Construction Dust: Inspection and Enforcement Guidance

Open Government status

Fully Open

Target audience

FOD Construction Inspectors (Bands 0-4)
SG Specialist (Occupational Hygiene) Inspectors (Bands 0-3)

Contents

Summary

This revised OG provides guidance on inspecting and enforcing where inadequate standards are found in relation to construction dust. It focuses on common tasks, prioritising those with the potential for significant exposure / risk of ill-health.

Introduction

Dust control is a priority topic for Construction Inspectors. This guidance will assist Inspectors in deciding on the action to take using COSHH and CDM where there are inadequate control measures to manage the risks. It has been updated to incorporate new tasks, provide answers to some FAQs and provide greater information on CDM management / track-back issues.

Note: This OG deals with respiratory risks from dusts (i.e. respiratory crystalline silica (RCS), wood and other dusts). Asbestos related issues are not covered. Neither are fumes from welding etc or dermatitis risks that can arise from these dusts or specific substances like lead dust which have other associated health risks / control issues.

Action

Inspectors should follow the steps set out in this guidance when assessing compliance with construction dust issues. It advises on relevant dutyholder and legislative issues to consider prior to enforcement (Appendix 1) together with information on the EMM

and initial enforcement expectations (IEE) regarding failures found. Inspectors should familiarise themselves with this guidance to ensure they are aware of current positions. Any copies of the previous version of this OG should be destroyed.

Inspectors should give priority to minimising on-site risk (i.e. control and the arrangements in place for this) over monitoring the symptoms (i.e. health surveillance). Particular focus should be given to those common tasks where inadequate controls can result in an extreme or substantial risk gap under the EMM. Significant on-site failings can have their roots in decisions taken by other dutyholders in the pre-construction phase.

- **Step 1: Assessing on-site control**

  Inspectors should initially focus on assessing the dust control measures in place.
  - The standards for the most common tasks are set out in HSE guidance via CIS 36 and on HSE's website.
  - The factors to consider regarding compliance are set out in Appendix 2.
  - The principles for applying the EMM to construction dust are explained in Appendix 3 together with the IEE for many common situations.

  Some activities can expose workers to dust levels sufficient to create an extreme risk of serious ill-health. Inspectors should deal with these situations as a priority to ensure this is prevented / effectively controlled (e.g. by issuing a PN).

- **Step 2: Identifying underlying management failures**

  The overall objective of any dust related inspection should be to ensure that a dutyholder can achieve sustained compliance. Consequently, where task-related non-compliance has been identified, underlying causes should be identified and addressed. Further information on this is contained in Appendix 4. Dutyholder and strategic factors should be applied as normal.

- **Step 3: Evaluating pre-construction decision making**

  Inspectors should follow up with the relevant client or (principal) designer where it is apparent that significant on-site failings have resulted from their earlier decisions. Further information on the approaches to take is contained within Appendix 5.

Background

The construction industry has high levels of ill-health. Exposure to construction dust contributes significantly to this. Construction dust is a general term used to describe the different dusts found on a construction site. There are three main types: RCS dust, wood dust and 'other' dusts.

Regularly inhaling these dusts can cause diseases like cancer, silicosis, asthma and Chronic Obstructive Pulmonary Disease (COPD). Many of these conditions are irreversible and can eventually be fatal; all are disabling. Construction workers have a high risk of developing them because many common tasks they do can create high dust levels if not adequately controlled. Over 500 construction workers annually are estimated to die prematurely from RCS exposure alone.

Organisation

There are no special organisational requirements.

Further References

Inspectors should pay attention to the following information sources:

- Task specific information
- COSHH essentials for RCS related construction tasks
- Construction Dust FAQs
- CIS 36: Construction dust
- WIS 23: Wood dust controlling the risks
- CIS 69: Controlling construction dust with on-tool extraction
- Thorough Examination and Test requirements for on-tool extraction
- HSG 53: Respiratory protective equipment at work
- INDG 479: Guidance on respiratory protective equipment fit testing
- EMM Application to health risks
- OC 273/20 COSHH general enforcement guidance and advice
- Operational Guidance on respiratory protective equipment (RPE)

Contacts

Construction Sector: Regulatory Support Unit

Appendix 1: Enforcement Considerations

This appendix provides an overview of the issues that inspectors should consider prior to taking enforcement action. Such action should also take into account information contained within the Enforcement Guide and OC 130/14. Additional information on enforcement policy and procedures is available through HSE's Learning Management System.

General Approach: Action to address non-compliance should be proportionately targeted at the dutyholder(s) most directly responsible for the failings identified. They have created the risk and therefore must 'own' it. In some circumstances this may be several dutyholders under different legislation. The three-stepped approach outlined in the main document should be followed.

Type of Action: Action should be in accordance with the EMM, Enforcement Policy Statement and the information in this document. Specific considerations are highlighted below:

- **Self-Employed:** Construction is a **prescribed undertaking** under the Health and Safety at Work etc Act 1974 (General Duties of Self-Employed Persons) (Prescribed Undertakings) Regulations 2015. A PN or IN can therefore be served against them where appropriate. However, **Fee for Intervention (FFI) does not apply to self-employed people where they only put themselves at risk**.

- **PN:** Some activities, highlighted in Appendix 3, can expose workers to dust levels that are sufficient to create an extreme risk of serious ill-health. Inspectors should deal with these situations as a priority to ensure the extreme risk is prevented / effectively controlled (e.g. by issuing a PN). Before issuing a PN you should consider:

  - **Substance:** A PN is most appropriate in relation to RCS, particularly for those high-risk tasks identified in Appendix 3. Suitable enquiries should be made, where necessary, into a product if the likely presence of crystalline silica is unclear (note that traces are not sufficient – e.g. as may occur in plasterboard).

    The risks associated with exposure to wood dust have been reviewed. Consequently, there is now **no automatic support for a PN on wood dust** generating activities even where the standards are found to be very poor. Inspectors are advised to **always** consult an Occupational Hygiene Specialist Inspector in these circumstances or where considering a PN in relation to other non-silica dusts.

  - **Control:** A PN is only appropriate in relation to those high-risk silica tasks where there is inadequate control at source **and** no suitable / adequate RPE for exposed workers.

  - **The Public:** Issuing a PN solely for the protection of members of the public is generally inappropriate. While unpleasant, their exposure is likely to be "transient", one-off and brief. Such exposure is unlikely to produce long-term

effects. There may be some exceptions to this, in particular where dust levels are extreme, and the work is longer duration (e.g. dry grit blasting with the same individuals experiencing significant and repeated exposures during the course of a lengthy project) and / or where there are vulnerable / susceptible people who have an underlying respiratory / other medical condition that could be aggravated by the dust. You are advised to get specialist assistance.

- **INs:** Once any immediate risk has been addressed the objective of any further action should be to ensure that a dutyholder can achieve sustained compliance. A PN and IN might therefore both be needed to deal with the same set of circumstances – the former to stop an extreme risk of serious personal injury and the latter to secure longer-term compliance. Inspectors should critically evaluate whether an IN should be:

  - **Task / Site / Issue Focussed:** This is most likely to be appropriate where work at site is ongoing for a significant period (e.g. so they have time to put the right controls in place) or the corrective action will 'automatically' improve future compliance (e.g. face fit testing of employees). Use of the Control of Substances Hazardous to Health Regulations 2002 (COSHH) or the Construction (Design and Management) Regulations 2015 (CDM) might be appropriate depending on the circumstances and dutyholder.

  - **Management Focussed:** This is likely to be appropriate where significant underlying failures are identified (see Appendix 4 and Appendix 5). Where possible the measures required should look to positively improve the overall approach taken by the dutyholder so that it facilitates sustained future compliance (e.g. the correct arrangements or equipment). This means moving away from notices that just require risk assessments towards those focussing on enabling appropriate control. INs on risk assessments still sometimes have their place. Any such notices require careful consideration regarding how compliance will be verified. COSHH only requires the results of a risk assessment to be recorded if there are 5 or more employees

  Note: The transient and/or short duration nature of much small site work may render a site specific IN inappropriate (i.e. the activity / issue to be addressed may finish before the notice expires and thus there is compliance by default). Where issuing an IN remains problematical, you are entitled to remind the duty holder that, even though a notice has not been served, action is still required to deal with the contraventions identified. Any continuing non-compliance with legal obligations can be cited as an aggravating feature at sentencing in any future prosecution.

- **Prosecution (PR):** Further detailed enquiries should be made where there is evidence of a sustained and very significant risk to workers health (e.g. regularly doing higher risk tasks without any or wholly ineffective controls). A proactive prosecution should be considered where supported by relevant dutyholder factors.

Legislation: HSWA and health specific legislation like COSHH place duties on the employer. This can present some issues within construction as the subcontracting nature of the industry means that it can be difficult to prove employment status of those

undertaking the risk generating activity. LAO advice has been sought on this matter and the advice is that where it is possible to establish an employer-employee relationship then the use of COSHH is preferred. If no employer-employee relationship exists and thus the employer duties do not apply, it is appropriate to use CDM Regulation 16(2) (or 16(3) in the case of a domestic client) with reference to reg. 17(2), as the relevant provision in Part 4 that is the breach, to ensure the notice is as clear and precise as possible

Action to address non-compliance might require use of a range of legislation. The most appropriate are likely to be:

- **COSHH:** This places duties on the employer of the person (as well as the self-employed themselves) that 'directly creates' the risk. In many instances, this may be the contractor carrying out the task in question (e.g. a groundworker / groundworks company). In more limited circumstances it may be the Principal Contractor (i.e. who employs labourers involved in dust related housekeeping roles).

