

General Safety Evaluation and Air Sampling for Respirable Crystalline Silica

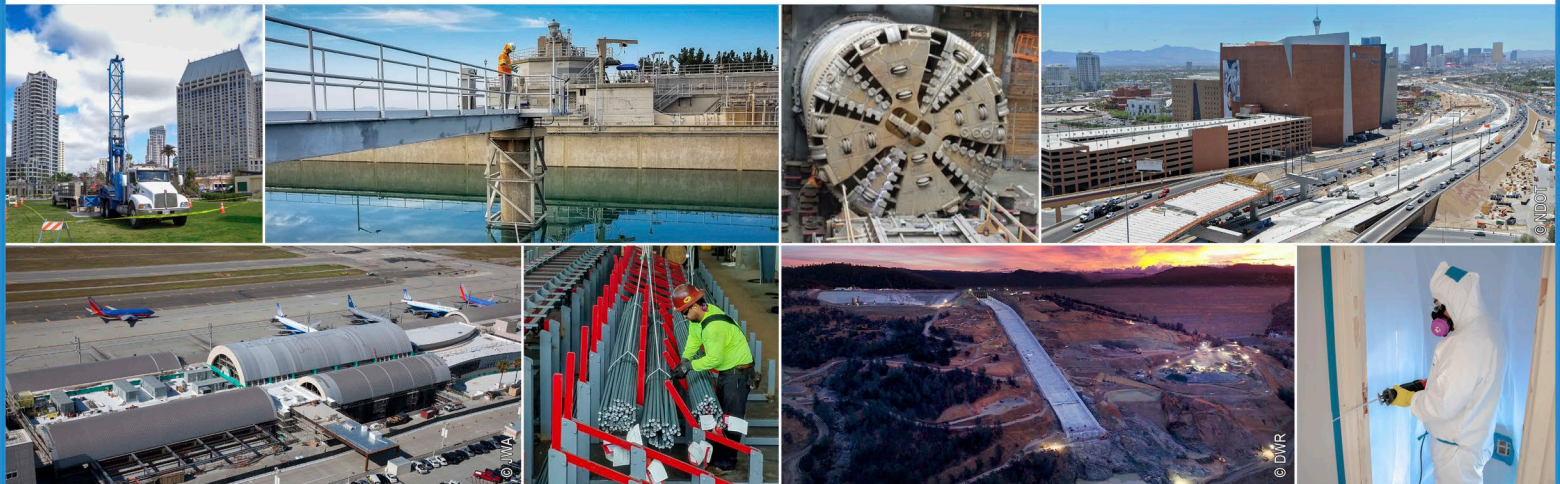
Ceramics Building Workplace Assessment

1140 West Mission Road, Building C
San Marcos, California

Palomar Community College

1140 West Mission Road | San Marcos, California

September 8, 2022 | Project No. 109507001



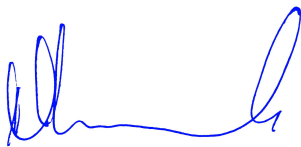
General Safety Evaluation and Air Sampling for Respirable Crystalline Silica

Ceramics Building Workplace Assessment

1140 West Mission Road, Building C
San Marcos, California

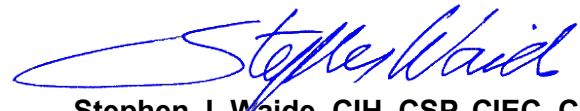
Mr. Derrick Johnson
Manager, Environmental Health & Safety
Palomar Community College
1140 West Mission Road | San Marcos, California 92069

September 8, 2022 | Project No. 109507001



Nicholas Marinello
Project Environmental Scientist

NSM/SJW/mp



Stephen J. Waide, CIH, CSP, CIEC, CMC
Principal Environmental Scientist

CONTENTS

1	BACKGROUND AND CERAMICS DEPARTMENT DESCRIPTION	1
2	MECHANICAL ADVANTAGE & GENERAL SAFETY OBSERVATIONS	1
3	SILICA REGULATORY STANDARDS	2
4	NIOSH AND ACGIH RECOMMENDED LIMITS	2
5	AIR SAMPLING METHODOLOGY	2
6	SAMPLE ANALYSIS AND RESULTS	3
7	RESPIRATORY PROTECTION PROGRAM	4
8	CONCLUSIONS AND RECOMMENDATIONS	5
9	LIMITATIONS	7

TABLE

1 – Personal and Area Silica Exposure Measurement Summary – Ceramics Department Activities	4
--	---

APPENDICES

A – Certification Documentation	
B – Photographs	
C – Sample Results and Chain-of-Custody Documentation	
D – Cal/OSHA Handout 1 – Silica General Industry Fact Sheet	
E – Cal/OSHA Handout 2 – Information for Employees Using Respirators When Not Required Under the Standard	

1 BACKGROUND AND CERAMICS DEPARTMENT DESCRIPTION

Ninyo & Moore was retained by Palomar Community College (PCC) to conduct a General Safety and Industrial Hygiene Evaluation of Ceramics Department personnel working in the Ceramics Building (Building C) at the 1140 West Mission Road campus in San Marcos, California. The objective of this evaluation was to evaluate worker exposures to unique lifting hazards and to assess potential worker exposure to airborne crystalline silica during routine working operations and to provide recommendations for their reduction and/or elimination where applicable. Fieldwork was conducted on August 26, 2022 by Mr. Stephen Waide, Ninyo & Moore's Certified Safety Professional (CSP) and Certified Industrial Hygienist (CIH). Certifications are provided in Appendix A.

