

## **FACTORIES AND MACHINERY (NOISE EXPOSURE) REGULATION, 1989**

In exercise of the power conferred by subsection (1) of section 56 of the Factories and Machinery Act 1967, the Minister makes the following regulations:

### **PART 1 PRELIMINARY**

#### **1. Citation and commencement.**

These Regulation may be cited as the Factories and Machinery (Noise Exposure) Regulation 1989 and shall come to force on the 1<sup>st</sup> February 1989.

#### **2. Interpretation.**

In these regulation, unless the context otherwise requires –

“Action level” means equivalent continuous sound level of 85 dB(A) or daily nise dose equal to 0.5

“Administrative control” means any procedure that limit daily exposure to noise by control of work schedule.

“Ambient noise” means the all-encompassing noise associated with a given environment, being usually a composite of sound level from sources near and far.

“Annual audiogram” means the subsequent audiogram taken after the baseline audiogram;

“Approved means” approved by Chief Inspector in writing;

“Audiogram” means a chart, graph or table resulting from an audiometric test showing an employing’s hearing threshold level as a function of frequency;

“Audiometric measuring instrument” means an elctroacoustical generator that provides pure tones of selected frequencies and of calibrated output, for the purpose of determining an employee’s threshold of audibility.

“A-weighted sound level” means sound level measured with an instrument which is incorporated with an electrical network having the characteristics specified in the International Electrotechnical Commission (IEC), Publication 179;

“Baseline audiogram” means the audiogram against which future audiograms are compared;

“competent person” means an employee or any other person appointed by an occupier and approved by the Chief Inspector to carry out employee exposure monitoring;

“continuous noise” means noise which has negligibly small fluctuations of sound level within the period of observation;

“dB” means decibel, a unit of measurement of unweighted sound level using a reference level of 20 micropascals;

“dB (A)” means decibel-A-weighted, a unit of measurement of sound level corrected to the A-weighted scale using a reference level of 20 micropascals;

“dB (A) -slow” means a unit of measurement of sound level indicated by a sound level meter, when used for A-weighted sound level at slow response;

“daily noise dose D” means the cumulative noise exposure of an employee during a working day and is derived from the equation

$$D = \frac{C_1}{T_1} + \frac{C_2}{T_2} + \dots + \frac{C_n}{T_n}$$

where C<sub>1</sub>, C<sub>2</sub> ..... C<sub>n</sub> are the actual durations of exposure for an employee at the various noise levels, while T<sub>1</sub>, T<sub>2</sub> ..... T<sub>n</sub> are the respective duration limits obtained from the table in the First Schedule;

“employee” means a person employed in a factory by the occupier or by any person who contracts with the occupier to carry out the whole or any part of any work undertaken by the occupier in the course of and for the purpose of the occupier's trade or business;

“employee exposure” means exposure to noise measured with a noise measuring equipment at a position which most closely approximates with the noise levels at the head position of the employee during normal operation;

“engineering control” means the reduction of the noise level reaching the ear-drums of an employee by lessening the amount of noise transmitted to the employee's ear-drums or the amount of noise level produced, but does not include a reduction obtained by the use of a hearing protection device;

“equivalent continuous sound level” means the sound level that would produce a given daily noise dose if an employee were exposed to the sound level continuously over an 8-hour workday;

“hearing impairment” means the arithmetic average of the permanent hearing threshold level of an employee at 500, 1000, 2000 and 3000 Hz which is shifted by 25 dB or more compared to the standard audiometric reference level;

“hearing threshold level” means the amount, in dB, by which the threshold of audibility for an ear differs from the standard audiometric reference level;

“Hz” means Hertz, a unit of measurement of frequency, numerically equal to cycles per second;

“impulsive noise” means a variation in sound level that involve maxima at intervals of greater than one per second;

“intermittent noise” means a sound level which suddenly drops to the ambient level several times during the period of observation and the time during which the level remains at a constant value different from that of the ambient level being of the order of one second or more;

“noise dosimeter” means an instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a daily noise dose;

“noise level” means sound level;

“noise measuring equipment” means a sound level meter or a noise dosimeter;

“peak sound pressure level” means the peak instantaneous pressure expressed in dB, using a reference level of 20 micropascals;

“protection factor” - (*Deleted by P. U. (A) 1 0611 989*).

