

Specialist Plant Operative

HAZARDS AND RISKS

Specialist plant operatives using excavators, bulldozers, graders, loaders, dumper trucks and piling/drilling machinery etc. to carry out demolition, excavate or move construction materials and waste about site can be exposed to many different harmful substances.

Dusts

Dust is generated when moving materials around construction sites, as well as during piling and drilling operations. Dust inside the driver cabs can dry out and become airborne when disturbed. The risk may be greater on derelict or contaminated land sites where hazardous substances such as asbestos, silica, toxic metals and organic matter, such as animal droppings, may be present.

Gases, fumes and vapours

Operation of plant and machinery can result in exposure to high levels of diesel engine exhaust emissions (DEEEs), particularly in confined spaces. Gases and vapours may arise where work involves disturbance of sludges. Work in confined spaces such as drainage or sewer structures (particularly on derelict sites) might also result in exposure to gases such as hydrogen sulphide.

Risks to health

Breathing in these hazardous dusts, gases and vapours can cause serious, debilitating, irreversible, life-limiting, and, in some cases, fatal illnesses, which include lung cancer, pulmonary fibrosis (eg. asbestosis/silicosis), asthma, pulmonary oedema and chronic obstructive pulmonary disease (COPD). DEEEs contain a complex mix of gaseous components and particulates. DEEEs may cause respiratory tract irritation and have also been linked to long term increased risk of lung cancer.

CONTROL OPTIONS

Control measures

silica dust

As there are so many airborne pollutants to which a plant operator may be exposed, it is vitally important that chemical risk assessments are completed for all activities to identify the significant risks and appropriate control measures. The findings should be communicated to ensure that they are understood by any worker who may assist with the chemical risk assessment, to help to identify exposures to hazardous substances, advise on the level of exposure risk and select the appropriate control measures – particularly where work is carried out on contaminated land or derelict sites. These measures should be task specific, and developed following a hierarchy of control which should start with preventative measures, followed by engineering controls and working methods and then consider PPE as a last resort.

Elimination/prevention

- In general, plan work so that operatives are located away from plant or tasks that generate dust; remote operation of plant is preferable.

DEEEs

- Substitute diesel plant for safer alternative eg. electric motors.
- Warm up diesel engines outside before entering confined areas, and do not leave engines idling.
- Ensure good engine maintenance.
- Fit catalysts/particulate traps to vehicle exhausts.

Engineering controls

Dusts

Rock drills, piling rigs etc. should feature integrated water dust suppression systems. Local exhaust ventilation (LEV) should be used to extract airborne dust before it can be breathed in. The most effective types of LEV are generally those that are integrated into plant.

General

- Use exhaust extraction to remove fumes to a safe place outside.
- Ventilated, closed cabs are one of the most effective measures for lowering exposures.

Safe working methods

DEEEs

- All working areas must be well ventilated, particularly where diesel plant or internal combustion engines (e.g.; on compressors or generators) operate.

PPE

PPE should be a last resort control measure as it has to be worn properly all of the time, and it does not "fail safe". It needs to be carefully selected to ensure it provides adequate

protection. Tight fitting respiratory protective equipment (RPE) must be face fit tested to ensure that it affords the anticipated level of protection for each individual.

Dust

- Minimise the height through which deposited materials fall to reduce the dustiness of a job – particularly during windy conditions.
- Apply water to cutting/drilling work, and on dusty thoroughfares over which vehicles travel.
- Dustless cleaning techniques such as vacuuming of cabs and wet cleaning of plant should be used; avoid using compressed air to clean dust from plant or personal work-wear.
- A high standard of internal cab cleanliness is important to prevent accumulation of dust which can be breathed in when disturbed. During work on contaminated sites, entry to and from a cab may need to be restricted to a "clean" zone to prevent contamination. Seats should feature an impermeable cover to prevent dust penetration and facilitate cleaning.

MANAGING THE RISK

Training & communication, supervision, maintenance & testing of controls and air

monitoring* are all vital aspects of managing the risk, in addition to health surveillance which can be a requirement in certain circumstances.

Air monitoring*

Air monitoring is a specialist activity. It may be needed as part of a chemical risk assessment, as a periodic check on control effectiveness and to assess compliance with relevant OELV's, or where there has been a failure in a control (for example if a worker reports respiratory symptoms). A qualified Occupational Hygienist can ensure it is carried out in a way that provides meaningful and helpful results.

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OCCUPATIONAL EXPOSURE LIMIT VALUES (OELVs) & EXPOSURE LEVELS

Agent or substance	Control/Exposure Limit	Exposure Levels
Asbestos	0.1 asbestos fibres per millilitre of air (0.1 cm ³) - eight hour reference period.	The aim should be to avoid any exposure. There is a high risk of exposure from particular ACMs, including sprayed asbestos coatings and asbestos insulation, which may be disturbed by workers when demolishing or renovating buildings built before 2000. An asbestos survey must be completed by a qualified independent Asbestos consultant prior to any construction work taking place
Respirable crystalline silica (RCS)	0.1 mg/m ³ (8 hour reference period).	
Hydrogen sulphide (H ₂ S)	5 ppm (8 10 ppm short term exposure limit - STEL)	
Construction Dust		These levels are not workplace exposure limit but the level at which the dust becomes defined as a 'hazardous substance' and so it subject to the chemical regulations . This does not apply to substances listed in Table 3.2 of part 3 of Annex VI of the CLP Regulation, substances specified with an indication of danger e.g. very toxic, toxic, harmful, corrosive or irritant
DEEEs		An overall OELV is not set for DEEE. Although the European Commission is considering 0.05 mg/m ³ for elemental carbon which represents the particulate fraction or 'soot' component of DEEE which is thought to link to the ill-health effects due to PAH absorption onto the soot). The OELV for gaseous substances are as follows: carbon monoxide 20 ppm 8hr-TWA and 100 ppm 15- min STEL, nitrogen monoxide 2 ppm (8hr-reference period), nitrogen dioxide 0.5 ppm 8hr-TWA and 1 ppm 15-min STEL.

Further information

Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006 (S.I. No. 386 of 2006)

- Safety, Health and Welfare at Work (Exposure to Asbestos) (Amendment) Regulation 2010 (S.I. No. 589/2010)
- Chemicals and Hazardous Substances: https://www.hsa.ie/eng/publications_and_forms/publications/chemical_and_hazardous_substances/
- The Safety, Health and Welfare at Work (Quarries) Regulations, 2008, (S.I. 28 of 2008)
- https://www.hsa.ie/eng/topics/biological_agents/laboratories_higher_risk_activities/health_surveillance/