2 MECHANICAL ADVANTAGE & GENERAL SAFETY OBSERVATIONS

The Ceramics Department places both instructors and students ("workers" under this evaluation) in positions where unique lifting exposures occur due to the necessary movement and placement of heavy clay items deep into large hot kilns (pictured in Appendix B, Photographs 1 and 2). These exposures include heavy lifts where both horizontal and vertical forces are exerted during necessary movement and placement within deep kiln areas. Mechanical advantage is absolutely critical for safe lifting of many of the heavy items being fired. Specialty manual forklifts, such as the 400-pound capacity Genie® Invertible Fork Material Lift, are designed for use with these types of material handling exposures.

Follow this link for Genie ® Material Lift:

<https://www.grainger.com/product/GENIE-Manual-Straddle-Stacker-400-4YZ86>

Mr. Wes French, Instructor, or another instructor familiar with the department, should be consulted prior to purchase of any lift to ensure that the particular piece of equipment is compatible with the kilns and the accessways currently in use.

Another serious lifting exposure identified during our evaluation was Ceramics Department workers dumping refuse into outdoor roll-off bins for trash collection (one such bin is pictured in Appendix B, Photograph 6). Large trash containers are currently being manually lifted and handled overhead to dump refuse into these bins. Mechanical advantage would also be highly valuable in this situation, but a piece of equipment that is specifically designed to safely handle trash cans is necessary. The Eagle Lift® is one such device designed for these types of material handling exposures.

Follow this link for Eagle Lift ®:

<https://lifelineliftco.com/>

Again, Mr. French or another instructor familiar with area access should be consulted prior to purchase.

3 SILICA REGULATORY STANDARDS

Chemical exposures discussed in this report are compared to the California Division of Occupational Safety and Health (Cal/OSHA) Permissible Exposure Limits (PELs) found in Title 8 of the California Code of Regulations (CCR) §5155, Table AC-1. The exposures are also compared to the Cal/OSHA Action Level (AL) for respirable silica (8 CCR §1532.3). Sampling was conducted for the purposes of determining Ceramics Department worker and general area exposures to respirable crystalline silica (quartz, fused, Tripoli) and to respirable cristobalite and tridymite. The PELs for these substances are 0.05 milligrams per cubic meter (mg/m^3) of air and the AL is $0.025 \text{ mg}/\text{m}^3$ measured as an 8-hour time-weighted average. The results of sampling and a comparison to the Cal/OSHA PELs and AL for each identified form of silica is presented in Table 1 of this report, Section 6. The Cal/OSHA Respiratory Protection standard (8 CCR §5144) is also referenced below in accordance with the observed use of elastomeric respirators.

4 NIOSH AND ACGIH RECOMMENDED LIMITS

Chemical exposures discussed in this report are also compared to the National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) for those substances. The Cal/OSHA PELs are the legally enforceable limits for employees of the Ceramics Department while the NIOSH RELs and ACGIH TLVs are simply *recommended* limits that are generally more protective of worker health. The TLVs are typically the most conservative of the three and refer to airborne concentrations that represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse health effects. These would also be the most applicable to students working in the Department. The RELs for these substances are also $0.05 \text{ mg}/\text{m}^3$, while the TLVs are $0.025 \text{ mg}/\text{m}^3$. Results of exposure monitoring are compared to the RELs and TLVs in Table 1 of this report, presented in Section 6.

5 AIR SAMPLING METHODOLOGY

Air samples were collected using suction pumps (Gillian BDXII Personal Air Sampling Pumps) with each set connected to SKC single-use parallel particle impactor-respirable dust samplers to measure the respirable fraction of dust. Each sampling train was calibrated in the field using a field rotometer which was itself calibrated to a primary standard at the laboratory. The sampling medium was a 37-millimeter (mm), 5.0 micrometer (μm) pore size polyvinyl chloride filter with a cellulose support pad pre-assembled with four porous plastic disc impaction substrates. The

sampler is a light weight, size-selective particulate collector widely recommended by the current methods for sampling airborne respirable crystalline silica. The sampled instructor (Mr. Wes French) wore the sampling pump during his entire exposure period with the filter media in his general breathing zone. Three area samples were also collected in the general work areas.

At the end of the sampling period and after the sampling train was removed from the instructor and general sampled areas, the post-sampling flow rate of each was recorded. The post-sampling reading of each was then checked to ensure that the average value was within 10 percent of the pre-sampling flow rate value, otherwise the sample would have been considered invalid.

Each sample was then labeled with an identification number, documented on a chain-of-custody form, and submitted to the laboratory for analysis by NIOSH Method 7500. The samples were submitted to LA Testing in Huntington Beach, California. LA Testing is an American Industrial Hygiene Association (AIHA) Accredited Laboratory.

6 SAMPLE ANALYSIS AND RESULTS

Samples were analyzed using NIOSH Method 7500, X-Ray Diffraction, to determine the levels of crystalline silica dust, as quartz (alpha-quartz [α -quartz]), cristobalite, and tridymite species. Sample filters were weighed before and after sampling at the laboratory and a dust concentration calculated using the difference in filter weight, after adjustment for blanks, and sampling volume. The results were expressed as mg/m^3 and the detection limit was between 0.0069 and 0.015 mg/m^3 .

Of the four air samples collected over the course of the full-shift sampling event, three showed measured concentrations of respirable crystalline silica above the laboratory limit of detection (LOD) for quartz. None of the samples indicated levels of cristobalite or tridymite above the laboratory LOD. Limited and fine visible airborne dust was noted throughout the day, localized to the activities of the Instructor, Mr. Wes French, during various mixing and clay or glaze-making operations. The result of personal sampling was a measured maximum respirable fraction exposure of 0.044 mg/m^3 (quartz), detected on the personal sample being worn by Mr. French. This result exceeds the Cal/OSHAAL of 0.025 mg/m^3 that, if exceeded for over 30 days in a year, requires the employer to offer medical surveillance to the affected employee, including an initial evaluation and ongoing surveillance at least every 3 years thereafter. It should be noted, however, that the samples were collected during a 6-hour period assumed to be representative of a very heavy day of dust-producing operations.

