

Lead Exposure in Outside Plant Operations



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What is Lead?



- Heavy metal at room temperature
- Bluish-gray
- Low melting point
- Pliable
- Corrosion resistant
- Can form lead compounds

Pliability, low melting point, and corrosion resistance made it perfect for...



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CABLE

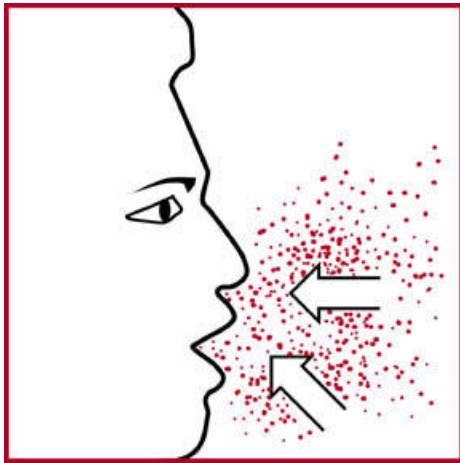


- Flexible
- Re-entenable
- Corrosion resistant



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Ways in which lead enters the body



- Inhalation ~ Breathing lead fumes (over 500C/900F) or dust. This is the most common route of entry in the workplace.



- Ingestion ~ Swallowing lead dust via food, cigarettes etc.



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When is lead a “hazard”



- Primary route of entry in industrial setting is inhalation
- Residential (specifically children) ~ Ingestion common route of entry. Not necessarily ingestion of chips as once thought, ingestion of dust is coming to forefront. i.e Paint of friction surface where dust below exceeds hazardous amount



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Lead at Home?



- If your home was built before 1978, it may contain lead based paint.
- Hobbies: stained glass, home remodeling or painting, recreational target shooting, melting lead for fishing weights, lead glaze in ceramics.
- Non-occupational exposures: backyard scrap metal recycling, leaded crystal tableware, cookware, folk remedies, pica, mine tailings, beauty products (eye make up, certain hair dyes).



Regulations on Lead Exposure



- Consumer Product and Safety Commission
 - banned the use of lead-based paint in 1978 (.06%) reduced to .009% effective August 14, 2009
- Clean Air Act
 - Banned use in gasoline in 1990
- Safe Water Act
 - Instituted the use of lead-free pipes, solder, flux in plumbing operations in 1974
- Community requirements
 - Air cannot exceed 0.15 micrograms/m³ (as of 10/15/2008)
 - Drinking water < 15 ug per L.
- OSHA 29 CFR 1910.1025
 - Permissible Exposure Limit is 50 microgram/cubic meter for an 8-hour period.



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Where is Lead in the Phone Industry?



- Paint (standard wall paint prior to 1978)
- Paint on steel structural members (any date)
- Paint on equipment (any date)
- Paint on metal guard rails etc. (any date)
- Solder (yes still)

- Lead-sheathed Cable



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Isn't the Lead Cable Gone?



- NO
- Some older metropolitan areas may still have over 50% lead cable.



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Different Aspects of Lead Cable



- Aerial Lead Cable

- Repair
- Removal

- Underground Lead Cable

- Repair
- Removal

- Big Differences in Location and Task



Repair vs. Removal

Repair

- Short Duration
- Use LEPEC to clean compounds from surface before beginning
- Recommend using waffle case or mechanical enclosure to close

