

Guidance Notes on Medical Examinations for Workers engaged in Hazardous Occupations in Industrial Undertakings



Occupational Safety and Health Branch
Labour Department



OCCUPATIONAL SAFETY & HEALTH COUNCIL

**Guidance Notes on
Medical Examinations for Workers
engaged in Hazardous Occupations
in Industrial Undertakings**

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Medical Examinations for Workers engaged in Hazardous Occupations in Industrial Undertakings

Introduction

The prevention of occupational diseases calls for a multi-disciplinary approach. While health hazards should be controlled at source by engineering measures such as enclosure and effective ventilation, there are other complementary control measures including administrative control, use of suitable personal protective equipment (PPE), education, training and supervision of workers, environmental monitoring and health surveillance.

This booklet aims to introduce the concept of health surveillance to employers and employees and provide practical guidance on medical examinations for workers engaged in certain hazardous occupations in industrial undertakings.

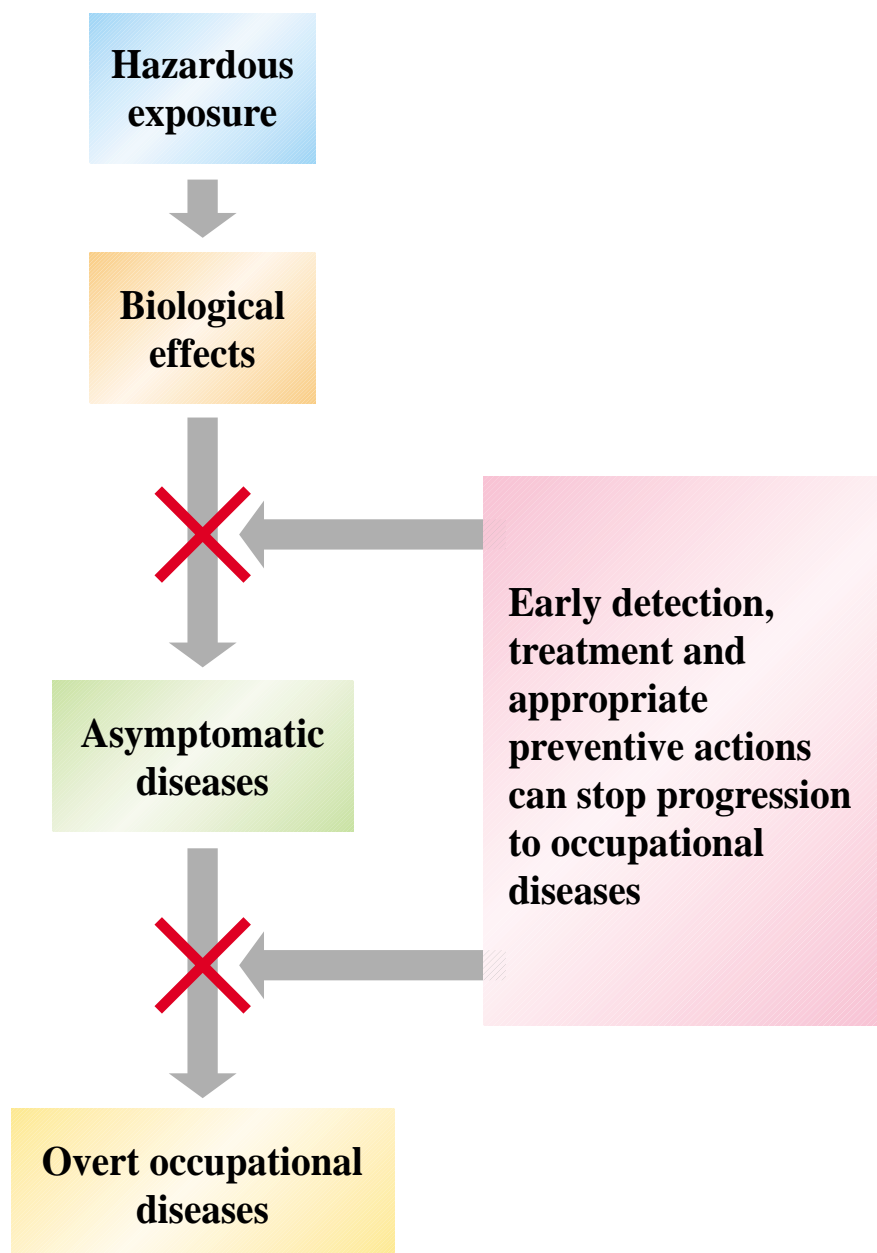
Health Surveillance

Health surveillance is basically a process of monitoring the health status of persons to determine departures from normal health, so as to identify potential problem areas and the effectiveness of existing preventive strategies. Medical examination is a common means of conducting such surveillance.