The Cal/OSHA PEL for the respirable fraction of quartz was decreased from 0.1 mg/m³ to the new PEL of 0.05 mg/m³ to match the cristobalite and tridymite standards (see Title 8 CCR §5155, Table AC-1) and went into effect on October 17, 2016. Therefore, Mr. French's exposure was slightly below the Cal/OSHA PEL; however, it *did* exceed both the Cal/OSHA AL of 0.025 mg/m³ and the *recommended* exposure limit of the ACGIH. The other measured exposures were below both the Cal/OSHA PEL and AL, the NIOSH RELs, and the ACGIH TLVs. Comparisons to these recognized exposure limits are provided in Table 1. Laboratory reports and chain-of-custody documentation are presented in Appendix C.

Employee/Area Name and Operation	Respirable Silica Type	Analytical Result (mg/m ³)	Cal/OSHA PEL (mg/m ³)	NIOSH REL (mg/m ³)	ACGIH TLV and Cal/OSHA AL (mg/m ³)
Mr. Wes French-Glaze & Clay Making/Mixing Clay, Plaster & Repro-Dry Base Recipe	Quartz	0.044	0.05	0.05	0.025
	Cristobalite	<0.015	0.05	0.05	0.025
	Tridymite	<0.015	0.05	0.05	NE
Glaze Lab (Room C7B)	Quartz	0.0076	0.05	0.05	0.025
	Cristobalite	<0.014	0.05	0.05	0.025
	Tridymite	<0.014	0.05	0.05	NE
Clay Making (Outdoor Location)	Quartz	<0.0069	0.05	0.05	0.025
	Cristobalite	<0.014	0.05	0.05	0.025
	Tridymite	<0.014	0.05	0.05	NE
Ceramics Warehouse (Room C8)	Quartz	0.0097	0.05	0.05	0.025
	Cristobalite	<0.014	0.05	0.05	0.025
	Tridymite	<0.014	0.05	0.05	NE
Notes: Cal/OSHA PEL – California Division of Occupational Safety and Health Permissible Exposure Limit NIOSH REL – National Institute for Occupational Safety and Health Recommended Exposure Limit ACGIH TLV – American Conference of Governmental Industrial Hygienists Threshold Limit Value Cal/OSHA AL – California Division of Occupational Safety and Health Action Level mg/m ³ – milligrams per cubic meter of air NE – Not established					

7 RESPIRATORY PROTECTION PROGRAM

While results of our full-shift sampling do not indicate that the use of respiratory protection is required for these activities even during heavy mixing and glaze or clay-making operations, Mr. French's exposure did exceed the Cal/OSHA AL and the ACGIH TLV, which are designed to represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse health effects. Instructors and students may also feel that the use of a respirator is a best-practice or increases their level of comfort. Respirators are an effective method of protection against airborne silica when properly selected and worn and their use should be encouraged for the dustier activities observed, even when exposures are expected to be well below the exposure limit. It should be noted, however, that if a respirator is used improperly or not kept clean then the respirator itself can become a hazard to the worker.

If PCC decides to provide respirators for voluntary use, or if PCC allows an employee or student to provide their own respirator, PCC must establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is medically able to use that respirator and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user. The exception to this rule is that employers are not required to include in a written respiratory protection program those employees whose only use of respirators involves the voluntary use of filtering facepieces (dust masks). The information in Appendix E “Information for Employees Using Respirators When Not Required Under the Standard” is required to be provided to these employees or students.

8 CONCLUSIONS AND RECOMMENDATIONS

The Ceramics Department places both instructors and students in positions where unique and potentially serious lifting exposures occur. Mechanical advantage is absolutely critical for safe handling of many of the heavy items being fired. A manual forklift, such as those described in Section 2 of this report, should be purchased for use in these areas. Another serious lifting exposure identified was Ceramics Department workers dumping refuse into outdoor roll-off bins for trash collection. Mechanical advantage would also be highly valuable in this situation, although a different piece of equipment is necessary for this use, also described in Section 2.

Other possible improvements to safety practices were noted during our assessment, which include:

1. Trash cans and storage containers throughout the working areas were large and bulky when filled (see Photographs 11 and 12, Appendix B). As discussed, mechanical advantage would reduce lifting/handling exposure. Smaller receptacles that decrease the potential overall weight would also reduce exposure by facilitating more frequent emptying and easier movement of these containers.
2. Many cabinets, lockers, and storage shelves are in use throughout the Ceramics Department (See Photograph 6, Appendix B). Shelves 6 feet tall or greater are recommended to be secured either to the floor, a wall behind, or some other stable surface. Other heavy items that are not secured were also noted. The bathtub in Photograph 8, Appendix B, is one such item that will remain unstable until secured properly.
3. Tripping hazards were identified in several areas within the Ceramics Department. In some cases, high visibility demarcation is needed (see Photograph 7, Appendix B) and in other areas, such as the double door entrance to Room C7 (see Photograph 10, Appendix B), a floor transition is needed to facilitate rolling items through these passageways.
4. All chemical containers should be clearly marked with the contents of the container. In one case, we observed two small cans of unmarked powdered material in an outdoor location (see Photograph 9, Appendix B). Documented inspections should be performed at least weekly to catch out-of-compliance conditions.

