EVERYTHING YOU NEED TO KNOW TO COMPLY WITH THE **NEW SILICA RULE**

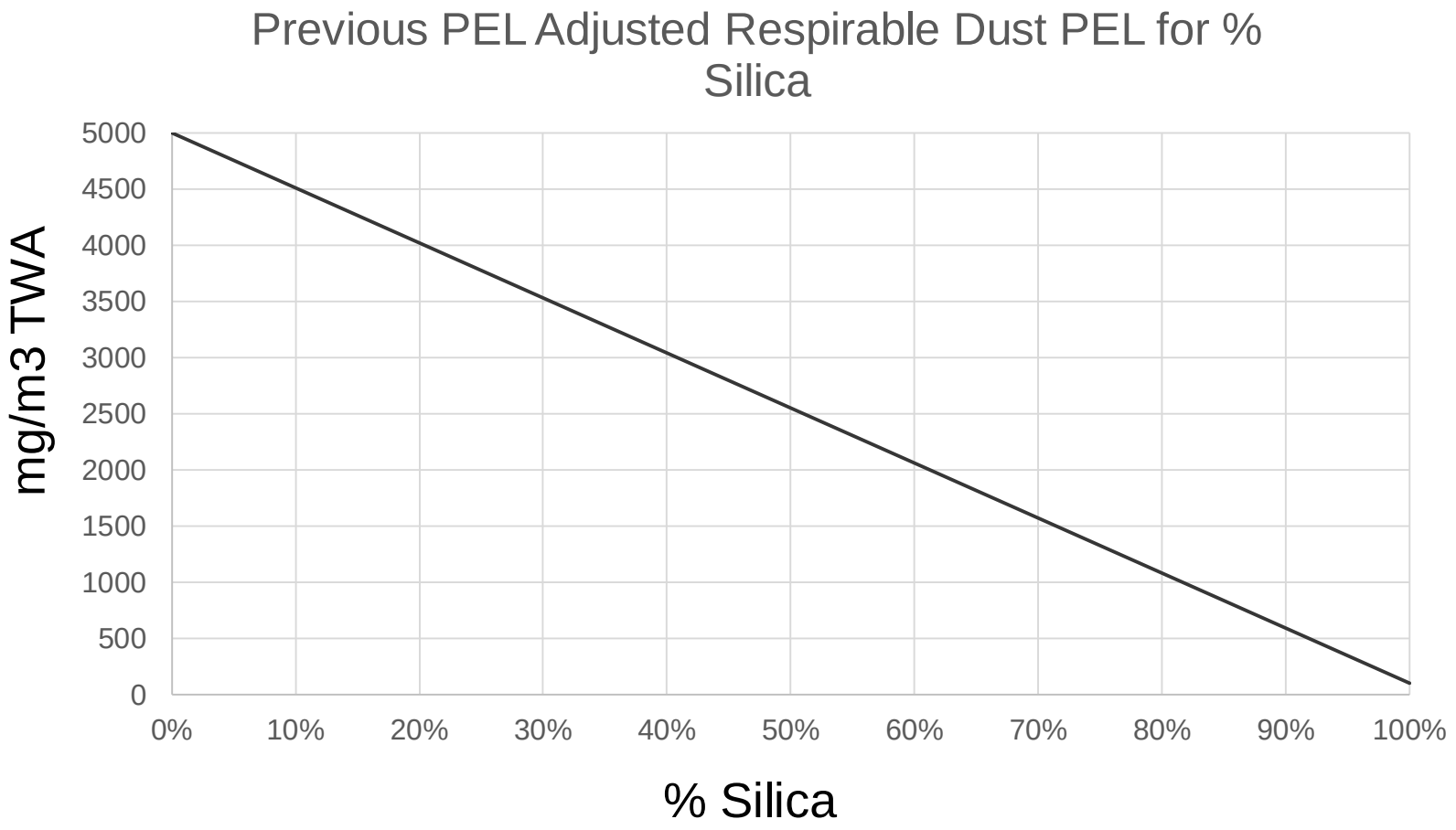
WHEN YOU NEED TO BE SURE

SGS

SGS GALSON HELPS YOU COMPLY WITH NEW OSHA SILICA REGULATIONS

- We meet all of the new laboratory qualifications for silica
- Lab pros provide expertise unsurpassed in the industry
- Two x-ray diffraction (XRD) instruments run consistently and analyses remain 100 percent on time
- Redesigned pumps/media match new requirements to easily monitor any silica dust hazards
- MSHA Self-Compliance Kit provides dust and silica, as well as noise monitoring to cover self-compliance reporting requirements

SGS GALSON HELPS YOU COMPLY WITH NEW OSHA SILICA REGULATIONS



$$\text{PEL (respirable fraction)} = \frac{10 \text{ mg/m3}}{\%\text{ quartz} + (\%\text{ cristobalite} \times 2) + (\%\text{ tridymite} \times 2) + 2}$$

Respirable Dust and Crystalline Silica: Quartz

	Sample ID	Lab ID	Analyte	Air Vol l	mg	%	mg/m3	Dust P E L mg/m3
V	589859	L238816-1	Dust	1163.103	0.28		0.24	0.48
			Quartz	1163.103	0.053	19	0.046	
V	589860	L238816-2	Dust	1172.73	0.16		0.13	0.56
			Quartz	1172.73	0.025	16	0.021	
V	589861	L238816-3	Dust	1197.09	<0.10		<0.084	5.0
			Quartz	1197.09	<0.010	ND	<0.0084	
V	589862 FIELD BLANK	L238816-4	Dust	NA	<0.10		NA	NA
			Quartz	NA	<0.010	ND	NA	

PREVIOUS OSHA SILICA STANDARD (CONSTRUCTION AND MARITIME)

- Current PEL based on research from 1960s
- Sampling and analytical method not commonly used for 40+ years (Dunn Cell)
- Allowed 2x the level of General Industry
  - ~240 µg/m3 [conversion from Millions of Particles per Cubic Feet (mppcf)]
- 1 mppcf = 0.1 mg/m3

Construction PEL (mppcf): $\frac{250 \text{ mppcf}}{\% \text{ Quartz} + 5}$

OSHA Fact Sheet:
OSHA's Proposed Crystalline Silica Rule Overview

KEY COMPONENTS