“quiet” means absence of exposure to sound levels exceeding 80 dB (A);

“registered medical practitioner” means a medical practitioner registered under the Medical Act 1971;

“sound level meter” means an instrument for measurement of sound level;

“sound level” means ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals;

“standard audiometric reference level” means a declared value, at a particular frequency, meeting the requirements of International Standard ISO 389-1975;

“standard threshold shift” means an average shift of more than

10 dB at frequencies of 2,000, 3,000 and 4,000 Hz relative to the baseline audiogram in either ear;

"technician" means a person who has been trained to operate and recognise the limitations, and to detect malfunctions of the audiometric measuring equipment; and

"temporary threshold shift" means the component of threshold shift which shows progressive reduction with the passage of time when the employee is no longer subjected to the noise.

### **3. Application.**

These Regulations shall apply to all factories in which persons are employed in any occupation involving exposure to excessive noise level in the workplace.

### **4. Obligation of occupier and employee.**

(1) It is the duty of every occupier pursuant to regulation 3 to comply with these Regulations.

(2) In pursuance of these Regulations, every employee shall-

- (a) co-operate with the occupier by wearing a noise dosimeter during employee exposure monitoring;
- (b) wear and make full and proper use of the hearing protection device provided for his use;
- (c) attend for and undergo audiometric testing or any medical examination or test arranged by the occupier; and
- (d) attend employee information and training programs conducted by the occupier. -

## **PART 11 PERMISSIBLE EXPOSURE LIMIT**

### **5. Permissible exposure limit.**

(1) No employee shall be exposed to noise level exceeding equivalent continuous sound level of 90 dB (A) or exceeding the limits specified in the First Schedule or exceeding the daily noise dose of unity.

(2) No employee shall be exposed to noise level exceeding 115 dB (A) at any time.

### **6. Impulsive noise.**

No employee shall be exposed to impulsive noise exceeding a peak sound pressure level of 140 dB.

### **7. Employee exposure when using hearing protection devices.**

When hearing protection devices are used to supplement administrative or engineering controls to comply with the requirement of regulation 5 and all the provisions of these Regulations have been met, employee exposure, for the purpose of determining whether the occupier has complied with the requirement of regulation 5, may be considered to be at the level provided by the attenuation factor of the hearing protection device for the periods being used.

**PART 111**  
**EXPOSURE MONITORING**

**8. General.**

- (1) For the purposes of this Part, employee exposure is the exposure which would occur if the employee is not using a Hearing protection device.
- (2) Every occupier shall conduct employee exposure monitoring to determine if any employee may be exposed to noise level at or above the action level.
- (3) All continuous, intermittent, and impulsive noise levels from 80 dB to 130 dB shall be integrated into the computation to determine employee exposure in pursuance to sub-regulation (2).
- (4) Exposure monitoring conducted in pursuance to sub- regulation (2) shall be representative of the monitored employee's normal and daily exposure to noise level.

**9. Initial employee exposure monitoring.**

- (1) An occupier shall conduct initial exposure monitoring in pursuance to regulation 8 within six months from the date Regulations take effect.
- (2) An initial employee exposure monitoring may be limited to one or more representative employee or employees from a particular group of employees performing the same work or from the same workplace, who the occupier reasonably believes is or are exposed to noise level representative of the group of employees.

**10. Positive initial employee exposure monitoring.**

- (1) Where an initial employee exposure monitoring shows the possibility of any employee exposure to noise level at or above the action level, the occupier shall determine noise exposure levels for employees engaged in the same work or from the same workplace within six months from the date of receipt of the results of the initial employee exposure monitoring.
- (2) An employee exposure monitoring may be limited to one or more representative employee or employees from a particular group of employees performing the same work, or from the same workplace, who the occupier reasonably believes is or are exposed to noise level representative of the group of employees.

**11. Negative initial employee exposure monitoring.**

Where an initial employee exposure monitoring shows that no employee is exposed to noise level at or above the action level, the occupier need not determine noise exposure levels for each and every employee engaged in the same work or from the same workplace except as otherwise provided in regulation 12.

**12. Additional monitoring.**

Whenever there has been a production, process, equipment, control measures or personnel change in the factory, the occupier shall conduct additional monitoring within six months from the date of such change or changes.

**13. Employee notification.**

Within two weeks after the receipt of the employee exposure monitoring results, the occupier shall notify each employee of the results of the monitoring.

**14. Approved equipment: Competent person to conduct monitoring.**

(1) The occupier shall use approved noise measuring equipment for employee exposure monitoring.

