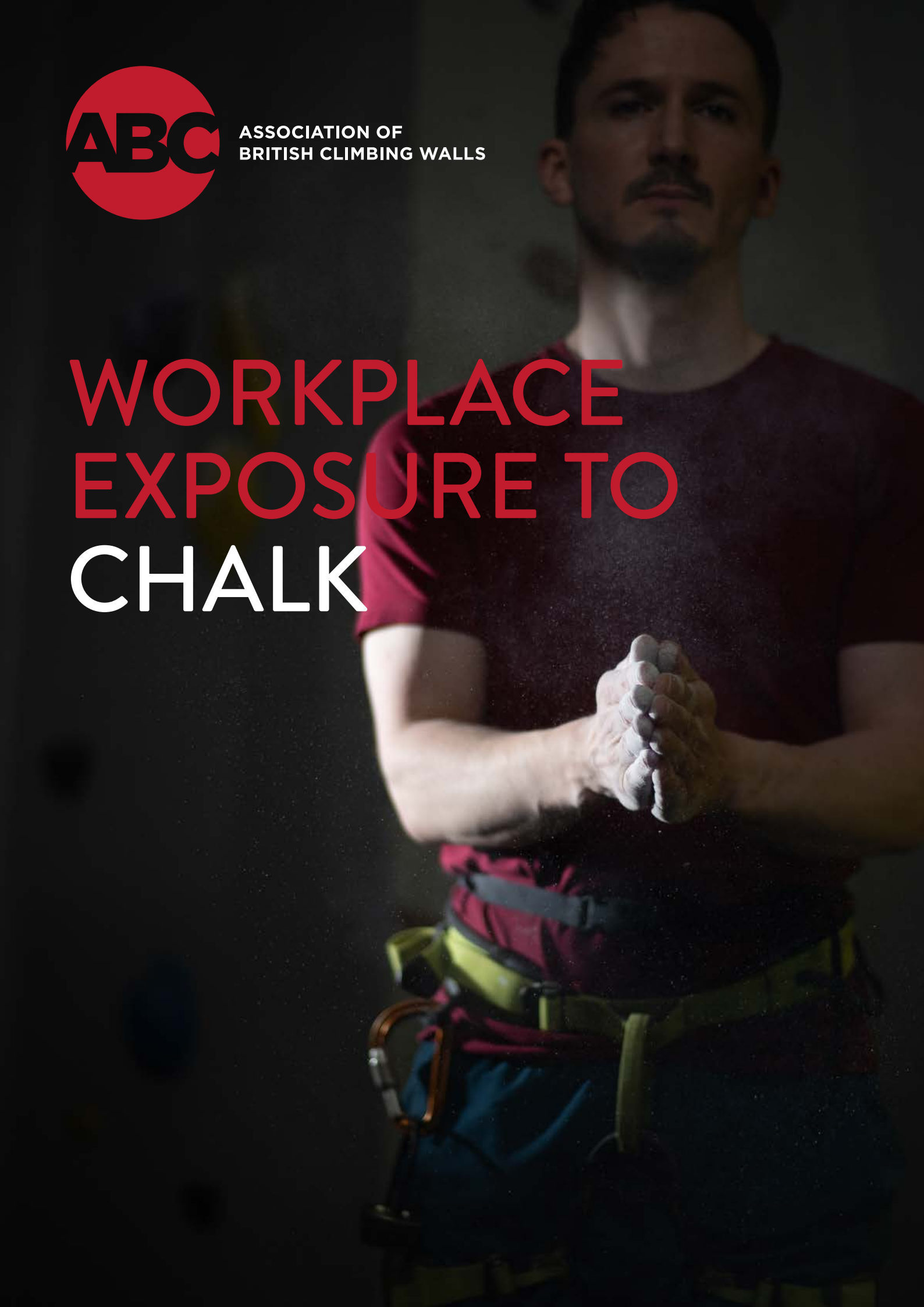
ASSOCIATION OF
BRITISH CLIMBING WALLS

WORKPLACE EXPOSURE TO CHALK

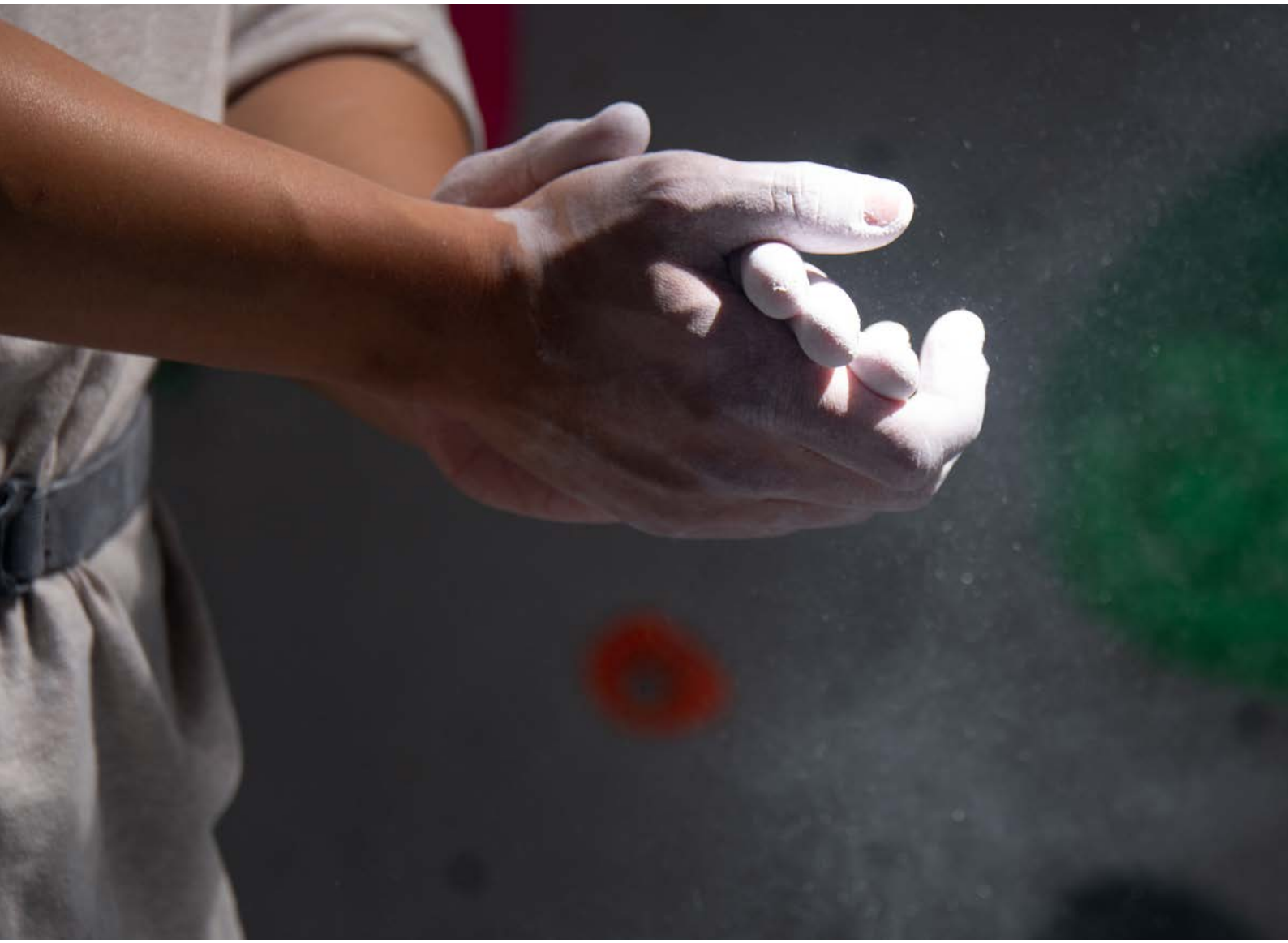


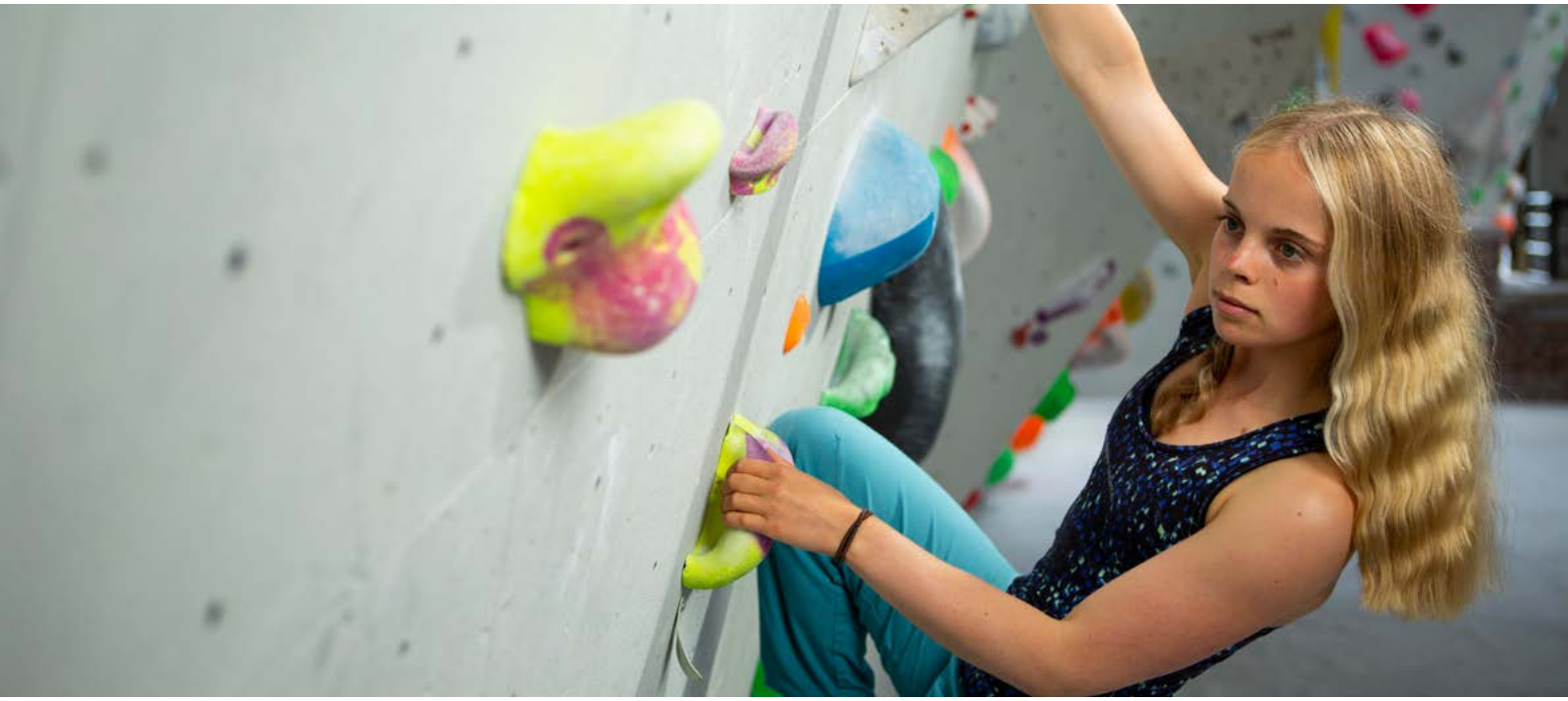
INTRODUCTION

The ABC's commitment to promoting the professionalism, safety, growth and diversity of indoor climbing considers all areas of the indoor climbing experience for both customers and staff. In this document we would like to address the issue of chalk exposure in the climbing wall environment which is particularly relevant for staff wellbeing.

There is relatively little data in this area but indications from some climbing walls are that inhalable chalk levels are higher than the HSE limits. There are many site specific factors at play, but here we intend to set out some introductory information and mitigating strategies to improve indoor air quality for everyone.

SOME INTRODUCTORY INFORMATION AND MITIGATING STRATEGIES TO IMPROVE INDOOR AIR QUALITY FOR EVERYONE.





HEALTH AND SAFETY EXECUTIVE (HSE) LIMITS

Magnesium carbonate is the main component of loose chalk which creates dust in the air. It originates from the mineral magnesite, primarily found in limestone deposits. The HSE's workplace exposure limits guidance (4th Edition 2020) sets out acceptable limits for Magnesite (MGCO3) in the air.

Magnesium Carbonate (Magnesite)	CAS number	Long-term exposure limit (8-hr TWA* reference period)
Inhalable dust	546–93–0	10 mg/m3
Respirable dust	546–93–0	4 mg/m3

*Time Weighted Average

Inhalable

This approximates to the fraction of airborne material that enters the nose and mouth during breathing, and is therefore available for deposition anywhere in the respiratory tract.