- Two Standards:
  - General Industry & Marine – 29CFR 1910.1053
  - Construction – 29CFR 1923.1153
- Limits are the same for Construction; General Industry and Maritime
- PEL is no longer a moving target – 50 ug/m3 total of all 3 forms
- Action level of 25 ug/m3
- MSHA is just beginning rulemaking process

KEY COMPONENTS

Respirable Crystalline Silica: Quartz, Cristobalite, Tridymite

	Sample ID	Lab ID	Analyte	Air Vol l	ug	ug/m3
V	QCT	L379941-1	Quartz	1200	14	NA
			Cristobalite	1200	<5.0	NA
			Tridymite	1200	<20	NA
			Total silica	1200	14	12

- Both Standards went into effect 6-23-16
- Companies must comply by:
  - Construction Sector – 9-23-2017
  - Marine and General Industry- 6-23-2018
    - Exception – Hydraulic Fracking – 6-23-2021

KEY COMPONENTS: EXPOSURE CONTROL PLAN

- Mandates a Written Exposure Control Plan
- Available to Employees, reviewed annually and updated as needed

Must Include:

- Description of Tasks that involve Silica Exposure
- A description of Engineering Controls, work Practices, and Respiratory Protection used to limit silica exposure for each identified task
- A description of Housekeeping Practices in Place

KEY COMPONENTS: MEDICAL SURVEILLANCE

- By 6-23-2018 (General Industry & Marine) Medical surveillance for workers exposed to silica at or above the PEL for at least 30 days per year. Surveillance includes an initial examination with an emphasis on the respiratory system.
  - Must be performed by licensed health care professional
  - Baseline
  - Chest X-Ray
  - Pulmonary Function
  - Latent tuberculosis
  - Periodic Exams (at least every 3 years)

- Medical Surveillance for Construction required beginning 6-23-2017
- By 6-23-2020 Medical surveillance for workers exposed to silica at or above the Action Level for at least 30 days per year.

