

Stonemasonry Dust Checklist

Stonemasons can suffer ill health and disease caused by the stone dust that they breathe in. If stonemasons get lung diseases and damage from inhaling too much stone dust, and they do, then the solution is to reduce the amount of dust they inhale. But this simple common sense statement begs a number of questions:

- Is the type of dust important?
- How much dust is too much dust?
- What controls will reduce the stonemason’s exposure enough?
- How do I know whether the controls are working?
- How do I keep the controls working?

The following questions and subsequent answers provide information guidance to help employers manage the risk to employees.

		YES	NO
1	Do you know what the health risks from stone dust are?		
2	Can you list them?		
3	What causes the risks?		
THE LAW, EXPOSURE, LIMITS & CONTROL			
4	Can you describe the fundamental properties of fine stone dust?		
5	Do you know which laws cover the control of stonemasonry dust?		
6	Do you know what the exposure limits relevant to stone dust exposure are?		
7	Do you know how to define ‘overexposure’ to stone dust?		
DUST EXPOSURE FROM STONEMASONRY PROCESSES			
8	Can you list the four steps to successful stone dust control?		
9	Do you know which stonemasonry processes generate the highest dust exposures?		
10	Do you know what effect the crystalline silica content of stone has on stone dust overexposure?		
11	Do you know the crystalline silica content of the stone you or your stonemasons work with?		
12	Do you know how to calculate daily stone dust exposure?		
STONE & DUST CONTROL			
13	Do you know what the ‘golden rule’ of control is?		
14	Do you know what the ‘control hierarchy’ is and means?		
15	Do you know what the four classes of control option are?		
16	Can you describe the essential features of a well-designed exhaust ventilation booth?		
17	Can you describe the strengths and limitations of exhaust ventilation ‘captor’ hoods?		
18	Do you know how to select and fit respirators?		
19	Do you know how to select the appropriate blend of dust controls?		
20	Do you know how stonemasons should best use the dust controls?		
21	Have you written down a description of the most effective dust control work methods?		
MAINTENANCE OF DUST CONTROLS			
22	Do you know what monitoring and checking of control ‘hardware’ is needed to maintain the effectiveness of dust control measures?		
23	Do you know what monitoring and checking of control ‘software’ is needed to maintain the effectiveness of dust control measures?		
24	Do you know what airborne dust monitoring can be used for and when it is needed?		
OCCUPATIONAL HEALTH SURVEILLANCE			
25	Do you know when medical surveillance is needed?		
26	Do you know what medical surveillance is needed and how often?		

Stonemasonry Dust Checklist - Answers

2	<p><i>Pneumoconiosis</i> <i>Silicosis</i> <i>Lung cancer</i></p>
3	<p>Exposure to respirable dusts Inhalable dust can cause irritation of the eyes, nose and throat, but it is the fine respirable dust which is of prime concern for serious long-term health problems. Excessive inhalation of any type of fine respirable dust can damage the lungs and impair health, but some forms of dust are more harmful than others.</p>
4	<p>Working on stone creates and releases into the air dust particles with a wide range of sizes. The large particles fall out of the air quickly and cannot be inhaled but the smaller, including respirable dust particles, will float, suspended in the air, for many minutes or longer, depending upon their size. Fine stone dust particles do not move in the air by themselves. They move with the air in which they are suspended. Controlling exposure to airborne stone dust is all about containing, drawing away and diluting dust-laden air.</p>
5	<p>Control of Substances Hazardous to Health Regulations 1999 (COSHH) requires employers and the self-employed to assess and control the risks from stone dust exposure. The Regulations set out the steps, in a logical order, that employers and self-employed people need to take</p>
6	<p><i>Silica maximum exposure limit (MEL)</i> Exposure should never normally exceed the MEL of 0.3 mg/m³, when measured or estimated for any 8-hour period, called a time-weighted average or TWA</p> <p>This is not a safe limit and there may be residual silicosis risk at exposures below the MEL.¹² To comply fully with COSHH, employers must reduce exposure to respirable crystalline silica dust as far as is reasonably practicable below the MEL.</p> <p><i>Silica medical surveillance threshold (MST)</i> Health surveillance is recommended for people who are regularly exposed to respirable silica dust levels greater than 0.075 mg/m³ (one quarter of the MEL), because of the residual risk at exposures below the MEL.</p> <p>If at all possible respirable silica dust exposure should be reduced to 0.075 mg/m³ and below to minimize the potential risk of silicosis.</p> <p><i>Respirable dust standard</i> 'Respirable' dust has a technical definition and is the fine dust which can be inhaled deep into the lungs.⁴ When exposures to respirable dust of any kind, including stone dust, exceed 4 mg/m³ (when measured or estimated for any 8-hour period) the COSHH Regulations apply.</p> <p><i>Inhalable dust standard</i> 'Inhalable' dust, like 'respirable' dust has a technical definition⁴ and consists of all sizes of particles, which can be inhaled. By definition, inhalable dust includes all respirable dust particles. When exposures to inhalable dust of any kind, including stone dust, exceed 10 mg/m³ (when measured or estimated for any 8-hour period) the COSHH Regulations apply.</p>