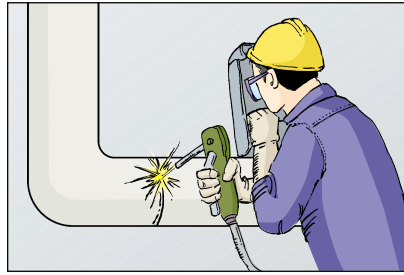
Objectives of Medical Examinations

1. To detect early abnormalities and prevent workers from developing occupational diseases

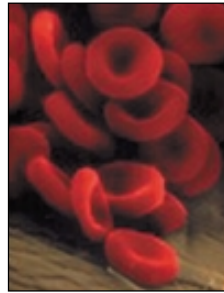
Many occupational diseases are chronic in nature, having minimal early signs and symptoms, and may be difficult to treat or even incurable, e.g. noise-induced hearing loss and pneumoconiosis. Regular medical examination of workers who are exposed to particular health hazards at work can detect abnormalities or diseases at the early stage so that timely treatment can be given to increase the prospect of cure and reduce the cost of care.



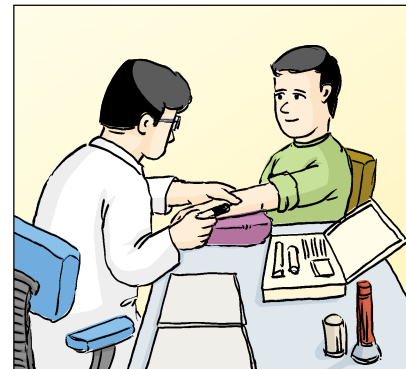
Example:



Lead exposure

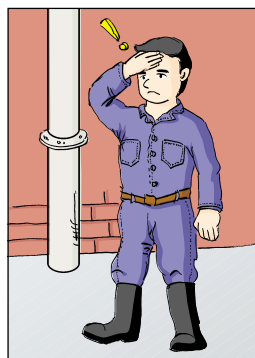
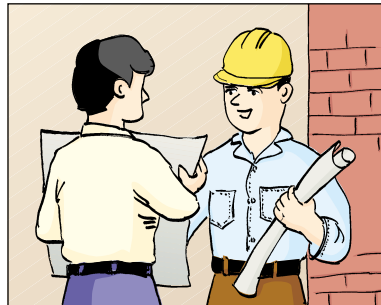


Inhibition of certain enzymes
in red blood cells



Early detection, treatment
and appropriate preventive
actions can stop progression
to lead poisoning

Asymptomatic
lead poisoning



Lead poisoning with anaemia

2. To verify the effectiveness of existing preventive strategies

The detection of index cases of over-exposure or early diseases in medical examinations will alert the employer concerned to review and enhance, as appropriate, the existing preventive and control measures to protect other workers from being affected by the health hazards.

3. To provide occupational health education and advice to workers

Medical examination is a good opportunity for doctors to educate workers of the health risks of exposure to specific hazards at work. Advice could also be given to the workers about necessary preventive measures to minimize the risks of contracting occupational diseases.



Pre-employment Medical Examinations

There are two main purposes of pre-employment medical examinations:

1. To provide base-line health data against which subsequent changes after employment can be evaluated

This is important for assessment of the effectiveness of preventive measures at work. For example, where the hearing threshold of a worker, which is normal before employment in a noisy occupation, is found to have increased after employment, this possibly indicates noise-induced hearing loss and a review of the hearing protection measures would be required. On the other hand, if the pre-employment hearing threshold of the worker has not been assessed, it would be difficult to ascertain whether the worker's high hearing threshold after employment is due to excessive noise exposure at work or to his own hearing problem before employment.



Pre-employment health data is also important in substantiating or negating employees' compensation claims since it provides evidence of the health status of claimants before employment.

2. To ensure medical fitness for work

Pre-employment medical examinations identify those persons who are medically unfit for employment in particular occupations. Persons with certain underlying medical conditions are particularly vulnerable to the effects of certain health hazards and are not suitable for employment in work with such exposures. For example, workers with thalassaemia (a genetic disease of the blood) should not be engaged in work involving lead exposure which may aggravate the anaemia.