KEY COMPONENTS: TRAINING

- Requiring employers to include silica in their hazard communication program, requiring worker training on operations that could result in exposure and on protective methods:
  - Health Hazards
  - Measures Implemented to control exposures
    - Engineering Controls
    - Respiratory Protection
    - Work Practices
- Standard Contents
- Medical Surveillance Program
- Identity of Competent Person

KEY COMPONENTS: RECORDKEEPING

- Requiring recordkeeping of air monitoring, medical surveillance, and other data:
  - Date of Measurement
  - Task Monitored
  - Sampling and Analytical Methods Used
  - Identity of Laboratory Performing Analysis
  - PPE worn by employee
  - Name, SS#, job classification of all employees in SEG, indicating which members were monitored

KEY COMPONENTS: AREA REGULATION

- Limiting worker exposure by creating regulated areas with limited access or establishing written access-control plans:

DANGER

RESPIRABLE CRYSTALLINE SILICA

MAY CAUSE CANCER

CAUSES DAMAGE TO LUNGS

WEAR RESPIRATORY PROTECTION IN THIS AREA

AUTHORIZED PERSONNEL ONLY

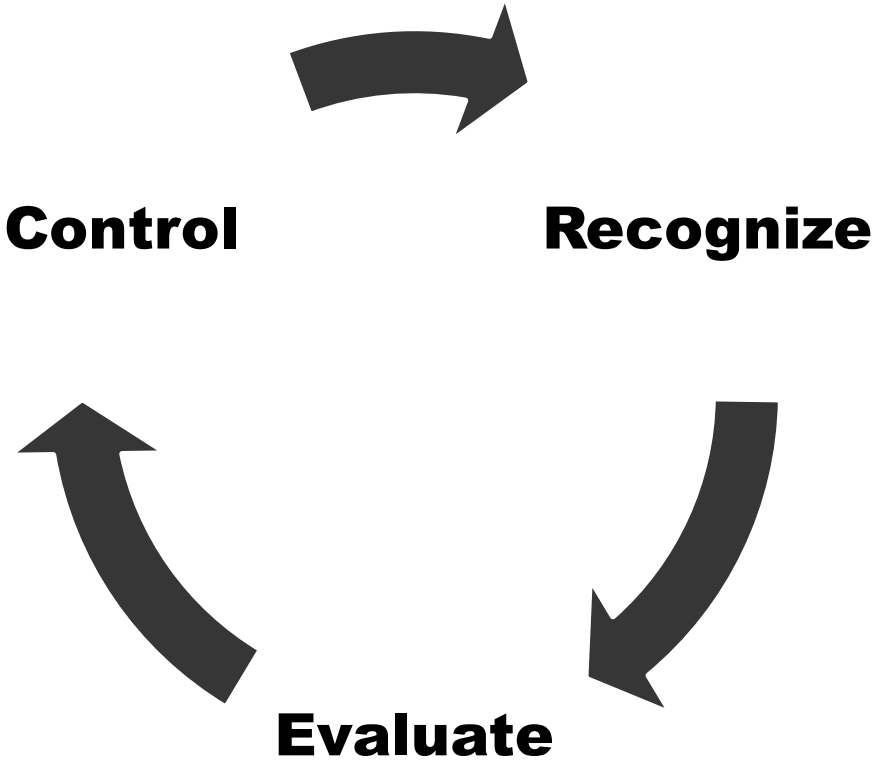
- Employees MUST wear respiratory protection when entering a regulated area
- Employees MUST be in the respiratory protection program to wear respiratory protection

