Midwest EHS Center of Excellence

**ENVIRONMENTAL**
- ISO 14001 Implementation Assistance
- P2
- EAQ, GIS systems emissions dispersion models
- MSDS biofuel assistance
- Prevention through Design (PtD) for biofuel production
- Globally Harmonized System—safe labeling, placarding and shipping requirements
- Reduce, Recycle, Reuse (3R)

**HEALTH**
- IAQ and Ventilation
- Risk Assessment – Chemical Exposures
- Ergonomics (REBA, RULA, SI assessment)
- LEED – Green Buildings AQ issues
- Particles, Mold and Allergens consultation
- Noise and Lighting

**SAFETY**
- Safety Leadership
- ANSI Z10 Implementation
- Hazard Assessment, JHA
- SAN Toyota Safety System Assistance
- Occupational Hazard Management
- High Hazard Industries Consulting
- BBS
- Injury Rates and Statistics
- ISO 31000 & Loss Control

Cost-Benefit Analysis

Business Case for EHS Development and assistance
Silicone Wires Spark plugs
Small Business PtD

- Silicone wire production involves variety of hazardous chemicals, toxic materials, and hazardous waste.
- Synthetic Fibers
- Solvents
- Ergonomics
# Exposure Limits Example

<table>
<thead>
<tr>
<th>Substance</th>
<th>VEMP</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Insulating wool fiber, slag wool</td>
<td>1 fiber/cm³</td>
<td>C2, EM</td>
</tr>
<tr>
<td>2-Insulating wool fiber, rock wool</td>
<td>1 fiber/cm³</td>
<td>C2, EM</td>
</tr>
<tr>
<td>3-Insulating wool fiber, glass wool</td>
<td>2 fibers/cm³</td>
<td>C3</td>
</tr>
<tr>
<td>4-Fiberglass, continuous filaments</td>
<td>10mg/m³</td>
<td>Total dust</td>
</tr>
<tr>
<td>5-Refractory fibers, (ceramic or others)</td>
<td>1 fiber/cm³</td>
<td>C3</td>
</tr>
<tr>
<td>6-Glass microfibers</td>
<td>1 fiber/cm³</td>
<td>-</td>
</tr>
</tbody>
</table>

C2: suspected carcinogen to humans  
C3: confirmed carcinogen to animals  
EM: substance that should be kept at the lowest practicable level
Lung cancer in the man-made mineral fiber industry
Talc

- **CAS:** 14807-96-6; Chemical Formula: \(H_2O_3Si \cdot 3/4 Mg\)

- The former OSHA PEL for non-asbestiform talc was 20 million particles per cubic foot of air (mppcf) as an 8-hour TWA; when expressed as mg/m³, this is comparable to 3 mg/m³.

- The health-effects evidence for talc is complicated by the fact that talcs contain amphiboles and other minerals, in addition to platiform talc crystals; adverse health effects appear to be related to the nonplatiform content of the talc.

- There are conflicting views regarding the extent to which the fibrous constituents are asbestos; however, no health effects information is available that is specifically related to fibrous talc.

- Studies by NIOSH of 398 white male workers employed between 1947 and 1959 in the talc industries found that 74 of these men had died, and that bronchogenic cancer was the cause of death in nine men.
Erionite CAS # 66733-21-9

Erionite fibers have been identified in lung tissue samples in cases of mesothelioma. The link between erionite and mesothelioma is most firm in two villages in Turkey where 50% of deaths are caused by mesothelioma. Erionite-containing volcanic tuffs were found in samples collected from the walls of local dwellings and rock and dust samples.

Descriptive studies have demonstrated very high mortality from malignant mesothelioma, mainly of the pleura, in these Turkish villages where the population had been exposed to erionite from birth. Erionite fibers were identified in lung tissue samples in cases of pleural mesothelioma; ferruginous bodies (diagnostic of exposure) were found in a much higher proportion in the lungs of inhabitants in contaminated villages than of those in two control villages.

EPA regulates erionite under the Toxic Substances Control Act (TSCA) as a chemical substance for which there are significant new uses and thereby specifies procedures for manufacturers, importers, or processors to report on those significant new uses.