With respect to exposures to airborne silica, six-hour personal sampling results on a very heavy day of mixing operations indicated that the Instructor's exposure to respirable crystalline silica (quartz) did not exceed the Cal/OSHA PEL on the day of sampling. It *did*, however, exceed the Cal/OSHA AL and the recommended limits of the ACGIH. The other measured chemical exposures were below both the Cal/OSHA PELs, ALs, the NIOSH RELs *and* the ACGIH TLVs. It should be noted that the PEL is the exposure level that cannot be exceeded without the use of appropriate respiratory protection. TLVs are guidelines that are constantly under study and review. As such, the TLVs are widely accepted in the industrial community as the most current and pertinent health based exposure standard. The TLVs refer to airborne concentrations of chemical substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse health effects.

Because the measured exposure of the Instructor was above the Cal/OSHA AL and ACGIH TLV (both being 0.025 mg/m³) and because the harmful effects of airborne silica dust are well-documented, steps should be taken to protect both instructors and students during various work operations (e.g., preparation of clays, glazes, etc.) and to keep airborne exposures to a minimum even with low documented exposures. Several relatively simple controls can be implemented to reduce exposure to workers during these dusty operations. Recommendations follow:

1. Engineering controls are the preferred method of reducing exposure to airborne contaminants and should be implemented, if possible, in the Glaze Lab (Room C7B) and the Ceramics Warehouse (Room C8). While both are fitted with ventilation systems and both were operating during the sampling event, neither system appears to be particularly effective. An evaluation of and improvement to these existing systems, or the installation of a local exhaust system that could be placed directly adjacent to the dust-producing activity, would greatly improve capture of airborne contaminants and further limit exposures.
2. Unless further engineering controls are implemented for the dusty operations performed by the Instructors, it is recommended that these instructors be enrolled in a respiratory protection program in accordance with 8 CCR §5144, Respiratory Protection, including the appropriate medical surveillance, fit-testing, etc. A NIOSH-approved half-face air purifying respirator with High Efficiency Particulate Air (HEPA) cartridges is recommended to protect against the measured concentrations. It should be noted that respirator wearers should be clean-shaven during respirator use. Medical surveillance should be offered to the instructors regardless of their enrollment in the Respiratory Protection program. Students should *not* need to be enrolled in the program.
3. Hazard communication training should be provided to persons performing glaze or clay making, or clay or plaster mixing operations with respect to the hazards of airborne silica. Appendix D includes a document produced by Cal/OSHA entitled "Silica General Industry Fact Sheet" and could be used to supplement this training. While the handout was designed for industrial workers, the information would be useful to both Instructors and students for the performance of these activities.
4. If not already established, PCC should initiate a **Voluntary Use** program within the existing Respiratory Protection program and provide filtering facepiece respirators (dust masks),

training and the contents of Appendix E of this document to the employees and students that are interested. It should be noted that the use of *elastomeric* respirators requires enrollment in the Respiratory Protection program, including medical evaluation, fit-testing, etc. Mr. Wes French was wearing a personal elastomeric respirator during our evaluation and should either be enrolled in the full respiratory protection program or should only wear filtering facepiece respirators in accordance with the Voluntary Use exemption.

9 LIMITATIONS

Sampling results are limited in that they represent concentrations of chemical agents at the time of sample collection only. Changes in weather, time between area activities, individual operator's experience and expertise, or other conditions may cause variations in airborne particulate concentrations.

Ninyo & Moore has performed the tasks set forth above in a thorough and professional manner consistent with industry guidelines. Ninyo & Moore cannot guarantee and does not warrant that this limited assessment has revealed all adverse environmental conditions affecting the specified operations. Nor can Ninyo & Moore warrant that the assessment requested would satisfy the dictates of, or provide a legal defense in connection with, environmental laws or regulations.

The results reported and any opinions reached by Ninyo & Moore are for the benefit of the client. Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions and laboratory results. It should be understood that changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge.

The services provided do not constitute a complete and comprehensive assessment of employee exposure, and the information obtained is relevant for the time and date the services were performed. The findings and conclusions, as presented in this report, are based on the services provided. No warranty, express or implied, is intended regarding the results of this report and any subsequent reports, correspondence, or consultation. The services summarized herein were performed in accordance with the local standard of care in the geographic region at the time the services were rendered.



APPENDIX A

Certification Documentation

BOARD OF CERTIFIED SAFETY PROFESSIONALS

affirms that

Steve Waide

Having made application for and given satisfactory evidence of qualification as required in the By-Laws; is qualified to receive and is hereby authorized to use the designation

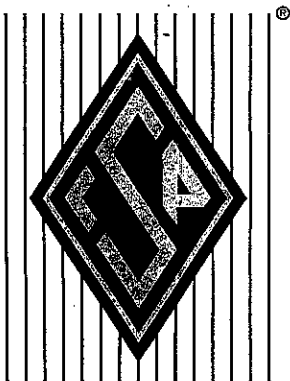
Certified Safety Professional

in

Comprehensive Practice

So long as this certificate of qualification is renewed annually and not revoked

*Board of Examiners in witness whereof we have here
unto set our hands and affixed the Seal of the Board
this 25th Day of April, 1998*



President

Allen H. Traczewski

Secretary

Jim Simon Clark

Serial No. 15352





September 8, 2022

Stephen J Waide, CSP
5710 Ruffin Rd
San Diego, CA 92123-1013

Validation of Certifications

CSP Date of Issue
12/03/2018
CSP Certificate Number:
CSP-15352

Dear Mr. Waide:

Please let this letter serve as proof of your current CSP certifications and the dates they were achieved.

Your name can also be found in our Certification Directory on our website at:
www.bcsp.org/Certification_Directory.

If you have any questions you may contact Customer Service at +1 317-593-4800 or by email at bcsp@bcsp.org.