KEY COMPONENTS: HOUSEKEEPING

- Prohibits dry sweeping or using compressed air to clean silica and mandates wet methods or HEPA-filter vacuuming
- Prohibiting rotating employees to different jobs to comply with the PEL
- Prohibits using compressed air for cleaning clothing unless in conjunction with ventilation system that captures dust

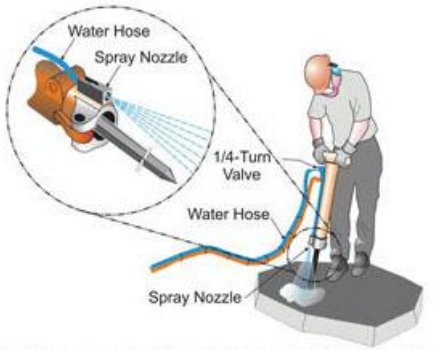
KEY COMPONENTS: MONITORING

- Employers obligated to initially monitor the airborne concentration of silica in the workplace, unless they can objectively demonstrate there is no silica released above the set action level.
- Results of Initial Monitoring within 12 months of compliance deadline:
  - If above PEL – Exposures re-assessed every 3 months
  - If above Action Level - Exposures re-assessed every 6 months
  - Discontinue when 2 consecutive measurements, 7 days apart are less than Action Level
- Reassess if changes to production, process, control equipment, personnel, or work practices could produce exposures greater than Action Level

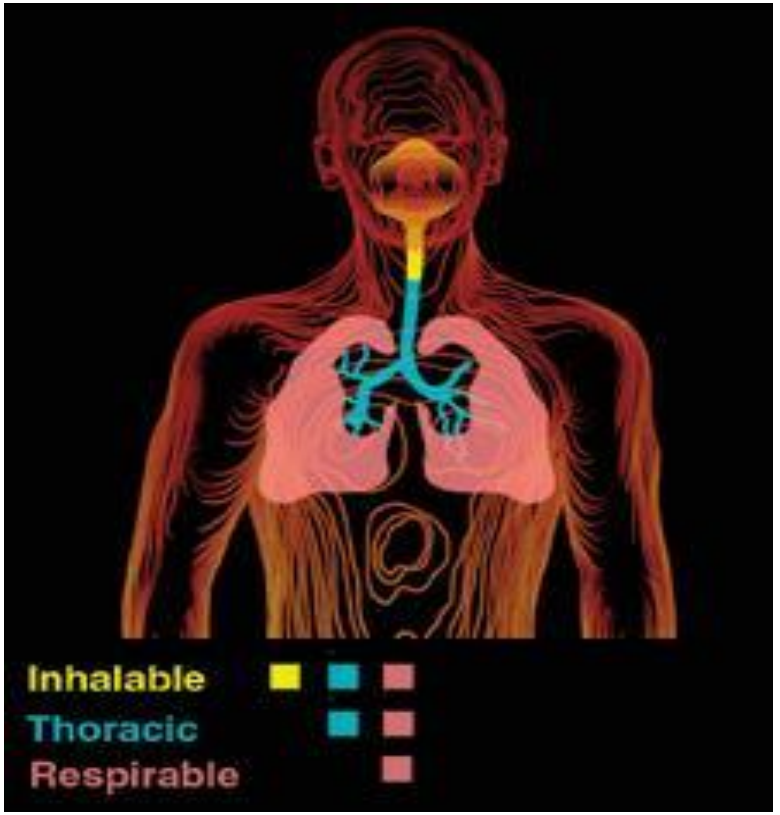


KEY COMPONENTS: MONITORING

- Employers can use specified dust control measures in lieu of sampling
- Table 1 – 18 Control Measures Listed
- After the initial monitoring, the rule allows businesses to choose between retesting the air on a fixed schedule or using the performance option, which calls for assessing exposure based on “any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures” to silica.

