OSHA's Crystalline Silica Rule

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Overview

- Final OSHA rule: March 25, 2016 Fed Reg 606 pp long!
  - 30 pp of actual reg text and the rest is preamble/explanation of consideration of comments and alternatives/reg impact
  - Construction must comply by 6/23/17
  - General industry/maritime must comply by 6/23/18
  - Fracking must fully comply by 6/23/21
- Will affect 2 million construction workers and 300,000 in general industry and maritime sectors, including hydraulic fracturing
- Litigation has commenced!

What is Crystalline Silica?

- 100 times smaller than ordinary sand on a beach
- Chemical compound is Silicon dioxide (SiO2)
- Makes up majority of the planet's crust (naturally occurring substance)
- Also found in almost all mines – including coal
- Impact to health: Over-exposure possible in occupations such as mining, construction, fracking, oil and gas, transportation, sandblasting, concrete manufacturing, demolition, and even dentistry.
- Classified as Group One Human Carcinogen by IARC in 1997 (also by NTP) – warning must be included on SDS of silica-containing products

How Are Workers Exposed?

- Respirable dust means the particle is small enough to penetrate the respiratory system (can't be expelled)
- Inhaled by workers during work activities and particles harm lungs
- Inhaled when cutting, sawing, grinding, drilling, and crushing the materials.
- Also present during extraction, processing, transfer for storage and transit, or use on a well pad of sand

How much respirable crystalline silica is the OSHA PEL?

OSHA PEL = 0.05 mg/m_3 TWA

0.05 mg/m_3 = 50 micrograms (µg)/m3

1 m^3 of air = 1,000 liters

Normal breathing rate (moderate work, 1 work day) = 10 m^3 (10,000 liters of air)

50 micrograms x 10 m^3 = 500 ug

Photo: Geoff Plumlee, USGS

Where do we find silica?

- Crystalline silica is present as an ingredient in the following:
  - brick and mortar,
  - concrete,
  - slate,
  - dimensional stone (granite, sandstone),
  - engineered stone products (countertops etc.)
  - stone aggregate,
  - tile,
  - asphalt filler,
  - roofing granules,
  - plastic composites,
  - soils, and
  - wallboard joint compounds, paint, plaster, caulking and putty.

Health Findings in OSHA Rule

- Over 600 deaths/yr and 900 new silicosis cases prevented by rule
- Crystalline Silica categorized as respiratory toxin that causes silicosis, COPD and lung cancer
  - Three types of silicosis: Chronic (15-20+ yrs), Accelerated (5-10 yrs), and Acute (months-2 yrs)
- OSHA also links occupational silica exposure with kidney disease
- Rule states more than 50 peer-reviewed studies were evaluated and found links between silica exposure and lung cancer in at least 10 industries
- Implications for litigation?

"Current" Exposure Limits (29 CFR 1910.1000, "Z" table, 1971)

- OSHA (general industry) and MSHA (Permissible Exposure Limit) PEL equates to 100 ug/m3
- OSHA (construction and shipyard) PEL equates to 250 ug/m3
- NIOSH (Recommended Exposure Limit (REL) – since 1970s - is 50 ug/m^3
- ACGIH dropped Threshold Limit Value (TLV) to 25 ug/m^3
  - TLV = airborne concentration of substances / represents level where repeated exposure do not cause health effects
  - Action level means a concentration calculated as an eight (8)-hour time-weighted average

OSHA Rulemaking History

- NIOSH issues REL of 50 ug/m3 for RCS in 1974
- OSHA launched emphasis programs dating back to 1997 IARC classification; current NEP required 2% of all OSHA inspections to be silica related
- Draft proposal reviewed by SBREFA panel 2003
- Proposed rule issued in 2013 (after 2 years at OMB), 3 weeks of public hearings
- OSHA evaluated over 1,700 written comments and 200 live statements (plus cross-exam by public and panel)
- OSHA's adopted PEL is consistent with NIOSH REL; action level is consistent with ACGIH TLV.
- New Standards: 29 CFR 1910.1053 (GI), 1915.1053 (Maritime) and 1926.1153 (construction)