  It may not always be immediately apparent who the relevant employer / self-employed dutyholder is given the extended sub-contracting and various employment arrangements that exist in the industry. This will have to be determined on a case by case basis, considering the information in the enforcement guide on:

  - Status of workers: http://intranet.hse.int/legal/enforcement-guide-ew/investigation/status-intro.htm

  - Dutyholder identity: http://intranet.hse.int/legal/enforcement-guide-ew/investigation/identifying-intro.htm

  Careful consideration of the specific circumstances is needed in relation to enforcing breaches of the control hierarchy. As a general principle, notices should reference regulation 7(1) of COSHH which requires 'prevention then adequate control'. The correct wording is also important. If it is entirely inappropriate to use a material or process, and suitable alternatives are available, then reference to the word prevent is appropriate. However, if it is accepted that use could not have been prevented but should have been better controlled, then any wording should reflect this. Wording should also reflect the phrasing 'adequate control' as used in 7(1) instead of ALARP. Careful use of ALARP and regulation 7(7)(c) of COSHH is required in relation to:

  - **RCS:** Whilst a recognised carcinogen, RCS **does not technically meet the criteria for ALARP.** This is because it does not have a harmonised classification for the hazard class 'carcinogenicity' and is not referred to in Schedule 1 of COSHH. COSHH does require the application of the principles of good control practice in Schedule 2A and that the workplace exposure limit (WEL) must not be exceeded for all substances. In addition, as exposure to RCS can cause occupational cancer, exposure should be reduced proportionate to the health risk until the cost becomes disproportionate – i.e. a

high standard is expected. In essence, this requirement is very similar to ALARP but reference to ALARP should not be made.

- **Hardwood Dust:** The criteria for **ALARP is met** in relation to this dust and mixtures likely to contain hardwood dust as it is mentioned in Schedule 1 of COSHH.

- **Softwood Dust:** The criteria for **ALARP is also met** in relation to softwood dusts. Reference is not made within Schedule 1. However, regulation 7(7)(c)(ii) makes it clear that ALARP does apply to '*any other substance which the risk assessment has shown to be a potential cause of occupational asthma'.* Within EH40, softwood dust has the SEN notification (capable of causing occupational asthma). This information should be considered as part of any risk assessment and therefore it is appropriate to apply the ALARP standard.

Further general enforcement guidance and advice on COSHH is contained in OC273/20.

- **CDM:** There will also be cases where other dutyholders have an 'indirect' impact on the level of risk being created; e.g. in relation to how associated work is being managed by the Principal Contractor or earlier design decisions made. COSHH will not be suitable in such circumstances as the employees of these dutyholders are not directly involved with the risk generating activity. CDM should be considered instead.

- **Other:** Other regulations should be considered where these provide a more suitable alternative to ensure sustained compliance – e.g. some of the requirements under the Management of Health and Safety at Work Regulations 1999. If appropriate, Inspectors should consider taking enforcement action against individual workers (e.g. a PN) where the employer has complied with their duties, but the worker is still creating a serious risk by failing to comply with their duties under Section 7 of the Health and Safety at Work etc Act 1974.

Appendix 2: Factors for determining task-related risk

Consideration should be given to the factors below. The outcomes, when combined with the information in Appendix 3, will enable a suitable assessment to be made of the significance of the risk present and the adequacy of any controls. Gathering and recording this information is important for supporting action subsequently taken.

Note: Inspectors are not expected to take / request on-site exposure monitoring to determine risk (unless the situation is unusual and based on specialist advice). Dutyholder(s) may provide evidence of exposure monitoring during an intervention as justification for the control measures decided on. This is valid, and part of the assessment process required by COSHH. However, exposure monitoring requires careful interpretation as inappropriate sampling methods / results can give a misleading picture of the risks involved. Specialist advice in interpreting results is advised.

Table 1: Factors determining risk

<table>
<tr><th>Issue</th><th>Detail</th></tr>
<tr><td>Substance</td><td>
What is the dust involved? This will influence the immediacy of any action needed. The main types are:

RCS: Exposure is highly dependent upon the crystalline silica content of different materials. The precise content will often not be known but materials very likely to contain significant amounts include:
<table>
<tr><th>Material</th><th>Crystalline Silica Content</th></tr>
<tr><td>Engineered / resin - based stone</td><td>Varies: Quartz-based stone (some up to 95% crystalline silica with about 5% resin, most often polyester-styrene) is used for kitchen and bathroom work surfaces, whilst marble-based stone is used for indoor floors and walls. Other engineered stones may contain no silica e.g. if based on aluminium trihydrate.</td></tr>
<tr><td>Sintered stone</td><td>Varies: These stones generally contain lower levels of crystalline silica than those above, typically 5-25%</td></tr>
<tr><td>Terrazzo</td><td>Varies: Often used for floors. It is produced by pouring concrete and then embedding crushed stone in the upper layer. If done on-site the pouring of the crushed stone into the concrete and surface polishing can produce significant dust.</td></tr>
<tr><td>Sand, sandstone gravel and flint</td><td>More than 70%</td></tr>
<tr><td>Mortar, Concrete</td><td>25% to 70%</td></tr>
<tr><td>Granite</td><td>20% to 45% Typically 30%</td></tr>
<tr><td>Roof tiles</td><td>30% to 45%</td></tr>
<tr><td>Slate</td><td>20% to 40%</td></tr>
<tr><td>Brick</td><td>Up to 30%</td></tr>
</table>
Inspectors should also be aware of the following common materials as they are unlikely to contain a significant quantity of silica:

Plasterboard: The primary constituent is gypsum

</td></tr>
</table>

	– **Some Natural Stone:** Basalt, dolerite and limestone typically contain up to 5% crystalline silica. The same is generally true for marble. However, this can contain layers/veins of crystalline silica unevenly distributed throughout the stone in which case the overall silica content may be significantly higher. Where this is the case both the WEL for marble and silica dust need to be complied with. **Note:** The substance of concern is specifically respirable crystalline silica (RCS). Silica does exist in other non-crystalline forms. For example, the process of making glass changes the structure from a crystalline form to a more amorphous form that may also include other elements. • **Wood:** The main consideration is whether the wood / wood-based products being used contain hardwood, softwood or a mixture of both. For enforcement purposes no further risk distinction is made between different wood species as all wood dust is considered to have the potential to cause occupational asthma. Particle boards etc are assumed to contain a proportion of hardwood dust unless there is evidence to the contrary. • **Other Dusts:** These fall into two sub categories: – ***Dusts with a WEL:*** There are several substances that have their own WEL within EH40. These include gypsum, limestone and marble – ***'General Dust':*** A dust with no WEL does not necessarily mean it is safe. COSHH will still apply to any dust once it exceeds 10 mg/m^3 of inhalable dust or 4 mg/m^3 of respirable dust (as 8hr time-weighted averages – TWA)
Task	**What work is creating the dust and how much energy is involved?** The higher the energy, e.g. power tools, the greater the risk created. It can also make the dust generated harder to control.
Location	**Where is the work taking place?** The more enclosed a space the greater the chance of dust building up on the area. Some tasks (like using a cut-off saw) will be high risk wherever they take place.
Duration	**How long is the task taking?** The longer the task the greater the dust generated and the higher the risk to workers. However, again some tasks give very high exposures in a short period.
Frequency	**How frequently is the task done?** Are people likely to be regularly exposed by doing similar tasks as part of their normal/ routine work? If a task is done very frequently, particularly in a poorly ventilated area, the worker may be exposed to increasing background levels of dust. When workers are doing a range of similar tasks as part of their normal routine, and being exposed to the same hazardous substance, the overall exposure from all the tasks needs to be considered.
People	**Who is being exposed?** Consider whether it is just the worker doing the task being exposed, how close they are to the task and whether any dust generated is being created in / going into their breathing zone. If others nearby are being exposed as well, control at source may need improving or the work area segregating
Control	**Are appropriate and effective control standards in place?** Typical issues that limit control effectiveness are detailed in Table 2.

Other Health and Safety Issues	**Does applying the appropriate controls introduce other significant health and safety issues?** For example: • Drilling holes while on a ladder (e.g. for cavity wall insulation) where using on-tool extraction may increase the risk of falls. • Working in areas that are hard to access (e.g. mortar raking a chimneybreast on a roof) where providing on-tool extraction may introduce falls or manual handling risks. The principles of good control practice in Schedule 2A of COSHH require that control measures do not '*increase the overall risk to health and safety'.* Inspectors should exercise judgement on this issue and consider relevant factors.

