

# WHITE PAPER: OSHA RESPIRABLE CRYSTALLINE SILICA DUST STANDARD HOW TO COMPLY WHEN INSTALLING ADHESIVES TECHNOLOGY CORPORATION'S PRODUCTS

By: Krista Maroni (Compliance Department)

## Introduction

Occupational Safety and Health Administration (OSHA) issued a final rule that is intended to provide improved personal and environmental protections to the potential adverse effects of respirable crystalline silica dust. OSHA estimates the new rule could save 600 lives each year and reduce the new cases of lung cancer, silicosis, pulmonary disease, and kidney disease by 900 cases each year. This document summarizes the OSHA respirable crystalline silica dust standard and suggests methods to comply by using commercially available dust abatement and remediation equipment with Adhesives Technology Corporation's (ATC's) products.

## What Changed with the OSHA Standard for Respirable Crystalline Silica Dust Exposure?

The revised standard consists of updates to the original respirable crystalline silica rule established in 1971. The new exposure limit is two to five times lower and reduces the permissible exposure limit (PEL) from 100 microgram (mcg) for general industry and 250 mcg for construction to 50 mcg averaged over an 8-hour period. Crystalline silica is a common material found in brick, concrete, tile, sand, asphalt, mortar and stone. The new rule will affect all workers who cut, grind, blast, drill, crush or frack these materials whereby silica dust is generated and exposure could occur. This means that employers will have to implement new work practices to reduce exposure, provide training and offer medical examinations to highly exposed workers. The rule is made up of two standards; General Industry and Maritime & Construction. OSHA estimates that 2.3 million workers and 676,000 workplaces will be effected.

## What are the Key Provisions?

- The PEL for respirable crystalline silica dust is now 50 mcg averaged over an 8-hour shift
- Employers are required to have engineering controls which prevent exposure past the new PEL
- Engineering controls include ventilation, vacuuming, enclosing an operation and wetting the dust
- Respirators must be provided when engineering controls are not in place or are inadequate
- The employer must also have a written exposure control plan to show how compliance is achieved on the work site and provide training to employees on limiting respirable crystalline silica exposure
- The construction standard includes a provision for a "competent person" who has the authority to address non-compliance and take corrective action
- Highly exposed workers must be given health information and offered medical exams

## What are the Compliance Methods?

1. **Table 1-** OSHA's Table 1 provides specific control methods and tasks that they have determined reduces respirable crystalline silica dust to acceptable levels. If these methods are used then air monitoring is not required. Several of the options do require respirators. If a respirator is required it is noted on the rightmost column. The Table includes 18 solutions which correspond with a task and specific products. The equipment must be maintained and used as instructed by the manufacturer in order to remain in compliance. Employers that properly and completely implement the Table 1 controls are not subject to other methods of compliance and assessments.

**WHITE PAPER: OSHA RESPIRABLE CRYSTALLINE SILICA DUST STANDARD  
HOW TO COMPLY WHEN INSTALLING ADHESIVES TECHNOLOGY CORPORATION'S PRODUCTS**

By: Krista Maroni (Compliance Department)

The following is an example from Table 1 showing the task of using a handheld drill and the engineering controls that should be used in order to comply with the respirable crystalline silica standard.

Table 1 Example		
Equipment/Task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)
		< 4 HR shift >4 HR shift
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills).	Use drill equipped with commercially available shroud or cowling with dust collection system.  Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. Use a HEPA-filtered vacuum when cleaning holes.	None..... None. None.

2. **Self-Monitoring Air Program-** Employers purchase equipment to monitor dust amounts and provide medical assessments for employees. Air samples must be taken and analyzed by a laboratory according to the specific methods of OSHA, NIOSH or MSHA. The methods of sampling analysis are listed in Appendix A of the Final Rule. The medical surveillance guidelines are listed in Appendix B.
3. **Objective Data-** Information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating employee exposure to respirable crystalline silica associated with a particular product or material or a specific process, task or activity. The data must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

**How Will This Affect the Use of ATC's Adhesive Products?**

There are some common tasks that could pose a risk of respirable crystalline silica exposure when installing ATC adhesives. The two most common tasks are drilling into concrete with a handheld drill or grinding concrete with a handheld grinder. Drilling into concrete is required for all anchoring and doweling applications and grinding is often required for concrete repair applications. This document focuses primarily on solutions for anchoring and doweling applications since proper installation depends on drilling into concrete, which could pose a respirable crystalline silica dust hazard. Historically, all

# WHITE PAPER: OSHA RESPIRABLE CRYSTALLINE SILICA DUST STANDARD HOW TO COMPLY WHEN INSTALLING ADHESIVES TECHNOLOGY CORPORATION'S PRODUCTS

By: Krista Maroni (Compliance Department)

anchoring and doweling applications required the user to drill a hole into concrete, then clean the hole by blowing the dust out of the hole, brushing the hole with a wire brush, followed with a second blowing of the hole prior to the adhesive being injected into the hole. This hole preparation technique is commonly identified as the blow-brush-blow cleaning method.

The following section will explain alternatives to these procedures that will allow the user to be compliant with Table 1.

## Anchoring & Doweling Compliance Methods

On September 23, 2017, the enforcement of the new rule began for construction. ATC recommends that Milwaukee Tool's drilling and dust extraction products be used in combination with ATC's adhesives to deliver compliant solutions that are available for order today.

<p>Milwaukee Tool launched its largest expansion of its Dust Extraction System to-date, all of which are completely compliant with Occupational Safety and Health Administration's (OSHA) regulation on respirable crystalline silica dust. With the launch of an 8-Gallon Dust Extractor and accessories, the company's full lineup of rotary hammers and grinders are compliant through either Table 1 or Objective Data Requirements.</p>	
--	---

The following ATC anchoring and doweling adhesives have been evaluated and proven to be compliant with Milwaukee Tool's OSHA compliant self-cleaning bits and vacuum.