Respirable

This is the inhaled airborne material that penetrates to the lower gas exchange region of the lung.

CHALK EXPOSURE IN THE CLIMBING WALL ENVIRONMENT IS PARTICULARLY RELEVANT FOR STAFF WELLBEING

CONTROLS

There are three basic strategies to improve indoor air quality:

1. Ventilation Improvements: to remove or dilute indoor airborne pollutants

- Better ventilation (open doors/ windows)
- More frequent changeover of air (e.g. using extractor fans)

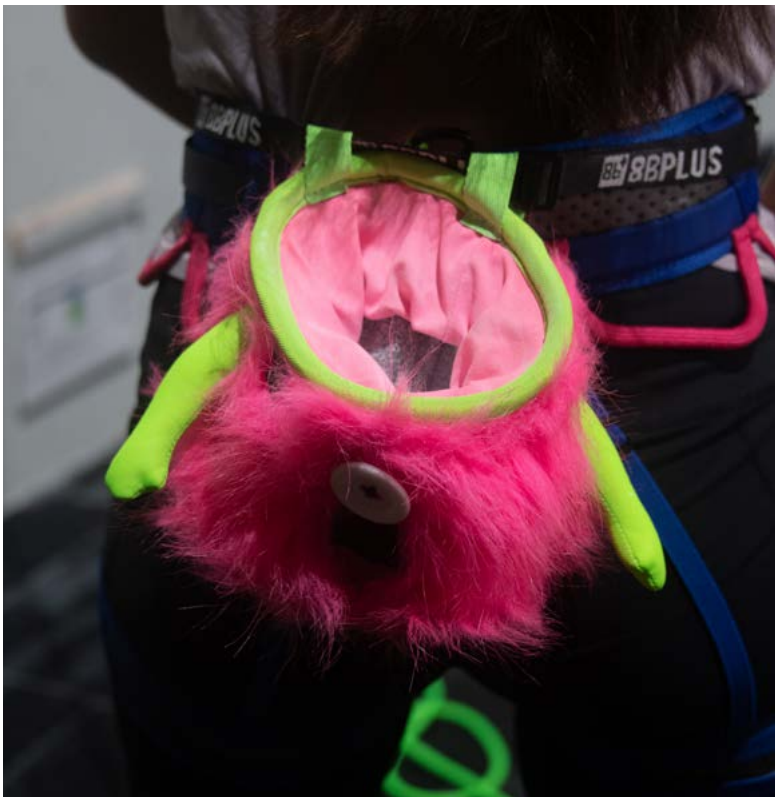
2. Source Control: to eliminate individual sources of particulate matter (PM) or reduce their emissions

- Better and more frequent cleaning of climbing surfaces and communal areas
- Consider encouraging the use of liquid chalk but support climbers in its proper use (ie. ensure the chalk is dry on hands before commencing climbing)
- Some walls have banned the use of loose chalk and have seen an anecdotal improvement in air quality. This is supported by a 2012 study on the air borne concentrations of multiple types of chalk which found that:
  - Chalk balls, pressed and powdered chalk lead to airborne chalk particles
  - Ethanol based liquid chalk also contains Magnesium Carbonate but coats the hands directly, leaves little residue and needs less frequent re-application than loose chalk
  - Lliquid chalk led to the same low mass concentrations of airborne chalk particles as banning chalk entirely

3. Air purification:

- Air purification units are commercially available, however, many are designed for lower ceiling heights and office type spaces so it is important to thoroughly investigate their capabilities in relation to total cubic meterage etc.
- You could consider heat exchange ventilation powered by a supply and extract fan which can reduce building heat loss

LIQUID CHALK LED TO THE SAME CONCENTRATIONS OF AIRBORNE CHALK PARTICLES AS BANNING CHALK ENTIRELY



MEASUREMENT

If there are any concerns about air quality, operators can take measures to monitor and understand levels of chalk dust around the centre at different times and locations.

A full description of the collection of inhalable, thoracic and respirable aerosol fractions in the air for the purpose of monitoring workplace exposure can be found in HSE's MDHS 14/4 guidance here.