Table 2: Typical issues limiting control effectiveness

Control	Issues Limiting Effectiveness
Water Suppression	For individual equipment the following problems commonly arise: • Lack of correct pressure / water flow rate; • Blocked spray jets; • Inadequate supply of water for the duration of the work; • Poor design of equipment; • Incorrect use; • Damping areas only before work or pouring water from a container; • Poorly trained worker. On larger sites where water is an integral control measure the following issues may also be relevant: • Insufficient water supply for all the equipment / work required; • Insufficient connections to the water supply meaning that some systems are stopped / used without water whilst the supply is used for other work; • Poor placement of the water supply system meaning that it cannot be used for some areas of the work; • Inappropriate placement of the water supply system in locations where it could become easily damaged (e.g. crushed by moving vehicles).
On-Tool Extraction	• Badly designed or incorrectly positioned captor hood; • Poor connection between the tool and extraction unit; • Wrong type of extraction unit / insufficient airflow; • Poor maintenance with damage or blockages to parts of the system and filters not replaced when needed / cheaper inadequate alternatives used; • Malfunctioning airflow indicator and built-in filter / blockage clearing mechanism (e.g. as indicated by simulating a blockage); • No suitable collection bags are fitted to the extraction device; • Inadequate power supply to power both the tool and the extraction unit at the same time. Note: This can be a problem in non-energised

	properties such as new home build sites where small generators are often initially relied upon.
RPE	• Not appropriate for the type of hazardous substances present • Does not give a high enough protection factor for the risk / has the wrong assigned protection factor (APF); • Does not fit the wearer – no / inadequate face fit testing for tight fitting masks; • Poor face-seal with tight fitting masks due to stubble or other PPE affecting the face-seal; • Not suitable for the duration of the work – tight fitting masks should not be used for more than 1 hour at a time without a break; • Not suitable for the environment • Not properly worn – loose/twisted straps; • Not stored, maintained or cleaned properly; • Poorly trained worker. Note: It is important to be aware of the following issues that frequently arise: – **When is RPE needed:** HSE does not set a threshold exposure level under the WEL for RCS or wood dusts below which RPE is automatically considered as not needed. HSE expects dutyholders to follow the principles of good control practices in Schedule 2A of COSHH including minimising emissions and controlling worker exposure proportionate to the risk for their task. The choice of specific control measures should follow the hierarchy of control. Guidance sets out HSE's position on good control practices in relation to many common tasks in 'typical' situations. However, the legal framework places the responsibility on the dutyholder to effectively manage the risks they create. As these risks can differ from one situation to another, the controls and justifications that dutyholders provide could also differ. The acceptability of these is for HSE, with appropriate specialist support, to decide. Key considerations are: ▪ The duration of the task and the overall effectiveness of the control at source being used; ▪ The extent to which the control at source could foreseeably fail and therefore RPE is needed for residual protection (e.g. the water pressure could fail or there is foreseeable human error); ▪ Other considerations relevant to the work / equipment (e.g. a worker's breathing zone is in much closer proximity to the operation of the cutting blade of a cut off saw when compared to a push along floor saw) – **Adequate and Suitable:** These terms are often used interchangeably but mean specific things in the context of RPE. Adequate is where RPE is right for the hazard and reduces exposure to the level required to protect the wearer's health. Suitable is whether the RPE is of the right size, can correctly fit the wearer, is compatible with other PPE and is appropriate for the task and environment such that the wearer can work freely and without additional risks. – **'Fit Check':** This is not the same as a face-fit test. However, the similarity in language has caused some confusion. Consequently,

	HSE now refers to this as a **pre-use wearer-seal check**. Some masks come with features to enable these checks to be more easily undertaken. Some claims have been made previously in parts of the supply chain that such a feature is a suitable alternative to a fit test. This is NOT the case. While such devices do aid the wearer to check that they have a good face seal each time they wear their RPE, HSE's position is that these are not an adequate alternative to the initial face-fit test process used to determine the suitability of a mask for the user. – **Facial hair / stubble:** BS EN 529:2005 on Respiratory protective devices provides a reference for unshaven in the context of RPE. It defines this as hair which has not been shaved within an 8-hour period prior to work starting. Studies have shown that even less than 1 day's growth can dramatically increase face seal leakage. While there is no reference to this within the new INDG 479, BSIF do refer to it in the companion documents to the fit2fit scheme https://www.fit2fit.org/resources/ to which HSE has input.

Appendix 3: Applying the EMM to Construction Dust Tasks

This appendix sets out how the EMM is applied generally to construction dust risks and specifically to a range of common tasks and situations. The management arrangements required to support the control measures outlined are dealt with separately in Appendix 4.

Consequence: Regular exposure to significant levels of dust can cause the following occupational lung diseases:

- RCS: silicosis, lung cancer, COPD
- Wood dust: Asthma, COPD and nasal cancer (hardwood only)
- 'Other' dusts: COPD

These conditions are irreversible. All are disabling, some can prove fatal. Consequently they come into the descriptor '**serious health effect**' as outlined in EMM guidance for health risks. This is comparable with the safety equivalent of a 'risk of serious personal injury'.

Likelihood: The likelihood of a serious health effect occurring varies considerably depending on the nature of the substance and the pattern of exposure.

- **Substance**: WELs are British occupational exposure limits set in order to help protect the health of workers. They reflect the likelihood of a specific health effect occurring in the working population as a whole. No account is taken of a specific individuals' susceptibility, as this will not be known. The current WELs for construction dusts are listed in Table 3.

Table 3: WELs linked to construction dusts

Dust	Inhalable WEL (8hr/TWA)	Respirable WEL (8hr/TWA)	Comments
Respirable Crystalline Silica	N/A	0.1 mg/m^3	The WEL for RCS is not a safe limit. Even at an exposure of half the WEL for a 45-year working life-time there is an estimated risk of 1 in 20 of developing silicosis. Given the serious health risk employers are required to apply a proportionate high and rigorous standard of control as well as reducing exposure below the WEL. This is reinforced by the recent notation of RCS as a carcinogen within EH40.
All Wood and wood-based products	3 mg/m^3 (hardwood & mixtures of dust) 5 mg/m^3	N/A	There are many different species of softwood and hardwood trees. For regulatory purposes all hardwood and softwood dusts are treated on the same basis as respiratory sensitisers (asthmagens) and require control of exposure to be ALARP. Hardwood dust is also considered a

	(softwood dust only)		carcinogen. Where there is a mixture of wood dust the hardwood WEL applies.
'Other' Dusts with a WEL in EH40. e.g. • Gypsum, • Limestone, • Marble, • Portland Cement,	10 mg/m^3	4 mg/m^3	In general, greater exposure to these dusts is required before a serious health effect manifests itself (compared to RCS and wood dust). Consequently, adequate control is of a proportionately lower standard.
Other 'general' dust	Only at levels equal to or greater than 10 mg/m^3	Only at levels equal to or greater than 4 mg/m^3	A dust with no WEL does not mean that it is safe. Any dust becomes a hazardous substance under COSHH when exposures are **equal to or above** these levels.

- **Exposure:** The likelihood of ill health increases with the number, duration and extent of individual exposure episodes. However, inspectors will not usually know the past or future exposure history of an individual. Consideration can only be given to the circumstances and conditions found at site. Construction sites are also typically dynamic environments often characterised by frequent short-duration activities (less than 15 minutes) with high peak exposures. If averaged over time these exposure peaks, may not exceed an 8-hour Time-weighted average (TWA) WEL. However, such exposures still have the potential to cause harm and should be adequately controlled. To reflect this EH40 recommends that, for those substances for which no short-term limit is specified, a figure of three times the long-term limit be used as a guideline for controlling short-term peaks in exposure

Benchmark: The benchmark likelihood for construction dust is '**nil or negligible**'. This means that exposure is insignificant / has been reduced to a level proportionate to the health risk. This will only be achieved where all control measures deemed necessary are in place and working effectively with no dust visible in the air. Table 2 summarises typical issues limiting control effectiveness.

Risk Gap: The single casualty table of the EMM (Table 2.1) should be used.

Standards: The control standards applied to construction dust are considered to be established unless otherwise noted. **Expected controls for common tasks are set out in:**

- CIS 36: Construction dust
- Task specific information on HSE's website
- COSHH essentials for silica related construction tasks

Inspectors should read the Tables below in conjunction with this information. Some new common task sections have been added to these tables to reflect new research / operational enquiries. Supplementary control information has also been provided in these instances to give the necessary context.

IEE for Common Tasks: The information below sets out an IEE framework for common tasks where deficiencies are found. It also provides a reference point when considering other tasks not covered. However, inspectors are also advised to seek specialist occupational hygiene opinion where appropriate.

The “likelihood” is based upon consideration of ‘typical exposure’ scenarios and the application of the EMM outlined above. Exposures may vary on occasions. For some tasks a range of different likelihoods has been given where ‘typical exposures’ are more difficult to establish. The key factor is the level (and effectiveness) of control in place relative to the expected standard of control for that task and the circumstances of the work. Inspectors should consider all the factors in Appendix 1 when making a judgement on the likelihood and risk gap.

Note: There are some situations when the likelihood can technically be reduced to a negligible level but the COSHH control hierarchy has not been met. For example, a lower risk task where RPE is being used instead of control at source. However, these controls are less reliable / sustainable over time.

