



# OSHA SILICA RULE

COMPLIANCE WORKBOOK WITH A STEP BY STEP  
CHECKLIST

1	BACKGROUND OF SILICOSIS
2	OVERVIEW OF THE NEW RULE
3	REQUIREMENTS OF THE NEW RULE
6	HOW DO I TELL WHICH STANDARD I COME UNDER?
7	STEP BY STEP CHECKLIST TO CONFORM
9	SUMMARY
10	COMMON ABRASIVES COMPARISON CHART
11	REFERENCES
11	DISCLAIMER



# BACKGROUND OF SILICOSIS

Blasting with silica sand has always been dangerous. Thousands of sandblasters throughout the world have died throughout the years through blasting with silica sand.

Silicosis isn't a nice way to go – it is an incurable lung disease. Essentially it is a slow death by suffocation, through no longer being able to breathe through the lungs. Prior to that the person who is suffering from silicosis will have lived the last few years of their life in terrible agony.

In the 1950-1960's all the European countries banned the use of silica sand for abrasive blasting. Most of the other first and second world countries banned it over the last 40-50 years. In fact, even most third world countries have banned the use of silica sand for blasting.

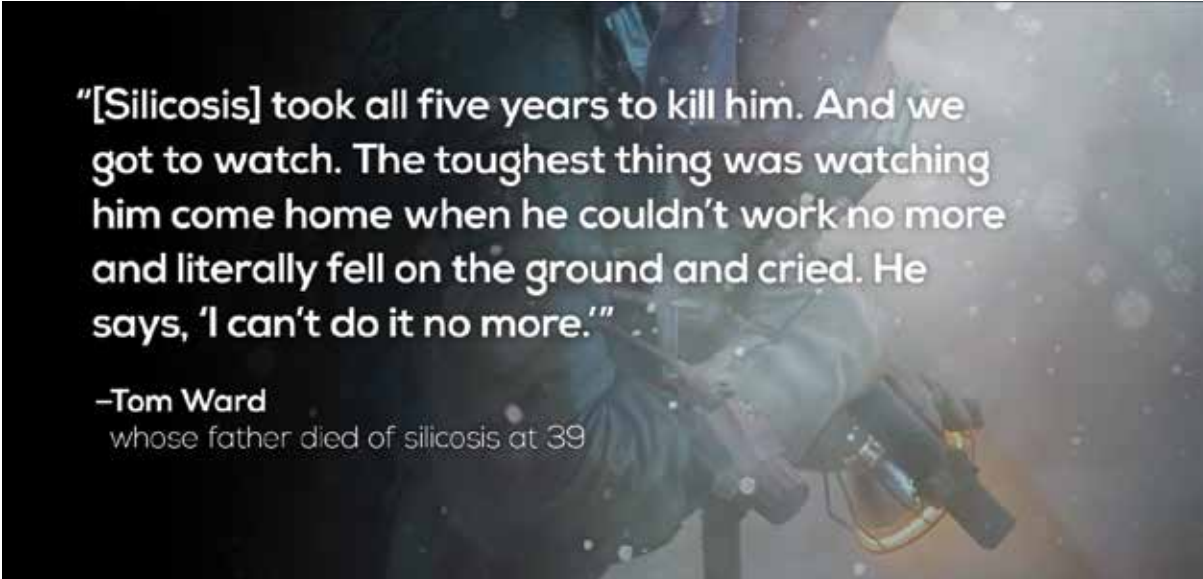
By 1974, the National Institute of Occupational Safety and Health (NIOSH) recommended the elimination of sand as an abrasive blasting material.

In 1992, NIOSH issued an Alert titled 'Request for Assistance in PREVENTING SILICOSIS AND DEATHS FROM SANDBLASTING'. NIOSH publication 92-102.

OSHA has been working hard over many years to do something about this issue, and finally, on June 23<sup>rd</sup>, 2016 the new OSHA silica law was finally codified into law.