Meters that will provide particulate level measurements can readily be purchased, but it is unlikely that they will give readings in compliance with HSE's 14/4 guidance. Specialist equipment is required and it is possible to contract an Occupational Hygiene Consultant to conduct a survey, validate and contextualise the results and highlight the need for any action and where it should be taken.

Qualified hygienists can be found on the consultants register on the British Occupational Hygiene website.

Reviewed by Graham Matthews, Occupational Hygienist, GKS Environmental Limited

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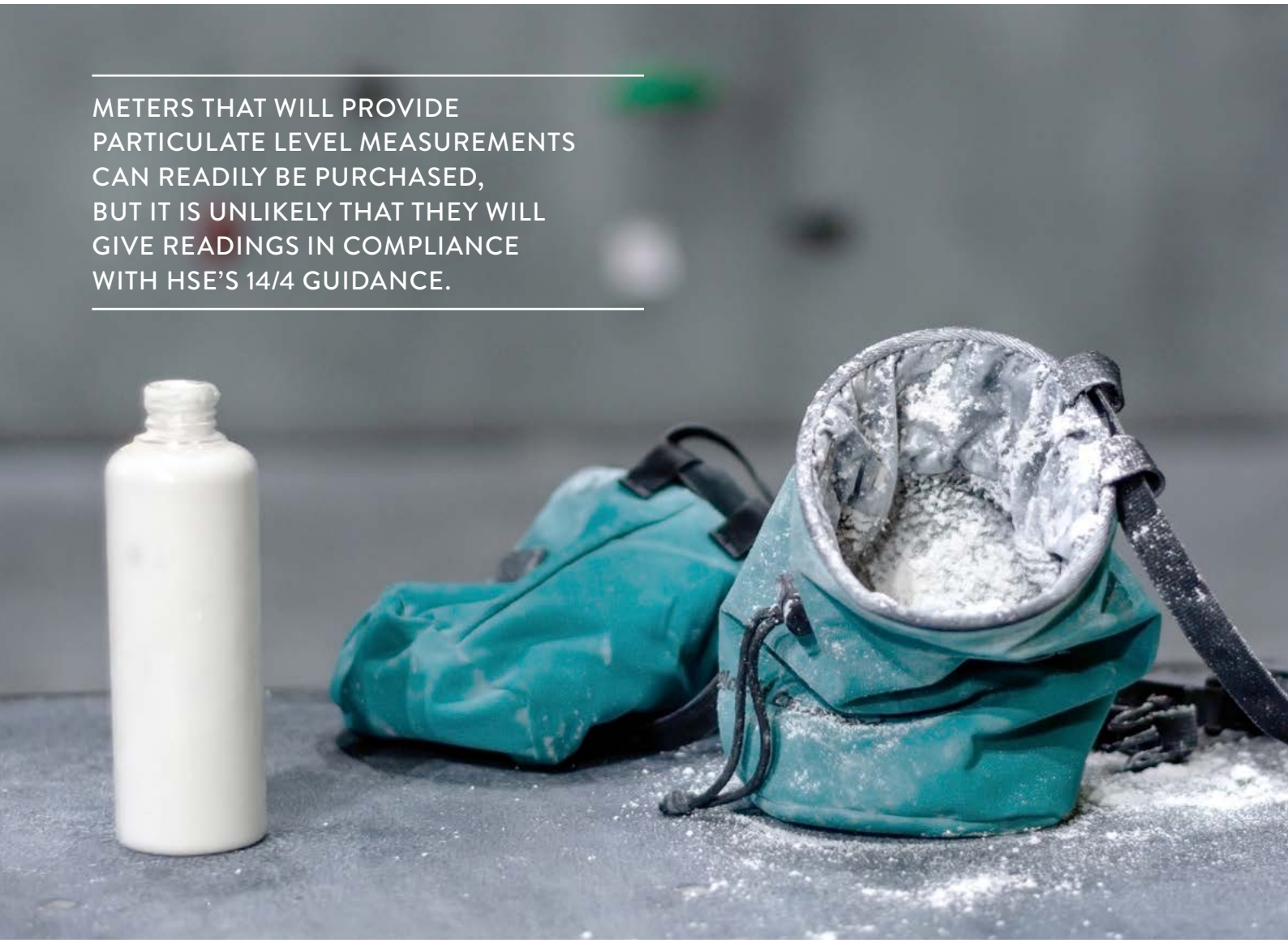

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