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 AFQ Inspectors
 Specialist Group Inspectors (Medical, Occ Hyg)

MEL FOR FLOUR DUST

This minute provides information for inspectors on a new MEL for flour dust and action required on flour dust control, flour dust monitoring and health surveillance at routine visits. The information in this minute reflects an interim position and it may be reissued as more information becomes available on short term dust exposure during routine bakery tasks.

EXPOSURE TO FLOUR DUST

1 Exposure to flour dust occurs across a range of food industries. In the UK flour is predominantly produced from wheat grain in the milling process. There are currently less than 70 mills in the UK, employing under 4000 people. Many mills are small, each employing between one and 24 people but there are a few large mills which employ just over 100 people.

2 Milled flour is supplied in powder form to a range of baking establishments in bulk by road tanker (into storage silos) and/or bags (32kg) and various lesser weights. Baking establishments vary in size and sophistication. There are about 4,500 small craft bakeries, each employing typically between 5 and 25 people; 350 medium sized bakeries each employing typically between 25 and 100 people; and, 150 large plant bakeries each employing more than 100 people. Additionally there are restaurants with their own bakeries, specialist pizza restaurants and other catering establishments.

3 Flour dust is a hazardous substance as defined under the Control of Substances Hazardous to Health (COSHH) Regulations 1999. It is a respiratory sensitiser and is known to cause allergic rhinitis and occupational asthma. Flour dust is also an irritant and may give rise to short term respiratory, nasal and eye symptoms. It may provoke an asthmatic attack in individuals with pre-existing disease and lead to chronic bronchitis.

MEL (8-HR TWA AND STEL)

4 The new MEL for flour dust applies to flour which has the following definition:

'Flour dust is taken to be the finely ground particles of cereals or pulses (including contaminants) which result from any grinding process and from any subsequent handling and use of that 'flour'. Any additives (eg flour improvers) are included in this definition only after they have been added to the final product mix.'

5 The MEL has been set at 10mg/m³ (8-hr TWA) with a Short Term Exposure Limit (STEL) of 30mg/m³ (15 minute reference period). The MEL is a stronger requirement than the industry agreement to 'reduce exposure to dust to below 10mg/m³ as far as reasonably practicable', which would permit exposure above 10mg/m³ if it was not reasonably practicable to get below it. Flour dust has also been given a 'sen' notation indicating that it is a recognised respiratory sensitiser.

6 The review of flour dust began in the early 1990s as a result of findings from the Surveillance of Work related and Occupational Respiratory Disease (SWORD) scheme and an HSE survey of Scottish bakeries which showed that bakery workers suffered widespread occupational ill health related to significant levels of flour dust exposure. In carrying out the review of flour dust, HSE has sought the cooperation of industry and has received comments regarding industry's concerns at various stages. Some sectors of the flour producing and flour using industries have consistently opposed a MEL and believe that an OES would have been more appropriate. However, the Advisory Committee on Toxic Substances has agreed that based on current scientific knowledge, there is no robust threshold of effect or safe level of airborne exposure for flour dust and hence the criteria for a MEL are met. Some sectors of the industry believe that flour improvers such as Fungal Alpha Amylase (FAA) and/or Bacterial Alpha Amylase (BAA) which are used in bread production are the main culprit in baker's asthma. A review of both fungal and bacterial alpha amylase is currently underway and separate MEL proposals are likely.

GUIDANCE

7 The Health and Safety in Bakeries Liaison Committee (HSBLC), which consists of representatives from all the relevant trade associations and unions together with HSE produced the publication *Guidance on dust control and health surveillance in bakeries* in 1999 which is a revision of earlier guidance. This guidance gives more comprehensive information on improving working practices to prevent dust becoming airborne; health surveillance is also covered. [SIM 1/1999/52](#) gives information on this guidance. The guidance may be revised in the future to incorporate changes brought about by the MEL. There is also an interactive training package entitled "Breathe Easy" which includes a copy of the guidance, training notes and a video illustrating the control measures specified in the guidance. The complete training package (including the publication) was distributed to office libraries in 1999. Inspectors are asked to promote this guidance and/or the package (£34.99 plus VAT) in bakeries.

CONTROL OF FLOUR DUST

8 The MEL for flour dust has been set at 10mg/m³ (8-hr TWA) with a STEL of 30mg/m³ (15 minute reference period). To comply with the COSHH 1999 Regs exposure should be reduced as far below the MEL as is reasonably practicable and should not exceed: 10mg/m³ when averaged over any 8 hour period; or, 30mg/m³ when averaged over any 15 minute period. The STEL is relevant to controlling short term peak exposures and is likely to be an important factor in reducing occupational asthma. The short term MEL should never be exceeded.

9 The setting of a short term limit is a recognition that brief peak exposures alone may lead to sensitisation and that the magnitude of peaks will have to be restricted. The control strategy adopted should address elimination of short term peaks as well as considering general control throughout the work shift.