On 23<sup>rd</sup> September 2017, the time will have come when OSHA will put their foot down.

Whilst OSHA isn't banning the use of silica sand for blasting, the new regulations essentially mean that blasting with silica sand is no longer going to be a viable option for abrasive blasting companies.



**"[Silicosis] took all five years to kill him. And we got to watch. The toughest thing was watching him come home when he couldn't work no more and literally fell on the ground and cried. He says, 'I can't do it no more.'"**

**-Tom Ward**  
whose father died of silicosis at 39

# OVERVIEW OF THE NEW RULE

Prior to the new silica rule that was issued on June 23, 2016, there was no single specific standard addressing silica exposure. Silica enforcement has been dependent upon several existing regulations and local authorities. This new federal rule involves two regulations that relate to the abrasive blasting industry:

29CFR 1910.1053 – General and Maritime Industries  
29CFR 1926.1153 – Construction Industry

The rule was codified into law on June 23, 2016, which means that it is illegal have exposure over the new exposure limits from this date on, however there is a compliance schedule in place which means that the law provisions wont be enforced until certain dates.

Construction Industry – September 23, 2017 enforcement date.


General and Maritime Industries – June 23, 2018 enforcement date.

The overarching scope of the new rule is the lowering of the Permissible Exposure Level (PEL) to 50 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ), averaged over an 8-hour shift. However, the Action level is set at 25  $\mu\text{g}/\text{m}^3$ . **Actions Levels must be followed.**

So in simplistic terms: if your abrasive blasting activities result in 25  $\mu\text{g}/\text{m}^3$  or greater as a 2 8-hour time weighted average (TWA) of airborne respirable crystalline silica, you must take action.

## HOW DO YOU DETERMINE YOUR CURRENT EXPOSURE?

You most likely need to do an Industrial Hygiene Study/Exposure Assessment to determine your exposure level. This Industrial Hygiene Study is not only for the blasters who are doing the blasting but for anyone who is near or around the blasting location. See our step by step instructions on **page 8-9**.



“The very best thing you can do to protect a company is to protect the workers who are, in effect, the heart and soul of that company. The two go together.”

–Michael Mangum  
National Asphalt Pavement  
Association program director

# REQUIREMENTS OF THE NEW RULE

If you have determined that your operations result in airborne respirable crystalline silica levels exceeding the Action Level of 25  $\mu\text{g}/\text{m}^3$ , you need to act.

The requirements that apply to anyone who has an exposure of over 25  $\mu\text{g}/\text{m}^3$  can be categorized under 6 headings.

## 1. EXPOSURE CONTROL METHODS (ENGINEERING AND WORK PRACTICE CONTROLS)

- This part of the new rule requires you to use engineering and work practice controls to reduce exposure to at or below 50  $\mu\text{g}/\text{m}^3$ .
- This applies not only for the blaster, but everyone in the vicinity of the blasting.
- The first obvious step here is to change abrasive to an abrasive that has less than 1% free silica.
- Another obvious step (if you are doing blasting at your own facility) is to install a blast room so all blasting is confined to a ventilated area, and use recyclable abrasive media
- In addition, employers need to comply with current OSHA standards such as ensuring all blasters are supplied with NIOSH approved blast helmets, and ventilation requirements.

## 2. HOUSEKEEPING

- Dry sweeping of silica dust will no longer be allowed
- Dry blowing down with compressed air of silica dust will no longer be allowed
- Water will have to be introduced with wet sweeping and/or blow down with water on the blast nozzle. Obviously this turns into sludge and is not really a viable alternative.
- The other alternative is to vacuum which obviously adds costs and time.

- Using compressed air to blow off employee clothing is not allowed and airwash showers will have to be used in place of compressed air. If an airwash shower is not available, clothes will have to be disposed of and this means an increase in disposable clothing costs every day.

