



Abrasive Blasting

Document Number: LMS0029A	Standard – Administrative	Applies To: Oil Sands and Fort Hills
Revision Date: 2016/07/26 Revision: 1 Review Cycle: 3 years	Document Owner (Title): Director, Environment & Regulatory	

Summary of Changes

Rev No.	Section Changed	Revision Made
1		Transferred to current Standard Template – assign revision #1 as no previous revision number assigned.
	Scope	Included Fort Hills
	ALL	Extensive changes – request previous version for comparison

Scope

This standard applies to all work performed at Suncor Energy Inc. Oil Sands and Fort Hills. employees, contractors, vendors and visitors in the Wood Buffalo region and is part of the EHS management system.

Purpose

The purpose of this standard is to protect the health and safety of workers while abrasive blasting and to ensure compliance with the Alberta Occupational Health and Safety Code, Part 4 Chemical Hazards, Biological Hazards and Harmful Substances.

Roles and Responsibilities

The following individuals and groups have the following roles and responsibilities:

- Document Owner**
 - Ensures this document is reviewed according to the required revision cycle.
 - Ensures the document is updated to accommodate changes to Suncor, provincial, and federal regulation.
 - Ensures the document is updated to mitigate risks found as the result of an incident.
- Document Approver**
 - Ensures this standard is necessary and that it aligns with management and company direction.
- Line Management**
 - Ensures implementation and adherence to this standard
- Abrasive Blaster**
 - Must be able to prove journeyman status as a Painter/Decorator or be a registered apprentice under supervision of a journeyman.

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Roles and Responsibilities *Continued***Abrasive Blasting Contractor**

- Ensures appropriate permits, training and authorizations are obtained before starting operation.
- Ensures abrasive blasters working with crystalline silica undergo a health assessment, as per regulatory criteria.

References

- [LMS0037A](#) Confined Space Entry
- [LMS0052A](#) Respiratory Protection
- [RGS0024A](#) Working at Heights
- [LMS0099A](#) Silica Code of Practice
- [LMS0061A](#) Lead Exposure Control
- Abrasive Blasting Industry Code of Practice 2013, Department of Industrial Relations, Queensland Government <https://www.worksafe.qld.gov.au/laws-and-compliance/codes-of-practice>
- CSA Standard Z180.1-00, Compressed Breathing Air and Systems
- Alberta OHS Bulletin, Crystalline Silica at the Work Site

Standard**1. Recognition****Item****Description**

- 1.1 Abrasive blasting is a method to remove rust, scale, paint, etc., from surfaces in preparation for finishing.
- A variety of abrasive materials can be used and include: silica sand, glass beads, metal slag (e.g. Kleen Blast), steel grit, metal shot, and aluminum oxide.
 - The process of abrasive blasting uses compressed air to propel the abrasive material at high speeds to remove the old surface finish.
 - Significant amounts of toxic dust are generated during the process. Of particular concern is the use of silica sand as an abrasive since exposure to silica dust can result in silicosis and crystalline silica is a known human cancer causing agent.
- 1.2 Additional hazards can include noise, lead and carbon monoxide.
- Significant noise is generated during abrasive blasting operations due to the discharge of compressed air at the blast nozzle.
 - Carbon monoxide can be generated as exhaust from gasoline or diesel powered equipment commonly used in blasting operations.
 - Paint removed by blasting may contain lead.

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2. Evaluation

Item	Description
2.1	A silica exposure evaluation for workers conducting blasting with silica blasting material inside the boundary will generally not be conducted since it is well established through observation and literature that there will be significant amounts of dust generated. Supplied air respiratory protection equipment has been shown to provide sufficient protection against potential exposure to silica and other contaminants.
2.2	A silica exposure assessment to assess the adequacy of a half face respirator for workers assisting the Blaster inside the flagged-off area (such as the Potman) may be conducted at the discretion of Industrial Hygiene.
2.3	A silica exposure assessment to assess the cabinet seal and ensure the cabinet is not leaking may be conducted for Blasters using silica blasting material.
2.4	Monitoring for airborne dust may be conducted at the blasting area boundary at the discretion of Industrial Hygiene.
2.5	Sampling methodology shall be in accordance with NIOSH Manual of Analytical Methods, 4 th Edition, 1994.