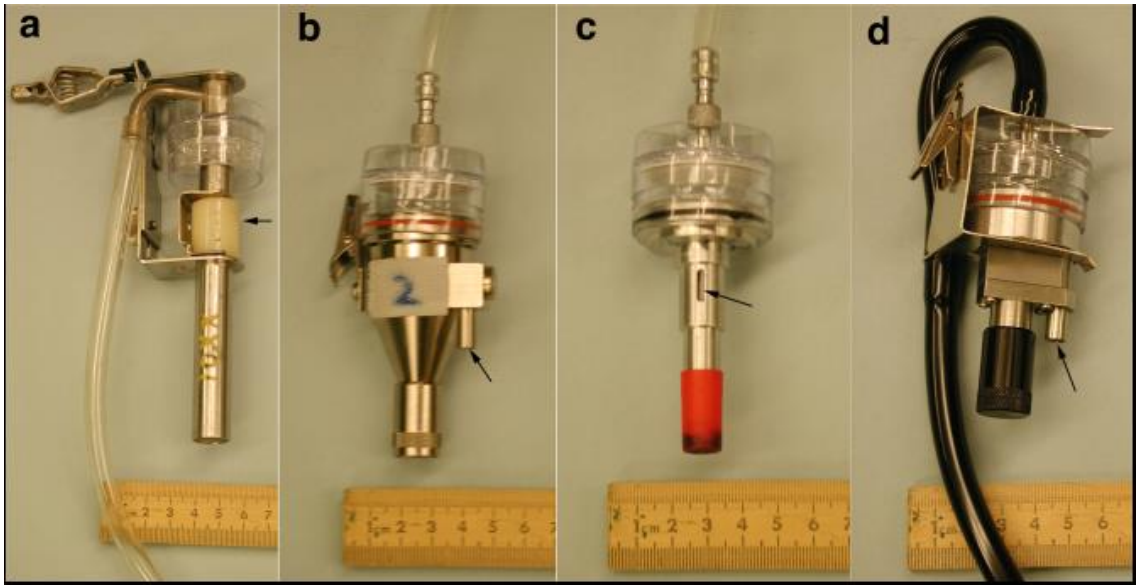


PARTICLE DEPOSITION IN RESPIRATORY TRACT

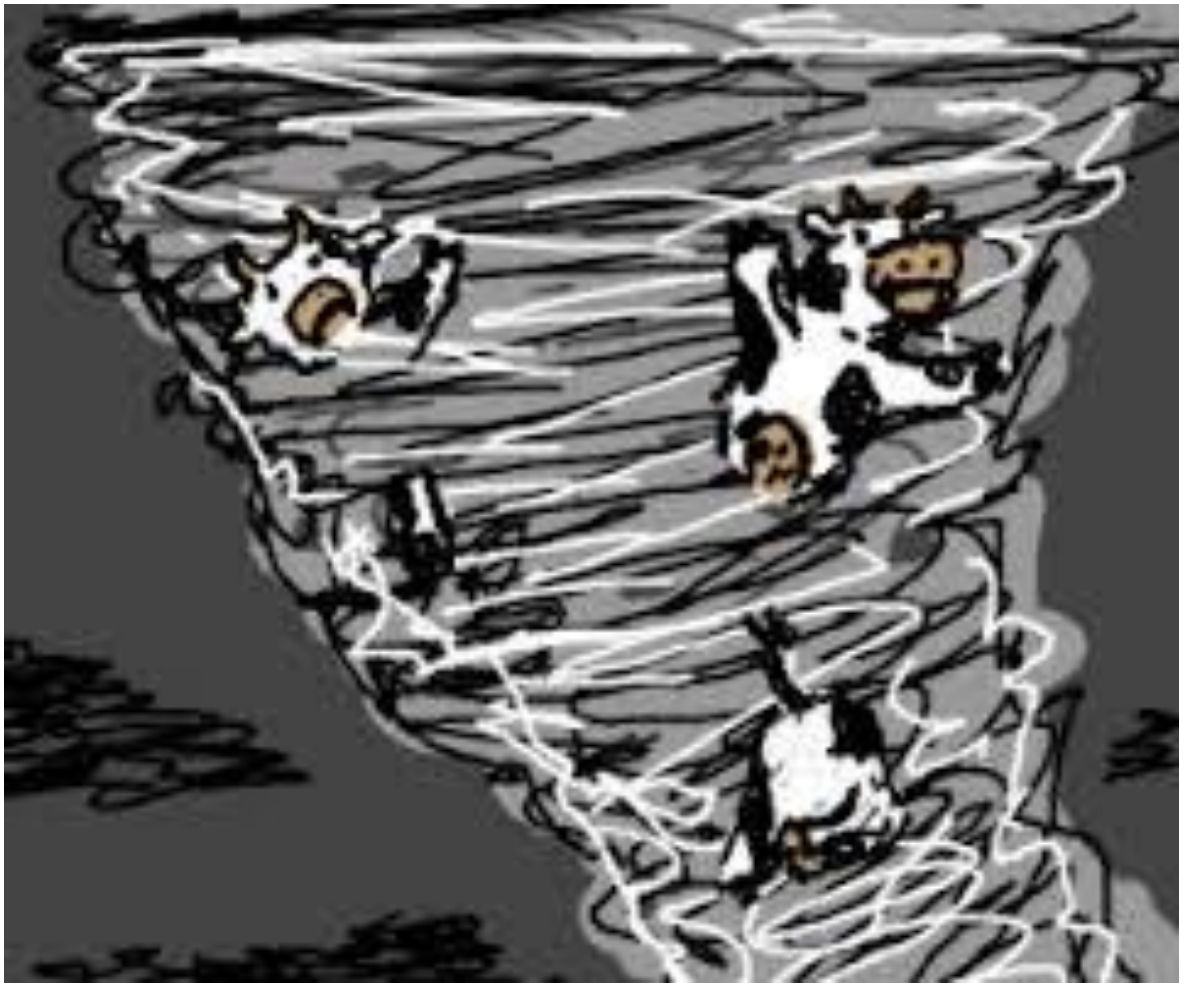


RESPIRABLE DUST SAMPLING

- Taken using a “Cyclone” Sampler



Nylon Dorr-Oliver GK 2.69 SKC Higgins-Dewell



RESPIRABLE DUST SAMPLING

- Flow Rate Determines Cut-Point Collected