	<ul style="list-style-type: none"> <li>ULTRABOND® HS-1CC*</li> <li>ULTRABOND® HYB-2CC**</li> <li>ULTRABOND® EPX-3CC*</li> <li>ULTRABOND® 1</li> <li>ULTRABOND® ACRYL-8CC**</li> <li>ULTRABOND® HS-200</li> <li>ULTRABOND® 1300</li> <li>ULTRABOND® ASF-1000</li> </ul>	
---	--	---

# WHITE PAPER: OSHA RESPIRABLE CRYSTALLINE SILICA DUST STANDARD HOW TO COMPLY WHEN INSTALLING ADHESIVES TECHNOLOGY CORPORATION'S PRODUCTS

By: Krista Maroni (Compliance Department)

For these ATC products, the blow – brush - blow method can be completely eliminated when using the Vacuum Drill Bits along with the Dust Extractor with HEPA filter as specified by Milwaukee Tool. To remain compliant with the revised OSHA standard, ATC recommends this as a preferred solution for removal of dust when drilling in dry concrete, while achieving equivalent performance of the ATC adhesive anchoring or doweling system.



Threaded Rod



Vacuum Drill Bit



Dust Extractor w/HEPA Filter

\* These products have been independently evaluated by ICC-ES and may be used with vacuum bit dust extraction solutions on applications that require IBC/IRC approval.

\*\*The use of Vacuum Drill Bits and Dust Extractor with HEPA Filter together with ULTRABOND® HYB-2CC and ULTRABOND ACRYL-8CC has not been evaluated by ICC-ES as an alternative drilling or hole cleaning method and therefore the use of the vacuum bit dust extraction solutions should be limited to applications that do not require IBC/IRC approval.

For the convenience of our customers, the Technical Data Sheets for the aforementioned products have been revised to indicate the proper OSHA compliant Milwaukee Tool accessories and how they are best used with ATC's adhesives.

**Important:** Prior to injecting the adhesive, the hole must always be clean, either by using self-cleaning vacuum bits or by using the blow-brush-blow cleaning method with a traditional hammer drill bit and dust shroud. Only vacuuming out a hole drilled with a standard masonry bit is NOT acceptable and will yield lower performance than published for the anchoring or doweling adhesive.

## Concrete Repair Compliance Methods

As mentioned above, there are also instances where grinding might be a necessary step prior to, or after, installing ATC's Concrete Repair adhesives such as CRACKBOND® CSR and MIRACLE BOND® REPAIR EPOXY. An example of an OSHA compliant system when grinding would be to use a Surface Grinding Dust Shroud in conjunction with a Dust Extractor with 99% efficiency (pictured below).



CRACKBOND CSR



Surface Grinding  
Dust Shroud



Dust Extractor

# WHITE PAPER: OSHA RESPIRABLE CRYSTALLINE SILICA DUST STANDARD HOW TO COMPLY WHEN INSTALLING ADHESIVES TECHNOLOGY CORPORATION'S PRODUCTS

By: Krista Maroni (Compliance Department)

## Conclusion

Adhesives Technology Corporation understands that it is the responsibility of the employer to ensure the safety of their installers and compliance with the referenced OSHA standards. However, ATC has been proactive in coupling our proven adhesive products with drilling and dust extraction solutions from Milwaukee Tool, a global leader in power tools and accessories, to bring our customers a user-friendly system to aid in compliance for their adhesive installation needs.

Milwaukee Tool's drilling and dust extraction accessories are commercially available through local distributors which can be found here: <https://www.milwaukeetool.com/buy-now>.

For more information see the links provided under the "References" section of this document or contact ATC directly with any questions at: [atcinfo@atcepoxy.com](mailto:atcinfo@atcepoxy.com).

## References:

OSHA Fact Sheet: <https://www.osha.gov/Publications/OSHA3681.pdf>

OSHA Information on Rule: <https://www.osha.gov/silica/>

OSHA - Frequently Asked Questions: [https://www.osha.gov/silica/Silica\\_FAQs\\_2016-3-22.pdf](https://www.osha.gov/silica/Silica_FAQs_2016-3-22.pdf)

Federal Register of the Final Rule: <https://www.federalregister.gov/documents/2016/03/25/2016-04800/occupational-exposure-to-respirable-crystalline-silica>

Table 1: <https://www.osha.gov/silica/Table1sect1926.1153.pdf>

For further information regarding the specifics of the power tools, drill bits, dust shrouds and vacuums referenced in this document can be found at: <https://www.milwaukeetool.com/silica-dust-extraction-solutions>

Adhesives Technology Corporation Technical Data Sheets: <http://www.atcepoxy.com/>

The information contained in this white paper is the proprietary and exclusive property of Adhesives Technology Corp. except as otherwise indicated. No part of this document, in whole or in part, may be reproduced, stored, transmitted, or used for design purposes without the prior written permission of Adhesives Technology Corp. The content provided in this document is intended solely for general information purposes, and is provided with the understanding that the authors and publishers are not herein engaged in rendering engineering or other professional advice or services. The practice of Engineering is driven by site-specific circumstances unique to each project. Consequently, any use of this information should be done only in consultation with a qualified and licensed professional who can take into account all relevant factors and desired outcomes. Some information in this document may be incomplete, incorrect, or inapplicable to particular circumstances or conditions. We do not accept liability for direct or indirect losses resulting from using, relying or acting upon information in this document.