(2) Employee exposure monitoring shall be conducted by a competent person.

## **PART IV**

### **METHODS OF COMPLIANCE**

**15. Engineering and administrative control.**

The occupier shall reduce and maintain employee exposure to noise level below the limits prescribed in regulation 5 by-

- (a) engineering control as far as is reasonably practicable;
- (b) administrative control; or
- (c) both the above

**16. Hearing protection devices.**

Whenever it is not feasible to comply with regulation 15 (a) or (b) or when the controls provided under regulation 15 (c) do not reduce employee exposure to a noise level below the limits prescribed in regulation 5, the occupier shall provide or supplement such controls with approved hearing protection devices in accordance with Part V of these Regulations.

**PART V**  
**HEARING PROTECTION DEVICES**

**17. General.**

(1) An occupier shall, at no cost to the employee, provide an approved bearing protection device to, and ensure its use by-

- (a) an employee exposed to noise level at or above the limits prescribed in regulations 5 and 6;
- (b) an employee receiving a daily noise dose between 0.5 and 1.0 if his baseline audiogram shows a hearing impairment, or if his annual audiogram shows a standard threshold shift; or
- (c) an employee who is required to wear a bearing protection device in accordance with the provisions of these Regulations.

(2) The hearing protection device provided in pursuance to sub-regulation (1) shall :-

- (a) correctly fit the employee;
- (b) be compatible with the job requirement of the employee; and
- (c) not prejudice the health of the employee.

**18. Hearing protection device attenuation.**

(1) A hearing protection device provided in pursuance to regulation 17 (1) (a) shall attenuate employee exposure to noise level below the limits prescribed in regulations 5 and 6.

(2) Hearing protection devices provided in pursuance to regulation 17 (1) (b) and (c) shall attenuate employee exposure to noise level below the action level.

**19. Procedures on issuance, maintenance, inspection and training.**

An occupier shall establish and implement procedures on the issuance, maintenance, inspection and training in the use of hearing protection devices

**PART VI**  
**AUDIOMETRIC TESTING PROGRAMME**

**20. General.**

- (1) An occupier shall establish and maintain an audiometric testing programme for all employees exposed to noise level at or above the action level.
- (2) The program shall be conducted at no cost to the employees.
- (3) The program shall be conducted under the supervision of a registered medical practitioner.
- (4) An audiometric test shall :-
  - (a) be conducted by a technician under the supervision of a registered medical practitioner;
  - (b) be preceded by a period of quiet of at least fourteen hours;
  - (c) be carried out in a room with background noise level meeting the requirements specified in the Second Schedule; and
  - (d) be of pure tone, air conduction, with test frequencies including 500, 1000, 2000, 3000, 4000 and 6000 Hz taken separately for each ear.

**21. Baseline audiogram and occupational and medical history record.**

An occupier shall establish-

- (a) a valid baseline audiogram against which subsequent audiograms shall be compared; and
- (b) a record of the medical and occupational history, particularly in relation to past ear diseases and exposure to noise,

for every employee within twelve months from the date these Regulations take effect or within six months from the day the employee commences work.

**22. Frequency of audiometric testing.**

An occupier, after obtaining the baseline audiogram of an employee, shall repeat the audiometric test on the employee-

- (a) very year for an employee exposed to noise level at or above the limits prescribed in regulation 5;
- (b) every year for an employee whose baseline audiogram shows a hearing impairment, or where his annual audiogram shows a standard threshold shift; and
- (c) once in every two years for an employee exposed to noise level at or above the action level but less than the limits prescribed in regulation 5.



**23. Retest.**

If the registered medical practitioner, after reviewing the annual and baseline audiograms of the employee and after taking into consideration the effect of temporary threshold shift, is of an opinion that a standard threshold shift has occurred, he shall notify the occupier and the occupier shall retest the employee within three months from the date of the last audiometric test.

**24. Permanent standard threshold shift.**

If the registered medical practitioner, after reviewing the retest audiogram and after examining the employee, is of an opinion that a permanent standard threshold shift has occurred, he shall notify the Chief Inspector and the occupier and the occupier shall-

- (a) inform the employee of the results of the retest within three weeks after being so notified;
- (b) provide the employee, if he has not been so provided, with a hearing protection device in pursuance to Part V of these Regulations; and
- (c) refit and retrain the employee in the use of a hearing protection device if he has been so provided with such a device.