7	<p>According to HSE guidance overexposure will be taken to be any exposure to respirable crystalline silica dust greater than the MST, 0.075 mg/m³ (when measured or estimated for any 8-hour period). Or, exposures above the respirable or inhalable dust standards of 4 mg/m³ and 10 mg/m³ respectively (when measured or estimated for any 8-hour period). In practice the main problems for stonemasons will be overexposure to respirable crystalline silica dust (where stone contains significant crystalline silica) and to respirable dust.</p>
8	<p>STEP 1: Is overexposure likely? If so, by how much and what's causing it? STEP 2: What are the control options available and how effective are they? STEP 3: What blend of control options will be adequate and sustainable? STEP 4: What monitoring, checking and maintenance are needed to make sure that the control measures continue to work?</p>
9	<p>The highest exposures will occur where stonemasons work with powered tools for prolonged periods on stone containing a high percentage of crystalline silica.</p> <p>Approximately the processes that generate the highest dust are (in order):</p> <ul style="list-style-type: none"> • Powered disc cutting • Powered disc polishing • Pneumatic chiseling • Hand chiseling <p>The following also has an impact on the dust levels:</p> <ul style="list-style-type: none"> • Power Tools • Prolonged Working • Small Workroom • No Segregation • Ineffective Controls
10	<p>The higher the crystalline silica content the more likely overexposure will move into the 'substantial' or even 'extreme' regions of overexposure. Even a relatively small proportion of crystalline silica in the stone being worked will push exposures above the MST or MEL and it is therefore essential to know the crystalline silica content of the stone being worked</p>
11	<p>The approximate ranges for the amount of crystalline silica found in materials (based on HSE data) includes the following</p> <p>Sandstone – 70-90% Plastic Composites- 19-90% Concrete/Mortar- 25-70% Shale- 40-60% China Stone-Up to 50% Granite-20-40% Tile-30-40% Slate-20-40% Brick- Up-Up to 30% Ironstone-Up to 15% Basalt/Dolerite- Up to 5% Limestone- Up to 2% Marble-Up to 2%</p>
12	<p>Estimate or measure the 'worst case' exposure.</p> <ul style="list-style-type: none"> • Select the highest likely exposure generated by each of the stonemasonry processes • Select the longest durations from the ranges in the stonemasons work logs • Calculate the highest daily exposures
13	<p>Control measures must be matched to the stonemasonry processes causing exposure.</p>
14	<p>There is a broad hierarchy of control options, referred to in the COSHH Regulations, starting with elimination of the hazardous substance and running through modification of the process and then on to application of controls to the process, such as exhaust ventilation. The 'hierarchy' can sometimes be too constricting and used by rote too rigidly. The key message is that there is a rough hierarchy of reliability of control.</p>