ACTIVITIES WHERE THE MEL (8-HR TWA AND STEL) MAY BE EXCEEDED

MEL (8-hr TWA)

10 In automated milling plants and bakeries, good engineering control will generally control dust within acceptable limits; jobs requiring manual input are infrequent. However, workers in small bakeries frequently carry out a variety of jobs and will be exposed to variable concentrations of flour dust in air throughout a shift. The following tasks (carried out without precautions) are known to cause high dust levels whether carried out in plant or craft bakeries:

- bag slitting and tipping;
- sieving and weighing;
- mixing,
- work at dough brakes;
- hand dividing and moulding;
- work at roll plants;
- dry sweeping with brush or compressed air cleaning.

11 If workers spend the majority of their working day at any one or more of these jobs then the MEL (8-hour TWA) is likely to be exceeded. Examples of total dust levels (8-hour TWA) for individual jobs in small bakeries are given in the HSBLC guidance, Table 2. These give an indication of which are the most dusty tasks.

STEL

12 Examples of activities (if carried out without precautions) which cause high levels of dust and are likely to exceed the STEL:

- dry sweeping with a brush
- cleaning up of large spillage
- use of compressed air for cleaning
- disposal of empty bags
- sieving

CONTROL OF EXPOSURE

13 Reasonably practicable measures are given in the HSBLC guidance, chapter 3. These measures can be divided into 2 categories:

- (1) precautions involving changes to working practices and;
- (2) precautions involving changes to plant and equipment.

14 Priority should be given to preventing exposure. Substitution is not practicable because

flour is the key ingredient in the product. In practical terms, the prevention of dust generation is the first priority. If the spread of flour can be prevented then background levels of flour dust will be lower, exposure of employees not directly involved in the process will be prevented and exposure of employees involved in the process will be reduced.

15 There is good evidence for many jobs that adherence to good working practices can greatly reduce dust exposure and control it to levels well below the MEL, for example, use of dredgers or sprinklers rather than hand throwing flour (see HSBLC guidance, page 3 for full list).

16 Local exhaust ventilation (LEV) is likely to be required when:

- (1) monitoring shows that the MEL (8-hr TWA) is being exceeded
- (2) dusty processes (see above) are continuous throughout a shift;
- (3) exposure is already less than the MEL, good practices are being adhered to but there is still evidence of emerging occupational ill health;
- (4) peak exposures above the STEL are known to occur and cannot be dealt with by a change in working practice.

17 A full set of photographs showing practicable LEV solutions are included on HSBLC guidance, pages 5-8. Inspector should be aware that some of these are taken at plant bakeries and may show solutions that are only applicable to the scale of operation in plant bakeries, for example sack tip units, weigh hoppers, weighing and sieving booths.

SHORT TERM PEAK EXPOSURES - CONTROL

18 As flour dust is a respiratory sensitiser, an important factor will be activities that are likely to lead to high short term exposures, eg cleaning up large spillages, cleaning filter socks, etc. These activities can be inherently very dusty if uncontrolled. Very high, very short term peak exposures can and do occur. The emphasis for these activities again must be to prevent these peaks by preventing dust getting into the air and spreading, for example the use of high efficiency vacuum cleaners to clear up spillages. Dry sweeping of flour with brushes must not be done. Care must be taken to minimise raising dust and respiratory protective equipment (RPE) must be worn. RPE must be suitable and adequate. Details of equipment type are given in the HSBLC guidance, Table 4.

MAINTENANCE OF CONTROL MEASURES

19 Maintenance of engineering control measures is important in reducing exposure of operators directly involved at source as well as the background levels of employees not directly involved in the process. COSHH reg.9 requires employers to ensure that control measures are maintained in an efficient state, in efficient working order and in good repair. Records and details of thorough examination and testing should be kept and should be available for inspection.

ASSESSMENT OF DUST LEVELS AND DUST MONITORING

20 The extent to which dust monitoring should be required in bakeries, particularly small craft bakeries has been questioned both by inspectors and by the trade associations. Questions generally fall into 2 categories:

(7) To what extent is dust measurement required when carrying out an initial risk assessment under COSHH (regulation 6)?

(8) To what extent is further measurement required by regulation 10?

21 The general COSHH ACOP, at para 15(b) under reg.6 requires an assessment to include an estimate of exposure. Dust monitoring is one technique that can be used to assess exposure but there are other qualitative techniques which equally can be used. These are: visual evidence, eg airborne dust/use of dust lamps; dust on surfaces; working practices; compliance with control measures and the indicative levels in the HSBLC guidance (Tables 1, 2 & 3).

22 For small bakeries dust monitoring can be an expensive way of finding out what is already known. The tables of exposures in the HSBLC booklet offer a simple guide to bakeries on likely levels and hence reduce the need for measurement. An acceptable approach, therefore is for bakeries to visually identify the dustiest processes and apply the control measures in the guidance.