FLOW RATES NEEDED FOR 4-um 50% CUT POINT

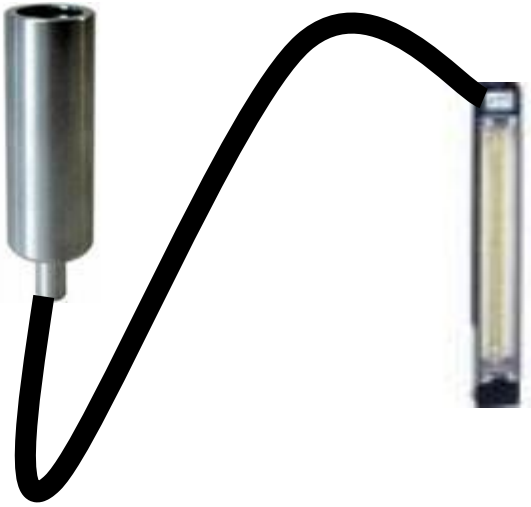
Type of Cyclone	Flow Rate (L/min.)
10 mm Dorr-Oliver nylon cyclone	1.7 (3.5 um cut point)
SKC aluminum cyclone	2.5
Higgins-Dewell cyclone	2.2
GK 2.69 cyclone	4.2

(calibrate both pre and post sampling; need to be within 5% of required flow)