15	<ol style="list-style-type: none"> 1. Workplace and process changes; 2. Ventilation; 3. Personal protective equipment; 4. Work methods.
16	<p>Be big enough for foreseeable operations Enclose the process as much as possible Have an even velocity & a minimum velocity within the booth of at least 1m/s (approximate 200 feet per minute) Air turbulence within the booth needs to be minimized by good design & restricting clutter Work should be arranged so that stonemasons are not forced to place themselves between the source of the stone dust & the back of the booth Even with well-designed booths, if powered tool working is intense, respirators may still be needed</p>
17	<p>Strengths- Can be effective on operations which take place on relatively small areas of stone</p> <p>Limitations- The capture distance is limited Need to regularly reposition the hood if working across or around a piece of stone</p>
18	<p>Different respirator types provide different 'protection factors' – the type chosen should be related to, and capable of dealing with, the airborne stone dust levels the stonemason is exposed to. De ices that sit on the face MUST be well sealed at all points. ONE SIZE DOES NOT FIT ALL. Where high 'protection factors' are needed for relatively long times, only powered or air-fed positive pressure devices will be adequate and suitable.</p> <p>Re disposable respirators – whichever type s used whether disposable respirators or devices with renewable filters, the devices or filters should be removed well before their performance is likely to deteriorate. All respirators, apart from disposable one-use devices, need maintenance All respirators, including disposables should be stored in suitable and clean containers. If respirators do not come in protective containers these should be supplied separately People MUST be trained to fit respirators properly and maintain their RPE</p>
19	<p>Which mix of control options you choose will depend on the type of work done and the extent of stone dust overexposure. The answer lies with understanding how effective the various control options can be and which will work effectively with what processes. Selection starts with the most reliable control options, which also reduce emission of stone, dust into the workroom, i.e. you start at the top of the control option hierarchy and work down.</p> <p>Controlling dust exposure is about selecting the right blend of control options that together add up to adequate and sustainable control measures. The options may be chosen from the classes of control listed earlier and will include working procedures that stonemasons need to adopt to get the best out of the controls. Control measures must be seen and managed as an integrated whole.</p>
20	<p>Stonemasons MUST understand how the controls they are provided with work and how to get the best control of dust exposure using those controls. They MUST be trained and best practice needs to be described and written down</p>
21	<p>You should write down a description of the most effective dust control methods that you use.</p>

22	<p>Local exhaust ventilation performance will fall off with time, often imperceptibly, and will need regular examination and monitoring. This could include static pressure checks in the ducts to the hood or regular measurement of face velocity. The frequency of checks should be related to the rate at which the exhaust ventilation system performance is likely to fall off. Regulation 9 of COSHH requires a 14 monthly 'thorough examination and test' by a competent person but regular and effective checks will be needed far more frequently than this. Given that it will be the stonemasons who use the equipment day to day it would make sense that they did regular and simple checks. One method is to link a (static) pressure gauge to the booth/hood ductwork with a simple green (for 'go') and red (for 'stop') scale.</p> <p>If respirators are part of the control measures they will need regular maintenance including replacement of filters, etc. If respirators with replaceable filters are used the body of the respirator itself will need replacing: they don't last forever. Also, if respirators are battery-powered the batteries will also need replacing after a time.¹⁵ And it is not just a question of listing what maintenance needs to be done but of deciding who is going to do it, how often, and who is going to supervise maintenance.</p>
23	<p>The way people are working and using the controls needs to be monitored. The appropriate work methods need to be described and written down, as a benchmark for all concerned.</p>
24	<p>How much the exposure of the stonemasons has been reduced. Measurement should be done under 'worst case' conditions As these are the most severe test of the control measures. Where dust sampling is needed it should be done carefully and competently by an experienced and qualified person</p>
25	<p>Regulation 11 of COSHH requires employers to introduce health surveillance where it is appropriate. If exposure can be kept well below the MST, health surveillance may not be needed.</p>
26	<p>The only way to detect the disease is by chest X-ray. A reasonable frequency of chest X-rays for workers with exposures above 0.075 mg/m would be every five years during the first 20 years' exposure and thereafter at more frequent intervals (at least every 3 years) at the discretion of the medical adviser and dependent on the level of exposure. Acute silicosis does not present the same radiological picture as either accelerated silicosis or classical silicosis, so doctors who are reading chest X-rays should be aware of these differences. All positive cases should be referred to a chest specialist for consultation and, if necessary, diagnostic lung biopsy.</p>