**25. Revised baseline audiogram.**

The baseline audiogram shall be replaced with the annual or retest audiogram if the annual or retest audiogram reveals :-

- (a) a permanent standard threshold shift; or
- (b) improved hearing threshold with respect to the baseline at two or more test frequencies.

**26. Audiometric measuring equipment.**

Audiometric measuring instrument shall be of an approved type and shall be calibrated and maintained at regular intervals.

## **PART VII EMPLOYEE INFORMATION AND TRAINING**

### **27. Training.**

- (1) The occupier shall institute a training program for, and ensure the participation of all employees exposed to noise level at or above the action level.
- (2) The occupier shall ensure that during the training program each employee is informed of the following:
  - (a) the provisions of these Regulations;
  - (b) the effects of noise on hearing;
  - (c) the purpose of hearing protection devices, the advantages, disadvantages and attenuation of various types of hearing protection devices, and instructions on their selection, fitting, use and care; and
  - (d) the purpose of an audiometric testing and an explanation of the test procedures
- (3) The training program shall be repeated at least once in every two years.

## **PART VIII WARNING SIGNS**

### **28. Warning signs.**

- (1) Warning signs shall be posted at entrances to or on the periphery of all well-defined work areas in which workers may be exposed at or above the limits prescribed in regulations 5 and 6.
- (2) The warning signs shall clearly indicate that the area is a high noise area and that bearing protection devices shall be worn.

## **PART IX RECORD KEEPING**

### **29. Exposure monitoring records.**

- (1) The occupier shall establish and maintain an accurate record of all exposure monitoring conducted in pursuance to Part 111 of these Regulations.
- (2) The record shall include the following information:
  - (a) the name of the employee and the daily noise dose;
  - (b) the location, date and time of measurement and the noise level obtained; and
  - (c) the type, model and date of calibration of the noise measuring equipment.

(3) The occupier shall maintain these exposure monitoring records for as long as the employee is employed.

**30. Audiometric test records.**

(1) The occupier shall keep an accurate record of all employee audiograms taken in pursuance to Part VI of these Regulations.

(2) The record shall include the following information:

- (a) the name and job location of the employee;
- (b) the date of the audiogram;
- (c) the name of the person conducting the test;
- (d) the model, make and serial number of the audiometric testing equipment, and
- (e) the date of the last calibration of the audiometric testing equipment

(3) Audiometric test records shall be retained for as long as the employee is employed and thereafter for a period of five years.

**31. Availability of records.**

The occupier shall make available upon request all records required to be maintained under these Regulations to the Chief Inspector.

**32. Transfer of records.**

(1) Whenever an occupier has ceased to carry on business, the successor occupier shall receive and retain all records required to be maintained under these Regulations.

(2) Whenever an occupier has ceased to carry on business and there is no successor occupier to receive and retain the records required to be maintained under these Regulations, the records shall be transmitted to the Chief Inspector.

(3) At the expiration of the retention period for the records required to be maintained under regulations 29 and 30, the occupier shall give the Chief Inspector at least three months notice that he intends to dispose of such records, and he shall transmit those records to the Chief Inspector if requested to do so within that period.

**PART X  
MISCELLANEOUS**

**33. Amendment of Schedule.**

The ministry may by order amend the schedule at any time

**34. Penalty.**

Any person who contravenes any provision of these Regulations shall be guilty of an offence and shall, on conviction, be liable to a fine not exceeding one thousand ringgit.

**FIRST SCHEDULE**  
**(Regulation 5 (1))**

**Permissible Exposure Limit**

Noise Level (dB (A) - slow)	Duration of Exposure Permitted per day (hours-minute)
85	16-0
86	13-56
87	12-8
88	10-34
89	9-11
90	8-0
91	6-58
92	6-4
93	5-17
94	4-36
95	4-0
96	3-29
97	3-2
98	2-50
99	2-15
100	2-0
101	1-44
102	1-31
103	1-19
104	1-9
105	1-0
106	0-52
107	0-46
108	0-40
109	0-34
110	0-30
111	0-26
112	0-23
113	0-20
114	0-17
115	0-15

## **SECOND SCHEDULE**

### **(Regulation 20 (4) (c) )**

#### **Maximum Allowable Octave-Band Sound Pressure Level for Audiometric Test Rooms**

Octave Band centre Frequency (Hz)	500	1000	2000	4000	8000
Sound Pressure Level (dB)	27	30	35	42	41

Made the 10<sup>th</sup> December 1988.

Minister of Labour.