

INFORMATION ON RESPIRABLE CRYSTALLINE SILICA DUST (RSC)

The “International Agency For Research On Cancer” (IARC) in 2009 recognised Respirable Crystalline Silica Dust as being a **Group 1 carcinogenic to humans**.

Since then the European Commission and indeed our own HSA have also listed Respirable Crystalline Silica as a Group 1. Carcinogenic which poses the highest risk to respiratory health of construction workers.

The practice of cutting concrete blocks is listed in almost all conducted studies as being the number one creator of airborne Respirable Crystalline Silica dust in the construction environment.

Our own HSA information leaflet on Silica dust depicts two images to highlight RCS dangers, both show someone cutting into concrete.

Respirable Crystalline Silica Dust causes many construction workers who have been exposed to develop silicosis which can lead to lung cancer, COPD, TB, Kidney disease among other serious health issues.

Respirable Crystalline Silica is very small in size (less than 10 microns) and is generally invisible to the human eye. This attribute means that it can get deep into the alveoli in the lungs (which is devoted to gas exchange) where it can remain for many years and eventually causes silicosis.

Silicosis is inflammation and hardening or scarring of the lung tissue.

(The white blood cells (Macrophages) which normally kills microorganisms and protects the lower lungs is destroyed by Respirable Crystalline Silica. Prior to the death of these white blood cells, they secrete compounds which activates other cells that initiates inflammation and in turn causes the rapid increase of fibrocytes that lay down fibers and cause scar tissue which cannot be replaced as lung tissue does not regenerate.)

Silicosis (or fibrosis) in itself is an incurable condition.

Many studies on this subject have been completed and reported on:

- *) In a joint report by the European Federation for Builders & Wood Workers Trade Union (EFBWW) and the European Construction Industry Federation (FIEC) who Promotes construction health & safety sustainable development (reduce greenhouse gases)
Provides information to construction companies and European policy makers.
Reports that out of all workers exposed to RCS, 75% are employed in construction and has listed cutting blocks as the main creator of RCS in this sector.
- *) The British HSE 2020 reports that
For every single fatality as a result of construction accidents approximately 100 construction workers die from WORK RELATED CANCER (Not up to 100 – APPROXIMATELY 100).
- *) The UK “All Party Parliamentary Group for Respiratory Health” describes Silica as
“THE NEXT ASBESTOS”
- *) Extensive air quality tests carried on RCS exposure in another sector which also involved cutting into stone resulted in 95% of all tests carried out being outside the Occupational Exposure Limit (OELV) which is 0.1mg (milligram/million)per cubic meter over 8 hours. Listing again the cutting action as the task which caused by far the most exposure, in

fact recording up to 70 times higher exposure than any other task.

Even when using the dusty shroud (dust guard on angle grinders etc.) the recorded values averaged 5 times the permitted limit (0.5mg per cubic meter).

It should be noted that the exposure should be kept well below the OEL.

The 2009-2011 SHEcan project (Socioeconomic Health & Environmental) conducted a two year study on Carcinogens & Mutagens.

The purpose of this comprehensive assessment was to

*) Introduce a system for setting occupational exposure limits (OEL) based on risk.

*) The requirement for Preventative actions.

They estimate that in 2006 5.3 MILLION employees in the EU were potentially EXPOSED to RCS and once again the construction sector workers make up over 75% of that number.

It is estimated that in 2010 there was approximately 6,800 deaths from lung cancer in the EU that could be due to past exposure of RCS.

Considering the construction sector accounts for 75% of this number,

then approximately 5,000 deaths would be attributed to construction work in 2006 alone.

If no action to change this number is taken, then it is estimated to remain at the same rate until 2030, accounting for the time between exposure to the effect becomes apparent.

The report concludes that not much has changed since then.

REPORT BY THE EUROPEAN COMMISSION (Guide For National Labour Inspectors 2016)

The European Workers Trade Union Group who represents 1.5 million workers in Europe

(EFBWW) European Federation of Builders & Wood Workers

& (FIEC) EUROPEAN CONSTRUCTION INDUSTRY FRDERATION

Who Promotes construction health & safety, sustainable development (reduce greenhouse gases)

Provides information to both small and large construction companies and European policy makers.

Once Respirable Crystalline Silica Dust becomes airborne, it can take a long time for it to settle.