Workers may fail to meet the specific health requirements for particular jobs so that they cannot undertake the jobs safely without risks to themselves or others. For example, workers with recurrent epilepsy should not operate dangerous machines.

Periodic Medical Examinations

Periodic medical examinations aim to detect susceptible workers for whom corrective actions are required before they develop overt occupational diseases. For example, a lead worker with a high blood lead level should be suspended from work temporarily to stop further exposure to lead and to receive necessary medical treatment. Meanwhile, safety and health measures at work should be reviewed for necessary remedial actions.

The frequency of periodic medical examinations depends on the nature of the occupational hazards. For most hazardous exposures, however, these examinations are conducted annually.

Medical Examination Requirements

The requirements of medical examinations depend on the nature of the hazardous exposures of workers. In general, the doctor will take a detailed occupational and medical history, conduct a physical examination and prescribe a range of ancillary laboratory and/or radiological investigations such as urine test, blood test, X-ray, lung function test and audiometric test.



Medical Examinations for Workers

Statutory Medical Examinations

In industrial undertakings, workers exposed to ionising radiation, asbestos or controlled carcinogenic substances (including alpha-naphthylamine and its salts (other than alpha-naphthylamine containing, as a by-product of a chemical reaction, more than one per cent of beta-naphthylamine), ortho-tolidine and its salts, dianisidine and its salts, dichlorobenzidine and its salts, auramine and magenta), and workers engaged in tunnelling work, mines, quarries and compressed air work, are required by the following regulations to undergo pre-employment and periodic medical examinations.



1. Radiation Ordinance (Cap. 303)

- Radiation (Control of Irradiating Apparatus) Regulations
- Radiation (Control of Radioactive Substances) Regulations

2. Factories and Industrial Undertakings Ordinance (Cap. 59)

- Factories and Industrial Undertakings (Asbestos) Regulation
- Factories and Industrial Undertakings (Carcinogenic Substances) Regulations
- Factories and Industrial Undertakings (Work in Compressed Air) Regulations
- Factories and Industrial Undertakings Regulations

Statutory medical examinations for asbestos workers, workers exposed to controlled carcinogenic substances and workers engaged in tunnelling work or mines, quarries and compressed air work can be performed by any registered medical practitioners who are conversant with such examinations. Those examinations for radiation workers, however, must be performed by the Medical Panel of the Radiation Board.

Details of the requirements of these statutory medical examinations are given in Appendix I.

Recommended Medical Examinations

Apart from the statutory requirements, medical examinations are recommended as a good occupational health practice for workers exposed to certain hazards in industrial undertakings. The following are examples of these hazards:

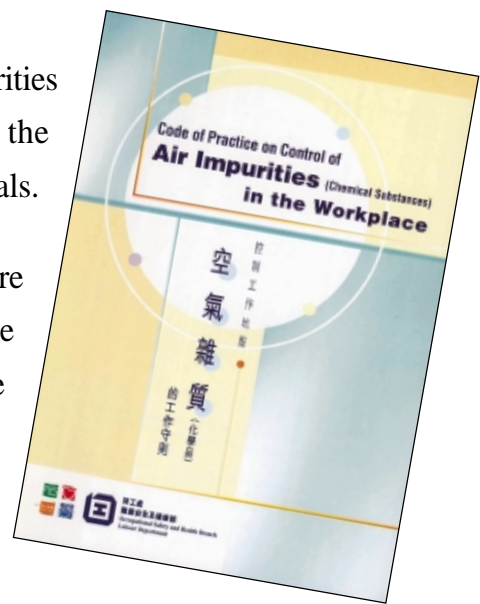
1. Silica
2. Arsenic
3. Cadmium
4. Manganese
5. Lead
6. Mercury
7. Organophosphates
8. Tar, pitch, bitumen and creosote
9. Raw cotton dust
10. Benzene
11. Methylenediphenyl diisocyanate (MDI) and Toluene diisocyanate (TDI)
12. Lasers (Class 3B & 4)
13. Excessive noise (daily personal noise exposure of 85 dB(A) and above)



For exposure to silica, lead, mercury, cadmium and manganese, if the exposure levels of workers are liable to exceed *half* of the Occupational Exposure Limits (OELs) of the respective hazardous agents, medical examinations would be required. In the case of exposure to arsenic, benzene, tar, pitch, bitumen and creosote, which is associated with significant cancer risks, or in the case of exposure to raw cotton dust, MDI, TDI and organophosphates, which is associated with allergic disorders or phosphate poisoning, medical examinations are recommended irrespective of the level of occupational exposure.

Please refer to the "Code of Practice on Control of Air Impurities (Chemical Substances) in the Workplace" published by the Labour Department for a list of OELs of different chemicals.

Examples of industrial processes in various industries where workers are exposed to the above hazardous agents and the corresponding recommended medical examinations are given in Appendix II.





Results of Medical Examinations

Depending on the medical examination findings, the examining doctor may advise the worker concerned that:

1. he is medically fit for working in the particular occupation; or
2. he is medically fit for working in the particular occupation but needs to take certain precautionary measures e.g. use of PPE, personal hygiene; or
3. he should refrain from working in the particular occupation temporarily, e.g. by seeking redeployment to another occupation or by taking sick leave, until he undergoes a further medical examination and is confirmed to be medically fit to work again in that occupation; or
4. he should refrain from working in the particular occupation permanently, e.g. by seeking employment in other occupations.

For the statutory medical examinations, the examining doctor will certify whether the worker is medically fit for working in his occupation, except in the case of examinations for mines, quarries and tunnelling workers where the examining doctor will forward a copy of medical examination reports to the Senior Occupational Health Officer of the Labour Department for certification of fitness to work, and in the case of examinations for radiation workers where the Radiation Board will do so.

With a view to safeguarding his health, the worker should follow the advice of the examining doctor. Nevertheless, in case of any doubt about the medical advice, the worker should discuss and clarify with the examining doctor or seek a second opinion from another doctor. The worker should also discuss with his employer how best to follow the doctor's advice, while the employer should cooperate by taking all reasonably practicable actions, e.g. providing the necessary PPE, redeploying the worker to another occupation.

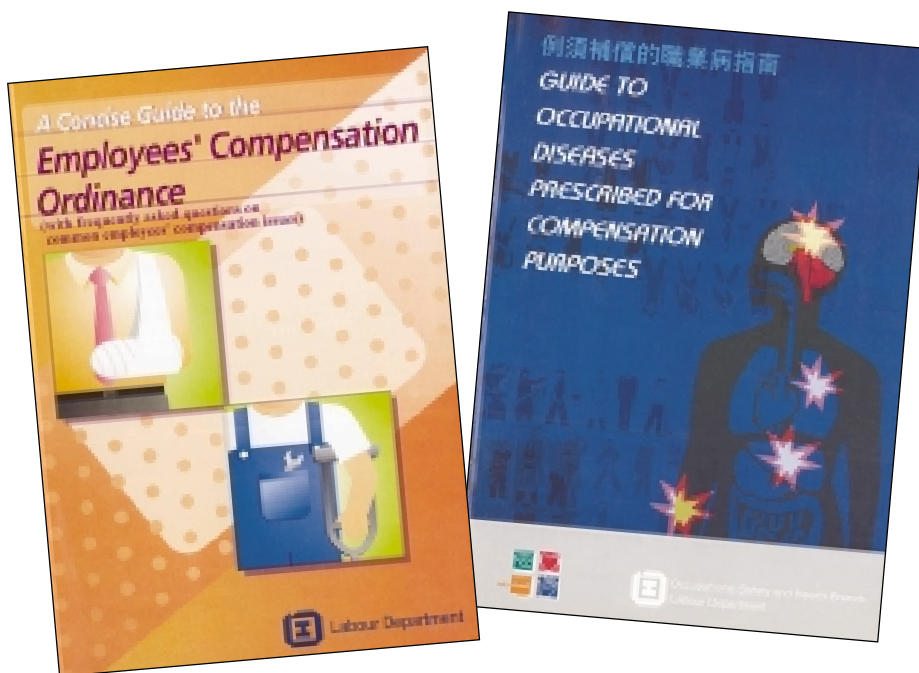
Notification of Occupational Diseases

Under the Occupational Safety and Health Ordinance (Cap. 509), a doctor is required to notify the Commissioner for Labour of cases of occupational diseases that are specified in Schedule 2 of that Ordinance.

Moreover, under the Employees' Compensation Ordinance (Cap. 282), an employer should notify cases of occupational diseases that are specified in the Second Schedule of the Ordinance to the Labour Department within 14 days of the employees' incapacity, or in the case of death, within 7 days of the death of the employee.

Please refer to the following publications issued by the Labour Department for a list of the compensable occupational diseases:

1. “Guide to Occupational Diseases Prescribed for Compensation Purposes”
2. “A Concise Guide to the Employees' Compensation Ordinance”



Requirements of Statutory Medical Examinations

Hazardous exposure/Work	Examples of jobs	Medical examinations	Frequency of examinations*
1. Ionizing radiation	Industrial radiographer Gas mantle worker Luminous watch worker	General examination, blood test	Once every 14 months
2. Asbestos	Demolition worker Service mechanic (repairing clutch linings) Asbestos worker (lagging and delagging of boilers)	General examination, chest X-ray	Once every 12 months
3. Controlled carcinogenic substances	Dyer Tanner	General examination, urine cytology	Once every 6 months
4. Compressed air work	Compressed air worker	General examination X-ray joints (>1 bar) Chest X-ray and lock test	Once every 3 months (\leq 1 bar) Once every 4 weeks (> 1 bar) After suffering from a cold, chest infection, sore throat, earache or other illness or injury necessitating absence from work for more than 3 consecutive days First examination within 4 weeks after employment, thereafter once every 12 months Pre-employment
5. Mines, quarries and tunnelling work	Quarry worker Miner	General examination, chest X-ray	Once every 12 months

* Apart from periodic medical examinations, a medical examination before employment is also required (except those for workers exposed to controlled carcinogenic substances, which should be performed within one month after employment).

Industrial Processes and the Corresponding Recommended Medical Examinations

Industry	Industrial process	Examples of jobs	Medical examinations	Frequency of examinations*
Construction	Site, decoration and maintenance work (exposure to noise)	Renovation worker Maintenance worker Bar bender & fixer Bricklayer Leveller Plumber Carpenter Metal worker Piling operator	General examination, audiometric test	Once every 12 months (≥90dB(A)) Once every 24 months (85-89dB(A))
	Site work (exposure to silica dust and noise)	Driller/borer Excavator Earthmoving machinery operator Concreter Compressed air worker Asphalter	General examination, chest X-ray Audiometric test	Once every 12 months Once every 12 months (≥90dB(A)) Once every 24 months (85-89dB(A))
	Path alignment with lasers	Surveying technician (land)	General examination, eye test	Once every 12 months
	Spraying of MDI/TDI in construction of insulation walls	Carpenter (formwork)	General examination, lung function test	Once every 12 months
	Painting (use of solvent containing benzene)	Painter	General examination, blood and urine tests	Once every 12 months
	Welding (exposure to lead, cadmium, manganese, noise)	Welder	General examination, blood test/urine test Audiometric test	Once every 12 months (For worker exposed to lead -once every 6 months) Once every 12 months (≥90dB(A)) Once every 24 months (85-89dB(A))
	Tar, pitch, bitumen application	Asphalter	General examination	Once every 12 months

Industrial Processes and the Corresponding Recommended Medical Examinations (Continued)

Industry	Industrial process	Examples of jobs	Medical examinations	Frequency of examinations*
Chinese restaurant	Cooking with pressurized fuel burner (exposure to noise)	Cook	General examination, audiometric test	Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85-89dB(A))
Battery manufacturing	Use of toxic metals (cadmium, manganese, lead or mercury)	Dolly press worker	General examination, blood test/urine test	Once every 12 months (For worker exposed to lead - once every 6 months)
Beverage industry	Packing/bottling (exposure to noise)	Packing/bottling worker	General examination, audiometric test	Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85-89dB(A))
Car repairing	Use of lasers for alignment	Service mechanic	General examination, eye test	Once every 12 months
	Use of cleansing solvent containing benzene	Service mechanic	General examination, blood and urine tests	Once every 12 months
Cargo transport	Mixing of MDI/TDI to form foam packing material	Packing and crating worker	General examination, lung function test	Once every 12 months
Electronic parts and components	Use of lasers for engraving	Electronics technician	General examination, eye test	Once every 12 months
	Doping of arsine gas (exposure to arsenic)	Electronics technician	General examination, chest X-ray, urine test	Once every 12 months
	Tin/lead soldering	Soldering worker	General examination, blood test	Once every 6 months
Furniture and accessories	Use of MDI/TDI for making foam	Foam moulding worker	General examination, lung function test	Once every 12 months
	Use of paints, lacquer, adhesive and cleansing solvent containing benzene	Carpenter	General examination, blood and urine tests	Once every 12 months

