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Preventing Dust Hazards in the Public Works Sector

25 July 2016



This “Dust Hazard Prevention” guide is a work in progress, intended to reflect:

- On the one hand, the results of exposure measurements, based on which the collective protection measures will be reinforced or modified proportionally to actual risks;
 - Developments of scientific knowledge on Elongated Mineral Particles (EMP);
 - The outcome of the supplementary request submitted to ANSES¹ and the consequent recommendations of administrative bodies; and
- On the other hand, the European-level regulations on HCA and/or CMR, particularly silica, and their transposition into the French regulatory system.

¹ In April 2016, the Directorates-General of the Ministry of Labour (DGT), Ministry of Health (DGS) and Ministry of the Environment (DGPR) submitted a supplementary request to ANSES to:

- Conduct a sector-wide study intended to collect data on aggregate uses involving the presence of EMPs and document potential exposure;
- Perform a review of available data on the presence of EMPs in materials, EMP emissions from such materials and exposure hazards;
- Develop a protocol for measuring EMP present in the air and in materials.
- Perform a feasibility study for a campaign of measurements focusing on EMP.

The results of the work carried out by ANSES are expected to become available in 2017.

Introduction

The operations carried out at public works sites may cause the emission of dusts containing very fine, hardly visible particle fractions, some of which may pose risks to employees. Such particles may be dangerous to health, especially in the case of emissions of crystalline silica particles or asbestos fibres.

In 2013, professional associations in partnership with Occupational Health and Safety bodies developed prevention guides which, among others, also addressed risks related to crystalline silica or asbestos fibres.

<http://www.usirf.com/les-actions-de-la-profession/prevention-des-risques-professionnels-dans-les-travaux-routiers/>

<http://travail-emploi.gouv.fr/sante-au-travail/outils-et-guides/article/prevention-des-risques-professionnels-lors-de-travaux-routiers>

The update of the “asbestos” section of these guides will soon be initiated.

The professional and contractors’ associations are engaged in a systematic approach of comprehensive prevention of dust emissions during works (apart from regulated asbestos, irrespective of origin) and, in this context, have initiated a new document on the prevention of dust risks. This document was developed together with the Organisation for Prevention of Occupational Hazards in the Construction Industry (OPP-BTP) and in association with the Directorate General of Labour (DGT). It is written in a guide format, to enable companies to integrate the “Dust Hazards” section into their Unique Document of Risk Assessment.

It includes the recommendations of the Directorate General of Labour on preventive measures (Note 14-906 of 12 December 2014) relating to actinolite and cleavage fragments (application of the general principles of prevention: lowering dust levels to the lowest levels that are technically feasible using wetting methods, managing residual risks by wearing appropriate PPE, etc.).

The range of collective protection measures recommended for contractor employees at construction sites also cover the protection of residents in the vicinity of work sites.

Scope of this guide:

At the moment, the scope of the “Dust Hazards” guide relates to pavement and primarily to bituminous materials, irrespective of the occupations participating in the pavement work. Accordingly, it targets all the players involved in work relating to pavement surfacing layers.

Types of dust within the scope of this guide:

- i. Inhalable dust
- ii. Crystalline silica dust
- iii. Non-asbestiform EMPs, including tremolite and actinolite cleavage fragments (refer to DGT Note 14-906 of 12 December 2014)

Processes covered by the guide:

This guide describes the general organisation steps and the recommended collective preventive measures that should be implemented during road surfacing work to minimise or even eliminate the generation of dust in suspension. It also discusses the recommended personal protective equipment (PPE) for residual risk of dust emission.

The targeted operations are:

- Milling/planing
- Sawing
- Chipping
- Crust clearing
- Core drilling

SHEET 1 - MILLING / PLANING

Scope of activities: this sheet describes the recommended preventive measures to implement during pavement planing operations. A distinction should be made between planers of less than one metre in size from larger planers. The sheet also covers sweeping after the milling operations.