## 3. WRITTEN EXPOSURE PLAN

You must have a Written Exposure Control Plan. The Written Exposure Control Plan is a new requirement and in your Plan you must:

- Describe all the processes which use silica dust, i.e. blasting with silica sand, or an abrasive that contains higher than 1% silica (like some grades of Starblast).
- Describe the engineering controls and work practises in respiratory protection to limit the employee exposure to silica dust.
- Describe the housekeeping measures in place to reduce exposure.
- Include an annual review of the Plan.
- Provide access to the Plan by all affected employees.

## 4. MEDICAL SURVEILLANCE

The next requirement by the new law is medical surveillance. This is the most complex part of the new standard and all but very large employers will likely choose to subcontract this activity to a qualified Occupational Medical Facility. This will add significant costs to the cost of any blasting job when using silica sand. This means that every single

one of your employees who is exposed, not only the blaster, but everyone who works around the blaster must do the following:

- Initial examination of all affected employees
- Medical and work histories
- Chest x-ray and B-Read from a certified NIOSH B-Reader.
- Pulmonary function testing
- Testing for Tuberculosis infection
- Tests every three years
- Written medical reporting for every affected employee
- Written medical opinion issued to employee, i.e. the worker
- Employers (the company) should pay special attention to the requirement for any individual reading receiving a B-read greater than 1/0, to be examined by a specialist.

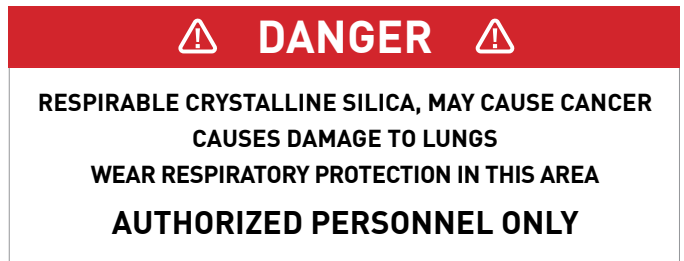
By definition, a B-read of 1/0 is *likely first level of opacity but x-ray maybe normal*. This provision in the standard will require the majority of the workers to be seen by a specialist, adding significant cost.

## 5. HAZARD COMMUNICATION

- Once the exposure assessment has been completed, every employee who was subject to an exposure assessment must be individually

notified in writing of the results of that assessment, or the results need to be posted in an appropriate location accessible to all affected employees.

- When doing sandblasting with silica sand there must be hazard communication signs, with signs posted saying:



- You should advise all your sandblasters and employees that you are making them use a sandblasting material which is unsafe and will likely lead to silicosis which could lead to lung cancer. It is worth noting that the demand for trained qualified blasters and painters is high, and other companies who may use abrasive materials that contain less than 1% free silica could be a more attractive employer.

## 6. RECORD KEEPING

- The standard requires employers to maintain records on all air monitoring, hazard communication, employee training and medical surveillance.



# HOW DO I TELL WHICH STANDARD I COME UNDER?

Several industrial and construction activities, however, cause silicosis. OSHA published a Fact Sheet citing what the agency believes are the primary industrial, construction and maritime causes of silicosis.

## INDUSTRIAL

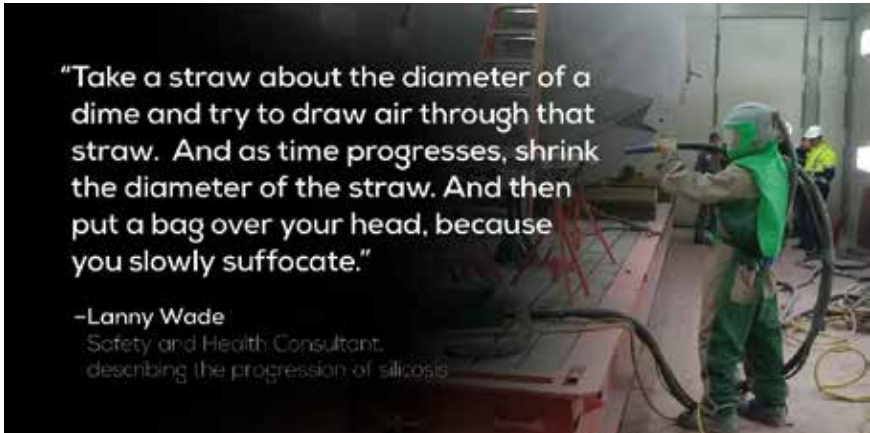
- Steel and casting foundries during casting cleaning
- Tombstone finishing operations
- Frosting glass
- Cement and brick manufacturing
- Asphalt pavement and shingle manufacturing
- Porcelain and ceramic manufacturing
- Tool and die operations
- Repair and replacement of refractory brick furnace linings
- Manufacturing household abrasives, adhesives, paints, soaps, and glass