Enforcement: Action to address non-compliance should be proportionately targeted at the dutyholder(s) most directly responsible for the failings identified. The tables below indicate those situations where an enforcement notice should be considered in relation to a range of common tasks. When using these tables, the following should be taken into account:

- The general issues outlined in Appendix 2 with regards to determining risk and control effectiveness;

- The specific information contained in the **Risk Factors** for each task. The level of risk can vary for some tasks and this information is provided to assist decision making in these circumstances;

- Whether the risk could have been prevented at the design stage or reduced through better application of the control hierarchy. Relevant information is contained in the **Risk Reduction** section of each task.

- A proactive prosecution should be considered where indicated by the EMM, particularly where there is evidence of repeated poor practice. This may be either a dutyholder who has failed to act on previous failings or where there is evidence that a high-risk task has been undertaken over a significant period with wholly inadequate controls.

- Table 4: IEE for common RCS tasks

- **Cutting concrete kerbs, flags and blocks with a cut-off saw**
- **Chasing concrete and raking mortar with a grinder**
- **Cutting roofing tiles with a cut-off saw**

Risk Factors: The high-energy nature of these tasks in conjunction with the silica content of the materials means that they are always likely to produce very significant silica exposure levels. Even during short duration work there will be high peak exposures. This means that a PN may often be appropriate where there are no or very ineffective controls.

Risk Reduction: Consideration should be given to using lower energy equipment (like a block splitter or hand saw for aerated concrete or light weight thermal blocks) or alternative methods (like over covering cables with a surface lining or wainscoting), limiting the number of cuts during design / layout or getting material cut off-site and delivered. Relevant industry guidance includes:

- National Federation of Roofing Contractors
- Interpave (see specific download on cutting paving).

Adequate Control: Water suppression / on-tool extraction and RPE with at least an APF of 20 – see the website

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
All controls missing or ineffective	Serious and Probable	Extreme	Established	Yes	IN to secure sustained compliance where appropriate
One effective control in use but not adequate control	Serious and Possible / Remote	Extreme / Substantial	Established	No	IN

- **Cutting concrete using a floor saw:**

Risk Factors: As with a standard cut-off saw, the high-energy nature of this equipment in conjunction with the silica content of the materials means that there is always the potential to produce very significant silica exposure levels. However, this can be reduced in practice because:

- The operator is pushing the floor saw and thus their breathing zone is not directly over the blade as is the case with a cut-off saw;
- They usually have a better supply of water to cool the blade;
- A good enclosure around the blade and a baffle to rear of blade restricts the escape of silica containing mist (the use of a sprung loaded enclosure to maintain control with the depth of cutting would improve this further).

RPE is therefore not needed where all the above is effective and the operator is not undertaking extensive work with a floor saw (i.e. approximately around 1- hour trigger time). However, it is important to consider the need for RPE where excessive mist is being generated as this will contain silica within it. Also consider whether the floor saw use is one of several silica-generating tasks being undertaken by the operative at that time. RPE may be needed as part of the control package for these tasks.

A PN may often be appropriate where there are no or very ineffective controls.

Risk Reduction: Extensive use of floor saws will also generate associated noise and vibration issues. Alternative measures are available that will limit all of these. Core cutting (stitch drilling), rail mounted cutting and wire cutting systems are available which can be operated at distance (including remotely). This can also enable large sections to be lifted / extracted for removal. More information on these can be found on the website of the Drilling and Sawing Association.

Adequate Control: Water suppression / on-tool extraction and, where required, RPE with at least an APF of 20.

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
No effective Controls	Serious and Probable	Extreme	Established	Yes	IN to secure sustained compliance where appropriate
Water suppression but no effective RPE where needed	Serious and Remote	Substantial	Established	No	IN

- **Surface grinding or scabbling using hand operated tools**

Risk Factors: There are a wide variety of scabbling and grinding machines available. The exposure levels associated with these vary. The higher the energy produced by the tool the greater the exposure levels and risk. This IEE does not cover ride-on or other larger equipment as this can be quite specialised.

Risk Reduction: Surface grinding or scabbling should be minimised at the design stage where possible, so only minor patch work is needed. Finishes can be designed into shuttering using special moulds. Surface preparation, to ensure a good concrete bond, can be achieved via methods such as the use of proprietary joint formers or chemical retarders and power washing. In new builds, floor issues can be avoided with a self-levelling screed. If levelling an existing floor, to make it even for an overlay system, a self-levelling floating floor could be considered. If just for the removal of high spots or where old wall beds exist then most battened and raised floor systems can allow for gaps to avoid this issue, as would laying battens in a different direction.

Adequate Control: Water suppression / on-tool extraction and RPE with at least an APF of 20 – see the website

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
All controls missing or ineffective	Serious and Probable / Possible	Extreme	Established	Yes, for high energy scabbling / grinding tools	IN to secure sustained compliance where appropriate
One effective control	Serious and Possible / Remote	Extreme / Substantial	Established	No	IN

- **Pneumatic breaking of concrete**

Risk Factors: Silica exposure during breaking activities will vary and may be limited by other factors (e.g. managing vibration trigger time). Longer duration breaking in enclosed spaces without controls can produce very high levels of silica exposure. In general, the longer the trigger time and the more enclosed the work the greater the risk will be. This means a PN will be appropriate in some circumstances

Risk Reduction: Breakers also generate noise and vibration issues. Significant use will therefore create unacceptable health risks from these as well. In addition to vehicle mounted or remotely operated breakers, alternative measures are available such as core cutting (stitch drilling), rail mounted cutting and wire cutting systems. More information on these can be found on the website of the Drilling and Sawing Association.

Adequate Control: Water suppression / on-tool extraction and RPE with at least an APF of 20 in most instances save for short duration work outdoors or very minor work indoors as the only RCS task – see COSHH Essentials CN9

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
All controls missing or ineffective	Serious and Probable / Possible	Extreme	Established	Yes, for longer duration enclosed breaking work	IN to secure sustained compliance where appropriate
One effective control	Serious and Possible / Remote	Extreme / Substantial	Established	No	IN

- **Drilling brick and concrete**

Risk Factors: The level of exposure depends on the power of the drill, the size of the hole and the number of operations involved. Infrequent 'one-off' holes as part of maintenance or installation work are unlikely to require much in the way or control other than to start the drilling on low power and use of some kind of passive dust collector. Where the frequency of drilling increases then the level of control will need to increase accordingly.

Risk Reduction: Where a large number of holes are required then direct fastening / screws may be an effective alternative. Consideration should also be given to designing out the risk of the selection of proprietary rigs that will remove the worker from the task.

Adequate Control: Control at source, via on-tool extraction is the preferred option. However, there will be some circumstances where this is impractical (e.g. cavity wall installation) and therefore RPE with an APF of 20 may have to be relied upon instead. RPE will be needed as an additional control where drilling is a main activity – see COSHH Essentials CN3

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
Longer periods of drilling without controls	Serious and Possible	Extreme	Established	No	IN

- **Coring brick and concrete**

Risk Factors: There is a variety of coring equipment available from the hand-held to large rig-supported corers and the potential exposure levels associated with these will vary. They can be subdivided into two broad categories:

- **Wet Coring:** This is the most common type. The water helps with the drilling process and maintenance of the bit. The dust is mostly captured and turns into a slurry. Rigs supporting the corer can also reduce the risk further by providing distance between the operator and the coring work. However, some of these do require pilot holes to be drilled as well. RPE is unlikely to be needed for most wet coring operations where water supply / failure is not a significant issue. RPE may be required where the work is of longer duration and giving rise to a fine mist, especially in an enclosed area.
- **Dry Coring:** This is mostly used where water is not suitable / practical; e.g. drilling through a wall in a home or office for M&E or gas boiler installation. It will generate significant levels of silica exposure unless appropriate on-tool extraction is applied. Such coring is most likely to be a 'one-off' operation to install a boiler flue etc. RPE with an APF of at least 20 will only be needed for longer duration work and /or work undertaken in an enclosed area with limited ventilation. A PN will generally not be appropriate unless the circumstances are extreme - for example, a significant section of stitch drilling is undertaken by workers with no extraction or RPE.

Risk Reduction: Coring can be an effective alternative to other activities such as pneumatic breaking. However, where a large number of cores are anticipated consideration should also be to appropriate alternatives during the design stage.

Adequate Control: See text above and COSHH Essentials CN8

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
Dry coring without controls	Serious and Probable / Possible	Extreme	Established	Only in the more extreme conditions	IN

• Remote / Machine Structural Demolition

Risk Factors: Dust can be created in two phases; firstly, during the initial removal and secondly as a result of the impact of falling material / debris. The material and how it is being demolished will be a significant influence on the levels of dust generated.

High reach machines will tend to disrupt the joints of structures largely consisting of brick or bedded stone (i.e. harder masonry set in weaker mortar). This releases relatively small amounts of dust at height. The machine may be fitted with a fixed bar, pecker or a selector grab for this type of work rather than a pulveriser attachment. Much of the dust is then created during the second phase by the falling material hitting other parts of the structure on the way down or when it strikes the ground/debris pile.