SKC CYCLONE CALIBRATION

>

Pump 2.5 LPM



Calibration Chamber

Calibrator

RESPIRABLE DUST SAMPLING

- Calibrate Pump at Proper Flow Rate for Chosen Cyclone, Record Flow Rate
- Sample Full-Shift Whenever Possible
- Make Sure Grit Pot is on Cyclone
- Mount Cyclone in Breathing Zone
- Record Activities, Start and Stop Times
- Perform Post Calibration, Record Flow Rate
- Include Field Blanks

RESPIRABLE DUST SAMPLING

- Don’t Turn the Cyclone upside Down Until you’ve removed the filter!
  - Grit from pot could enter the cassette.
- Clean Cyclones Between Use
  - Use mild soap and water
  - Ultrasonic cleaner
  - Be careful not to scratch cyclone interior

RESPIRABLE DUST SAMPLING

- Alternative to Cyclone – SKC Parallel Particle Impactors (PPI) Sampler
  - Meets Standard Requirements
  - Single use or Re-Usable
  - 2, 4, or 8 LPM Models

- Pros:
  - Removes some problems associated with cyclones
  - Availability of High-Flow Personal Sampling Pumps

- Cons:
  - Single use adds cost

KEY COMPONENTS: LABS

- The proposal mandates that companies have silica samples analyzed by laboratories that meet specified accreditation criteria:
  - Accredited to ISO 17025
  - Evaluates all samples using the procedures specified in one of the following analytical methods: OSHA ID-142; NMAM 7500; NMAM 7602; NMAM 7603; MSHA P-2; or MSHA P-3
  - X-Ray Diffraction or Infrared Spectroscopy (Most labs use XRD – MSHA uses IR)
  - Must be able to identify polymorphs and account for interferences
  - 5 point calibration Curve
  - NIST Traceable Standards
  - LOD Optimized to be no higher than 25% of PEL based on air volume
  - Labs have till June 23, 2018 to comply

ASK TO SEE YOUR LAB'S PT DATA!!

Testing Results for IHPAT Round 207

Contaminant	Units	#	Result	Ref. Value	Lower Limit	Upper Limit	z-Score	Rating
Silica	mg	1	0.0428	0.0517	0.0294	0.074	-1.2	A
	mg	2	0.1525	0.1705	0.1064	0.2345	-0.8	A
	mg	3	0.0625	0.0711	0.0424	0.0998	-0.9	A
	mg	4	0.1199	0.1329	0.0803	0.1854	-0.7	A