General setup measures for any type of machinery:

- Perform risk assessment based on data provided by the ordering party or the network administrator on the composition of the road surfacing.
- Give precedence to the use of techniques that generate the least possible amount of dust.
- Adopt a work setup that minimises the number of employees exposed to dust as well as the duration of exposure.
- Arrange the workstations so as to position operators as far as possible from sources of dust.
- Reduce the dwell time in the immediate vicinity of the planer.
- Keep the driver's workstation clean (do not use blow guns).
- Organise cleaning of non-disposable personal protective equipment (PPE).
- Perform preventive maintenance of machines to ensure:
 - ✓ The integrity of the milling compartment;
 - ✓ The proper functioning of the suction unit, if existing;
 - ✓ Maintaining the cover of the receiving and discharge belts in good condition, if installed;
 - ✓ The proper functioning of the sprinkling systems of the milling unit and of the conveyor belts, if existing.
- Particular attention shall be given to the cleanliness of the work clothing.

1-1 PLANERS OF LESS THAN ONE METRE:

Collective protective measures

- Systematic work using wet methods by sprinkling the milling drum (the sprinkling primarily serves for cooling the tool).
- Keeping lorry traffic lanes wet in planed areas
- This type of planers cannot be outfitted with VCS devices (suction of fines). Within the collective preventive measures, it is recommended to:
 - ✓ Give priority to the use of integrated misting and spraying means, when they exist and are available.
 - As a first step, a misting system should be set up at the top of the discharge belt;
 - If possible, in a second phase, a misting boom should be installed along the entire belt,
 - In the event of belt replacement, or when purchasing new equipment, the installation of a belt shroud should be requested,
 - ✓ Failing this, an additional misting or spraying system should be planned to make the dust settle during the dust-generating phases.

Personal protective measures

The need for wearing personal anti-dust respiratory protective equipment shall be determined based on assessment of the specific risks at each site (duration of operations, dust level, amount of physical effort involved, temperature, etc.).

In case of a need for PPE, the driver shall be equipped with a respiratory protective device (RPD). It is recommended to provide a full-face, TM3P-type assisted ventilation respirator or equivalent.

The upcoming performance of measurements of dust amounts at the relevant workstation will enable adapting the currently recommended preventive device to the actual risk, particularly in the choice of PPE (particularly RPD).

1-2 PLANERS OF MORE THAN ONE METRE:

1-2-1 Planers outfitted with VCS

Collective protective measures

The main steps to mitigate dust emission at a planing site are:

- Systematic work using wet methods by sprinkling the milling drum (the sprinkling primarily serves for cooling the tool).
- Installing skirting around the milling area, to be provided by the machine manufacturer.
- Using machines outfitted with a dust suction device in the milling area, which enables a significant decrease of operator exposure.
- Installing shrouding of the discharge conveyor belt of milled material whenever possible.
- Keeping lorry traffic lanes wet in planed areas.

Personal protective measures

The presence of a VCS device in addition to the collective **protection** measures identified above can significantly lower dust amounts.

The upcoming performance of measurements of dust amounts at the relevant workstation will enable validating this assumption and adapting the currently recommended preventive device to the actual risk, possibly recommending the use of suitable PPEs (particularly RPD).

1-2-2 Planers not outfitted with VCS

Collective protective measures

- Systematic work using wet methods by sprinkling the milling drum (the sprinkling primarily serves for cooling the tool).
- Keeping lorry traffic lanes wet in planed areas,
- In addition, it is recommended to:
 - ✓ Give priority to the use of integrated misting and spraying means, when they exist and are available.
 - As a first step, a misting system should be set up at the top of the discharge belt;
 - If possible, in a second phase, a misting boom should be installed along the entire belt,
 - In the event of belt replacement, or when purchasing new equipment, the installation of a belt shroud should be requested,

- ✓ Failing this, an additional misting or spraying system should be planned to make the dust settle during the dust-generating phases.

Personal protective measures

The need for wearing personal anti-dust respiratory protective equipment shall be determined based on assessment of the specific risks at each site (duration of operations, dust level, amount of physical effort involved, temperature, etc.).

If, based on risk assessment, wearing of PPE is necessary, the driver shall be equipped with a respiratory protective device (RPD). It is recommended to provide a full-face, TM3P-type assisted ventilation respirator, or equivalent.

The upcoming performance of measurements of dust amounts at the relevant workstation will enable adapting the currently recommended preventive device to the actual risk, particularly in the choice of PPE (particularly RPD).