3. Control Measures

Note: The selection of the most appropriate control option(s) will be governed by the specific task and specific work area. The preferred hierarchy of control options are in the order below.

Item	Description
Elimination	3.1 The Alberta OHS Code stipulates that when selecting abrasive blasting materials, where practical, a substitute to silica be used unless there is a sound technical reason for using it or a less harmful substance is not available.
	3.2 The use of crystalline silica for abrasive blasting is to be approved by Industrial Hygiene. The one location in the Wood Buffalo Region where Industrial Hygiene has authorized the use of silica sand as an abrasive material is in the Base Plant Sandblasting Yard, under direction of an authorized abrasive blasting contractor. Suncor's guidance is that abrasive materials that do not contain crystalline silica should be used in all other areas on site.

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Item	Description
3.3	<p>Some of the alternatives to crystalline silica in abrasive material contain heavy metals for which there are also health concerns.</p> <p>Some abrasive materials can contain low percentages of crystalline silica (quartz). If used in uncontrolled abrasive blasting operations, enough airborne respirable crystalline silica can be generated to exceed occupational exposure limits.</p> <p>Some abrasive materials have a toxicity similar to that of silica sand or more toxic than silica sand. Health effects of substitute materials should be assessed during the product approval process prior to use.</p>
Engineering Controls	<p>3.4 Suitable engineering controls to minimize emission of dusts could include:</p> <ul style="list-style-type: none"> • Substituting a less hazardous surface preparation method, such as wet abrasive blasting or high pressure water jetting • Isolating the abrasive blasting activity inside a blasting cabinet • Installing temporary enclosures or boundaries around the open sand blasting area.
Administrative Controls	<p>3.5 Administrative controls are to be applied when the engineering controls cannot fully reduce worker exposure. Suitable administrative controls include:</p> <ul style="list-style-type: none"> • Scheduling abrasive blasting activities outside normal work hours • Job rotation • Relocate abrasive blasting activity away from other workers • Adequate housekeeping measures to limit accumulation of dust at ground and equipment • Use of HEPA vacuum to collect accumulated dust • Adequate personal hygiene before eating, drinking or smoking • Ensure workers decontaminate themselves prior to leaving a restricted area • Avoid blasting in windy conditions.
Personal Protective Equipment	<p>3.6 Abrasive blasters performing the open abrasive blasting shall wear the following protective equipment:</p> <ul style="list-style-type: none"> • NIOSH approved Type C air-line respirator with sandblaster's hood. <ul style="list-style-type: none"> • System supplying the air to the sandblaster's hood must meet the requirements and breathing air quality guidelines outlined in CSA Standard Z180.1-00, Compressed Breathing Air and Systems. • Gauntlet-type leather gloves • Hearing protection (single or double hearing protection as required) • Personal protective equipment normally required in the work area. <p>3.7 Workers assisting the blaster inside the flagged-off area (such as the Potman) shall wear the following protective equipment:</p> <ul style="list-style-type: none"> • Monogoggles • NIOSH approved half-face dual-cartridge air purifying respirator with P100 filters • Hearing protection (single or double hearing protection as required) • Personal protective equipment normally required in the work area.