Sincerely,

Treasa M. Turnbeaugh, PhD, MBA, CSP, CET
Chief Executive Officer

The Board for Global EHS Credentialing (BGC)

through its vested authority, hereby confirms that

Stephen J. Waide

has met all requirements of education, experience, and examination, and on-going maintenance set forth through the BGC's American Board of Industrial Hygiene® (ABIH®) credentialing division for re-certification in the Comprehensive Practice of Industrial Hygiene and is thereby conferred the credential of

Certified Industrial Hygienist® (CIH®)

The aforementioned individual is given all rights, privileges, and responsibilities as both a diplomate of the BGC and holder of the CIH credential, provided that the credential is not suspended or revoked, and it is renewed annually. Moreover, the holder must meet all recertification requirements, including the obligation to practice ethically as prescribed by the BGC.

Credential Number: 7005 CP
Award Date: December 4, 1995
Expiration Date: June 1, 2027



Alan Leibowitz, CIH, CSP, FAIHA
Chair of the Board of Directors



Ulric K. Chung, MCS, PhD
Chief Executive Officer and Secretary



BOARD FOR GLOBAL EHS CREDENTIALING

6005 W. Saint Joe Hwy., Suite 300 Lansing, Michigan 48917-4876 **P:** (517) 321-2638 **F:** (517) 321-4624 **E:** info@EHSCredentialing.org

December 1, 2021

Stephen J. Waide, CIH
Ninyo & Moore
5710 Ruffin Road
San Diego CA 92123

Dear Stephen J. Waide,

I am pleased to inform you that your Certification Maintenance (CM) worksheet has been reviewed and your professional activities have fulfilled the Board's requirements for recertification. Your new certificate is enclosed.

Your next 60-month CM cycle will be from 1/1/2022 to 12/31/2026. Remember that you can earn CM credit only between your CM Cycle Start Date and End Date.

Key changes during your next CM cycle will be announced via email, which makes having your current email address very important. You can review your contact information, key CM cycle dates and begin entering your activities for your next CM cycle by logging into the *CAPS* system on the ABIH web site (we will no longer be accepting a cm worksheet via excel or paper).

The Board appreciates your continued professional service and support of its programs.

Sincerely,

Pamela J. Trim
Certification Director
517-853-5763
certificationdirector@gobgc.org



ANSI Accredited Program
PERSONNEL CERTIFICATION



International Occupational
Hygiene Association
Recognized Certification Board





APPENDIX B

Photographs



Photograph 1: General view of large kilns needing mechanical advantage to load.



Photograph 2: General view of small kilns needing mechanical advantage to load.

FIGURE B-1



Photograph 3:

Mr. Wes French (Sampled Instructor) performing mixing activities in the Glaze Lab (Room C7B). Sampling pumps are operating on Mr. French (Sample #PCC-P-01) and in the general work area (Sample #PCC-A-01)).



Photograph 4:

Mr. French performing Clay Making activities outdoors. Area sample #PCC-A-02 running in the immediate area behind Mr. French.

FIGURE B-2



Photograph 5: Mr. French performing mixing operations in the Ceramics Warehouse (Room C8). Sample #PCC-A-03 running in foreground.



Photograph 6: Example of standing cabinets that require stabilization. Roll-off bin for trash collection is visible in rear of photograph.

FIGURE B-3



Photograph 7: Tripping hazard requiring high visibility demarcation.



Photograph 8: Bathtub requiring stabilization.

FIGURE B-4



Photograph 9: Unmarked chemical containers observed outside.



Photograph 10: Tripping/rolling hazard at double door entrance to Room C7.

FIGURE B-5



Photograph 11: Large trash can observed in working area, Containers of this size should be replaced with smaller receptacles or handled using mechanical advantage.



Photograph 12: Two sizes of material containers. Smaller containers are ideal for reducing lifting/handling exposure and are easier to maneuver.

FIGURE B-6



APPENDIX C

Sample Results and Chain-of-Custody Documentation



LA Testing

5431 Industrial Drive Huntington Beach, CA 92649
 Phone/Fax: (714) 828-4999 / (714) 828-4944
<http://www.LATesting.com> / gardengrovelab@latesting.com

LA Testing Order ID: 332217785
 Customer ID: 32NIN63
 Customer PO:
 Project ID:

Attn: Steve Waide
 Ninyo & Moore
 5710 Ruffin Road
 San Diego, CA 92123

Phone: (858) 576-1000
Fax: (858) 576-9600
Collected: 08/26/2022
Received: 08/29/2022
Analyzed: 08/31/2022

Proj: PALOMAR COLLEGE (109507001)

Test Report: Silica w/ Total or Respirable Dust by NIOSH 7500/OSHA ID142-All Species, Alpha Quartz, Cristobalite, Tridymite

Sample ID	Collected	Location / Description	Vol (L)	Respirable Dust (mg)	Respirable Dust Concentration (mg/m ³)	Silica	% Silica	Weight (µg)	Conc. (µg/m ³)	Analytical Sensitivity (µg/m ³)
PCC-P-01 332217785-0001	8/26/2022	WES FRENCH	684	0.27	0.39	α-Quartz	11	30	44	7.3
						Cristobalite	N/A	<10	<15	15
						Tridymite	N/A	<10	<15	15
						RCS		30	44	
PCC-A-01 332217785-0002	8/26/2022	GLAZE LAB (C7B)	720	0.094	0.13	α-Quartz	5.9	6	7.6	6.9
						Cristobalite	N/A	<10	<14	14
						Tridymite	N/A	<10	<14	14
						RCS		6	7.6	
PCC-A-02 332217785-0003	8/26/2022	CLAY MAKING OUTDOOR	720	0.12	0.17	α-Quartz	N/A	<5	<6.9	6.9
						Cristobalite	N/A	<10	<14	14
						Tridymite	N/A	<10	<14	14
						RCS		<10	<14	
PCC-A-03 332217785-0004	8/26/2022	CERAMIC WAREHOUSE (C-8)	720	0.14	0.20	α-Quartz	4.8	7	9.7	6.9
						Cristobalite	N/A	<10	<14	14
						Tridymite	N/A	<10	<14	14
						RCS		7	9.7	

Analyst(s)

Christopher Miranda

Michael Chapman

Michael Chapman, Laboratory Manager
 or Other Approved Signatory

Any questions please contact Michael Chapman.