For concrete frames, high reach machines will be fitted with a pulveriser attachment to free up sections of beam or column and then lifting / dropping these. A significant amount of the finer dust will be generated at height. Much of the rubble created will generally be smaller and therefore raise less secondary dust on impact. Sporadic initial and secondary dust clouds may also be created if the high reach is used to drag (sweep) a high floor clear of debris that has started to build up

Significant visible dust clouds created during these operations will be mostly 'general' inhalable dust although they will contain respirable particles including RCS. Silica may only constitute a limited amount of the overall content depending upon the nature of the material and the removal method used. Demolition of high silica content material, e.g. sandstone buildings, will present the most significant risk. Also, the higher the distance from the ground, the more likely the finer respirable dust are to remain suspended in the air and become diluted (depending on wind speed and direction) where these are not captured by the on-tool water spray.

Risk Reduction: High reach / remote methods are better than hand demolition but only if there is a large enough exclusion zone and appropriate ground conditions etc. The initial focus should be on selecting the most appropriate demolition method and then ensuring all the associated hazards are adequately controlled.

Adequate Control: Relevant factors are:

- **Vehicle Cab:** Studies have shown that operator's exposures are significantly reduced when they keep their cab shut, particularly if they have a filtration system. Air-conditioning also enables windows to be kept closed while maintaining a comfortable working environment. Some secondary contamination of the cab is inevitable. Cleaning should be via a dust class M or H vacuum and/or wet cleaning techniques to prevent the re-suspension of settled dust into the air.

- **Associated Damping:** Damping will be needed to control any significant secondary dust sources. Portable misting units (fed with clean, mains water – directly or pumped from a bowser) are standard in the industry for this type of use. A single hose pipe spray is not as effective in covering the wider areas involved at ground level. Positioning is key but should not impair the visibility of plant operators, particularly in bright sunshine.

- **Water Supply:** Good control practice for any type of water suppression includes an appropriate water supply with robust piping and connections. This should allow all systems to work simultaneously. Machinery needing a water supply should not be run without it (e.g. to enable the damping down of another part of the site due to limited connections). Water suppression supply hoses also need careful placement to prevent them being crushed by moving vehicles.

- **Distance and Duration:** Non-essential personnel should be excluded from any area where significant levels of secondary dust may be created. Those remaining may need to wear RPE if the associated general damping is providing insufficient control and should be exposed for the minimum period possible.

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
High reach operator and inside of cab visibly dusty	Serious and Possible / Remote	Extreme / Substantial	Established	No	IN
Evidence of significant secondary exposure to other workers in close proximity without suitable RPE	Serious and Possible / Remote	Extreme / Substantial	Established	No	IN

• Manual Structural Demolition/ Dismantling

Risk Factors: As with mechanical demolition, the dust produced will contain a mixture of respirable particles including silica. The equipment used will have the most significant impact. Where power tools are used reference should be made to the most appropriate table in this document for that equipment. The information below only considers non-powered hand-tool use e.g. manually taking down stone walls stone by stone in order to preserve the materials for future use or the removal of an internal wall using a sledgehammer.

While manual demolition may produce a lot of dust, this may not contain a high silica content. A judgement will need to be made based upon the factors outlined in Table 1.

Risk Reduction: As with high reach / remote methods, the initial focus should be on selecting the most appropriate demolition method and then ensuring all the associated hazards are adequately controlled.

Adequate Control: Relevant factors are:

- **Control at Source:** While the options for this may be limited in practice, they should still be considered and used where possible (e.g. water suppression/spraying or mobile LEV to control the build-up and spread of dust). Consideration should also be given to the provision of suitable mechanical ventilation

systems where general ventilation on its own is likely to be insufficient. These systems should include measure to help protect against dust in the air from being recirculated.

- **General Ventilation:** Work indoors requires adequate ventilation. This is an important measure for controlling residual levels of dust. There is also a legal duty to ensure that sites have sufficient fresh air in general. This means that air must be replaced at a reasonable rate. As a guide, the ACOP to the workplace regs recommend that fresh-air supply rate should not normally fall below 5 to 8 litres per second, per occupant. When establishing a fresh-air supply rate the floor area per person; the processes, equipment and the strenuousness of the work should also be considered. Windows or other openings will usually provide sufficient ventilation in some or all parts of the site. Additional measures may be needed where these are covered/ blocked.
- **Housekeeping:** Good housekeeping should be used to prevent a build-up of dust on the floor / surfaces that could otherwise become airborne again. Alternatives to dry brushing should be used.
- **Segregation:** Non-essential personnel should be excluded from any area where significant levels of dust may be created. Measures to prevent spread should also be considered, particularly where others undertaking separate jobs could be affected.
- **PPE:** Depending upon the above, RPE with at least an APF of 20 may be required in addition to, or as the only suitable control for the specific task and environment. Protective coveralls etc may also be appropriate.

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
Significant manual demolition without controls	Serious and Possible / Remote	Extreme / Substantial	Established	No (unless with specialist support in very visibly dusty situations)	IN

• Crushing and Screening Demolition Material

Risk Factors: Key factors influencing the level of silica risk associated with the machines used for such work are:

- The location of the machine and stockpiles in relation to wind exposure and enclosed spaces;
- The presence / absence of water suppression at crushing and transfer points (Note: visible airborne water mist could also contain silica depending on the content of the debris being processed);
- The height that processed material is being dropped from;
- Covering exposed conveyor sections to prevent wind drift.

Workers will be subject to the greatest exposures when working on the access platform.

Risk Reduction: A properly designed mobile crushing operation should not need any person to be present on the crusher access platform during normal crushing operations. It may be necessary for a person equipped with the appropriate PPE to spend a few minutes setting the feed speed initially if there is no remote facility. The feed should then be controlled from the machine feeding the crusher by varying the loading rate into the feed hopper. Operators standing on a platform for significant periods may be indicative of other problems such as repeated blockages or other safety issues – see http://www.hse.gov.uk/quarries/crushing.htm

Adequate Control: Water suppression at crushing and transfer points. RPE with at least an APF of 20 will be needed for workers on the access platform. RPE will also be appropriate for individuals spending a significant period in the immediate vicinity of such operations – see COSHH Essentials CN4

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
Exposure in the immediate vicinity without any controls	Serious and Probable / Possible	Extreme	Established	Yes, in the more extreme conditions	IN to secure sustained compliance.
Exposure in the immediate vicinity with suppression but no RPE	Serious and Possible	Extreme	Established	No	IN

- **Abrasive blasting concrete and other silica containing material**
- **Cleaning of stone buildings**

Risk Factors: A range of different blasting machines is available. Some saturation blasting equipment can work at lower pressures and therefore does not produce as much dust. The risk is linked to the machine in use, the blasting material used and the material worked on (e.g. the difference in silica content between sandstone and limestone). General dust levels linked to this work can also be very high. The IEE given is in relation to the worker doing the work using traditional grit blasting equipment on non-sandstone buildings. An effective blasting helmet (i.e. air fed with an APF of 40) will significantly reduce their risk and hence some of the reduced likelihoods given. However, the amount of dust can also be a significant risk to other workers (e.g. the potman) and should also be taken into account.

Risk Reduction: As indicated, a range of equipment is available that can generate variable levels of dust. Careful consideration should be given at the planning stage as to the extent of cleaning required, the material involved and the most appropriate method / equipment for this process. Silica-free blasting material (i.e. with less than 1% silica) should always be used. The risks associated with any alternative practices (e.g. chemical cleaners) will also require appropriate assessment.

Adequate Control: Traditional grit blasting should be used with segregation / sheeting to prevent spread, silica free blasting material and wet/saturation or vacuum equipment. The shot blaster will require air fed RPE with an APF of 40. Those working nearby (e.g. 'kettleman') will need RPE with at least an APF of 20. Controls for other equipment should be reduced in proportion to the risk – see COSHH Essentials CN7

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
Blasting operative with no controls (i.e. dry blasting)	Serious and Probable	Extreme	Established	Yes	IN to secure sustained compliance where appropriate
Blasting operative with effective RPE but no control at source	Serious and Remote	Substantial	Established	No	IN where practical to use control at source
Blasting operative with control at source but no effective RPE	Serious and Probable / Possible	Extreme	Established	Possibly where work is on a high silica containing material like sandstone	IN

Secondary exposure of 'kettleman' or others nearby without control at source and no RPE	Serious and Probable / Possible	Extreme	Established	Possibly depending on proximity, duration and material.	IN

- **Removing silica containing dust and debris**

Risk Factors: Dry sweeping can produce significant exposure levels. These levels vary depending upon the location, duration and frequency. Infrequent dry brushing for short periods is not good practice but is unlikely to give rise to significant risk while very high levels can be created by prolonged periods of dry sweeping in enclosed spaces. Inspectors should not just focus on the individual situation they find but enquire about the general arrangements in place to control this risk. A PN may be appropriate in more extreme conditions (e.g. where the same person is doing the dry brushing over a sustained period indoors without any control).

The risk associated with other 'clearing' activities (e.g. removing scaffold boards with dust / debris contamination) is situation dependent. Other trades should have removed any significant risk as part of their work (see below). Where this has not occurred, proportionate controls will be needed. Inspectors should not just focus on the individual situation they find but enquire about the general arrangements in place to control this risk.

