

A decorative graphic on the left side of the slide consists of several overlapping, semi-transparent red chevron shapes pointing to the right. The top-most chevron is the most prominent and is a solid dark red, while the others behind it are lighter and more faded.

Dust exposures from industrial cleaning

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What's the problem



Many activities in manufacturing and construction generate dust and debris which contaminate the workplace and necessitate frequent cleaning.

Objectives

Quantify the contribution that industrial cleaning activities can make to overall dust exposures

Quantify the reduction in exposure that can be achieved by implementing good practice

Estimate the prevalence of different cleaning methods

Identify common exposure control failures pertinent to cleaning activities

Identify barriers to the adoption of 'low dust' cleaning techniques.

Methodology

Review of published literature

Data mined from HSL library of ~1,500 OH reports

Searched and catalogued using Endnote[©]

Extracted qualitative and quantitative data

Prevalence of good/bad practice

Industry	Number of reports	Number with exposure data	Number of reports		
			Dry sweeping	Vacuum cleaners	Compressed air
Woodworking	26	11	21	22	7
Bakery	12	7	10	8	2
Waste & Recycling	29	12	16	3	8
Brickmaking	15	5	14	10	0
Stoneworking	21	0	14	3	5
Foundry	14	2	12	3	6
Construction**	9	3	6	4	0
Tissue	6	5	5	4	5
Other	28	9	20	10	8
All	160	54	118	66	41

The prevalence of bad practice, mainly dry sweeping and the use of compressed airlines, is widespread.

Measured inhalable dust exposures

	Number of reports	Number of data points	Median exposure mg/m ³	Average (arithmetic mean) exposure mg/m ³
Compressed air blowing	12	38	26.4	58
Dry sweeping	20	30	12.8	27.2
Vacuum cleaning	12	15	3.8	4.9

Where good practice is not implemented, there is potential for very high inhalation exposures to dust during cleaning tasks.

A short spell of cleaning can contribute more to a worker's daily dust exposure than several hours of production activity

Barriers (?)

Heavy items cannot be vacuumed

Manufacturer's instruction to clean machinery with compressed air

Electric cable to vacuum didn't reach end of room

Expense of vacuum cleaners

Vacuum cleaning is time consuming

Water supply and drainage not arranged

Brooms are removed – but
keep coming back !

Vacuum cleaner broken

No electricity

Electrical equipment- no wet cleaning possible

Frequently, the failure to adopt low dust cleaning techniques appears to be due to a failure to adequately consider the exposure risk, rather than genuine technical barriers.

The right kit



RPE use...



Case study - brickmaking



RCS exposure 0.83 mg/m^3 (70 minutes) - enough to exceed 8 hour TWA WEL

Cleaning contributed 45 % of daily dose – no RPE !

BK5

**COSHH essentials
in brick and tile
making: Silica**

Manual de hacking and batching

Control approach R

Respiratory protective equipment (RPE)

Cleaning and housekeeping

- ✓ Clean the machinery and workroom at least once a week.
- ✓ Use procedural controls (eg lock-off) before cleaning.
- ✓ Use a Type H vacuum cleaner fitted with a HEPA filter to clear up dust eg. on overhead fittings.

Caution: Don't clean up with a brush or compressed air.

Case study – waste and recycling

Inhalable Dust Assessment – materials recycling facility

	Number of measurements	Number > 10 mg/m ³	Mean Exposure (mg/m ³)
HSE 2010	17	5	7.1
Company 2011	6	0	1.2
HSE 2014	15	6	13.2

Company assessment didn't include end of shift clean down

Company assessment under estimates risk

Task specific dust exposures at other plants > 100 mg/m³ during cleaning

Conclusion



Better implementation of the hierarchy of control would reduce the need for cleaning

Conclusion



There is potential to significantly reduce respiratory health risk in construction and manufacturing by better adoption of good practice for cleaning dust from production areas.

Thanks for listening...



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