RCS = Respirable Crystalline Silica

The laboratory can only verify the concentration of silica on the filter and not the final concentration due to data obtained by non-laboratory personnel. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on

Samples analyzed by LA Testing Huntington Beach, CA AIHA-LAP, LLC-IHLAP Accred. Lab 101650

Initial report from: 09/06/2022 11:18:19



LA Testing

5431 Industrial Drive Huntington Beach, CA 92649
Phone/Fax: (714) 828-4999 / (714) 828-4944
<http://www.LATesting.com> / gardengrovelab@latesting.com

LA Testing Order ID: 332217785
Customer ID: 32NIN63
Customer PO:
Project ID:

Attn: Steve Waide
Ninyo & Moore
5710 Ruffin Road
San Diego, CA 92123

Phone: (858) 576-1000
Fax: (858) 576-9600
Collected: 08/26/2022
Received: 08/29/2022
Analyzed: 08/31/2022

Proj: PALOMAR COLLEGE (109507001)

Test Report: Silica w/ Total or Respirable Dust by NIOSH 7500/OSHA ID142-All Species, Alpha Quartz, Cristobalite, Tridymite

Sample ID	Collected	Location / Description	Vol (L)	Respirable Dust (mg)	Respirable Dust Concentration (mg/m ³)	Silica	% Silica	Weight (µg)	Conc. (µg/m ³)	Analytical Sensitivity (µg/m ³)
BLANK	8/26/2022	FIELD BLANK	N/A	<0.050	N/A	α-Quartz	N/A	<5	N/A	N/A
332217785-0005						Cristobalite	N/A	<10	N/A	N/A
						Tridymite	N/A	<10	N/A	N/A
RCS								<10	N/A	

Comment: Field Blank

Field Blank submitted with sample set. Results are not blank corrected.

Analyst(s)

Christopher Miranda

Michael Chapman, Laboratory Manager
or Other Approved Signatory

Any questions please contact Michael Chapman.

RCS = Respirable Crystalline Silica

The laboratory can only verify the concentration of silica on the filter and not the final concentration due to data obtained by non-laboratory personnel. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on

Samples analyzed by LA Testing Huntington Beach, CA AIHA-LAP, LLC-IHLAP Accred. Lab 101650

Initial report from: 09/06/2022 11:18:19



LA Testing

5431 Industrial Drive Huntington Beach, CA 92649
Phone/Fax: (714) 828-4999 / (714) 828-4944
<http://www.LATesting.com> / gardengrovelab@lateesting.com

LA Testing Order ID: 332217785
Customer ID: 32NIN63
Customer PO:
Project ID:

Attn: Steve Waide
Ninyo & Moore
5710 Ruffin Road
San Diego, CA 92123

Phone: (858) 576-1000
Fax: (858) 576-9600
Collected: 08/26/2022
Received: 08/29/2022
Analyzed: 08/31/2022

Proj: PALOMAR COLLEGE (109507001)

Test Report: Silica w/ Total or Respirable Dust by NIOSH 7500/OSHA ID142-All Species, Alpha Quartz, Cristobalite, Tridymite

QC Batch ID: 33Q220831-03-1Q

Collected	Location / Description	Vol (L)	Respirable Dust (mg)	Respirable Dust Concentration (mg/m ³)	Silica		Weight (µg)	Conc. (µg/m ³)	Analytical Sensitivity (µg/m ³)
					Silica	% Silica			
Method Blank		N/A	N/A	N/A	α-Quartz	N/A	<5	N/A	N/A
					Cristobalite	N/A	<10	N/A	N/A
					Tridymite	N/A	<10	N/A	N/A
	α-Quartz (0.005 mg)					N/A	0.005		N/A
	Cristobalite (0.010 mg)					N/A	0.011		N/A

Analyst(s)

Christopher Miranda

Michael Chapman, Laboratory Manager
or Other Approved Signatory

Any questions please contact Michael Chapman.

RCS = Respirable Crystalline Silica

The laboratory can only verify the concentration of silica on the filter and not the final concentration due to data obtained by non-laboratory personnel. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on

Samples analyzed by LA Testing Huntington Beach, CA AIHA-LAP, LLC-IHLAP Accred. Lab 101650

Initial report from: 09/06/2022 11:18:19



EMSL ANALYTICAL, INC.
TESTING LABS • PRODUCTS • TRAINING

Silica - Chain of Custody

EMSL Order Number / Lab Use Only

#332217785

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077

PHONE: (800) 220-3675
EMAIL: CinnAslab@EMSL.com

If Bill-To is the same as Report-To leave this section blank. Third-party billing requires written authorization.

