



SARNIA REFINERY
SILICA CONTROL

Issue Date: August 28, 2017 Revision #: 4

STANDARD

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4000-ZSD-S-MSAFeca-00216
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Document Owner: Manager, EH&S

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SCOPE AND PURPOSE

This Standard identifies controls required to reduce the risk of exposure to silica.

This Standard applies to all work activity that involves the disturbance of silica-containing material.

ROLES & RESPONSIBILITIES

Occupational Hygienist is accountable to provide support, as necessary, to ensure appropriate control of worker exposure to silica and conformance to this Standard.

Contractors are accountable to ensure conformance to this Standard and compliance with all applicable requirements of the Ontario Ministry of Labour Guideline for Silica on Construction Projects.

RISK ASSESSMENT

The presence of silica must be considered during the planning of all work activity that involves the disturbance of potential silica-containing materials, including but not limited to:

1. Crystalline silica-containing materials:
 - Cement and cement-containing materials;
 - Brick and mortar;
 - Rock and stone;
 - Sand; and
2. Amorphous silica-containing materials that have been exposed to significant heat:
 - Refractory;
 - Silica-containing catalyst.

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All suspect materials must be assumed to be silica-containing unless verified otherwise.

Acceptable methods for deeming a suspect material silica-free may include:

1. Bulk sampling and analysis:

- Samples representative of all areas to be disturbed shall be collected and analyzed by an American Industrial Hygiene Association (AIHA) accredited laboratory. A suspect material may be deemed silica-free if it contains less than 1% silica by weight. Records of all samples collected shall be maintained by the Occupational Hygienist.

2. Material Safety Data Sheet (MSDS) review;

- The material may be deemed silica-free if the MSDS is available for review and it:
 - does not indicate the presence of silica; or
 - indicates the presence of silica in a concentration of less than 1% by weight.

Notes:

- Amorphous forms of silica (CAS#7631-86-9) may convert to crystalline silica upon exposure to significant heat. Therefore, materials that contain amorphous forms of silica and have been exposed to significant heat must be considered suspect materials.
- A cut-off concentration of 1% has been chosen in order to align with:
 - Laboratory limit of detection;
 - IAPA guideline for Silica in the Workplace (2008) which states that “dusts containing more than 1% crystalline free silica by weight are considered to pose a potential exposure hazard”; and
 - Canadian Ingredient Disclosure List (SOR/88-64) which prescribes that product manufacturers disclose quantities of silica within a product that are 1% or more by weight.

RISK CONTROL

All work involving the disturbance of silica-containing materials shall be classified as a Type 1, 2 or 3 operation in accordance with Appendix A. The control measures prescribed in Appendix B must be followed.

Classification of work activities not adequately represented within Appendix A should be conducted in consultation with the Occupational Hygienist.

For long-term projects, air monitoring may be conducted periodically, and as appropriate, to verify the effectiveness of the implemented control measures.

DEFINITIONS

Silica

The following forms of crystalline silica:

- Quartz (CAS#14808-60-7)
- Tripoli (CAS#1317-95-9)
- Cristobalite (CAS#14464-46-1)
- Tridymite (CAS#15468-32-3)

Silica-containing Material

Any material containing $\geq 1\%$ crystalline silica by weight.

REFERENCES

- [Respiratory Protection Standard](#)
- [MOL Guideline for Silica on Construction Projects](#)

END OF STANDARD



REVISION LOG

Date MM/DD/YYYY	Revision	Section	Comment
07/25/2009	Original		Transferred into "Standard" template. Revision# Original. Replaces S.O. #1.005.
03/01/2012	1	All	The original document addressed exposures to silica during sandblasting operations only which is no longer permitted on-site. The document was revised completely to address exposure to other, current, and sources of crystalline silica.
06/27/2012	2	All	Updated format but content was NOT altered.
07/24/2013	-	Header	Document Owner & Contact Updated. NO content change. (L. Lebert)
12/03/2014	3	Risk Assessment	Wording changed to allow for inclusion of silica-containing materials not specifically identified.
		Risk Control	Removed requirement to reference MOL Lead Guideline and replaced it with direction to new Appendices containing relevant information regarding work activity classification and control measures.
			Added direction to consult with OH for classification of work activities not adequately represented in Appendix A.
		Appendix A	New – silica work activity classification information for common site activities based on task description and duration of activity.
		Appendix B	New – summary of silica control measures as prescribed by the MOL Silica Guideline.
01/21/2016	-	Web site link	E-sign page lost due to edit to hyperlink. Approved by Peter Lynch
08/28/2017	4	Appendix B	Added requirement to decontaminate hard hat and footwear before leaving silica work area

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APPENDIX A SILICA WORK ACTIVITY CLASSIFICATION

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Description of Work Activity	Daily Duration of Activity			
	<9min	9-48min	49-96min	>96min
Drilling holes in concrete or rock that is not part of road construction	Non-Silica		Type 1	
Charging mixers/hoppers with material containing ≥95% silica				
Cutting concrete with a wet saw				
The use of a power tool outdoors to chip or break and remove concrete, masonry or stone				
Removal of silica-containing refractory materials with a jackhammer or similar tool	Non-Silica	Type 1		Type 2
Drilling holes in concrete that is part of road construction				
The use of a power tool to cut, grind or polish concrete, masonry or refractory materials				
The use of a power tool indoors to chip or break and remove concrete, masonry or stone				
The use of a power tool to remove silica containing materials				
Abrasive blasting of a silica-containing material	Type 3			

Note:

The above classifications were determined by calculating maximum daily time-weighted average worker exposures based on the following presumed airborne concentrations as provided in the MOL Guideline for Silica on Construction Projects (2004):

	Cristobalite and Tridymite	Quartz and Tripoli
Type 1	>0.05-0.50mg/m ³	>0.10-1.0mg/m ³
Type 2	>0.50-2.50mg/m ³	>1.0-5.0mg/m ³
Type 3	>2.5mg/m ³	>5.0mg/m ³

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APPENDIX B SILICA CONTROL MEASURES

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	Non-Silica	Type 1	Type 2	Type 3
General Controls	Cleaning only by wet wiping or HEPA vacuuming (no compressed air or dry sweeping); Hard hats and footwear to be decontaminated by wet wiping or HEPA vacuuming before leaving work area when performing silica work activity that requires disposable coveralls to be worn; and Workers required to use washing facilities when leaving work area			
Respirator	Half-face APR with P100 filters		Full-face APR with P100 filters	Abrasive blasting helmet-style SAR
Disposable Coveralls	Not required	Required for refractory work. Otherwise recommended if significant dust is generated	Required	
Signage	Not required	Required. Must display the following at each entrance to the work area: <i>There is a silica dust hazard;</i> <i>Access to the work area is restricted to authorized persons; and</i> <i>Respirators must be worn in the work area</i>		
Barrier/Enclosure	Not required	Barrier around immediate work area required	Enclosure or 10m barrier required	Enclosure or 25m barrier required
Changehouse	Not required		Recommended if significant dust is generated	Required

Note:

The above table represents a summary of the Suncor Sarnia Refinery's interpretation of the control measures provided in the MOL Guideline for Silica on Construction Projects (2004).

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The following individuals have approved and signed this document.

UserName: Todd Murray (toddmurray)

Title: Mgr EH&S Sarnia Refinery

Date: Friday, 08 September 2017, 12:24 PM Mountain Time

Meaning:

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