OSHA regulates erionite under the Hazard Communication Standard and as a chemical hazard in laboratories.
Talc “Powder”
Erionite – Mixed with Talc
Print ink extenders/solvents

- The following print ink extenders were used: benzene, methyl ethyl ketone (MEK), acetone, and toluene. Some of the symptoms described by the operator are associated with the above-mentioned solvents.

- The sampling was performed utilizing the PID (photo ionization detector) with IP (Ionization Potential) of the ultraviolet lamp 10.6 electron volts (eV).

\[
E_m = \frac{0.344}{1000} + \frac{0.578}{1} + \frac{1.844}{200} + \frac{0.829}{200} = 0.000344 + 0.578 + 0.00922 + 0.0041 = 0.592
\]
Degreasing solvents

- Benzene and toluene were used as degreasing agents until May 16, 2009. During the degreasing operation, the benzene short-term exposure level of 5ppm was slightly exceed. The auditor measured 5.4 ppm with the PID. Only benzene was used during the operation and it was assumed that the levels measured with the PID relate to benzene exposure only.
New type degreasing agents

Air Contaminants

<table>
<thead>
<tr>
<th>Compounds</th>
<th>Results ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Ammonia</td>
<td>0.1</td>
</tr>
<tr>
<td>2  NOx</td>
<td>0.5</td>
</tr>
<tr>
<td>3  VOC</td>
<td>2.2</td>
</tr>
<tr>
<td>4  H₂S</td>
<td>0.5</td>
</tr>
<tr>
<td>5  Isopropyl Alcohol</td>
<td>0.13</td>
</tr>
<tr>
<td>6  Limonene</td>
<td>0.22</td>
</tr>
<tr>
<td>7  Naphtha</td>
<td>0.072</td>
</tr>
<tr>
<td>8  Petroleum Distilates</td>
<td>0.098</td>
</tr>
<tr>
<td>9  α-Pinene</td>
<td>0.031</td>
</tr>
<tr>
<td>10 Xylene</td>
<td>0.039</td>
</tr>
<tr>
<td>11 CO</td>
<td>2.3</td>
</tr>
<tr>
<td>12 CH₄</td>
<td>16</td>
</tr>
</tbody>
</table>

\[
Em = \sum_{i=1}^{6} \frac{C_i}{L_i} = \frac{\text{Naphtha}0.072}{100} + \frac{\text{IsoAlcohol}0.13}{400} + \frac{\text{PD}0.098}{500} + \frac{\text{Xylene}0.039}{100} + \frac{\text{CO}2.3}{50} + \frac{\text{Ammonia}0.1}{50}
\]

\[
Em = 0.00072 + 0.000325 + 0.000196 + 0.000039 + 0.046 + 0.002 = 0.049631
\]
• Repetitive motion is common for spark plug boots installation operations.
• Unfortunately, the nature of the work requires a lot of repetitive movements.
The Missouri Workers’ Safety Program (MWSP) was created to help employers improve workplace safety, reduce workers’ compensation costs, and regulate safety services provided by insurance carriers.

Law requires all insurance carriers writing workers’ compensation insurance in Missouri to provide comprehensive safety engineering and management services to employers upon request and sets forth requirements for certification of safety consultants and engineers.

Program functions include certifying and maintaining a registry of safety consultants and engineers; certifying safety programs of self-insured employers, self-insured trusts, third-party administrators, and workers’ compensation insurance carriers; investigating complaints of inadequate loss control services against insurance carriers; monitoring the impact of safety services being provided by insurance carriers; performing on-site safety audits and consultations; and conducting occupational safety education and training.
PtD – Included in OSHA Training Classes

The OSHA Training Institute (OTI) Education Center program was initiated as an extension of the OSHA Training Institute, which is the primary training provider of the Occupational Safety and Health Administration. OTI targets Federal and State compliance officers and State consultation program staff, but also provides training for private sector personnel and Federal personnel from agencies other than OSHA on a space available basis.

Select the map below to find an Education Center near you.

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- Frequently Asked Questions

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