Removal

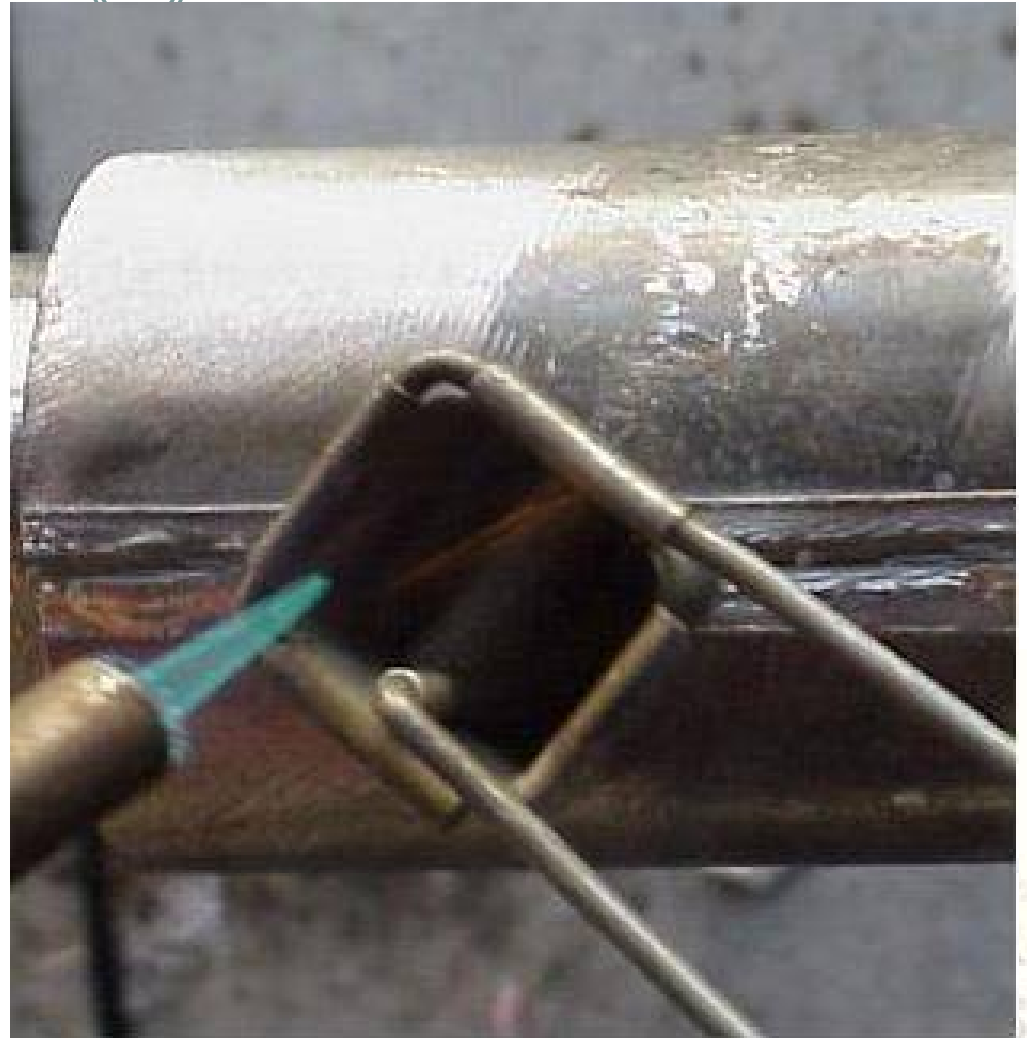
- Long processes
- No way to remove compounds
- Dependant on location, speed of removal



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Solder/ Cable Repair

- Lead melts at around 620⁰ F.
- At 1000⁰ F fumes are emitted from the lead at significant levels
- potentially resulting in an exposure to the person performing the operation.



What We Have Found, Expect, Suspect, & Know



- Cable repair presents low risk of inhalation hazard

- Primarily due to short duration and location



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Cable Removal



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Aerial Cable



- In the aerial plant, the lead compounds that are most likely to form on the surface of lead-sheathed cables are
 - Lead monoxide (sparingly soluble)
 - Lead carbonate (sparingly soluble)
 - Lead sulfate (sparingly soluble; generally found where the air contains industrial pollutants and where acid rain falls).
- These compounds generally adhere tightly to the lead surface.

Source – BELLCORE PRACTICE BR 877-112-001 ISSUE 1, AUGUST 1996



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Aerial Cable



- Limited sampling has demonstrated little exposure when removing lead cable.
- More sampling/ data needed.



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Underground Ducted and Buried Cable

In the buried plant, the lead compounds that are most likely to form on the surface of lead sheathed cables are:

- Lead carbonate
- Lead monoxide
- Lead sulfate
- Lead chloride
- Lead dioxide
- Lead acetate
- Lead nitrate
- Lead sulfide

Many of these compounds do not adhere as tightly to the cable and are easily airborne



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Underground Ducted and Buried Cable

Environmental Impact

- The soils retained between 83 and 98 percent of the released lead within 2 inches (5 centimeters) from the cables



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Underground Ducted and Buried Cable

Safety/ Health Issues

- Extraction of cable from underground duct can release unexpected high levels of lead dust.
- Wetting was not capable of controlling dust in many cases.
- Location of employees to cable extraction is important.



Disposal of Lead Debris



- Varies state by state. In some states only chips and dust are regulated, components can be disposed in landfills
- TCLP test – raw % of lead in waste does not define disposal requirements. A TCLP test is used to determine how much lead will leach from substrate into environment.
 - The TCLP maximum contaminant concentration for lead is 5.0 mg/L (5.0 ppm)
- **RECYCLE**



What we Have Found-Expect-Know



- Cable Repair presents little risk of inhalation hazard.
- Aerial Cable presents little hazard for airborne particle inhalation (studies continue).
- Underground cable presents real possibilities for overexposure.



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What You Can Do



- **Develop NIDs (Negative Initial Determinations)**
- **NIDs for several operations including:**
 - Drilling holes in walls with LCP
 - Removing ductwork with LCP
 - Lead soldering on frames



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Questions/ Discussion



- Questions
- Would love to cooperate with anyone interested in collecting data and verifying safe procedures.



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