Changes to Final Rule

- Scope of standards revised to exclude tasks that involve low exposures
- OSHA opted not to include worker medical removal provisions
- OSHA removed provisions that barred worker rotation
- Standards do not apply where worker exposures remain below 25 ug/m3 for 8 hr TWA under foreseeable conditions (ER must have evidence to support this exception)
- Standard for GI/Maritime doesn't apply to exposures from processing sorptive minerals
- GI/Maritime standard allows ER to comply with specified exposure control methods in construction rule instead of complying with PEL in certain circumstances
- No requirement for protective clothing
- All employers must have written exposure control plan (and construction must have competent person to implement plan)

Compliance Deadlines

- Construction – 6/23/17 to achieve most requirements (can adopt "Table 1" controls in lieu of exposure monitoring)
- General Industry/Maritime: 6/23/18 to comply with most requirements (including medical exams for employees exposed above PEL for 30+ days/yr)
- OSHA allowed additional time:
  - for all fracking employers to install dust controls to meet new PEL (due 6/23/21)
  - for all GI employers to offer medical surveillance to employees exposed between PEL and the AL for 30+ days/yr (due 6/23/20)

Compliance Challenges?

Covered General Industry Sectors - Many EE Exposed Above New PEL:

- Asphalt roofing materials (45%)
- Concrete products (29%)
- Cut Stone (56%)
- Foundries (35%)
- Jewelry (36%)
- Porcelain Enameling (40%)
- Pottery (40%)
- Railroads (32%)
- Ready-Mix Concrete (74%)
- Shipyards (73%)
- Structural Clay Products (41%)
- Support activities for Oil & Gas Operations (66%)

OSHA's Economic Analysis

- Total Annualized Costs: $1.030 billion including:
  - Engineering controls: $661.5 million
  - Respirators: $32.9 million
  - Exposure assessment: $96.2 million
  - Medical Surveillance: $96.4 million
  - Familiarization & Training: $95.9 million
  - Regulated Area: $2.6 million
  - Written Exposure Control Plan: $44.3 million
- Annualized benefits monetized: $8.687 billion
  - Costs of prevented fatal lung cancers, silicosis and other respiratory diseases, renal disease and other silica-related mortality
- Net benefits: $7.657 billion

OSHA's 2016 GI/Maritime Rule

- Includes provisions for:
  - Measuring worker exposures to silica if at or above 25 ug/m3 action level and workers get notification of results within 15 working days;
  - Using engineering controls (e.g., water, ventilation) and work practices to limit exposures from exceeding 50 ug/m3 over 8 hr time-weighted average workday;
  - Limiting access to areas where workers could be exposed above the PEL;
  - Using respirators when necessary after implementing engineering and administrative controls;
  - Restricting housekeeping practices that expose workers to silica if feasible alternatives are available;
  - Medical exams for highly exposed workers;
  - Worker training on work ops that result in exposure and ways to limit exposure; and
  - Recordkeeping of workers' silica exposure and medical exams.

Exposure Monitoring - GI

- Initial monitoring to assess 8 hr TWA for silica exposure of representative employees for each job classification (picking EE with highest expected exposure)
  - If initial monitoring shows below AL, employer may discontinue monitoring for those employees
  - IF most recent monitoring indicates exposure > AL but < PEL, repeat monitoring within 6 mo.
  - IF most recent monitoring indicates exposures > PEL, repeat within 3 mon.
  - Where non-initial monitoring indicates exposures < AL, repeat monitoring within 6 mo. until 2 consecutive are < AL … then discontinue monitoring.

Exposure Monitoring – GI

- Reassess exposures whenever change in production, process, control equipment, personnel or work practices indicate new or additional exposures above AL, or if ER has reason to believe exposures above AL have occurred.
- Sample analysis must conform to Appendix A.
- Employee representative has right to observe air monitoring and must be provided with appropriate PPE at no cost.
  - Exposure records and medical surveillance must be maintained and made available in accordance with 29 CFR 1910.1020

Medical Surveillance

- ER must make medical surveillance available at no cost to EE for each worker exposed to respirable CS at or above AL for 30+ days/yr
- All exams and procedures must be performed by PLHCP – after initial, exam must be repeated every 3 years or more often if recommended Baseline exam includes:
  - past, present and anticipated exposure to RCS, dusts, and other agents affecting respiratory system,
  - history of resp system dysfunction and TB,
  - smoking status and history,
  - physical exam,
  - chest X-ray,
  - pulmonary function test,
  - testing for latent TB infection,
  - any other tests determined appropriate by PLHCP.