It can take up to 24 hours for RCS dust to settle in a standard room as it takes approximately 7 hours for a tiny dust particle 1um (.001mm – one micron) to sink 1 meter.

Brushing dry dust of floors may seem harmless but this action was highlighted as a serious contributor as it also raises dust particles into the air.

But the root cause is cutting the walls and creating of the duct in the first instance.

If you solve the root cause of the problem which is the creation of Respirable Crystalline Silica Dust, then the knock on effect will automatically and dramatically improve the second issue.

EU National Labour Inspectors have been instructed to use visible dust in the air as a guide for the presence of RCS. Where dust is visible then almost certainly the level of RCS will be above the occupational exposure limit value (OELV) which is 0.1 mg (milligram) per cubic meter over an 8 hour period.

This limit was set after the revision of the Carcinogens and Mutagens Directive in 2017.

(This limit is detailed in the "Carcinogens And Mutagens Directive 004/37/EC).

Water suppressions and Local Exhaust Ventilation (LEV) systems are deemed not reliable and even when functioning correctly do not eliminate enough silica dust.

In Ireland the occupational exposure limit value (OELV) test can be conducted by

“Shore Control Safety, Naas, Co. Kildare. Tel: 045-898198.”

The focus of the European Commission to address the health issues is confirmed in Part 2 (section 2.1 and 2.2) of the guidance for inspectors.

Again cutting concrete blocks (chasing walls) is listed as the number one generator of significant airborne concentrations of RCS under their heading “Hierarchy Of Controls” and recommends that the preventative action should be to Design Out actions that may cause the generation of RCS.

They recommend products that “Limit The Number Of Cuts” or products that “Do Not Need cutting or chasing” should be included at the design stage to prevent RCS being generated in the first place.

In 2022 the European Social Partners together with technical, prevention bodies and equipment suppliers from various countries devised and published a simple “MAPPING” traffic light system which details various construction activities that could create exposure to RCS, safety measures that exist at the moment and how effective they are if they are used correctly and how safe certain tasks are if these safety measures are not used correctly.

The information and recommendations detailed in this MAPPING document has been accumulated as a result of exposure data and experience on construction sites.

This MAPPING system deems that Chasing walls “WITH EXTRACTION” as “A Rather Poor practice” and conducting this action WITHOUT EXTRACTION as the worst practice as far as eliminating RCS exposure to workers.

Duties & Responsibilities

EU DIRECTIVE 2004/37/EC (Carcinogens or Mutagens at work)

“Workers exposure to carcinogens must be prevented”.

The employer shall reduce the use of carcinogens by replacing them with substances that is not dangerous. Where technically possible exposure should be reduced to a minimum.

The employer shall

- *) Limit the quantities of carcinogens.
- *) Keep the number of workers exposed to a minimum.
- *) Design the work processes to minimise the substance release.

Employers shall inform workers about objects on site containing carcinogens.

EU DIRECTIVE 2017/2398 – AMENDMENT OF DIRECTIVE 2004/37/EC (above) (on protecting workers from the risks related to exposure of carcinogens at work)

This directive should be implemented by January 2020

So far as “TECHNICALLY POSSIBLE” (where it is possible to be done) the employer shall

- *) Implement measures that reduce or prevent the exposure of Carcinogens to workers.
- *) Replace processes to reduce Carcinogens exposure to workers.

EU [Directive 89/391/EEC](#) (article 6) introduces measures to encourage improvements in Health & Safety. It is the obligation of the employer to avoid risks and replace dangerous practices with non or less dangerous practices.

In the context of responsibility, the employer shall evaluate the risks, then take the necessary measures for the safety and health protection of workers.

Including prevention of occupational risks by combating risks at source and provide information and training resulting in risk avoidance. This follows the hierarchy of prevention measures.

The "Guidance for National Labour Inspectors (NLI) asks their inspectors to check if the employer "Has considered elimination or substitution of materials for example "Pre Cut Materials".

If adequate prevention and protection has not been achieved the inspector may make arrangements for air sampling and analysis to be carried out.

If the assessment carried out by the employer reveals there could be a risk to the safety and health of workers – in this case meaning RCS exposure.

The specific protection, prevention and monitoring measures listed below must be applied:

- *) The employer must ensure that the risk is eliminated or reduced to a minimum, preferably by substitution (replacing a hazardous chemical agent with a chemical agent or process which is not hazardous or less hazardous).

