohibited) Be aware of elastic cuffs which can trap molten metal
- Hard Hat
- Face Shield (acrylic or steel mesh)
- Safety glasses
- Hearing protection

Pouring Operations Other Hazards

- Carbon monoxide and heavy metal exposures
- Falls from walking on roller conveyors
- Falls from pouring platforms
- Explosions from standing water under mold conveyors or under the raised pouring floor
- Equipment energization when cleaning around and under equipment
- Silica exposures from ladle repair
- Slip/trip hazards from uneven flooring, buckled metal grating, and sand build-up

Material Handling

- Cranes
 - Pendant controls on cranes and hoists not labeled
 - Brakes on the cranes are worn, misadjusted, or burned out. This requires the employees to “plug” the crane in reverse to stop motion
 - Wire ropes double reave on the hoist drum
 - Warning sirens or audible alarms not functioning
 - Capacities not marked on the crane bridge

Material Handling

- **Cranes**
 - Charge buckets not rated as to their capacity
 - Wire ropes worn excessively, bird-caged, kinked, or busted strands
 - Daily inspections not performed
 - Annual inspections performed but deficiencies not corrected
 - Broken safety latches on hooks
 - Fall hazards for operators accessing cab operated cranes
 - Upper limit switches not functioning

Material Handling

- **Pouring and transfer ladles**
 - Ladles must have a locking mechanism or be self-righting to prevent uncontrolled tipping during molten metal transfer
 - Ladle handlers must be marked with the gross load rating
 - Water shall not be allowed to accumulate on the floors where ladles will pass
 - Unattended ladles containing molten metal must be lowered to the ground

Finishing Department

- Carbon monoxide from forklifts/bobcats
- Lacerations/hand injuries from grinding wheels and/or sharp castings
- High Noise from grinders and adjacent equipment
- Crane deficiencies
- Compressed air not regulated to less than 30 psi

Finishing Department

- Foreign bodies in the eyes from the lack of safety glasses and face shield
- Forklift traffic and forktrucks delivering totes to employees standing in front of snag grinders, fixed equipment or work benches. (Usually finishing departments are very tight quarters)

Finishing Department

- Respirable crystalline silica overexposures are common in grinding operations, adjacent shakeout and blasting operations, and forklift traffic disturbing dust.

Finishing Department

- **Combustible metal dust, such as but not limited to, magnesium and aluminum dust generated by grinding operations may be combustible under NFPA.**
 - Dust collectors must be located outside
 - Dust collectors must have deflagration venting
 - Dust collectors must have deflagration propagation protection
 - Cleaning of duct collectors cannot generate dust
 - Dust collection system must be grounded and bonded
 - Cannot recalculate air back into the facility
 - Warning signs must be posted around the dust collector and at the machinery generating the dust, etc.....

Shakeout Department

- Most serious hazards are silica and noise over exposures
- Silica can be controlled through the use of slot hoods and canopy hoods
- There are is no feasible way to reduce the noise below the PEL. However some attempts can be made to reduce the noise a few decibels by:
 - Ensuring any loose parts of the shaker table are secured
 - Isolating the operator area from other sources of noise such as a casting tumbler, air compressors and pneumatic knockout machines
 - Insulate the bottom and back side of the shaker table with a sound deadening material such as rubber
 - Reduce the distance castings fall onto the shaker table and ensure the castings fall onto a rubber mat (old conveyor material)

Shakeout Department

- Employees are also exposed to falling castings
- Burns from hot castings
- Forklift traffic
- Slips, trips, and falls from uneven flooring
- Pinch points created by the reciprocating table and fixed objects
- Walking on or over the shakeout table is prohibited

Table Blast/Tumble Blast Department

- Employees are exposed to fork truck/bobcat struck by hazards
- Deficiencies with lifting equipment such as hoists and cranes
- Employees are overexposed to silica, high levels of noise, and foreign bodies in the eyes
- Silica can be controlled by ensuring the shot blast machines are equipped with ventilation duct work and by ensuring there are no leaks which emit dust or steel shot