Risk Reduction: It is important that the overall site management arrangements ensure that each subcontractor prevents or adequately controls any dust they create and subsequently removes any remaining residual amounts. All the combined residual dust should not be left for the last trade / labourer to deal with. Not only does this present an increased risk for them but it also creates a recirculation risk during intervening activities.

Adequate Control: Dry brushing for very short periods outside is not good practice but is unlikely to give rise to significant risk where RPE with at least an APF of 20 is worn. Where appropriate vacuum equipment is unavailable a means of damping down (e.g. light water spray) and the use of a brush, shovel and bucket to remove the material will suffice. For scaffolding removal etc other controls, except for RPE, are unlikely to be reasonably practicable as part of any dismantling work. RPE is only likely to be needed where there is a significant risk of dusty material falling into a worker's breathing zone and they are undertaking a larger amount of removal at once (e.g. 3 or more lifts on a significant property). The exception to this is where significant work has been undertaken, particularly on material with a high silica content like sandstone. Site specific controls should be decided upon in these instances.

For more regular / larger cleaning work a rake, shovel and bucket / wheelbarrow should be used to separate and remove larger debris from the finer dust. The latter can then be removed with a suitable vacuum. RPE is unlikely to be needed unless there is significant RCS suspension / re-suspension in the air. Where a vacuum cannot be used, damp dusting and RPE with an APF of 20 will be needed together with measures to prevent / protect others from exposure due to any re-circulation – see website and COSHH Essentials CN5.

Note: Inspectors will need to use discretion regarding enforcement where there is infrequent dry brushing outside without controls.

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
Extensive/ regular dry brushing in an enclosed space with no controls	Serious and Probable	Extreme	Established	Only in the more extreme conditions	IN
Extensive/ regular dry brushing in an enclosed space with effective RPE	Serious and Remote	Substantial	Established	No	IN

(where others not affected)					

• On-Site Stonemasonry Work

Risk Factors: There is no one-size fits all control package for all on-site stonemasonry work. Variable factors include the nature of the stone involved, the work practices and equipment required, the extent and location of the work together with any restrictions necessary to comply with other legislation (e.g.in the case of a listed building or scheduled monument). An appropriate combination of the options below in line with the hierarchy of control may be required depending upon the level of risk.

This variability also means it is not possible to provide relevant IEEs. Other information in this table should be used where appropriate as a basis for decision making. Specialist advice should also be sought where questions remain.

Risk Reduction: It may be possible to reduce some exposure by:

- **Organisation**: So that as much of the stone working as possible is carried out in a factory or on-site workshops where more effective control measures can be provided.
- **Equipment:** By using lower energy tools and reducing the use of hand-held power tools via more initial dimensioning (shaping). Other risk reduction methods mentioned elsewhere in this document should also be considered where appropriate

Adequate Control: Achieving adequate control is likely to need a combination of measures, especially when greater levels of RCS dust are released. In addition to the measures mentioned elsewhere in this document consideration should be given to:

- **Water:** Exposure can be controlled by water suppression where compatible with the stone working process. Reliability of water supply, direction and flow rate onto the stone and management of the slurry are all potential issues. **Pre-soaking stone** in water will help reduce RCS levels as the surface of the stone is worked, but becomes ineffective once processing reaches the dry material inside. **Misting** will reduce the background level of dust but is unlikely to provide adequate control of the larger amounts of dust present at the point of generation during stone processing.
- **LEV:** On-site **workshops** with effective LEV should be set up for work that is not required to be done in-situ. Where power and space permit, **on-tool** extraction can be an effective option for in-situ stonemasonry work. However, there are some practical difficulties with in-situ stonemasonry work. Effectiveness is reduced where there are curves, bends or uneven surfaces being worked or where work is at the edge of the stone. The extraction attachment may also obscure direct sight of the cut leading to adapted working methods. **Capturing hoods** are only suitable for use with hand tools and in situations where the stone to be worked is more limited in size.
- **RPE:** An APF of 20 is likely to be adequate (e.g. a FFP3 disposable mask) for some stone working activities with effective control at source. However, an APF of 40 may be required where the silica content is high (e.g. sandstone) and there is significant power tool use. An APF of 40 is also likely to be required where powered hand-tools are being used and the control at source is only likely to be partially effective.
- **Segregation:** High risk processes should be segregated when possible. On construction sites a good deal of effort is expected to ensure this. Principal contractors may need to sequence work to minimise other workers on site when stone cutting tasks are taking place. Segregation could be by **time** or **distance** for short duration or manual tasks and stone with low crystalline silica content. It should be more substantial e.g. an **enclosure** under negative pressure when power tools are being used for longer duration tasks and for stones that contain higher levels of crystalline silica
- **Spread:** Segregation is an effective means to prevent spread. However, it may not be the only one required. Heavily contaminated work clothing should be cleaned before removal to minimise dust resuspension or disposable coveralls provided. Workplace organisation including suitable cleaning and housekeeping arrangements are also important.

Table 5: IEE for common wood tasks

Note: A PN for wood dust **is unlikely to be appropriate** in most circumstance. Conditions that might prove an exception to this are where substantial dust is visible in the air, there is a build-up on surfaces and the work involves multiple tasks capable of generating significant exposure for a prolonged period in an enclosed space. Specialist advice and support is recommended. **Inspectors should also consider any associated fire or explosion risks**

• Cutting wood with power tools

Risk Factors: These will vary depending upon both the wood and equipment used:

- **Wood:** The biggest risk is from fine dust, as it can be inhaled deep into the lungs where it will do the most damage. It will also spread further from the process. In general, green timber will produce less fine dust than seasoned wood when cut. Hardwood and particle board (like MDF) will also tend to produce more dust (about twice as much) than softwood when cut.
- **Task:** Circular saws can produce high exposures of wood dust in certain circumstances, particularly when using hardwood or particle board indoors. Non-powered tools will produce significantly less dust compared to powered tools.

Risk Reduction: Cutting should be reduced as much as possible by:

- Considering how the final look will impact on the number of cuts and fixings required (e.g. mouse board, dado rails and picture rails all add to the joinery package).
- Using flooring, skirtings and mouldings that are produced in standardised lengths typically centred on the most common door heights. Deviation from these is likely to result in an increased need for joinery work.
- Seeking advice from timber manufacturers/suppliers on the most suitable and efficient systems to use when lining floors or completing internal joinery. Prefabricated window and door units may help to reduce on site working while variations in flooring thicknesses can allow for wider joist centres thereby potentially reducing the number of cuts and fixings.
- Purchasing timber components in dimensions which reduce the number of cuts on site can reduce waste and the volume of tool usage required to install. Trained joiners/carpenters should be well versed in cutting and sizing to reduce wastage.
- Considering alternative equipment (e.g. extraction fitted to plunge-saws can provide more effective control at source compared to a mitre saw).

Adequate Control: – see website. Relevant control considerations include:

- **Control at Source:** Wood dust is one of the most significant occupational health risks for joiners. As such it is reasonable to expect them to have on-tool extraction as a standard item of work equipment. Its use is expected as a minimum for most wood-working other than very infrequent tasks or where its provision introduces additional risk issues. However, performance effectiveness can be variable. The exposed and fast rotating section of blade at the point of the cut means that capture effectiveness can be compromised. The extraction should therefore also be used to regularly remove any dust that escapes. Passive attachments like cloth bags that come fitted to some devices are not effective in controlling workplace exposures. **They should not be accepted.**

  Note: Large wood cutting tasks can produce significant levels of larger non-inhalable / non-respirable particles which can quickly fill up an extraction unit. The use of a suitable pre-separator will overcome this and reduce the load on the main extraction filter, thereby maintaining better suction.
- **RPE:** As with extraction, it is always reasonable to expect a joiner to have adequate and suitable RPE available to them. An APF of 20 is likely to be appropriate in most circumstances. The requirement to use the RPE will be situation dependent. However, the use of appropriate RPE would normally be expected along with control at source for cutting and sawing wood activities. If the task is very short duration,

inspectors are advised to consider the efficiency of the extraction and any residual dust when making any enforcement decision regarding the need for RPE.

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
All controls missing or ineffective	Serious and Probable	Extreme	Established	No	IN
One effective control for more significant cutting work where all controls (e.g. extraction and RPE) are reasonably practicable	Serious and Possible / Remote	Extreme / Substantial	Established	No	IN

• Sanding wood with power tools

Risk Factors: These will vary depending upon both the wood and equipment used:

- **Wood:** When sanded MDF will produce more dust than softwood (about twice as much) with hardwood producing a lot less.
- **Task:** Power tool sanding can produce very high dust levels. The most important factors are the amount of wood removed from the surface and how quickly this occurs (belt sanders in particular create a lot of dust quickly). Hand-sanding can also produce significant volumes of dust depending upon wood, location and duration.

Risk Reduction: Sanding should be reduced as much as possible by:

- Considering to what extent pre-finished or partially finished materials can be used.
- Seeking advice from timber manufacturers/suppliers on the most suitable and efficient systems to use. Purchasing prefabricated or timber components in dimensions which reduce waste and the volume of tool usage required.