- *) Employees who may be exposed to RCS should be informed by the employer of the potential risks involved and the long term health effects of RCS exposure.
Including information on when and where this RCS exposure may occur.

- *) Inspectors are advised to check and verify that construction workers have received this information.
Action should be considered by the inspector if workers are not aware of the risks of RCS.

The employer must regularly measure chemical agents which may present a risk to workers' health, in relation to the occupational exposure.

The employer must limit values and immediately take steps to remedy the situation if exceeded.

Ongoing need for Health monitoring and surveillance of employees exposed to RCS should be considered as part of the risk assessment conducted by employers.

HSA GUIDE TO SAFETY, HEALTH & WELFARE AT WORK ACT (2005) CHAPTER 3

"GENERAL DUTIES OF DESIGNERS, MANUFACTURERS & SUPPLIERS OF SUBSTANCES"

This means – "ARCHITECTS, CONTRACTORS AND BLOCK SUPPLIERS"

Page 25

It is strongly recommended that a preventative approach is taken by employers and self employed.

There are 9 general principles of prevention and the No.1 is the avoidance of risk.

The employers should comply with relevant directives of European Communities.

Chapter 3 – section 18

Employers should identify health hazards and document them in a "Safety Statement" or similar which includes exposure to other risks e.g. RCS.

Then take steps to improve them and secure the health & safety of their employees.

A Safety Statement shall

- *) Detail the identified hazardous risks.
- *) Detail the Protective & Preventative measures.
- *) An employer should bring this information to his/her existing employees (minimum annually) and also to any new recruits.
- *) Bring this information to the attention of any person who may be exposed to health & safety risks. Especially any person who is performing tasks that carry a serious health & safety risk.
- *) Employees must also be made aware of any changes to the Safety Statement.

SECTION 21 (B (ii))

*) Where Employers share a place of work they shall inform each other and their respective employees of any risks to their safety, health & welfare.

Including extracts from their Safety Statement relating to hazards and risks to employees.

*) In cases where employees perform duties that may cause serious risk to Health & Safety.

An Employer shall ensure that they are assessed by a registered medical practitioner of their fitness to perform these work activities.

These risks may be identified when the Risk Assessment is being drawn up and may form part of a continuous Health Surveillance program.

Employers shall supply information both on the already known health & safety risks and also suspected health & safety risks with his / her employees.

Adequate information on the risks should be given to the person who may be exposed to RCS.

Employers have a duty of care as an onus of proof can be placed on an employer if failure to do what is now "Technically" possible (changed from Practically possible) to prevent health hazards occurring in the first place.

This means "where possible" the employer must carry out preventative action.

The employer must inform workers:

- on emergency arrangements;
- on the results of the risk assessment;
- on the hazardous chemical agents present at the workplace with access to safety data sheets;
- by training on the appropriate precautions and on the personal and collective protection measures that are to be taken.

ARCHITECTS & DESIGNERS

EUROPEAN COMMISSION GUIDENCE ON WORKER EXPOSURE TO REPIRABLE CRYSTALLINS SILICA FOR NATIONAL LABOUR INSPECTORS

Page 8 “Hierarchy Of Controls” – 1st Line

Design the appropriate work processes, such as using pre-cut materials or systems that RCS is no longer necessary.

Page 10 – Eliminate or Substitute – 1st Line

Has the employer considered elimination or substitution e.g. use of pre-cut materials so less cutting is required.

Page 11

“Substitution should be encouraged when possible, using building materials so less cutting is needed.

Page 14.

Water suppression and LEV systems are not fully reliable and even when functioning effectively they do not eliminate all silica dust.

Page 25 & 26.

Cutting & Chasing Blocks is High Risk.

No.1 recommendation is to “Design Out Risks” and

“Limit the number of cuts during design or use products that do not need chasing”.

HEALTH & SAFETY GUIDE TO SAFETY 2005

Page 22.

Section.16.

General duties of Designers, Manufactures, Importers & Suppliers.

*) The article is designed and constructed so that it can be used safely and without risk to health at work.

*) A person who designs or manufactures an article for use at work must carry out the necessary research with a view as far as reasonably practicable eliminate or minimise any risks to health. “Reasonably practicable” is now revised to “Technically Possible”
This is repeated in the “Irish Safety, Health And Welfare Act 2005”

Page 23

Duties to be compiled by persons who commission or procure construction work should ensure that the project is designed and is capable of being constructed without risk to health.