When making new purchases of equipment, it is recommended to invest in equipment outfitted with a VCS system.

SWEEPING AFTER PLANING

Within the collective protection measures, it is recommended to perform:

- On the first passage of the road sweeper: misting
- On the second passage: wash using a high pressure spray boom
- On the third passage: misting

In addition, cabins and windows must be kept closed during sweeping operations.

General recommendations for cabin-type road equipment:

- Particular attention must be devoted to the maintenance and cleaning of vehicle cabins. In fact, in addition to compliance with the window closing instructions, the maintenance of the door seals, air-conditioner filters and the general state of cleanliness must be monitored by the company to prevent “internal” and “external” secondary contamination.

SHEET 2 - SAWING

The scope of this sheet: pavement and curbs.

The equipment covered by this sheet includes floor cutters, thermal chainsaws and cylinder saws.

General setup measures for any type of equipment:

- Perform risk assessment based on data provided by the ordering party or the network administrator on the composition of the road surfacing.
- Dry sawing should be prohibited.
- Give precedence to the use of techniques that generate the least possible amount of dust.
- Adopt a work setup that minimises the number of employees exposed to dust as well as the duration of exposure.
- Arrange the workstations so as to position operators as far as possible from sources of dust.
- Reduce the dwell time in the immediate vicinity of the equipment.
- Organise cleaning of non-disposable personal protective equipment (PPE).
- Keep the machines well maintained to ensure the proper functioning of the water supply mechanism, when existing.
- Particular attention shall be given to the cleanliness of the work clothing.

2-1 FLOOR CUTTER



Collective protective measures

This equipment is operated using wet methods (flowing water is needed to cool the disc).

Personal protective measures

The need for wearing personal anti-dust respiratory protective equipment shall be determined based on assessment of the specific risks at each site (duration of operations, dust level, amount of physical effort involved, temperature, etc.).

2-2 THERMAL CHAINSAW

Collective protective measures

This equipment requires a water tank or connection to an external supply network.



Personal protective measures

The need for wearing personal anti-dust respiratory protective equipment shall be determined based on assessment of the specific risks at each site (duration of operations, dust level, amount of physical effort involved, temperature, etc.).

If, based on the risk assessment, wearing of an RPD device is necessary, it is recommended to use an FFP3-type respirator or equivalent for non-recurrent operations (<15 minutes) involving a low level of dustiness. The recommended prevention device will be selected based on supplementary dust measurements.

2-3 CYLINDER SAW (manhole cutter for utility lines)



Collective protective measures

This equipment requires a water supply.

Personal protective measures

The need for wearing personal anti-dust respiratory protective equipment shall be determined based on assessment of the specific risks at each site (duration of operations, dust level, amount of physical effort involved, temperature, etc.).

General recommendations for cabin-type road equipment:

- Particular attention must be devoted to the maintenance and cleaning of vehicle cabins. In fact, in addition to compliance with the window closing instructions, the maintenance of the door seals, air-conditioner filters and the general state of cleanliness must be monitored by the company to prevent “internal” and “external” secondary contamination.

SHEET 3 - CHIPPING

This sheet covers two types of equipment: the jackhammer and the hydraulic rock breaker (HRB).

General setup measures for any type of equipment:

- Perform risk assessment based on data provided by the ordering party or the network administrator on the composition of the road surfacing.
- Give precedence to the use of techniques that generate the least possible amount of dust.
- Adopt a work setup that minimises the number of employees exposed to dust as well as the duration of exposure.
- Arrange the workstations so as to position operators as far as possible from sources of dust.
- Reduce the dwell time in the immediate vicinity of the equipment.
- Organise cleaning of non-disposable personal protective equipment (PPE).
- Keep the machines well maintained to preserve the proper functioning of the sprinkling system, when existing.
- Give priority to the use of integrated misting and spraying means, when they exist and are available. Failing this, an additional misting or spraying system should be planned to make the dust settle during the dust-generating phases.
- Particular attention shall be given to the cleanliness of the work clothing.

3-1 JACKHAMMER

General setup measures: Whenever possible, priority should be given to other operating methods, such as sawing under water. This type of equipment is used for non-recurrent operations of limited duration.

Collective protective measures

This equipment may be used with a mobile misting device.

