

(C) 1.

Guidelines for the minimum infrastructure to be created by the manufacturers of pesticides and their formulations to meet the requirements for issue of licence by respective State Governments (Licencing Authority)- as approved in 261st RC held on 15-02-2006

These are the general requirements, However, for individual chemicals, specific requirements are to be installed and additional equipment are to be supplemented to suit the reactions involved in the manufacturing process. Further, other specifications as per the Insecticides Rules viz. medical facilities, protective clothing, respiratory devices, first aid measures, training towards safety precaution and handling safety equipment, safety disposal, etc. are required to be made.

1. The minimum infrastructure with respect to manpower shall be as under

<u>Sr. No.</u>	<u>Manpower</u>	<u>For Technical plant</u>	<u>For formulation plant</u>
1	Production Manager	R	R
2.	Supervisor	R	R
3.	Instrument and process control personnel	R	R*/NR
4.	Maintenance Personnel (Plant and utilities)	R	R
5.	Store Keeper (Raw material and finished products)	R	R
6.	Quality Control Chemist	R	R
7.	Security personnel	R	R

*** In case of automatic plant**

2. Minimum infrastructure with respect to machinery & equipment

A. For technical plant

<u>Sr. No.</u>	<u>Equipment</u>	<u>For Technical plant</u>
1	Control console	R
2.	Feed tank for raw material	R
3.	Reactors	R
4.	Distillation towers	R
5.	Evaporators	R
6.	Condenser / heat exchanger / boiler/ extinguisher plant / chilling system / steam plant	R
7.	Crystallizer	R
8.	Centrifuge	R

9.	Drier	R
10.	Phase separator	R
11.	Extractor	R
12.	Storage tank	R
13.	Process water tank	R
14.	Pipelines with conventional colour code	R
15.	Gas plant	R

B. For Formulation plant

S.No.	Equipment	Solid, DP, WG, SP, etc	WG/G	Liquid (EC, EW, SL)
1.	Feeding channel / Chute	R	R	R
2.	Jaw Crusher	R	R	NR
3.	Raw material feed tank	R	R	R
4.	Pulveriser	R	R	NR
5.	Blender	R	R	R
6.	Siever	R	R	R
7.	Bag Filter	R	NR	NR
8.	Homogenizer	R	R	R
9.	Ball mill	R	NR	NR
10.	Weighing machine / platform balance	R	R	R
11.	Vessel with stirrer	R	R	R
12.	Drier	R	R	NR
13.	Cooling machine	NR	R	R
14.	Sprayer	NR	R	NR
15.	Water tank for liquid	NR	NR	R
16.	Filter	NR	NR	R

3. Equipment for quality control laboratory

1. Analytical weighing balance
2. Hot air oven
3. Refrigerator
4. pH meter
5. Spectro-photometer / colourimeter
6. GLC / HPLC depending on the products analytical process as in the specification.
7. Standard glassware, chemical and general requirements for laboratory
8. Pesticide Repository
9. Specification / BIS standard of the product to be manufactured / formulated
10. Sieve shaker.
11. Fume Hood

12. Distilled water still
13. Flash point apparatus
14. Melting point apparatus

4. Packaging plant and equipment

1. Packaging machinery.
2. Filling machine (automatic / semi automatic).
3. Weighing machine
4. Bagging machine
5. Sealing machine
6. Labeling equipment.

(C) 2.3**Guidelines for minimum infrastructure facilities to be created by the manufacturers of botanical biopesticides (Pyrethrum, Azadirachtin, Cymbopogon etc.)****(as approved in 297th meeting of RC held on 29-01-2009)**

Sl.No.	MANPOWER REQUIRMENT
1.	Quality Control Biologist
2.	Sufficient personnel to supervise production, maintenance, stores etc.
	GENERAL REQUIREMENT
1.	Extraction room
2.	Production room
3.	Formulation unit
4.	Packing and storage room
5.	Quality control laboratory
6.	Protective clothing
7.	Respiratory devices
8.	First aid measures
9.	Waste disposal arrangement in compliance with Pollution Control norms
	PLANT EQUIPMENT/INSTRUMENT REQUIREMENT
1.	Phase separation vessels
2.	Decanter
3.	Mixing vessels with stirrer
4.	Centrifuge
5.	Soxhlet apparatus
6.	Electric oven with thermometer
7.	Chemical measuring cylinders
8.	Chemical transfer pumps
9.	Filter pressure pump
10.	Measuring cans
11.	Electric weighing machine
12.	Counter scales
13.	Filtration assembly
14.	Water distillation unit
15.	Wrist action shaker
16.	Blender
17.	Vortex
18.	Large air tight containers
19.	Material filling trays