Customer Information Customer ID: Company Name: NINYO & MOORE Contact Name: STEVE WAIDE Street Address: 5710 RUFFIN RD. City, State, Zip: SAN DIEGO, CA 92123 Country: Phone: 858.449.8619 Email(s) for Report: swaide@ninyoandmoore.com				Billing Information Billing ID: Company Name: Billing Contact: Street Address: City, State, Zip: Country: Phone: Email(s) for Invoice:				
Project Name/No: PALOMAR COLLEGE (109507001)								
EMSL LIMS Project ID: (If applicable, EMSL will provide)				US State where samples collected: CA				
Media Type: PPI				State of Connecticut (CT) must select project location: ☐ Commercial (Taxable) ☐ Residential (Non-Taxable)				
Media Manufacturer/Part Number:		Media Lot Number:						
Sampled By Name: STEVE WAIDE		Sampled By Signature: <i>[Signature]</i>		No. Samples in Shipment: 5				
Method Requested: ☐ NIOSH 7500 by XRD ☐ Include: Respirable Dust ☐ Include: Total Dust ☒ **Check only one of the above ☒ Include: TWA ☐ NIOSH 7602 by IR **Charlotte (Pineville), NC Lab ONLY		Media Submitted: Cassette ☐ 37mm PVC 5.0um Cassette / Pre-Weighed Filter ☐ No Cyclone ☐ 37mm PVC 5.0um Cassette / NON Pre-Weighed Filter ☐ No Cyclone (Lab assumes cyclone utilized in sampling train unless No Cyclone selected.) PPI ☐ 2 LPM PPI / Pre-Weighed Filter ☒ 2 LPM PPI / NON Pre-Weighed Filter ☐ 4 LPM PPI / Pre-Weighed Filter ☐ 4 LPM PPI / NON Pre-Weighed Filter ☐ 8 LPM PPI / Pre-Weighed Filter ☐ 8 LPM PPI / NON Pre-Weighed Filter		Species Requested: ☒ ALL Species (Includes Alpha Quartz, Cristobalite, Tridymite) ☐ Single Species (Please check one or two below) ☐ Alpha Quartz ☐ Cristobalite ☐ Tridymite				
Turnaround Time (TAT) Options - Please check: (If no selection made, Standard 2 Week (EOD) TAT will apply) ☐ 2 Week ☐ 1 Week ☐ 4 Day ☐ 3 Day ☐ 2 Day ☐ 1 Day (Call Lab)								
Client Sample ID	Location/Description	Analyte/Method	Media	Flow (lpm)	Sample Time On Off	Sample Type	Sample Date	Comments
PCC-P-01	WES FRENCH			2.0	08:10 14:10	☒ Area ☐ Personal	8/26/22	360X 1.94PM = 684 L
PCC-A-01	GLAZE LAB (C7B)			2.0	08:10 14:10	☒ Area ☐ Personal		360X 2.04PM = 720 L
PCC-A-02	CLAY MARKING OUTDOOR			2.0	08:10 14:10	☒ Area ☐ Personal		
PCC-A-03	CERAMICS WAREHOUSE (C-8)			2.0	08:10 14:10	☒ Area ☐ Personal		
BLANK	FIELD BLANK			N/A		☐ Area ☐ Personal ☐ Area ☐ Personal		
Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)								
Method of Shipment:					Sample Condition Upon Receipt:			
Relinquished by: <i>[Signature]</i>		Date/Time: 8/29/22 0800			Received by: <i>[Signature]</i>		Date/Time: 8/29/22 8a	
Relinquished by:		Date/Time:			Received by:		Date/Time:	

Controlled Document - COC-73 Silica R1 03/18/2021

☐ AGREE TO ELECTRONIC SIGNATURE (By checking, I consent to signing this Chain of Custody document by electronic signature.)

EMSL Analytical, Inc.'s Laboratory Terms and Conditions are incorporated into this Chain of Custody by reference in their entirety. Submission of samples to EMSL Analytical, Inc. constitutes acceptance and acknowledgment of all terms and conditions by Customer.



APPENDIX D

Cal/OSHA Handout 1 – Silica General Industry Fact Sheet

OSHA's Crystalline Silica Rule: General Industry and Maritime

OSHA is issuing two standards to protect workers from exposure to respirable crystalline silica — one for general industry and maritime, and the other for construction — in order to allow employers to tailor solutions to the specific conditions in their workplaces.

Who is affected by the general industry and maritime standard?

About 295,000 workers are exposed to respirable crystalline silica in over 75,000 general industry and maritime workplaces. Exposure to respirable crystalline silica can cause silicosis, lung cancer, other respiratory diseases, and kidney disease.

Some of the affected industries are shown below.

Number of Workers Exposed to Respirable Crystalline Silica in Selected General Industry/ Maritime Sectors		
Industry sector	Workers currently exposed	Workers currently exposed above the new PEL
Asphalt Roofing Materials	3,158	1,410
Concrete Products	32,981	9,391
Cut Stone	9,429	5,243
Dental Laboratories	31,105	864
Foundries	34,591	12,173
Jewelry	6,772	2,434
Porcelain Enameling	4,113	1,654
Pottery	6,269	2,496
Railroads	16,895	5,340
Ready-Mix Concrete	27,123	19,941
Shipyards	3,038	2,228
Structural Clay Products	7,893	3,198
Support Activities for Oil and Gas Operations	16,960	11,207

Source: OSHA Directorate of Standards and Guidance

OSHA estimates that over 100,000 workers in general industry and maritime are exposed to silica levels that exceed the new permissible exposure limit (PEL).

What does the standard require?