## CONSTRUCTION

- Abrasive Blasting for paint and rust removal from bridges, tanks, concrete structures
- Abrasive Blasting of other surfaces
- Jack hammering
- Rock/well drilling
- Concrete mixing
- Concrete drilling
- Brick and concrete block cutting and sawing
- Tuck pointing
- Tunnelling operations

## MARITIME

- Blasting operations for paint removal and cleaning for surface preparation of steel halls, bulkheads, decks and tanks for paints and coatings



“Take a straw about the diameter of a dime and try to draw air through that straw. And as time progresses, shrink the diameter of the straw. And then put a bag over your head, because you slowly suffocate.”

—Lanny Wade  
Safety and Health Consultant,  
describing the progression of silicosis

# STEP BY STEP CHECKLIST TO CONFORM

1. Does our company use an Abrasive that contains more than 1% free silica?

- Yes  
 No

On **page 11-12** there is a helpful chart you could use as a quick reference. Alternatively, you can ask your abrasive supplier for an updated copy of the product datasheet and look for Crystalline Silica, SiO<sub>2</sub>, Free Silica, Quartz.

2. Do any of the products you are blasting contain silica?

- Yes  
 No

For example, if you are blasting concrete, brick, etc, there is a possibility that your blasting operation will exceed the action level, even if you are using a low silica abrasive

3. If you answered “No” to both questions, you should be able to safely ensure that no employee is exposed to an airborne concentration of respirable crystalline silica in excess of 50 µg/m<sup>3</sup> calculated as an 8-hour TWA, and you could assume you comply with the new standard. However it would be prudent to still perform an exposure assessment.

If you answered “Yes” to either question, please proceed on with step #4.

4. Prepare a detailed list of employees who is or may reasonably be expected to be exposed to respirable crystalline silica, including their job titles, and indicating how they may be exposed to silica dust exceeding the action level of 25 ug/m<sup>3</sup>.
5. Perform an exposure assessment – this is air monitoring of each of the above listed employees to determine their eight hour time weighted exposure.

- The air monitoring must be performed every six months.
- If exposure level is found to be above 50 ug/m<sup>3</sup> monitoring must be repeated every three months.
- Sampling must be done in compliance with the Standard. This is a helpful article on this subject: [https://www.osha.gov/dsg/etools/silica/measure\\_amount/measure\\_amount.html](https://www.osha.gov/dsg/etools/silica/measure_amount/measure_amount.html)
- You will need to use a laboratory to do your sampling
- All monitoring activities must be performed with an employee representative present.
- All results must be made available and sent to all affected employees

6. Delineate the areas where the employees are exposed and post specific signs with the text: “Danger Respirable Crystalline Silica may cause Cancer, causes damage to Lungs, wear Respiratory Protection in this Area, Authorised Personnel Only.”
7. Provide documented training to all affected personnel. This requirement makes sure that all your employees know of the hazards associated with the silica dust exposure. They should be made aware that there are alternatives available and what those alternatives are.
8. Identify and provide proper respiratory protection for any effected employee. This needs to be such as a NIOSH approved Abrasive Blasting Helmet (everyone who has a risk of inhaling the silica dust needs to wear this, not just the blasters)
9. Medical monitoring for all your employees as detailed on **page 4 section 4**.
10. If you are to continue using an abrasive that has more than 1% free silica you should hire a qualified safety professional to develop, write, train and implement all the elements of these new standards.