Table Blast/Tumble Blast Department

- Noise levels can be reduced by separating the shot blast machines with sound deadening barriers
- Employees must use safety glasses, tight fitting safety glasses, foundry glasses, or spoggles
- All doors must be interlocked so they cannot be opened while machinery is running

Abrasive Blasting

- Employees must wear type CE respirators approved for abrasive blasting
- The respirators must be properly stored to prevent contamination and cleaned (stored in trash bags or plastic storage totes)
- Breathing air coupling must be of a different type than other couplings to prevent an employee from plugging into a nitrogen line or other gas
- Must wear heavy canvas or leather gloves and aprons
- The blast nozzle must have an automatic shut off switch (and it must work)
- Blasting must take place in an enclosure that has adequate ventilation so there is an inward flow of

Molding Department

- Rotating equipment hazards on the sand muller
- Automatic molding machines must be guarded so employees cannot reach into the machinery
- Hoisting hazards
- Employees must lockout the equipment when cleaning or making pattern changes on molding machines

Mold Department

- Molders may be exposed to molten metal hazards if molten metal pouring operations are adjacent to the molding stations.
- Exposed to eye injuries due to falling sand from overhead sand conveyors and compressed air usage
- Entry into enclosed mullers would be considered a permit required confined space entry

Mold Department

- Molders and sand prep employees may be over exposed to silica and high levels of noise
 - Silica can be controlled through ventilation, prevention of falling sand, and enclosed muller operations.
 - Noise can be lowered by maintaining pneumatic vibrators on the sand hoppers, securing loose or broken equipment, and isolating individual molding stations with partitions.

Core Room Hazards

- Employees are exposed to numerous chemicals during core making such as formaldehyde, TEA gas, DMEA, and isocyanates.
- Forklifts drive up to employees standing at stationary machinery
- Employees exposed to dermatitis hazards from the core chemicals, check MSDS's
- Core chemicals can be corrosive requiring working eyewash stations and emergency shower, check MSDS's

- Employees are exposed to levels of high noise from core box and material hopper vibration devices
- Core chemicals can be flammable so dispensing must comply with 1910.106
- Machine guarding & Lockout / Tagout hazards

Core Room Hazards

- **Core Ovens**
 - Natural gas core ovens are required to have a flame monitoring system according to NFPA 86
 - Employees can be overexposed to formaldehyde or carbon monoxide if the oven is not vented properly
 - Employees will need to wear protective gloves and sleeves when handling carts and trays coming out of the core oven

Maintenance Operations

- Maintenance employees are exposed to the most hazardous operations in the foundry:
 - Falls from the top equipment
 - Unexpected movement of machinery
 - Electrical hazards
 - Hazardous substances such as silica, carbon monoxide, heavy metals, and high noise
 - Unguarded equipment
 - Confined spaces
 - Flammable gas (natural gas and/or propane) hazards

Falls

Electrical – NFPA 70E

Confined Spaces

Chain and sling inspections

Respirator Program

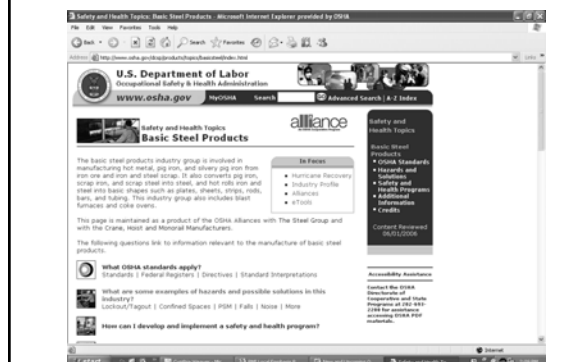
Hearing Conservation Program

www.osha.gov

- Click on e-tools
– Safety and Health Topics Page



Basic Steel Products



HAZARDS AND SOLUTIONS



Resources

- Ohio OSHA Offices
 - Cleveland (216) 615-4266
 - Cincinnati (513) 841-4132
 - Columbus (614) 469-5582
 - Toledo (419) 259-7542
- Ohio On-Site Consultation
 - 1-800-282-1425