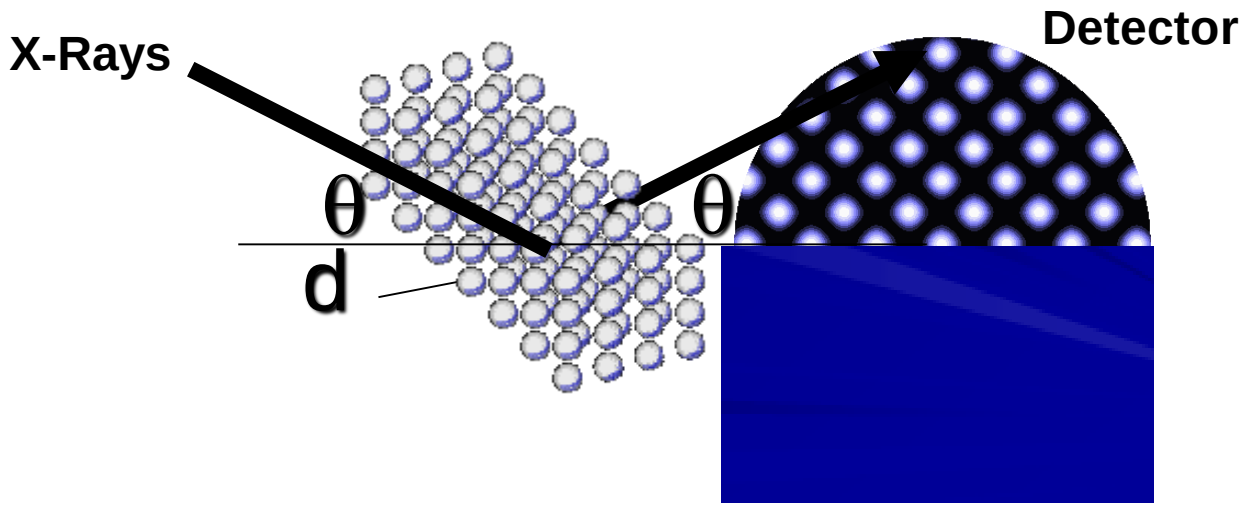
CRYSTALLINE SILICA ANALYSIS

- Two Step Process:
  1. Gravimetric (weighing)- Total Mass Collected on the Filter
  2. X-Ray Diffraction - Measures how much of the mass collected is Crystalline Silica

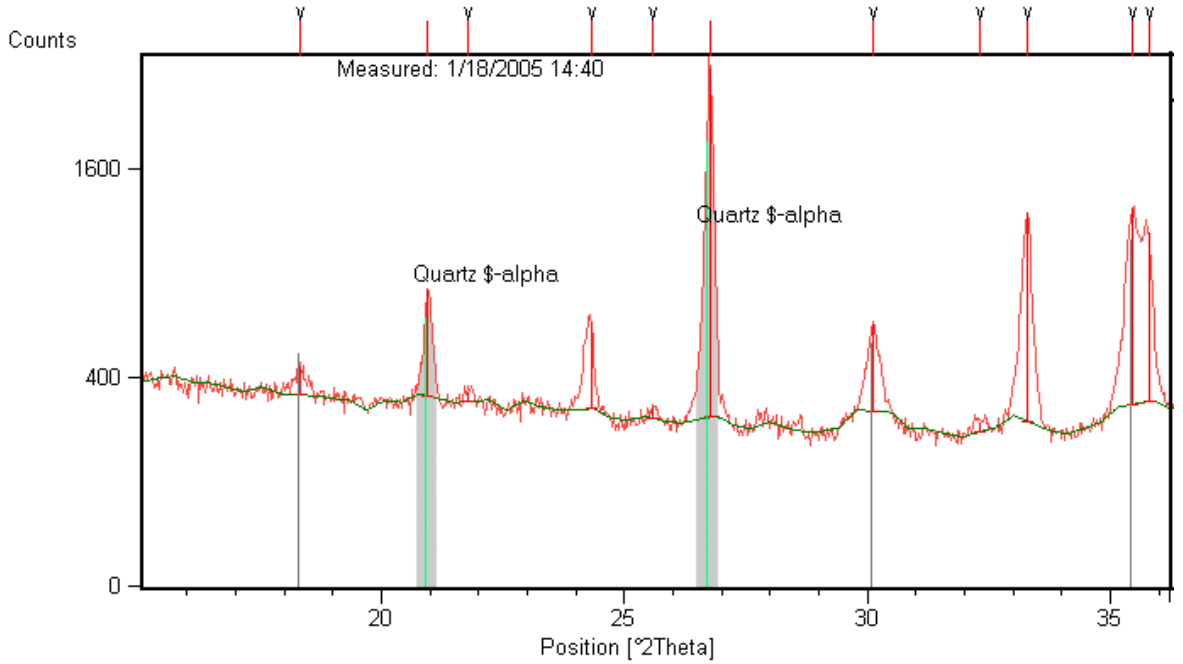
  X-Ray Diffraction – NIOSH 7500/ OSHA ID-142

CRYSTALLINE SILICA ANALYSIS

- Measures the three angles occurring from the x-rays bouncing off of the crystalline silica
- Amorphous silica not measured as there is no crystalline structure



CRYSTALLINE SILICA ANALYSIS



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CONTACT INFORMATION:

THANK YOU! QUESTIONS?

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