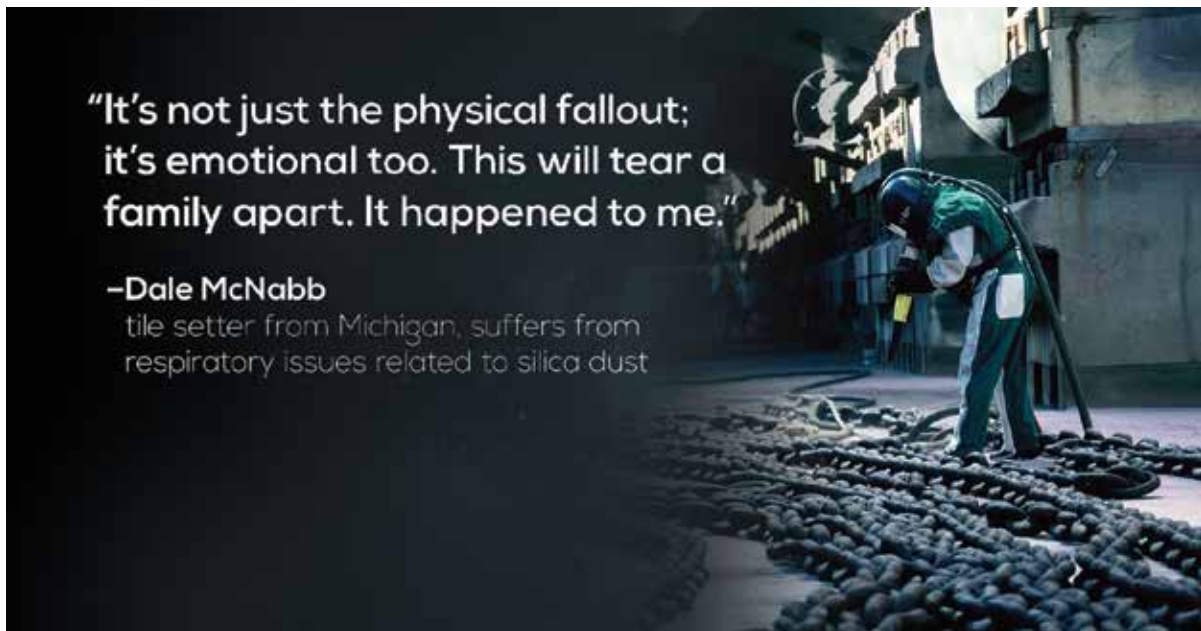


# SUMMARY

The new silica standard is possible to implement in your company but is no small task. There are choices to be made.

The first serious choice as a company is look at changing abrasive blast media away from an abrasive that contains more than 1% free silica (i.e. Silica Sand or standard Starblast). Sand is a cheap, single use abrasive but over the last 50-60 years there have been many advances made on abrasives. Your cost of blasting does not have to increase with the change of abrasive. Speak to BlastOne to discuss what abrasive might be best for you to replace your current silica sand with, if you are currently using it.

Also, going into a blast room and using a recyclable media eliminates all needs to comply with the new silica sand laws.