Adequate Control: – see website. Relevant control considerations include:

- **Control at Source:** Wood dust is one of the most significant occupational health risks for joiners. As such it is reasonable to expect them to have on-tool extraction as a standard item of work equipment. Its use is expected as a minimum for most wood-working other than very infrequent tasks or where its provision introduces additional risk issues. On-tool extraction for sanding can be very effective on large flat surfaces providing the sanding material has sufficient air holes to enable the dust to pass through. This effectiveness is reduced at corners, edges, curved surfaces etc. Passive attachments like cloth bags that come fitted to some devices are not effective in controlling workplace exposures. **They should not be accepted.**
- **RPE:** As with extraction, it is always reasonable to expect a joiner to have adequate and suitable RPE available to them. An APF of 20 is likely to be appropriate in most circumstances. The requirement to use the RPE would be expected in most instances alongside control at source.

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
All controls missing or ineffective	Serious and Probable	Extreme	Established	No	IN

One effective control for more significant sanding work where all controls (e.g. extraction and RPE) are reasonably practicable	Serious and Possible / Remote	Extreme / Substantial	Established	No	IN

- **Removing wood dust**

Risk Factors: Dry sweeping can produce significant exposure levels. These levels vary depending upon the location, duration and frequency. Infrequent dry brushing for short periods is not good practice but is unlikely to give rise to significant risk while very high levels can be created by prolonged periods of dry sweeping in enclosed spaces. Inspectors should not just focus on the individual situation they find but enquire about the general arrangements in place to control this risk.

Risk Reduction: Cleaning tasks can give rise to high short-term peak exposures resulting in a disproportionate effect on overall wood dust exposure. They need to be managed accordingly. Most of the wood dust should have been prevented using the correct cutting / sanding methods above. However, it is recognised that full control at source is difficult.

Adequate Control: Dry brushing for very short periods outside is not good practice but is unlikely to give rise to significant risk where RPE with an APF of 20 is worn. Where appropriate, the extraction unit for the cutting / sanding equipment should be used to vacuum the remaining material. Where small amounts have been created without this availability, damp/ wet cleaning should be used. RPE may also be needed. A rake, shovel and bucket / wheelbarrow should be used to separate and remove larger debris from the finer dust.

Note: Inspectors will need to use discretion regarding enforcement where there is infrequent dry brushing outside without controls.

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
Extensive/ regular dry brushing in an enclosed space with no controls	Serious and Probable	Extreme	Established	No	IN
Extensive/ regular dry brushing in an enclosed space with effective RPE	Serious and Remote	Substantial	Established	No	IN

Table 6: IEE for common ‘other dust’ tasks

- **Sanding Plasterboard jointing**

Risk Factors: In general, this work produces high levels of inhalable dust and lower, but still significant, levels of respirable dust. Sanding using a hand-held block tends to generate higher dust levels nearer the worker’s breathing zone than those created when the sanding block is on the end of the pole and further from the worker.

Risk Reduction: All the typical board types (thermal, fire and sound) come with a tapered edge option. This usually needs less sanding as only the edge of the plaster fill requires dressing to get the whole surface level.

Adequate Control: The use of extraction to dust class L specification is usually sufficient on its own. Manual sanding equipment with a hollow telescopic pole is now available that allows an extraction unit to be fitted. This also eliminates associated noise and vibration issues. Use of the correct sanding material is important as this requires enough ventilation holes to remove the dust as it is created – see website.

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
Dry sanding with no controls	Serious and Probable / Possible	Extreme	Established	No	IN
Dry sanding with effective RPE only	Serious and Possible / Remote	Extreme / Substantial	Established	No	IN

- **Soft strip removal of plasterboard ceilings etc**

Risk Factors: Manual demolition may produce a lot of 'general' dust. Levels will be dependent upon the work practices, the energy involved in the removal process, the extent to which the work is enclosed and the duration of the work. The same considerations apply as outlined in manual demolition / dismantling above.

Risk Reduction: As with manual structural demolition / dismantling methods, the initial focus should be on selecting the most appropriate demolition method and then ensuring all the associated hazards are adequately controlled.

Adequate Control: The same considerations apply as outlined in manual demolition / dismantling above. However, as the risks should be lower the control strategy can be reduced accordingly.

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
All controls missing or ineffective	Serious and Possible / Remote	Extreme / Substantial	Established	No	IN
Partially effective controls	Serious and Remote	Substantial	Established	No	IN

- **Using a cut-off saw, grinder etc on low silica containing stone (e.g. limestone)**

Risk Factors: The high-energy nature of these tools means that they are always likely to produce very high levels of both inhalable and respirable dust. However, given the higher WEL (when compared with silica) a PN is only likely to be appropriate where sustained work is ongoing (i.e. not a 'one-off') and where there are no or wholly ineffective controls.

Risk Reduction: Measures that can be taken include:
- Getting stone pre-cut to size prior to delivery or more initial dimensioning (shaping) of stone using primary and secondary saws;
- Using lower energy equipment / reducing use of hand-held power tools.

Adequate Control: Water suppression / on-tool extraction. RPE with an APF of 20 will also be needed for most work other than very short duration tasks as this still will be / has the potential to be dusty.

Issue	Consequence & Likelihood	Risk Gap	Standard	Consider PN	IEE
All controls missing or ineffective	Serious and Probable / Possible	Extreme	Established	Only in more extreme conditions with specialist support	IN
Effective control at source and no RPE	Serious and Remote	Substantial	Established.	No	IN
No effective control at source but effective RPE	Serious and Possible / Remote	Extreme / Substantial	Established.	No	IN

Appendix 4: Underlying Management Arrangements

Where task-related non-compliance has been found on-site, consideration should be given to identifying and addressing any underlying causes. Action should be proportionately targeted at the dutyholder(s) most directly responsible for the failings identified using the most appropriate legislation (e.g. COSHH or CDM). This appendix outlines the issues to consider.

Contractors:
The main duty to control dust rests with the dutyholder that 'creates and owns' this risk. This will often be the contractor doing the work and not the Principal Contractor. The overall objective of any dust related inspection should be to ensure that the dutyholder is able to achieve sustained compliance throughout the range of work that they undertake. The table below provide some lines of enquiry to help determine this.

Note: The focus should not just be on the task the contractor is seen doing at the time of the site inspection and the controls being used. It is important to consider the range of work they are likely to do on a regular basis. For example, a joiner will undertake several different wood dust-generating activities. It is therefore reasonable to expect them to have readily available the full range of control options necessary for these tasks.

Table 7: Contractor management arrangements

Issue	Examples
Risk Appreciation and Planning	• What routine dust generating activity is the dutyholder involved with as part of their normal business? • Do they know the risks associated with these? • Have they determined the range of controls that they need to have / provide to cover these scenarios? • Have they made adequate arrangements for ensuring the right controls are available and can be effectively used for the duration of their work (including access and sufficient water / electrical supply)? • Are they aware of the extent of their legal duties in relation to these issues; particularly where there are issues of self-employment, subcontracting and cooperation / coordination with others?
Maintenance	• Are adequate pre-use checks being carried out to ensure the equipment is in a suitable condition for use? • Are there measures in place to undertake minor repairs where faults have been identified? - (e.g. the cleaning of blocked spray nozzles, a replacement seal for a water bottle, the changing of filters in extraction units or RPE)? • Is the equipment subject to appropriate maintenance, thorough examination and testing (TEXT) as appropriate? On-tool extraction is a form of LEV so needs a TEXT. Details on

	how this can be achieved in practice are outlined in a series of FAQs (Note: where a unit is **only** used for vacuum cleaning purposes this requirement does not apply). • How is non-disposable RPE maintained? This will also need to undergo monthly checks (which should be recorded) and maintained in line with the manufacturer's advice. Maintenance may include cleaning, examination, replacement of the filter, repair and testing. • Are there appropriate arrangements for storing equipment to prevent equipment being damaged? • What should happen if things are not working and is action taken to support this?
Supervision	• Are there effective supervision arrangements? • How do these work in practice to ensure control measures are correct and are being properly used, maintained and monitored? • Is any additional account being taken of new, inexperienced or young people, as well as those whose first language is not English?
Information, Instruction and Training	• What information, instruction and training has been given? • Does the worker understand the dust risk(s)? • Is the worker aware of the correct methods of work and the controls needed? • Does the worker know how to use these controls? • Is the worker aware of the actions to take or how to raise concerns if controls are damaged/missing/inadequate etc.?

Health Surveillance: This is required where '*there is a reasonable likelihood that the disease or effect may occur under the particular conditions of the work and a valid technique exists for detecting indications of it'.* Guidance on the surveillance requirements for different health conditions is detailed below:

- **Silicosis:** G404.pdf and the supplementary note on health surveillance
- **Occupational asthma:** G402
- **COPD:** G401

The primary focus of current operational work should be to ensure that exposure to construction dust is minimised – i.e. that adequate controls and underlying arrangements are in place. While health surveillance is never a substitute for this, it still plays an important role in helping to protect the health of employees. Inspectors should therefore make relevant enquiries into the provision of this where workers may be subject to **potentially significant and ongoing silica or wood dust exposures**.