EU DIRECTIVE 2004/37/EC (Carcinogens or Mutagens at work)

IRISH SAFETY AND HEALTH ACT 2005

Design the work processes to minimise the release of carcinogens.

Section 16. (page 25) Manufactures, imports or supplies any article for use at work shall:

- *) Ensure the article, so far as reasonable practicable to “be safe and without risk to health when properly used by a person at a place of work”.

- *) Ensure the article undergoes appropriate levels of testing to ensure compliance.

HSA – 2021 CODE OF PRACTICE FOR SAFETY, HEALTH & WELFARE AT WORK

Page 4.

“In practice, exposure levels should be maintained well below the “OELV” and should always be as low as “Reasonably Achievable”. This is particularly important for carcinogens.

Page 16.

“Silica, Crystalline Respirable Dust is listed as a Carcinogen.

EU DIRECTIVE 2004/37/EC (Carcinogens or Mutagens at work)

& Amended EU DIRECTIVE 2017/2398

“Workers exposure to carcinogens must be prevented.

The employer shall reduce the use of carcinogens by replacing them with substances that is not dangerous.

Where “Technically Possible” exposure should be reduced to a minimum.

The employer shall

- *) Design the work processes to minimise the substance release.
- *) Limit the quantities of carcinogens.
- *) Keep the number of workers exposed to a minimum.
- *) The maximum OEL limit “MUST NOT BE EXCEEDED”
(section 2. – 2017/2398 EC DIRECTIVE).

WHY USE CHASED BLOCKS ?

Chased blocks is a simple concept, but is a very effective all round solution to greatly reducing workers exposure to RCS in a construction workplace and in turn should dramatically reduce the number of the many deaths from lung cancer caused by exposure to RCS in construction.

These blocks eliminate the Number 1. cause of RCS creation and exposure to construction workers which is cutting concrete blocks for chasing purposes.

Chased Blocks have been developed with one goal in mind which has been documented many times in European and National Guidance and directives as being the Number 1. Solution to this problem.

That is to “Prevent” and “Designing Out” the problem – use products that do not need to be cut..

This is exactly what Chased Blocks does.

It also satisfies the socioeconomic requirements between block manufactures and contractors as the overall economic costs should not increase. We estimate the costs of the Chased Blocks will be approximately 20c euro more expensive than the standard traditional blocks, however the contractors will save at least the difference by not having to have the walls cut when chasing.

When using Chased Blocks, the cutting element which is the main cause of Respirable Crystalline Silica is removed from the chasing process.

For this product to work successfully, the complete interior of a property should to be built using Chased Blocks.

As we know the position of plug sockets etc. are often not planned before the property is built and even when they are planned in advance, there are changes required at later stages.

When the inside of a property is built using Chased Blocks, sets of lines are automatically created on from the floor to the ceiling on both sides of the wall.

These sets of lines are available approximately every 20cm and then between these lines can be punched as required for chasing purposes without the need for cutting into concrete blocks.

The chase width is approximately 6cm wide x 2.5cm deep – capable of taking a double set of standard conduit.

This 6cm width also allows for left to right flexibility when positioning the sockets or switches.

Crucially there are no lines back to back as this is not permitted for the installation of electrical cables.

Chased Blocks have already being manufactured and tested for strength and size.

The blocks comply with both tests and indeed have surpassed the strength of the standard blocks.

Results are available on our website www.chasedblocks.com.

Chased Blocks has been invented in Ireland by Danny Morning and we have the following protections filed on this product.

IRISH Patent Application: No.S2002.0034

U.K. Patent Application: No.2111605.8

(Patent Numbers for Europe, United States etc. will follow in due course)

12 Registered Community Designs which are already GRANTED.

These patent specifications, design registers are available on our website www.chasedblocks.com

Other benefits when using Chased Blocks.

*) As these blocks are manufactured on their long side and there is only 22 blocks per bail instead of the normal bail size of 44 blocks. They are much safer when working on scaffolding because the centre of gravity is much lower which means when the bail of blocks are opened they are much less likely to spill off the edge of the scaffolding.

*) Once the first row of blocks are in position, then the lines on the blocks will act as a guide for the block layer.

*) When plastering, the plaster will have a better grip on the wall because of the it being held by the

5mm slit in the blocks.