The standard for general industry and maritime requires employers to:

- Measure the amount of silica that workers are exposed to if it may be at or above an action level of **25 µg/m³** (micrograms of silica per cubic meter of air), averaged over an 8-hour day;
- Protect workers from respirable crystalline silica exposures above the permissible exposure limit of **50 µg/m³**, averaged over an 8-hour day;
- Limit workers' access to areas where they could be exposed above the PEL;
- Use dust controls to protect workers from silica exposures above the PEL;
- Provide respirators to workers when dust controls cannot limit exposures to the PEL;
- Restrict **housekeeping** practices that expose workers to silica where feasible alternatives are available;
- Establish and implement a **written exposure control plan** that identifies tasks that involve exposure and methods used to protect workers;
- Offer medical exams — including chest X-rays and lung function tests — every three years for workers exposed at or above the action level for 30 or more days per year;
- Train workers on work operations that result in silica exposure and ways to limit exposure; and
- **Keep records** of workers' silica exposure and medical exams.

Examples — Dust control methods

In most cases, dust controls such as wet methods and ventilation can be used to limit workers' exposure to silica. These technologies are widely available, affordable and already commonly used by many employers.



A worker cutting granite using a saw that applies water to the blade. The water reduces the amount of silica-containing dust that gets into the air.



Photo: Alliance — OSHA Cooperative Program

A worker grinding castings in a foundry. The work is performed in a ventilated booth to reduce the worker's exposure to silica.

When are employers required to comply with the standard?

General industry and maritime employers must comply with all requirements of the standard by **June 23, 2018**, except for the following:

- **Medical surveillance** must be offered to employees who will be exposed **at or above the action level** for 30 or more days a year starting on June 23, 2020. (Medical surveillance must be offered to employees who will be exposed **above the PEL** for 30 or more days a year starting June 23, 2018.)
- **Hydraulic fracturing** operations in the oil and gas industry must implement engineering controls to limit exposures to the new PEL by June 23, 2021.

Additional information

Additional information on OSHA's silica rule can be found at www.osha.gov/silica.

OSHA can provide extensive help through a variety of programs, including technical assistance about effective safety and health programs, workplace consultations, and training and education.

OSHA's On-site Consultation Program offers free and confidential occupational safety and health services to small and medium-sized businesses in all states and several territories across the country, with priority given to high-hazard worksites. On-site consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing and improving safety and health management systems. To locate the OSHA On-site Consultation Program nearest you, call 1-800-321-OSHA (6742) or visit www.osha.gov/dcsp/smallbusiness.

For more information on this and other health-related issues impacting workers, to report an emergency, fatality, inpatient hospitalization, or to file a confidential complaint, contact your nearest OSHA office, visit www.osha.gov, or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For assistance, contact us. We can help. It's confidential.



www.osha.gov (800) 321-OSHA (6742)



U.S. Department of Labor



APPENDIX E

Cal/OSHA Handout 2 – Information for Employees Using Respirators When Not Required Under the Standard



VOLUNTARY USE OF FILTERING FACEPIECES (DUST MASKS)

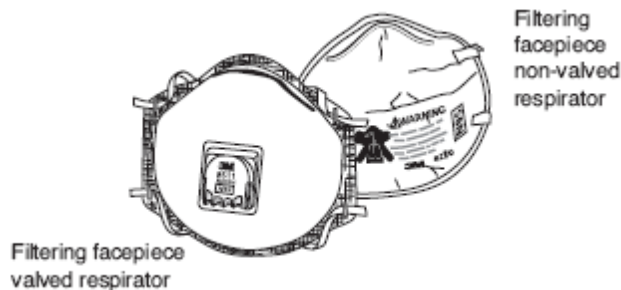
*Prepared by Chief Executive Office, Risk Management Branch
Loss Control and Prevention Section*

3333 Wilshire Blvd., Suite 1000, Los Angeles, CA 90010

Contact Loss Control and Prevention at (213) 738-2269 for additional information

The use of filtering facepieces (a.k.a. dust masks) may enhance employee comfort. When used on a voluntary basis, Cal/OSHA requires minimal precautions. The purpose of this bulletin is to provide an overview of filtering facepieces, voluntary use, and the requirements under Title 8 California Code of Regulations Section 5144, Respiratory Protection (<http://www.dir.ca.gov/title8/5144.html>).

A filtering facepiece is defined by Cal/OSHA as a “negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.” Filtering facepieces are distinguished from ordinary dust masks by the double straps and the National Institute for Occupational Safety and Health (NIOSH) approval rating (e.g. N95). They often have an exhalation valve on the front that looks like a button. Examples are below:



Voluntary use of a filtering facepiece means that the use is purely by choice, not for compliance with Cal/OSHA Permissible Exposure Limits (PELs) or for protection against a potentially harmful substance that does not have a PEL. Examples of voluntary use are an employee with seasonal allergies wearing a filtering facepiece for comfort while working outdoors and an employee wearing a filtering facepiece while sweeping a floor.

When the use of filtering facepieces is voluntary, Cal/OSHA has three requirements. The employer must:

- Ensure that filtering facepieces are not dirty or contaminated.
- Ensure that their use does not interfere with employee's ability to work safely.
- Provide employees with the information contained in Appendix D of the Respiratory Protection standard (<http://www.dir.ca.gov/title8/5144d.html>). Please see page two of this bulletin for a copy of Appendix D.

Note: if ordinary dust masks (single strap) are used, the above requirements do not apply. Dust masks should be used according to the manufacturer's instructions.

Subchapter 7. General Industry Safety Orders
Group 16. Control of Hazardous Substances
Article 107. Dusts, Fumes, Mists, Vapors and Gases
§5144. Respiratory Protection.

Appendix D to Section 5144: (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designated to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

NOTE

Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

HISTORY

1. New appendix D to section 5144 filed 8-25-98; operative 11-23-98 (Register 98, No. 35).



5710 Ruffin Road | San Diego, California 92123 | p. 858.576.1000

ARIZONA | CALIFORNIA | COLORADO | NEVADA | TEXAS | UTAH

ninyoandmoore.com

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants