GUIDELINES FOR LICENSING OF MANUFACTURING INDUSTRIES (DRUGS, COSMETICS, HOUSEHOLD CHEMICAL SUBSTANCES AND MEDICAL DEVICES)

1 SCOPE

In pursuance of **Sections 115, 130 and 131 of the Public Health Act, 2012, Act 851,** these Guidelines are hereby made to provide prospective applicants with information on the general requirements for the establishment of industries. These Guidelines apply to all body-corporates duly registered by the Registrar-General Department which want to establish manufacturing industries in Ghana.

2 DEFINITION OF TERMS

In these Guidelines, unless the context otherwise states:

cGMP
HEPA
Site Master File
Batch Manufacturing Records

a) The process of manufacture is to be carried out under the supervision of a Pharmacist or person approved by the Authority as having specialist knowledge in the article to be manufactured (Refer to FDA "Guidelines for Selection of Authorized Person in the Pharmaceutical and Chemical Industry")

b) The conditions under which the manufacture is carried out is in the opinion of the Authority suitable for ensuring that the article will be safe for use.

3 REQUIREMENTS

3.1 General Requirements

3.1.1 Submission of Application

a) An application for a license to manufacture a product shall be made in writing to the Authority.

b) The application form shall be completed in accordance with the sequence of appendices, and shall be dated, signed and stamped by the applicant/license holder.

a) The application shall be submitted in duplicate together with:
   i. Site Master File
   ii. Permit from the Environmental Protection Agency (EPA)
   iii. Basic floor plan showing plant installation
   iv. Architectural engineering permit issued by the local authority

b) The content of a Site Master File shall include, but not be limited to, the following:
   i. General information ii. Personnel
   iii. Premises
   iv. Sanitation
   v. Equipment
   vi. Production
   vii. Quality control
   viii. Contract manufacturing analysis
   ix. Self-inspection
   x. Disposal of equipment
   xi. Complaints, distribution and production recall
   xii. Waste disposal

c) General information of the company shall include:
   i. Name of company
   ii. Office address of the company
   iii. Factory address of the company
   iv. Short description of the site (taking into consideration the total area in square meters)
   v. Nearby industrial units and the waste generated by theses industries
   vi. Any other manufacturing activities carried out on the site
   vii. Dosage forms or type of products intended to be manufactured
   viii. Number of employees expected to be engaged in production, quality control, storage and distribution
   ix. Short description of the quality management system that will be put in place
   x. Use scientific, analytical or other technical services from countries abroad in relation to manufacturing and analysis

3.1.2 Personnel

This section of the file must include the organizational structure of the company. Qualification, experience and responsibilities of the key personnel must be stated. There must be an outline of arrangements for basic and in-service training, including how the records are maintained. Manufacturing staff should undergo periodic health checks and the records must be kept. Personnel hygiene requirements including clothing must be addressed.

3.1.3 Premises

a) Manufacturing premises should consist of an administrative unit, quality control units, production unit, staff changing rooms, storage and toilet facilities.

b) Simple plan or description of manufacturing areas with indication of scale (architectural or engineering drawings not required) should be provided.

c) The nature of the construction and finishes for the walls, floors and ceiling of the various sections should be specified.

d) A brief description of the plumbing work, electrical fittings, drains and ventilation systems should be provided.

e) More information on the lighting, heating and the air handling units, taking into consideration the properties of items being produced, should be provided.

f) More details should be given for critical areas with potential risks or airborne contamination (schematic drawings of the systems are desirable). Classification of the rooms used for the manufacturing of sterile products should be mentioned. If there are special areas for the handling of highly toxic, hazardous and sensitive materials these should be mentioned.

g) Brief description of water systems (schematic drawings of the systems are desirable), including sanitation, as well as a description of planned preventive maintenance programs premises should be provided.

h) Proposed pest and rodent control mechanisms that will be put in place should be stated.

i) Storage areas should have adequate space and suitable lighting, and should be designed to prevent the entering of pests. The area must be equipped to allow cleaning and orderly placement of stored materials and products. Such areas should provide for suitable and effective separation of quarantined and starting materials. Provision should be made for the storage of thermolabile and hygroscopic substances.

3.1.4 Equipment

a) Brief description of major equipment used in production and quality control.

b) Description of planned preventive maintenance program for equipment.

c) Qualification and calibration of equipment must be stated.

d) Standard Operative Procedures (SOPs) must be developed and followed for cleaning, maintenance and use for major equipment, utensils and containers.

3.1.5 Sanitation

Description of written specification and procedures for cleaning manufacturing areas and equipment must be provided.

3.1.6 Documentation

a) Quality Management plans for the presentation, revision and distribution of necessary documentation for manufacture, such as Standard Operative Procedures and work instructions, must be stated.

b) Any other documentation related to product quality that is not mentioned elsewhere, such as microbiological controls on air and water, especially for sterile manufacturing units, must be mentioned.

3.1.7 Production

a) Brief description of production operations using flow charts to specify important stages. Indicate what critical parameters are monitored at each of these stages.

b) Arrangements for the handling and in-process control of starting and packaging materials, as well as bulk and finished products, including sampling, quarantine, release and storage, must be included.

Arrangements for the handling of rejected materials and products must be stated. Brief description of general policy for process validation must be indicated.

3.1.8 Quality Control

a) The quality control departments should be independent of other departments and be directly responsible to management.

b) Provide description of the quality control system and the activities of the quality control department. Include procedures for evaluation of quality and stability of raw material, semi-finished and finished products. Specification for packaging materials must be provided.

3.1.9 Contract Manufacturing and Analysis

Describe means by which the GMP compliance of the contract acceptor is assessed for either production, or quality control or both.

3.1.10 Complaints, Distribution and Product Recall

Include arrangements and recording system for handling of complaints, distribution of products and product recall, when necessary.

3.1.11 Self-Inspection

Description of the self-inspection system, including key personnel involved in self-inspections, reporting procedures and mode of implementation of recommendations.

3.1.12 Disposal of Equipment

Description of proposed equipment disposal protocols must be stated.

3.1.13 Waste Management

Description of arrangement of solid, liquid and gaseous waste disposal must be stated. In the case of liquid waste, the treatment prior to its disposal shall be indicated.

3.2 Special Requirements (Manufacture of Drugs)

3.2.1 Factory Location and Surroundings

The factory building(s) shall be so situated or shall have such measures as to avoid contamination from open sewage, drain, public lavatory, or any factory which produces disagreeable or obnoxious odour or fumes or large quantity of soot, dust or smoke.

3.2.2 Building

a) The buildings used for the factory shall be constituted so as to permit production of drugs under hygienic conditions. They shall conform to the conditions laid down in the Factories Act, 1948 (63 of 1948).

3.2.3 Premises

a) The premises used for manufacturing, processing, packaging, labelling and testing purposes shall be:

i. Compatible with other manufacturing operations that may be carried out in the same or adjacent premises

ii. Adequately provided with the working spaces to allow orderly and logical placement of equipment and materials so as to:

- Avoid the risk of mix-up between different drugs or with component(s)
- Control the possibility of cross-contamination by other drugs or substances and avoid the risk of omission of any manufacturing or control step

b) It shall be designed, constructed or maintained to prevent entry of insects and rodents. Interior surfaces (walls, floors and ceilings) shall be smooth and free from cracks to permit easy cleaning and disinfection.

c) It shall be provided with adequate lighting and ventilation and, if necessary, air conditioning to maintain as satisfactory temperature and relative humidity that will not adversely affect the drug during manufacture and storage, or the accuracy of the functioning of the laboratory instruments.

d) It shall be provided with an underground drainage system in the processing area as far as possible. The sanitary fittings and electrical

fixtures in the manufacturing area shall be concealed and ventilation and air inlet points should be flushed with the wall as far as possible.

3.2.4 Water Supply

The water used in manufacture shall be pure and of a drinkable quality, free from pathogenic micro-organisms.

3.2.5 Disposal of Waste

Waste water and other residues from the laboratory, which might be hazardous to the workers or to public health, shall be disposed of after suitable treatment

3.2.6 Sterile Products

a) For the manufacture of sterile drugs, separate enclosed areas, specifically designed for the purpose, shall be provided. These areas shall be provided with air locks for entry and shall be essentially dust-free and ventilated with an air supply.

b) For all areas, where aseptic manufacturing has to be carried out, air supply shall be filtered through bacteria-retaining filters (HEPA filters), and shall be at a pressure higher than in the adjacent areas. The filters shall be checked for performance on installation and periodically thereafter, and records thereof shall be maintained.

c) All surfaces in manufacturing areas shall be designed to facilitate cleaning and disinfection. Routine microbial counts of all sterile areas shall be carried out during manufacturing operations. The results of such counts shall be checked against established house standards and records maintained.

d) Access to the manufacturing areas shall be restricted to minimum number of authorised personnel. Special procedures to be followed for entering and leaving the manufacturing areas shall be written down and displayed.

e) For the manufacturing of drugs that can be sterilized in their final containers, the design of the areas shall preclude the possibility that products intended for sterilisation could be mixed up with or taken to be products already sterilised.

f) In case of terminally sterilised products, the design of the area shall preclude the possibility of mix-up between the non-sterile and sterile products.

3.2.7 Working Space and Storage Area

a) The manufacturer shall provide adequate working space (manufacture and quality control) and adequate room for the orderly placement of equipment and materials used in any of the operations for which it is employed so as to minimize or eliminate any risk of mix-ups between different drugs or raw materials, and to control the possibilities of cross-contamination of one drug by another drug that is being manufactured, stored or handled in the same premises.

b) There shall be adequate space in storage areas for materials under test, approved and rejected with arrangements and equipment to allow dry, clean and orderly placement of stored materials and products, wherever necessary, under controlled temperature and humidity.

3.2.8 Health, Clothing and Sanitation of Workers

a) All personnel, including temporary staff, who come into direct contact with the products, including raw materials, shall undergo periodic health check-up.

b) All personnel shall be free from contagious or obnoxious diseases. Their clothing shall consist of white or coloured material made up of cotton or synthetic fabric suitable for the nature of work and climate and shall be clean.

c) Just before entry to the manufacturing area, there shall be changing rooms (minimum area of 8 sq. metres each), separate for each sex, with adequate facility for personal cleanliness, such as clean towels or hand dryers, soap, disinfectant and hand scrubbing brushes so that all the personnel change their street clothes and wash and wear clean factory uniform, head gear and footwear, before entering any manufacturing area or analytical laboratory.

d) For all workers engaged in filling and sealing of containers of sterile preparations, suitable sterile gowns, headgear, footwear and masks made of synthetic fabric shall be provided to cover the nostrils and mouth during work.

3.2.9 Medical Checks

The manufacturer shall also provide:

a) Adequate facilities for first aid.

b) Medical examination of workers at the time of employment and periodic check-ups thereafter, once in a year, with particular attention being devoted to freedom from infections. Records thereof shall be maintained.

3.2.10 Sanitation in the Manufacturing Premises

a) The manufacturing area shall not be utilised for any other purpose.

b) The manufacturing premises shall be maintained clean and in an orderly manner, free from accumulated waste, dust, debris, etc.

c) Eating, drinking, chewing, smoking, or any unhygienic practices, shall not be permitted in the manufacturing area.

d) The manufacturing area shall not be used as general thoroughfare for personnel, or for storage of materials, except for material being processed.

e) A routine sanitation programme shall be drawn up and observed. This shall be properly recorded and shall indicate:
   i. Specific areas to be cleaned and cleaning intervals.
   ii. Cleaning procedure to be followed, including equipment and materials to be used for cleaning.
   iii. Personnel assigned the responsibility for cleaning operations.

f) Records of compliance in respect of sanitation shall be maintained for inspection.

3.2.11 Equipment

a) Equipment used for the manufacture of drugs shall be constructed, designed, installed and maintained to:
   i. Achieve operational efficiency and attain the desired quality.
   ii. Prevent physical, chemical and physico-chemical change through surface contact.
   iii. Prevent contact of any substance required for the operation of the equipment such as lubricants, etc.
   iv. Facilitate thorough cleaning wherever necessary.
   v. Minimise any contamination of drugs or their containers during manufacture.

b) Specific, written, cleaning instructions shall be for all equipment and utensils should be readily available, and the operators are required to be familiar with them.

c) Manufacturing equipment and utensils shall be thoroughly cleaned and, if necessary, sterilized in accordance with the written and specific instructions. When indicated, all equipment should be disassembled and thoroughly cleaned to preclude the carry over of drug residues from previous operations/batches.

d) The accuracy and precision of the equipment used for specific filling shall be checked and confirmed at regular intervals, and records of such checks shall be maintained.

e) The accuracy of precise filling shall be checked, confirmed and calibrated at regular intervals, and the records of such checks shall be maintained.

f) Equipment used for sterilization of drugs shall be fitted with recording devices so as to monitor and evaluate the performance of the equipment. The equipment shall be calibrated and checked at regular intervals, and records thereof shall be maintained.

g) Equipment used for critical steps in processing shall be monitored by devices capable of recording the permanent parameters or with an alarm system to indicate malfunctions. These devices shall be calibrated and tested, and records thereof shall be maintained.

3.2.12 Raw Materials

a) The licensee shall keep an inventory of all raw materials to be used at any stage of manufacture of drugs and maintain records.

b) All such materials shall be:

i. Identified and their containers examined for damage and assigned control number.
ii. Stored at optimum temperatures and relative humidity. iii. Labelled indicating the name of the materials, control number of the manufacturer and be specifically labelled under test or approved or rejected.
iv. Systematically sampled by quality control personnel.
v. Tested for compliance with required standards of quality vi. Released from quarantine by quality control personnel

through written instructions.

vii. So organised that stock rotation is on the basis of first in and first out principle in the storage areas.

viii. So arranged that all rejected materials are conspicuously. identified and are destroyed or returned to the suppliers as soon as possible and records maintained thereof.

3.2.13 Master Formula Records:

a) The licensee shall maintain master formula records relating to all manufacturing procedures for each product, which shall be prepared and endorsed by the competent technical staff, i.e. head of production and quality control.

b) The Master Formula Records shall give the following :

i. The patent or proprietary name of the product along with the generic name, if any, strength and the dosage form.

ii. A description or identification of the final containers, packaging materials labels and closures to be used.

iii. The identity, quantity and quality of each raw material to be used, irrespective of whether or not it appears in the finished product. The permissible over-age that may be included in a formulated batch should be indicated.

iv. A description of all vessels and equipment and the sizes used in the process.

v. Manufacturing and control instructions, along with parameters for critical steps, such as mixing, drying, blending, sieving, sterilizing the product, etc.

vi. The theoretical yield to be expected from the formulation at different stages of manufacture and permissible yield limits.

vii. Detailed instructions on precautions to be taken in manufacture and storage of drugs and of semi-finished products.

viii. The requirements of in-process quality control tests and analysis to be carried out during each stage of manufacture, including the designation of persons or departments responsible for the execution of such tests and analysis.

3.2.14 Batch Manufacturing Records

The licensee shall maintain batch manufacturing record as per Schedule U, for each batch of the drug produced. Manufacturing records are required to provide a complete account of the manufacturing history of each batch of a drug showing that it has been manufactured, tested and analysed in accordance with the manufacturing procedures and written instructions as per master formula.

3.2.15 Manufacturing Operations and Controls

a) General controls

i. All manufacturing operations and controls shall be carried out under the supervision of competent technical staff approved by the Board. Each critical step in the process relating to the selection, weighing and measuring of raw materials addition during the process, and weighing and measuring during the various stages, shall be performed under the direct personal supervision of a competent technical staff.

ii. The contents of all vessels and containers used in manufacture and storage during various manufacturing stages shall be conspicuously labelled with the names of the product, batch number, batch size and stage of manufacture. Labels shall be attached to all mechanical manufacturing equipment during their operations. Such labels shall be conspicuous and bear the name of the product and batch number.

b) Precautions against Contamination and Mix-up

i. The licensee shall prevent cross-contamination of drugs with steroids, β-lactam antibiotics and antineoplastic drugs by appropriate methods, which may include:

- Carrying out manufacturing operations in separate building or adequately isolating the operation by total enclosure within the buildings.
- Using appropriate pressure differential in the process area.
- Providing a suitable exhaust system.
- Designing laminar flow sterile air systems for sterile products.

ii. Water for injection shall either be used immediately, or stored, to prevent microbial growth at temperatures of not less that 80^0C in a jacketed stainless storage tank.

iii. Individual containers of liquid orals, parenterals and ophthalmic solutions shall be examined, after filling, against a black/white background fitted with diffused light to ensure freedom from contamination with foreign suspended matter.

iv. Finished tablets shall be inspected for presence of foreign matter besides any other defects.

v. Expert technical staff approved by the Board shall check and compare actual yield against theoretical yield, before final distribution of the batch.

c) All process controls, as required under Master Formula Records, including room temperature, relative humidity, weight variation, disintegration time, mixing time, homogeneity of suspension, volume filled, leakage and clarity, shall be checked and recorded.

3.2.16 Reprocessing and Recovery

If a product batch has to be reprocessed, the reprocessing procedure should be authorized and recorded. An investigation should be carried out into the causes necessitating reprocessing and appropriate corrective measures should be taken for prevention of recurrence. Recovery of product residue may be carried out by incorporating in subsequent batches of the product, if permitted in the master formula.

3.2.17 Labels and other Printed Materials

a) Printed and packaging materials, including leaflets, shall be stored, handled and accounted for in such a way as to ensure that batch packaging materials and leaflets relating to different products do not become intermixed. Access to such materials shall be restricted to authorised personnel only.

b) Prior to issue, all labels for containers, cartons and boxes, inserts and leaflets, shall be examined and released as satisfactory for use by the quality control personnel.

c) To prevent packaging and labelling errors, a known quantity of labelling and packaging units shall be issued and, if required, coded. Such issues shall be made against a written and signed request.

d) Prior to packaging and labelling of a given batch of a drug, it must be ensured that the batch has been duly tested, approved and released by the quality control personnel.

e) Upon completion of the packaging and labelling operations, a comparison shall be made between the number of labelling and packaging units issued and the number of units labelled and packaged. Any significant or unusual discrepancies in the numbers shall be carefully investigated, before releasing the final batch.

f) Unused coded and spoiled labels and packaging materials shall be destroyed.

g) Records shall be maintained for each consignment received of each packaging material indicating receipt, examination relating to testing and whether accepted or rejected.

3.3 Special Requirements (Manufacture of Cosmetics)

3.3.1 Location and Surroundings

The factory shall be located in a sanitary place and hygienic conditions shall be maintained at all times. The premises shall not be used for residence or be interconnected with residential areas. It shall be well ventilated and clean.

3.3.2 Buildings

The buildings used for the factory shall be constructed so as to permit production under hygienic conditions and not permit entry of insects, rodents, flies and other pests. The walls of the room in which manufacturing operations shall be carried out shall be

smooth, water-proof and capable of being kept clean. The flooring shall be smooth, even and washable, and shall be such as not to permit retention or accumulation of dust.

3.3.3 Water Supply

The water used for manufacturing shall be of potable quality.

3.3.4 Disposal of Waste Water

Suitable arrangements shall be made for disposal of waste water.

3.3.5 Health, Clothing and Sanitary requirements of Staff

All workers shall be free from contagious diseases. They shall be provided with clean uniforms, masks, head gear and gloves, wherever required. Adequate facilities for first aid shall be provided.

3.4 Special Requirements (Manufacture of Household Chemical Substances)

3.4.1 Location and Surroundings

The factory shall be located in a sanitary place and hygienic conditions shall be maintained in the premises. Premises shall not be used for residence or be interconnected with residential areas. It shall be well ventilated and clean.

3.4.2 Buildings

a) The buildings used for the factory shall be constructed so as to permit production under hygienic conditions and not permit entry of insects, rodents, flies and other pests.

b) The walls of the room in which manufacturing operations shall be carried out shall be smooth, water-proof and capable of being kept clean. The flooring shall be smooth, even and washable, and shall be such as not to permit retention or accumulation of dust. In all cases, the materials for the finishing of the floors, ceilings and walls shall not react to the product being manufactured

3.4.3 Water Supply

The water used for manufacturing shall be of portable quality.

3.4.4 Disposal of Waste Water

Suitable arrangements shall be made for disposal of waste water.

3.4.5 Health, Clothing and Sanitary requirements of Staff

All workers shall be free from contagious diseases. They shall be provided with clean uniforms, masks, head gear and gloves, wherever required. Adequate facilities for first aid shall be provided.

3.5 Special Requirements (Manufacture of Medical Devices)

3.5.1 Location and Surroundings

The factory shall be located in a sanitary place and hygienic conditions shall be maintained in the premises. Premises shall not be used for residence or be interconnected with residential areas. It shall be well ventilated and clean.

3.5.2 Buildings

a) The buildings used for the factory shall be constructed so as to permit production under hygienic conditions and not permit entry of insects, rodents, flies and other pests.

b) The walls of the room in which manufacturing operations shall be carried out shall be smooth, water-proof and capable of being kept clean. The flooring shall be smooth, even and washable and shall be such as not to permit retention or accumulation of dust.

c) The premises shall be kept under controlled conditions of temperature humidity so as to prevent any deterioration in the properties of materials and products due to poor storage and process conditions.

3.5.3 Water Supply

The water used for manufacturing shall be of potable quality.

3.5.4 Disposal of Waste Water

Suitable arrangements shall be made for disposal of waste water.

3.5.5 Health, Clothing and Sanitary requirements of Staff

All workers shall be free from contagious diseases. They shall be provided with clean uniforms, masks, head gear and gloves, wherever required. Adequate facilities for first aid shall be provided.

APPENDIX 1

EQUIPMENT FOR THE MANUFACTURE OF DRUGS

A. Equipment required for the manufacture of external preparations (i.e. ointments, emulsions, lotions, solutions, pastes, creams)

The following equipment is required for the manufacture of external preparations:

1. Mixing tanks
2. Vessel/Kettle (steam, gas, or electrically heated)
3. Mixer
4. Storage tanks
5. A colloid mill or a suitable emulsifier or any other suitable equipment
6. A triple roller mill or an ointment mill or any other suitable equipment
7. Liquid filling equipment
8. Jar or tube filling equipment

A minimum area of 30 (thirty) square metres is required for the basic installation.

B. Equipment required for the manufacture of liquid oral preparations (i.e. syrups, elixirs, solutions and suspensions)

The following equipment is required for the manufacture of liquid oral preparations:

1. Mixing and storage tanks
2. A colloid mill or suitable emulsifier or any suitable equipment
3. Filter press or other suitable filtering equipment such a matafilter or sparkler filter
4. Vacuum or gravity filter
5. Filling machine
6. Pilfer proof cap sealing machine
7. Water treatment system
8. Inspection table

A minimum area of 30 (thirty) square metres is required for the basic installation.

C. Equipment required for the manufacture of tablets

For effective operations, the tablet production department shall be divided into three (3) distinct and separate sections:

a. Granulating section
b. Tableting section
c. Coating section

The following equipment is required in each of the three (3) sections in the tablet production department.

Granulating Section

1. Mills and sieves
2. Powder mixer
3. Mass mixer
4. Granulator
5. Ovens, thermostatically controlled or other suitable equipment

Tableting section

1. The tablet section shall be free from dust and floating particles. For this purpose it is desirable that each tablet machine is connected to an exhaust system and isolated into cubicles.
2. Tablets machine, single punch or rotary
3. Punch and dice storage cabinet
4. Tablet counter
5. Tablet inspection belt
6. In-process testing equipment like hardness Tester, accurate weighing balance and Disintegration Test apparatus

Coating section

1. The coating section shall be made dust free and suitable exhaust provided to remove excess powder and the fumes resulting from solvent evaporation
2. Jacketed kettle, steam gas electrically heated for preparing solution
3. Coating pan
4. Polishing pan
5. Heater and exhaust system
6. Air conditioning and dehumidification arrangement

A minimum area of 30 (thirty) square metres is required for basic installations in each of the above three sections.

D. Equipment required for the manufacture of capsules

The following equipment is required for the manufacture of capsules:

1. Semiautomatic or automatic capsule filling machine
2. Capsule de-dusting and polishing machine
3. Air conditioners and dehumidification arrangements

A minimum area of 25 (twenty-five) square metres is required for the basic installation.

E. Equipment required for the manufacture of suppositories and pessaries

The following equipment is required for the manufacture of suppositories and pessaries:

1. Mixing and pouring equipment
2. Moulding equipment

A minimum area of 20 (twenty) square metres is required to allow for the basic installation.

In the case of pessaries manufactured by granulation and compression, if the licensee does not have a tablet section, a separate minimum area of 30 (thirty) square metres for the installation of the following equipment is considered necessary:

1. Mixer
2. Granulator
3. Drier
4. Compressing machine
5. Pessary and tablet counter

F. Equipment required for the manufacture of inhalers

The following equipment is required for the manufacture of inhalers:

1. Mixing equipment
2. Graduated delivered equipment for measurement of the medicament
3. Sealing equipment

A minimum area of 20 (twenty) square metres is required for the basic installations

G. Equipment required for the manufacture of parenteral preparations

The whole process of the manufacture of parenteral preparations may be divided into the following separate operations:

a) Preparation of the containers and closures. This includes cutting, washing, drying and sterilizing of ampoules, vials, bottles and closures prior to filling
b) Preparation of the solution. This includes preparation and filtration of the solution
c) Filling and sealing. This includes filling and sealing of ampoules or filling and capping of vials and bottles
d) Testing

Equipment required in the Manufacturing Area

1. Storage equipment for ampoules, vials bottles and closures
2. Washing and drying equipment
3. Dust proof storage cabin
4. Water still
5. Mixing and preparation tanks or other containers (The tanks or container shall be made of such materials as will not react with the liquid)
6. Mixing equipment where necessary
7. Filtering equipment
8. Hot air sterilizer
9. Aseptic filling and sealing rooms
10. Benches for filling and sealing
11. Bacteriological filters
12. Filling and sealing unit under laminar flow work station

Equipment required in the General Room

1. Inspection table
2. Leak testing equipment
3. Labelling and packing benches
4. Storage equipment including cold storage and refrigerators, if necessary

A minimum area of 60 (sixty) square metres, partitioned into suitable sized cubicles with air lock arrangements, is required for the basic installations.

H. Equipment required for the manufacture of eye ointments, eye-lotions and other preparation for external use

The following equipment is required for manufacture of eye preparations

1. Hot air oven electrically heated with thermostatic control
2. Colloid mill or ointment mill
3. Kettle gas or electrically heated with suitable mixing
4. Tube filling equipment
5. Mixing and storage tanks of stainless steel or other suitable material
6. Sintered glass funnel, Seitz filter or filter candle
7. Liquid filling equipment
8. Autoclaves

A minimum area of 25 (twenty-five) square meters is required for the basic installations. The manufacture and filling shall be carried out in an air conditioned room under aseptic conditions.

APPENDIX 2

EQUIPMENT FOR THE MANUFACTURE OF COSMETICS

A. Equipment required for the manufacture of powder cosmetics (face powder, cake make-up, compacts, face packs, masks and rouges)

The following equipment is required for the manufacture of powder cosmetics.

1. Powder mixer of suitable type provided with a dust bin, collector
2. Perfume and colour blender
3. Sifter with sieves and suitable mesh size
4. Ball mill of suitable grinder
5. Trays and scoops (stainless steel)
6. Filing and sealing equipment provided with dust extractor
7. For compacts:
    i. A separate mixer
    ii. Compact pressing machine
8. Weighing and measuring devices
9. Storage tanks

A minimum area of 15 square metres is required for the basic installation. The section is to be provided with adequate exhaust fans.

B. Equipment required for the manufacture of creams, lotions, emulsions, pastes, cleansing milks, shampoos, pomades, brillantines, shaving-creams and hair oils and creams

The following equipment is required for the manufacture of creams, lotions etc.

1. Mixing and storage tanks of suitable materials
2. Heating kettle-steam, gas or electrically heated
3. Suitable agitator
4. Colloid mills or homogeniser (where necessary)
5. Triple roller mill (where necessary)
6. Filling and sealing equipment
7. Weighing and measuring devices

A minimum area of 25 square metres is required for the basic installation.

C. Equipment required for the manufacture of lipsticks and lip gloss

The following equipment is required for the manufacture of lipsticks and lip gloss.

1. Vertical mixer
2. Jacketed kettle-steam, gas or electrically
3. Mixing vessels (stainless steel)
4. Triple roller mill/ball mill
5. Moulds with refrigerating facility
6. Weighing and measuring devices

A minimum area of 15 square metres is required for the basic installation.

D. Equipment required for the manufacture of eyebrow pencils, mascara, eyeliners

The following equipment is required for the manufacture of eyebrow pencils, mascara, eyeliners etc.

1. Mixing tanks
2. A suitable mixer
3. Homogenizer (where necessary)
4. Filling and sealing equipment
5. Weighing and measuring devices

A minimum area of 10 square metres is required for the basic installation.

E. Equipment required for the manufacture of aerosols

The following equipment is required for the manufacture of aerosols.

3. Air compressor
4. Mixing tanks
5. Suitable propellant filling and crimping equipments
6. Liquid filling unit
7. Leak testing equipment
8. Fire extinguisher (where necessary)
9. Suitable filtration equipment
10. Weighing and measuring devices

A minimum area of 15 square metres is required for the basic installation.

F. Equipment required for the manufacture of alcoholic fragrance solutions

The following equipment is required for the manufacture of alcoholic fragrance solutions.

3. Mixing tanks with stirrer
4. Filtering equipment
5. Filling and sealing equipment
6. Weighing and measuring devices

A minimum area of 15 square metres is required for the basic installation.

G. Equipment required for the manufacture of hair dye

The following equipment is required for the manufacture of hair dye.

1. Stainless steel tanks
2. Mixer
3. Filling unit
4. Weighing and measuring devices
5. Mask, gloves and goggles

A minimum area of 15 square metres with proper exhaust is required for the basic installation.

H. Equipment required for the manufacture of tooth powders and toothpastes

The following equipment is required for the manufacture of tooth-powders and toothpastes

1. Tooth powder

   Equipment
   a. Weighing and measuring devices
   b. Dry mixer (powder blender)
   c. Stainless steel sieves
   d. Powder filling and sealing equipment

An area of 15 square metres with proper exhaust is required

2. Toothpaste

Equipment

a. Weighing and measuring devices
b. Steam kettle (gas or electrically heated)
c. Planetary mixer
d. Stainless steel tanks
e. Tube filling equipment
f. Crimping machine

An additional area of 15 square metres with proper exhaust is required

I. Equipment required for the manufacture of toilet soaps

The following equipment is required for the manufacture of toilet soaps

1. Kettles/pans for saponification
2. Boiler or any other suitable heating arrangement
3. Suitable stirring arrangement
4. Storage tanks or trays
5. Driers
6. Amalgamator/chipping machine
7. Mixer
8. Triple roller mill
9. Granulator
10. Plodder
11. Cutter
12. Pressing, stamping and embossing machine
13. Weighing and measuring devices

A minimum area of 100 square metres is required for small scale manufacture.

APPENDIX 3

EQUIPMENT FOR THE MANUFACTURE OF HOUSEHOLD CHEMICAL SUBSTANCES

A. Equipment required for the manufacture of emulsions, lotions and solutions

The following equipment is required for the manufacture of household chemical substances ie emulsions, lotions, solutions.

1. Mixing tanks
2. Vessel/kettle (steam, gas, or electrically heated)
3. Mixer
4. Storage tanks
5. A colloid mill or a suitable emulsifier or any other suitable equipment
6. A triple roller mill or an ointment mill or any other suitable equipment
7. Liquid filling equipment
8. Jar or tube filling equipment

A minimum area of 30 square metres is required for the basic installation.

B. Equipment required for the manufacture of aerosols

The following equipment is required for the manufacture of aerosols.

11. Air compressor
12. Mixing tanks
13. Suitable propellant filling and crimping equipments
14. Liquid filling unit
15. Leak testing equipment
16. Fire extinguisher (where necessary)
17. Suitable filtration equipment
18. Weighing and measuring devices

A minimum area of 15 square metres is required for the basic installation.

NOTE:
These guidelines give equipments and space requirements for certain categories of drugs, cosmetics, medical devices and household chemical substances only. The Board shall, in respect of other dosage forms that do not appear in the guidelines, have the discretion to examine the adequacy or otherwise of factory premises, space, plant and machinery and other requisites, having regard to the nature and extent of the manufacturing operations involved.

The above requirements are made subject to modification at the discretion of the Board, if the Board is of the opinion that having regard to the nature and extent of the manufacturing operation it is necessary to relax or alter them in the circumstances of a particular case.

APPENDIX 4

EQUIPMENT FOR THE MANUFACTURE OF MEDICAL DEVICES

The process of manufacture of medical devices shall be divided into the following separate operations:

1. Moulding (wherever manufacture of medical devices is to start from granules)
2. Assembling (includes cutting, washing and drying, sealing, packing labelling etc)
3. Storage
4. Sterilization
5. Testing

A. Equipment required for the manufacture of sterile, disposable perfusion and blood collection sets

The following equipment is required for the manufacture of sterile, disposable perfusion and blood collection sets.

1. Moulding
   a. Injection Moulding Machine
   b. Extruder Machine
   c. PVC resin compounding machine

2. Assembling
   a. Hand pressing machine for filter fixing of drip chamber
   b. Bag sealing machine
   c. Compressor machine
   d. Leak testing bench
   e. PVC tube cutting machine
   f. Tube winding machine (wherever necessary)
   g. Welding machine (where necessary)

An area of 30 square metres for moulding and 15 square metres for assembling is required for the basic installation. The assembling area shall be air-conditioned and provided with HEPA filters. The moulding section shall, if necessary, have a proper exhaust system.

B. Equipment required for the manufacture of sterile, disposable hypodermic syringes

1. Moulding
    a. Granulator
    b. Injection Moulding Machine
    c. Air Compressor
    d. Weighing Devices

2. Assembling
    a. Blister Pack Machine
    b. Vacuum Dust Cleaner
    c. Rubber-tip Washing Machine
    d. Foil stamping or screen printing equipment

An area of 30 square metres for moulding and 15 square metres for assembling are required. The assembling area shall be air-conditioned with HEPA filters. The moulding section shall, if necessary, have a proper exhaust system.

C. Equipment required for the manufacture of sterile, disposable hypodermic needles

1. Moulding
    a. Needle grinding and levelling machine
    b. Electro polishing machine
    c. Cutting machine
    d. Injection moulding machine
    e. Needle pointing deburrine machine
    f. Air-compressor

2. Assembling
    a. Needle cleaning machine with magnetic separator
    b. Blister packing machine
    c. Needle inspection unit

An area of 30 square metres for moulding and 15 square metres for assembling are required. The assembling area shall be air-conditioned provided with HEPA filters. The moulding section shall, if necessary, have a proper exhaust system.

D. Equipment required for the manufacture of surgical dressings, other than absorbent cotton wool

1. Rolling machine
2. Trimming machine
3. Cutting equipment
4. Folding and pressing machine for gauze
5. Mixing tanks for processing medicated dressing
6. Hot air drying oven
7. Steam sterilizer or dry heat or other suitable equipment

A minimum area of 30 square metres is required for the basic installations. In case medicated dressings are to be manufactured, another room with an area of thirty square metres shall be provided.