23 Before enforcement on monitoring is considered, inspectors should evaluate control of exposure by reference to the COSHH assessment, visual evidence and any evidence of ill health from health surveillance. [Paragraphs 9 and 10](#) of this SIM indicates activities where the MEL is likely to be exceeded. Employers should be given an opportunity to improve control measures first. **The emphasis of enforcement under the new MEL is on control.**

24 Where initial monitoring has been carried out, control in a bakery is good and health surveillance has not thrown up any occupational health problems, further ongoing dust measurements are not considered essential. Supervisory checks on adherence to good working practices, maintenance of LEV and visual observations are more useful on a routine basis. However, some monitoring will be required if conditions change significantly and are likely to result in higher levels of dust exposure.

HEALTH SURVEILLANCE

25 Flour dust as defined is a respiratory sensitiser and has been given a “sen” notation in EH40/2001. Health surveillance is therefore appropriate. In practice all workers who are exposed to flour dust as part of their day to day work, whether working in a small craft bakery, a large plant bakery or any other establishment using flour must be under adequate health surveillance.

26 There have been many questions about what would constitute adequate health surveillance and, in particular, whether lung function testing is required. Decisions on the extent of health surveillance will depend on the likely level of workplace exposure (its level, frequency and duration). However, the Sector has decided to set a base line level of health surveillance (agreed with industry) which does not require blanket lung function testing, but that should ensure a higher level of health surveillance than before as well as ensuring that employers have arrangements for following up any reported ill health effects with the appropriate medical intervention eg spirometry, skin prick test, clinical examination, etc.

27 Unless the employer can demonstrate that there is insignificant or no risk of exposure to flour dust in an employee’s work circumstances, health surveillance should as a minimum involve the following arrangements:

(1) pre-employment screening, to include, a questionnaire about present or past asthma or chest illness (see HSBLC guidance, appendix 1), advise new starters

about symptoms to look out for and that they should report symptoms;

(2) ongoing questionnaire (see HSBLC guidance, appendix 2) to enquire about symptoms;

(3) the questionnaires must be administered by a trained person who must understand the purpose of the questionnaire, confidentiality requirements and what records must be kept;

(4) the employer must also have access to a named occupational health professional or company, who can advise on any adverse findings from the questionnaire and who can make arrangements for further investigation where necessary. This might include lung function testing, skin prick tests, etc, looking at workplace exposures, and advising whether the level of health surveillance needs to be increased.

28 For the majority of plant bakeries, these arrangements will already be in place as most have their own appointed occupational health adviser. For craft bakeries and other baking establishments there are a number of options available for occupational health provision:

(1) NHS OH department;

(2) private occupational health company;

(3) general practitioner with occupational health qualification (minimum Diploma in Occupational Medicine).

Employers may contact their local EMAS for a list of occupational health providers.

29 There should be an individual health record for each employee exposed. Each employee should be given information about the risks from flour dust and other additives, eg fungal alpha amylase, the relevant symptoms and the need to inform the responsible person or the employer if the symptoms occur.

ACTION BY INSPECTORS

30 Due to publicity in the trade press, the majority of occupiers in the bakery and associated industries will be aware that a MEL has come into force. Now that the MEL is in force it is appropriate to take stronger enforcement action than hitherto.

31 Inspectors are asked to concentrate on the following during visits to bakeries or establishments using flour:

(1) checking that the employer is aware of the MEL (8-hour TWA and STEL) and has made an assessment of the risks under COSHH reg.6 which takes the new limits into account;

(2) control of dust levels to below 10mg/m³ (8-hour TWA) and 30mg/m³ (15 minute reference period STEL) by good working practices and the provision of LEV where reasonably practicable (as indicated in the HSBLC guidance). Where controls are absent or there is doubt over the effectiveness of existing arrangements, employers should be given the opportunity to improve control measures first.

(3) checking that RPE, PPE and where appropriate extraction equipment (eg vacuum cleaners) are used to adequately control peak exposures, for example spillages, maintenance etc;

(4) reducing dust levels as far below the MEL as is reasonably practicable. The HSBLC guidance gives examples of control measures. (See also [paras 12-18](#) of this SIM). Negative results from a competent health surveillance programme may be used as one indicator that control is working;

(5) checking that the employer has a health surveillance programme in place which covers all employee's exposed to flour dust and that an individual health record is kept for each employee (the surveillance programme should include access to a named occupational health professional);

(6) promoting the HSBLC guidance and the 'Breathe Easy' package in bakeries.

ENFORCEMENT

32 Whilst each case will be based on its own merits, inspectors are advised to consider enforcement action in the following circumstances:

(1) no risk assessment or inadequate assessment of exposure (including consideration of short term peak exposures) where these are or may be high - IN (COSHH reg.6);

(2) failure to control exposure below the MEL- IN (COSHH reg.7);

(3) no 14 monthly thorough examination and test of LEV. IN (COSHH reg. 9)

(4) failure to provide RPE to adequately control possible peak exposures and evidence that those peak exposures may occur. IN (COSHH reg.7);

(5) no health surveillance arrangements or inadequate arrangements for employees exposed to flour dust. IN (COSHH reg.11).

33 Date first issued: 9 November 2001