# COMMON ABRASIVES COMPARISON CHART

Use this page to easily identify the characteristics of different abrasives

ABRASIVE GENERIC NAME	OTHER NAMES	% OF FREE SILICA	INDICATOR OF HEALTH HAZARD	HEALTH NOTES
<b>Silica sand</b>	Cemex Gordon Sand Sil Sand Golden Flint	70% - 100%		#1 Carcinogenic Material
<b>Australian Garnet</b>	GMA Garnet SpeedBlast PremiumBlast ToughBlast ExtremeBlast	<0.1%		Low dust. No heavy metals
<b>Indian Garnet</b>	Bengal Bay Indian Garnet	0.5% - 2.0%		Medium dust levels
<b>Copper Slag</b>	Kleenblast Sharpshot Black Diamond Iron Horse Ebony Grit	<0.1%		Low silica, but could have some heavy metals Dust levels high
<b>Coal Slag</b>	Black Beauty Black Magic Blackblast Black Magnum Black Diamond	<0.1%		Low silica, but could have some heavy metals Dust levels high
<b>Nickel Slag</b>	Green Diamond Ultrablast	<0.1%		Low silica, but could have some heavy metals Dust levels high
<b>Staurolite</b>	Starblast Powerblast	1.0% - 5.0%		The standard Starblast has up to 5% silica
<b>Aluminum Oxide</b>	Blastite Fused Alumina Alox Fullblast Recycled Alox	<0.1%		Low dust. No heavy metals
<b>Crushed Glass</b>	New Age Media Briteblast Greengrit Glassblast Black Beauty Glass	<0.1%		Medium dust - some blasters complain from the glass shards causing blood noses
<b>Glass Bead</b>	Potters	<1.0%		Low dust. No heavy metals
<b>Walnut Shell</b>	Black Walnut Eco-Shell	<1.0%		Low dust. No heavy metals
<b>Steel Grit</b>	Profilium No brand Amasteel/Amagrit	0%		Low dust. No heavy metals
<b>Steel Shot</b>	Amasteel Steel shot	0%		Low dust. No heavy metals
<b>Soda</b>	Armex Natrium	<1.0%		Low dust when used with water (this is normal application) No heavy metals
<b>Sponge</b>	Spongejet	0%		Low dust. No heavy metals
<b>Corn Cob</b>	Grit-o-cob	0%		Low dust. No heavy metals
<b>Plastic Media</b>	Plastigrit	0%		Low dust. No heavy metals

## REFERENCES

- OSHA Silica Site <https://www.osha.gov/silica/index.html>
- Centres for Disease Control and Prevention <https://www.cdc.gov/niosh/topics/blasting/>
- <https://ohsonline.com/articles/2009/05/06/petition-osha-to-ban-silica-in-sandblasting.aspx>
- [http://ehstoday.com/ppe/respirators/ehs\\_imp\\_37292](http://ehstoday.com/ppe/respirators/ehs_imp_37292)
- Clemco Respirable Crystalline Silica: Its History, Associated Disease, and the New OSHA Standard—Understanding the New Regulations



**“The tools that we need to protect workers are already out there. They’re available. They’re not prohibitively expensive, and they need to be implemented.”**

**–Deven Johnson**

Director of Training, Health and Safety for the  
Operative Plasterers’ and Cement Masons’  
International Association

**DISCLAIMER:** BlastOne has issued this suggested workbook as a resource to the industry to use and refer to. It is the responsibility of the reader and/or users of this information to separately determine and verify each and/or any relevant or appropriate or required or necessary or updated or accurate standards and/or their contents for any particular topic or aspect. BlastOne expressly disclaims any liability for the use or misuse of the included information.

This document is based on our interpretation of the OSHA Silica Rule documents that are publicly available. BlastOne expressly disclaims any liability should any of the OSHA Silica Rule’s documents be misrepresented or communicated incorrectly.

©Copyright BlastOne 2017. All rights reserved.



**BLASTONE INTERNATIONAL**

4510 Bridgeway Avenue  
Columbus Ohio 43219 USA

Toll Free 800 999 1881  
Tel (614) 476 3000  
Fax (614) 476 3002  
Email [sales@blastone.com](mailto:sales@blastone.com)  
[www.blastone.com](http://www.blastone.com)

**AUSTRALIA**

Adelaide | Brisbane | Darwin |  
Mackay | Melbourne | Perth | Sydney

**NEW ZEALAND**

Auckland | Christchurch

**NORTH AMERICA**

Columbus | Los Angeles |  
Minneapolis | Chicago

**UNITED KINGDOM**

London