Personal protective measures

The need for wearing personal anti-dust respiratory protective equipment shall be determined based on assessment of the specific risks at each site (duration of operations, dust level, amount of physical effort involved, temperature, etc.).

If, based on the risk assessment, wearing of an RPD device is necessary, it is recommended to use an FFP3-type respirator or equivalent for non-recurrent operations (<15 minutes) involving a low level of dustiness. The recommended **protection** device will be selected based on supplementary dust measurements.

3-2 HRB

Collective protective measures

Depending on the environment, this type of equipment may be outfitted with a misting device. The cabin must be closed. The use of an HRB does not require an operator on foot.

Personal protective measures

The need for wearing personal anti-dust respiratory protective equipment shall be determined based on assessment of the specific risks at each site (duration of operations, dust level, amount of physical effort involved, temperature, etc.).

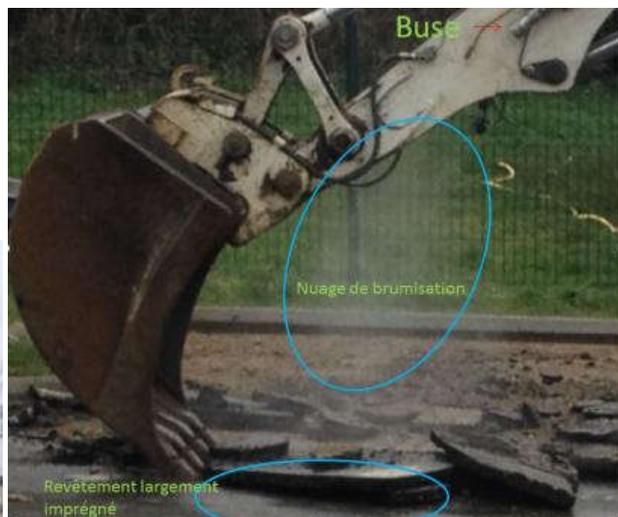
General recommendations for road equipment with cabin:

- Particular attention must be devoted to the maintenance and cleaning of vehicle cabins. In fact, in addition to compliance with the window closing instructions, the maintenance of the door seals, air-conditioner filters and the general state of cleanliness must be monitored by the company to prevent “internal” and “external” secondary contamination.

SHEET 4 - CRUST CLEARING

General setup measures for any type of equipment:

- Perform risk assessment based on data provided by the ordering party or the network administrator on the composition of the road surfacing.
- Give precedence to the use of techniques that generate the least possible amount of dust.
- Adopt a work setup that minimises the number of employees exposed to dust as well as the duration of exposure.
- Arrange the workstations so as to position operators as far as possible from sources of dust.
- Reduce the dwell time in the immediate vicinity of the equipment.
- Organise cleaning of non-disposable personal protective equipment (PPE).
- Give priority to the use of integrated misting and spraying means, when they exist and are available.
- Otherwise:
 - If possible, the crust clearing shovel should be outfitted with a misting system (tank installed on the cabin roof, a pump and two nozzles, one of each side of the arm).



- Failing this, provide an additional misting or spraying system to settle the dust during the dust-generating phases.
- Keep the machines well maintained to preserve the proper functioning of the sprinkling system, when existing.
- Particular attention shall be given to the cleanliness of the work clothing.

Collective protective measures

Depending on the environment, this type of equipment may be outfitted with a misting device. The cabin must be closed. Using a shovel does not require an operator on foot.

Personal protective measures

The need for wearing personal anti-dust respiratory protective equipment shall be determined based on assessment of the specific risks at each site (duration of operations, dust level, amount of physical effort involved, temperature, etc.).

General recommendations for cabin-type road equipment:

- Particular attention must be devoted to the maintenance and cleaning of vehicle cabins. In fact, in addition to compliance with the window closing instructions, the maintenance of the door seals, air-conditioner filters and the general state of cleanliness must be monitored by the company to prevent “internal” and “external” secondary contamination.

SHEET 5 - CORE DRILLING

Collective protective measures

Core drilling must always be performed under water. The core cutter may be surrounded by an anti-splatter shield.

Personal protective measures

The results of measurements made available to professional bodies have highlighted the effective control of dust trapped at the source (no dust detected at operator level on sites).