Industrial Processes and the Corresponding Recommended Medical Examinations (Continued)

Industry	Industrial process	Examples of jobs	Medical examinations	Frequency of examinations*
Garment industry	Use of lasers for alignment	Cutter/Cutting room operative	General examination, eye test	Once every 12 months
	Sewing (exposure to noise)	Sewing machine operator	General examination, audiometric test	Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85-89dB(A))
Metals industry	Welding, cutting of alloy or coated article (exposure to cadmium, manganese, lead, noise)	Welder	General examination, blood test/urine test Audiometric test	Once every 12 months (For worker exposed to lead - once every 6 months) Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85 -89dB(A))
	Metal work, making ball and roll bearings, nuts, bolts, nails etc (exposure to noise)	Metal worker	General examination, audiometric test	Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85 -89dB(A))
	Use of cleansing solvent containing benzene	Metal worker	General examination, blood and urine tests	Once every 12 months
	Use of lasers for engraving, cutting etc	Metal worker	General examination, eye test	Once every 12 months
Manufacture and industrial application of pesticides	Manufacturing, mixing, dissolving, transferring, packing, dispensing and spraying of insecticides, fungicides, herbicides, etc. (exposure to arsenic, mercury, organophosphates)	Industrial pesticides worker	General examination, chest X-ray, blood test/urine test	Once every 12 months (For worker exposed to organophosphates - once every 6 months)
Plastics industry	Mixing of pigments containing cadmium or lead	Plastics worker	General examination, blood test/urine test	Once every 12 months (For worker exposed to lead - once every 6 months)
Polyurethane foam manufacturing	Manufacture of foam using TDI/ MDI	Foam moulding worker	General examination, lung function test	Once every 12 months

Industrial Processes and the Corresponding Recommended Medical Examinations (Continued)

Industry	Industrial process	Examples of jobs	Medical examinations	Frequency of examinations*
Printing industry	Use of cleansing solvent containing benzene	Printer	General examination, blood and urine tests	Once every 12 months
	Offset printing (exposure to noise)	Printer	General examination, audiometric test	Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85 -89dB(A))
Quarrying and mining	Rock crushing, screening and loading (exposure to noise)	Quarry worker/Miner	General examination, audiometric test	Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85 -89dB(A))
Shipbuilding, repairing and breaking	Welding and cutting of alloy (exposure to cadmium, lead, manganese, noise)	Welder	General examination, blood test/urine test Audiometric test	Once every 12 months (For worker exposed to lead - once every 6 months) Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85 -89dB(A))
	Metal work, grinding and sawing (exposure to noise)	Sheet/structural metal preparer	General examination, audiometric test	Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85 -89dB(A))
	Painting (use of paint containing arsenic/mercury)	Painter	General examination, urine test, chest X-ray	Once every 12 months
Stone work	Rock cutting, grinding and polishing (exposure to silica dust and noise)	Mason	General examination, chest X-ray	Once every 12 months
		Tombstone worker	Audiometric test	Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85 - 89dB(A))

Industrial Processes and the Corresponding Recommended Medical Examinations (Continued)

Industry	Industrial process	Examples of jobs	Medical examinations	Frequency of examinations*
Textile industry	Opening, blowing, carding and spinning of raw cotton	Blowing room machine tender Carding machine tender Spinning machine tender	General examination, lung function test	Once every 12 months
	Weaving (exposure to noise)	Weaver	General examination, audiometric test	Once every 12 months ($\geq 90\text{dB(A)}$) Once every 24 months (85 - 89dB(A))
Toy making	Use of MDI/TDI for making foam or foam mould	Foam moulding worker/ Mould maker	General examination, lung function test	Once every 12 months
	Use of cleansing solvent containing benzene	Printing operator	General examination, blood and urine tests	Once every 12 months

* Apart from periodic medical examinations, a medical examination before employment is also required.



Useful Information

If you wish to enquire about this guidance notes or require advice on occupational health and hygiene, please contact the Occupational Safety and Health Branch of the Labour Department through:

Telephone: 2852 4041

Fax. : 2581 2049

E-mail : enquiry@labour.gov.hk

Information on the services offered by the Labour Department and on major labour legislation can also be found by visiting our Home Page in the Internet. Address of our Home Page is <http://www.labour.gov.hk>.

Information on the services offered by the Occupational Safety and Health Council can be obtained through our telephone hotline on 2739 9000.