Medical Surveillance

- PLHCP must explain exam results to worker and any limitations on exposure, and provide written medical opinion to ER within 30 days that includes:
  - Date of exam
  - Statement that exam meets requirements of standard
  - Any recommended limitations on worker's use of respirators
  - IF employee provides written authorization, info on any recommended limitations to worker's RCS exposure, a statement that worker should be examined by specialist if chest X-ray is 1/0 or higher by B reader
- Employer must ensure worker gets copy of written medical opinion within 30 days.

Employee Training

- Each covered employee must be trained, under OSHA's Haz Com Standard (29 CFR 1910.1200) on hazard of RCS containing products and have access to labels and SDSs
- Workers must also be trained on:
  - Health hazards associated with exposure to RCS
  - Specific tasks in workplace that could result in exposures
  - Specific measures ER has implemented to protect EE from exposure, including engineering and WPC, and respirators to be used
  - Contents of OSHA rule
  - Purpose and description of medical surveillance program

Written Exposure Control Plan

- Plan must include following elements:
  - Description of tasks involving exposure to respirable crystalline silica
  - Description of engineering controls, work practices, and respiratory protection used to limit worker exposure for each task – engineering and WPC must be used unless employer demonstrates not feasible.
  - Description of housekeeping measures used to limit employee exposure – dry sweeping, dry brushing, and use of compressed air not allowed (unless compressed air is part of ventilation system that captures dust cloud)
- ER must review and evaluate effectiveness of written plan at least annually and update as necessary
- Plan must be available for exam and copying by OSHA rep

Regulated Areas

- Employer must establish regulated area if worker exposures are expected to be above PEL, and demarcate area from rest of workplace so minimizes number of exposed employees
- Must post signs at all entrances with: DANGER – RESPIRABLE CRYSTALLINE SILICA. MAY CAUSE CANCER. CAUSES DAMAGE TO LUNGS. WEAR RESPIRATORY PROTECTION IN THIS AREA. AUTHORIZED PERSONNEL ONLY.
- Limit access to persons authorized by employer and required by work duties to be present, anyone who is employee's designated representative to observe monitoring, anyone authorized by OSH Act or regs to be in area
- Each person in regulated area must be provided by employer with appropriate respirator and it must by used while in regulated area.

OSHA's 2016 Construction Rule

- High risk tasks: masonry saws, grinders, drills, jackhammers, chipping tools, drilling rigs, milling crushing, heavy equipment used for demolition & other tasks
- Rule includes provisions for:
  - Use of control methods in Table 1 OR measure worker exposure and decide which controls work bets to limit exposures to PEL in workplace
  - Written exposure control plan with implementation by designated competent person
  - Restriction on housekeeping practices that expose workers to silica
  - Medical exams (chest X-ray and lung function tests) every 3 years for workers who wear respirator 30+ days/yr.
  - Worker Training & Recordkeeping

Construction "Table 1"

81 Fed. Reg. 16877-16879

- **Employers who follow Table 1 correctly are NOT required to measure worker exposure to silica and are NOT subject to PEL! Otherwise 50 ug/m3 PEL and 25 ug/3 AL apply.**
- Table 1 lists:
  - Equipment/Task (18 tasks included),
  - Engineering & Work Practice Control Methods, and
  - Required Respiratory Protection and Minimum Assigned Protection Factor (APF) for shifts <4 hr and those > 4 hrs
- Chart lets employers know what they need to do, including use of water and ventilation, sometimes supplemented with respiratory protection.

Table 1 Task Example

Equipment/task	Engineering & WPCM	Resp protection and APF
Handheld power saw	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	< 4 hrs: none if used outdoors, < 4 hrs: APF 10 if used indoors or in an enclosed area > 4 hrs: APF 10 whether indoors or outdoors

Construction Tasks Not in Table 1

- For tasks not listed in Table 1, or if ER does not fully implement controls and PPE:
  - Must ensure no exposures above 50 ug/m3 PEL
  - Must assess EE exposure if $\geq$ AL following either "performance option" or "scheduled monitoring option" … if exposures > PEL, repeat within 3 mo. If > AL and < PEL, repeat within 6 mo.
  - Reassess as needed whenever changes in production, equipment, etc.