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4. Isolating Abrasive Blasting Operations

Item	Description
4.1	<p>The boundary of the abrasive blasting operation shall be physically restricted by the use of one strand of red banner guard tape at waist level approximately 10 metres from the work area. If this is not possible, adjust accordingly based on the physical area limitations.</p> <ul style="list-style-type: none">• The strand shall read “Danger Do Not Enter” and must be in place before work begins.• Signage indicating that abrasive blasting is in progress and no unauthorized personnel may enter must be posted at all access points.• The boundary may need to be expanded depending upon wind conditions and work activities in the areas surrounding the abrasive blasting operation.
4.2	<p>When abrasive blasting is conducted indoors or adjacent to plant buildings, every effort shall be made to clear the area beyond the boundary of workers not involved in the operation. In addition, any ventilation system in the area should be isolated for the duration of the operation.</p>
4.3	<p>If operation is indoors and space constraints do not allow a 10 metre boundary around the operation, the area should be hoarded in with materials such as 6 mil polyethylene.</p>
4.4	<p>Abrasive blasting operations in hoarded areas or in confined spaces must be ventilated at all times by a vacuum system, such as a vacuum truck or air mover, to exhaust airborne dust and other contaminants. Ensure Industrial Hygiene is consulted before setting up the exhaust system.</p>

5. Safety Precautions

Item	Description
5.1	<p>Abrasive blasting equipment must be fitted with a deadman control which can quickly stop flow of the abrasive material and must be under direct control of the Operator.</p>
5.2	<p>Hoses should be constructed with anti-static linings or fitted with a ground wire to prevent electrical shock.</p>
5.3	<p>Air-moving equipment utilized in any area of abrasive blasting should be grounded to prevent build up of static electricity and risk of explosion.</p>
5.4	<p>When dry blasting, a means of discharging static electrical charge must be provided for the nozzle and the object being blasted.</p>
5.5	<p>Abrasive blaster's shields shall be changed regularly to eliminate problems with visibility.</p>

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- | Item | Description |
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| 5.6 | Abrasive blasting equipment must be inspected on a routine basis and be in good working condition prior to use. |
| 5.7 | When the abrasive blasting operation is performed in a confined space or at an elevated height, additional precautions are required. Work performed under these conditions must conform to Suncor standards on confined space entry and working at elevated heights. |

6. Housekeeping

- | Item | Description |
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| 6.1 | Abrasive Blaster must regularly clean the blasting area to remove accumulated abrasive materials and eliminate slipping hazards. |
| 6.2 | Abrasive material must be removed from item(s) which have been blasted before the item(s) being released back into the area. |
| 6.3 | The Abrasive Blaster must use proper decontamination methods to prevent the generation of airborne dust. Wet sweeping or vacuuming with an HEPA vacuum are the preferred methods for cleanup of abrasive materials. |

7. Personal Decontamination and Hygiene

- | Item | Description |
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| 7.1 | All workplace surfaces are to be maintained free of accumulations of dust. |
| 7.2 | Before exiting an area with potential for overexposure to silica and before the removal of protective clothing and respiratory protection, crystalline-silica containing dust must be removed from the clothing using a method that prevents the generation of airborne dust. Decontamination is not required in the event of an emergency requiring evacuation from the area. |
| 7.3 | Crystalline-silica containing dust must never be removed from clothing by dry sweeping, shaking or blowing with compressed air. |
| 7.4 | Workers should change out of work clothes that have been worn in an area containing crystalline silica dust and ensure that Suncor supplied clothing is laundered when dirty. |
| 7.5 | Workers must not eat, drink or use tobacco products in areas contaminated by crystalline silica. The hands and face should be washed before eating, drinking or smoking. |

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8. Health Assessment Requirements

Item	Description
8.1	Employers of abrasive blasters must ensure that they comply with the health assessment requirements outlined in Section 40, Part 4 of the Occupational Health and Safety Code.

9. Exceptions

Item	Description
9.1	Abrasive blasting in a blasting cabinet is exempt from the PPE requirements and boundary establishment since the operation is enclosed and workers are not exposed.
9.2	Workers conducting abrasive blasting at a blasting cabinet are not required to have certification as a journeyman Painter/Decorator.

End of Standard

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The following individuals have approved and signed this document.

UserName: Sheila Chernys (schernys)

Title: Dir OS Enviro & Reg

Date: Tuesday, 26 July 2016, 09:00 AM Mountain Time

Meaning: Approver 1 Signed

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