However, the nature and composition of the construction industry means that there can be practical implementation challenges in this area. Work is ongoing with the industry on this. **Inspectors are therefore advised to consult an Occupational Health Specialist Inspector before taking any enforcement action**.

Principal Contractor:
While the main duty to control dust rests with the dutyholder that 'creates and own' this, the PC also has a duty under CDM to provide the right project environment to enable this to happen throughout the duration of the project. This requires appropriate planning, management, monitoring and co-ordination. The table below provide some lines of enquiry to help determine the adequacy of the measures in place.

Note: The focus should not just be on the task(s) the contractor(s) is seen doing at the time of the site inspection and the controls being used. It is important to consider the range of work they are likely to do on the site during the construction phase and the arrangements needed for the duration of this.

Table 8: Principal Contractor Site Management Arrangements

Issue	Examples
Planning	Planning must consider the dust risks likely to arise during the construction work as well as the measures needed to manage, monitor and co-ordinate the work (covered below). • To what extent has any information been given by designers about dust risks that have not been eliminated and the steps to be taken to reduce or control those risks? • What reasonable steps have been taken to ensure contractors on site have the appropriate skills, knowledge and experience? • What arrangements and site rules have been established? Section 2 of Schedule 3 in CDM also applies to higher risk dust tasks. What specific measures have been recorded for these arrangements in the construction phase plan? Areas to explore include: – Has the presence of dust risks / the different types / the tasks with the greatest risks been identified? – Is there a statement on the control measures (or types of measures) that will be expected (possibly including more specifics for unusual / very high-risk tasks)? – Are there criteria to help assess where dust exposure is unacceptable or processes / conditions that will not be tolerated? – Are arrangements in place for managing / supervising these risks including the extent of any exposure monitoring where needed?
Managing	To manage the construction phase, the PC must ensure that effective, preventative and protective measures are put in place to control dust risks. • How does the PC ensure that the general principles of prevention are being applied in a consistent manner across

	the project? What are the agreed standards and how is a contractor's method of work evaluated against this? • Has the PC made adequate provision for 'communal resources' that are required to control dust risks? (e.g. sufficient water supply / connections or electrical power). If not, what has been agreed with the relevant contractors and is this adequate? • How does the PC ensure each contractor removes any residual dust they have created instead of leaving this for subsequent contractors or what other adequate arrangements have they made to deal with this? • How are unsafe conditions and working practices challenged?
Monitoring	PCs do not have to undertake detailed supervision of contractors' work. Contractors have their own duties under COSHH to ensure that control measures are properly used. However, the rapidly changing nature of construction sites means that regular oversight of agreed standards is required. • What time and resource has been allocated to this? • What performance measures are being used and why? • Is there evidence that monitoring is being routinely done and is effective? • What action has been taken where necessary?
Co-Ordinating	The PC must liaise with those involved in a project to establish a common understanding of the health and safety standards expected and gain cooperation in meeting these. • What arrangements exist for liaising with the Principal Designer (PD) and contractors during the duration of the project and how effective are these? • Does the site induction / information highlight particular dust risks and the control measures those working on the project need to know about? • To what extent has the PC liaised with contractors to ensure that the site measures take into account their needs in relation to dust control? • What arrangements exist to ensure contractors under their control cooperate with each other so the risks from their work are managed effectively? • How are decisions taken when determining which items or stages of work can take place at the same time or in sequence?

Applying the EMM: This should be applied as normal. Account should be taken of the following:

- **Risk Gap Analysis:** Gap analysis is not appropriate for compliance and administrative arrangements that do not directly result in the control of risk. Inspectors should use the **Compliance and administrative arrangements Initial enforcement expectation table** (Table 5.2 in the EMM) in these circumstances. However, there are occasions where the arrangements under consideration do

directly increase dust-related health risks (e.g. the lack of a face fit test or user knowing not how to correctly wear / maintain RPE). Risk gap analysis is appropriate in these circumstances and therefore should be considered in relation to the information in Appendix 3.

- **Standard:** All matters within Table 7 are 'Established' and in line with existing guidance / ACOP associated with COSHH. The only exception is a failure to have a TExT undertaken of a LEV system within the specified 14-month period which is 'Defined'. All matters within Table 8 are either 'Established' or 'Interpretative' depending upon the extent to which they are detailed within the CDM guidance (L153) or must be interpreted from that. A decision will need to be made based on the individual circumstances.

Appendix 5: Evaluating Pre-Construction Decision Making

Inspectors should make enquiries into decisions made during the pre-construction phase where it is apparent that these have led to significant on-site failing(s). The best opportunities to do this are likely to be where the following conditions are met:

1. A task was encountered on site where the dust risks were disproportionately high (regardless of whether they were being adequately controlled or not);

2. Reasonable steps had not been taken to eliminate, control or reduce a risk during the pre-construction / design process where appropriate options are available; and

3. Information proportionate to the remaining risk was not provided to those who needed it.

Design Related: Under CDM a designer is anyone (including a client, contractor or other person referred to within CDM) who '*in the course or furtherance of a business prepares or modifies a design; or arranges for, or instructs, any person under their control to do so*'. A design is also defined and includes '*drawings, design details, specifications and bills of quantities (including specification of articles or substances) relating to a structure, and calculations prepared for the purpose of a design*'.

The table below provides some lines of enquiry with regards to important themes within CDM. Not all will be relevant, and they should be adjusted as necessary with regards to the relevant CDM role(s) and its legal requirements.

Table 9: Designer intervention lines of enquiry

Theme	Examples
Skills, Knowledge, Experience (SKE) and Organisational Capability (where appropriate)	• **Understanding:** Can the dutyholder demonstrate an understanding of the construction activities that will give rise to the creation of significant dust risks? What do they understand as the key element of their role and how it is delivered? • **Knowledge:** How is effective knowledge about hazard and risk associated with dust provided and maintained? What membership / active participation is there with relevant industry forums and bodies including CPD? • **Experience:** How is learning from experience and feedback captured, promoted and used? • **Competence:** How does the dutyholder ensure they have the right SKE and organisation capability if needed to accept their role? • **Organisational Capability:** Does the dutyholder have the right policies and systems in place to set acceptable health and safety standards which comply with the law, and the resources and people to ensure these are delivered? What design and review procedures are used?
Principles of Prevention	• **Understanding:** To what extent are the general principles of prevention understood? How is this considered in relation to

	dust risks? What access is there to, and use made of good practice and other relevant guidance material on dust? • **Application:** What arrangements exist to ensure significant dust risks are identified. How is the elimination, reduction and control of these being followed during the design process?
Provision of Information	• **Dissemination:** How is information on significant residual dust risks conveyed to those who need it? How is the suitability and effectiveness of this assessed?
Planning, Managing, Monitoring and Coordinating	• **Reviews:** What risk, opportunity and design review meetings are held? How are significant dust issues reviewed as part of this? • **Design Changes:** How are request for these managed? How are relevant parties informed? • **Design Oversight:** How is this managed to ensure early selection and options decisions consider dust risks? What arrangements are in place to ensure those involved can contribute information and raise concerns about health risks? How are challenges to design decisions raised, considered and closed out? What factors are considered during this process and how is 'impartial / independent' decision making maintained? How is practical risk reduction ensured?

Client Related: Under CDM a client is '*any person for whom a project is carried out*'. The table below provides some lines of enquiry with regards to important themes within CDM.

Table 10: Client intervention lines of enquiry

Theme	Examples
Appointments	• **Principal Designer:** When were they appointed? Was this as early as possible? Was the appointment terminated prematurely? What reasonable steps were taken to ensure they had the right skills/ knowledge and experience / organisational capability? • **Principal Contractor:** Were they appointed early enough to enable the construction phase plan to be drawn up on time? What reasonable steps were taken to ensure they had the right skills/ knowledge and experience / organisational capability?
Specification	• **Materials and appearance:** Decisions in this area will be design related. The relevant sections in Table 9 above should be referred to.
Information	• **Pre-Construction:** Is there any information relevant to dust risks that the client should provide (e.g. measures required to protect vulnerable members of the public)? How was the importance of this identified and evaluated?
Suitable Arrangements	• **Client's brief:** Has the client taken ownership of these arrangements? Are they clearly communicated in a 'brief' or other suitable form? Are specific risks adequately covered

	where warranted? What is in place to ensure co-operation and co-ordination? How are the arrangements maintained and reviewed? • **Construction Phase Plan:** How did they ensure that this was prepared before the construction phase began?

Applying the EMM: This should be applied as normal. Account should be taken of the following:

- **Risk Gap Analysis:** For the purposes of the EMM the above issues should in general be considered as 'compliance and administrative arrangements. Gap analysis is not appropriate for those factors that do not directly result in the control of risk. Inspectors should use the **Compliance and administrative arrangements Initial enforcement expectation table** (Table 5.2) in these circumstances.

- **Standard:** All matters within Table 9 and 10 are either established or interpretative. This depends upon the extent to which they are detailed within the CDM guidance (L153) or must be interpreted from that. A decision will need to be made based on the individual circumstances.

The procedures for recording and handling pre-construction material breaches should be in accordance with the guidance provided on HSE's intranet on Fee for Intervention http://intranet.hse.int/strategy/cost-recovery/.