Table 1: Work Tasks/Equipment

- Stationary masonry saws
- Handheld power saws
- Handheld power saws for cutting fiber-cement board (blade diameter of 8" or less)
- Walk-behind saws
- Drivable saws
- Rig-mounted core saws or drills
- Handheld and stand-mounted drills
- Dowel drilling rigs for concrete
- Vehicle-mounted drilling rigs for rock and concrete
- Jackhammers and handheld powered chipping tools
- Handheld grinders for mortar removal (i.e., tuck pointing)
- Handheld grinders for uses other than mortar removal
- Walk-behind milling machines and floor grinders
- Small drivable milling machines
- Large drivable milling machines
- Crushing machines
- Heavy equipment and utility vehicles used during demolition
- Heavy equipment and utility vehicles for grading & excavating

Other Construction Requirements

- Use of Respiratory Protection as needed by Table 1, where engineering/WPC not able to reduce below PEL, or when exposures exceed PEL during implementation of engineering/WPC
- Housekeeping controls and bans on methods
- Written exposure control plan – competent person designed by ER must conduct frequent and regular inspections of job sites, materials and equipment to implement WECP
  - In lieu of regulated areas, construction ER must include in WECP procedures to restrict access to work areas to minimize number of exposed EE
- Medical surveillance
- Employee training under HazCom & new rule
- Recordkeeping – air monitoring data and medical surveillance data in accord with 1910.1020

Delivering a Complete Solution

Roles and Responsibilities

- General Contractor (Construction)
  - Very important to allocate responsibilities upfront before the work starts
  - Coordination of work activities to minimize the silica exposure to all employers' employees
  - Key item to cover is surface dust or common dust at a worksite – Direct read instrument
- Employer
  - Ensure the WECP is fully and properly implemented - WECP must be present at worksite
  - All materials and other resources are available to implement WECP
  - Update WECP at least annually
  - Coordinate with the GC and train your supervisors and employees
- Supervisor/Competent Person
  - Provide adequate training and instruction to employees in the implementation of the WECP
  - Ensure engineering controls are implemented and that employees are trained in their use
  - Ensure employees "can demonstrate knowledge and understanding of…"
- Employee
  - Read, understand and comply with the WECP
  - Use the engineering controls, follow work practices, use respirators when required, and report issues

Interface with Consensus Standards

- Industry voluntarily recognized the need for comprehensive standards addressing the hazards of crystalline silica.
- Voluntary consensus standards have been adopted for general industry (ASTM E 1132) and construction (ASTM E 2625).
  - There were referenced by OSHA in the proposal and final rule but were not incorporated by reference
- These voluntary standards include provisions for exposure measurement, use of dust controls, respiratory protection, medical surveillance, and training.

Issues To Consider

- Current laboratory testing is imprecise. Will test results be less certain with the lower PEL and an Action Level that is near limits of detection?
- New OSHA standards lowering PEL and documenting overexposures based on findings of lung cancer, silicosis, COPD and kidney disease may establish occupational exposure liability (and third party PI/WD liability when subcontractors or temps become ill).
- Plaintiffs will increasingly access OSHA/MSHA public data on sampling results and citations to support litigation or to block permitting of industries they oppose.
- Both revised OSHA standard and voluntary consensus standards such as ASTM E1132 and E2625 will be used by plaintiff attorneys to show violation of industry "standards of care."

Issues To Consider

- Employers must sample for silica and implement preventative measures NOW (not wait for OSHA enforcement of new rule) to protect workers and third parties from adverse effects of possible overexposures.
- Critical to begin designing and implementing effective occupational health programs that include medical evaluations, surveillance, and exposure monitoring
- Awareness of national consensus standards and application of these "best practices," where appropriate, may help provide defense to citations and tort litigation, and will assist in designing compliant programs
  - ✓ **A proactive approach to silica risk reduction is key to reducing worker injuries, as also for fending off OSHA/MSHA citations, toxic tort lawsuits, and worker's compensation claims.**

Questions?

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