20.	Storage tank
21.	Filling machine
22.	Sealing machine
23.	Packing accessories
	LABORATORY EQUIPMENT/INSTRUMENT REQUIREMENT
1.	HPLC System
2.	pH meter
3.	Spectrophotometer
4.	Refrigerator
5.	Thermometer
6.	Microscope
7.	Autoclave
8.	U. V. Lamp
9.	Abel flash point Apparatus
10.	Incubator
11.	Glassware viz. Conical Flasks, Test tubes, Beaker, Separating funnel, Funnels, Glass tubes, etc.
12.	Pipette fillers
13.	Pipette
14.	Burette
15.	TLC apparatus & accessories
16.	Micro-syringes

Note: These are the general requirements of minimum infrastructure to be created by the manufacturers. However, for specific botanical biopesticides formulation(s) and their quantum of production, requirement of manpower, space, equipment /instrument may be needed.

(C) 2.1

Guidelines for minimum infrastructure facilities to be created by the manufacturers of microbial biopesticides (Antagonistic fungi, Entomopathogenic fungi, Antagonistic bacteria, Entomotoxic bacteria).

(as approved in 297th meeting of RC held on 29-01-2009)

Sl.No.	MANPOWER REQUIREMENT
1	Quality Control Biologist
2.	Sufficient personnel to supervise production, maintenance, stores etc.
	GENERAL REQUIREMENT
1.	Production, Mixing & Drying Room and Formulation Unit for Antagonistic fungi/ Entomopathogenic fungi
2.	Inoculation, Fermentor, & Sterilization Room and Formulation unit for Antagonistic bacteria/ Entomotoxic bacteria.
3.	Packaging and storage room
4.	Quality Control laboratory
5.	Protective clothing
6.	Respiratory devices
7	First Aid Measure
8.	Waste disposal arrangement in compliance with Pollution Control norms
	PLANT EQUIPMENT REQUIREMENT
1.	Plant Fermentor with all accessories / Bioreactor / Shaker
2.	Steam Boiler
3.	Chilling plant
4.	Air compressor
5.	RO/ Softener (water treatment plant)
6.	Distillation Unit
7.	Micro centrifuge
8.	Magnetic stirrer
9.	300 μ and 160 μ Sieves
10.	Electronic Weighing Balance
11.	Blender/Homogenizer
12.	Vortex
13.	Vibro-screen
14.	Autoclavable bag
15.	Large air tight container
16.	Pouch sealing machine
17.	Box strapping machine
18.	Racks and cabinet

	LABORATORY REQUIREMENT	EQUIPMENT/ INSTRUMENT
1.	Autoclave	
2.	Water bath	
3.	Shaking incubator	
4.	Refrigerator	
5.	Thermo hygrometer	
6.	U. V. light	
7.	BOD Incubator	
8.	Hot Air oven	
9.	Laminar Flow	
10.	pH meter	
11.	Balance (2-3 decimal places)	
12.	Vacuum pump	
13.	Hot plate	
14.	Deep freezer	
15.	Spirit	
16.	Microscope and all accessories	
17.	Glassware viz. Conical Flasks, Test tubes, Beaker etc.	
18.	Petri dishes	
19.	Titanium inoculating needles	
20.	Pipette fillers	
21.	Pipettes (0.1 ml to 20 ml)	
22.	Haemocytometer	
23.	Colony counter	

Note: These are the general requirements of minimum infrastructure to be created by the manufacturers. However, for specific microbial biopesticides formulation(s) and their quantum of production, requirement of manpower, space, equipment/ instrument may be needed.

(C) 2.2**Guidelines for minimum infrastructure facilities to be created by the manufacturers of Baculoviruses (NPV, GV).****(as approved in 297th meeting of RC held on 29-01-2009)**

Sl.No.	MANPOWER REQUIREMENT
1	Quality Control Biologist
2.	Sufficient personnel to supervise production, maintenance, stores etc.
	GENERAL REQUIREMENT
1.	Post culture production room with temperature and humidity control
2.	Moth ovi-position room with temperature and humidity control
3.	Production room with temperature and humidity control
4.	Diet preparation room
5.	Virus processing lab.
6.	Quality control lab.
7.	Formulation unit
8.	Cold storage
9.	Washing and sterilization facility
10.	Stores room
11.	Protective clothing
12.	Respiratory devices
13.	First aid measures.
14.	Waste disposal arrangement in compliance with Pollution Control norms

	EQUIPMENT/INSTRUMENT REQUIREMENT
1.	Diet preparation machine (mixer)
2.	Diet dispenser.
3	Multi channel pipette
4.	Vacuum pump with an aspirator
5.	Blenders
6.	Multipurpose centrifuges
7.	B.O.D. incubator or an incubator room or an environmental chamber
8	Scale balance
9	Digital balance
9.	Haemocytometer shallow depth Counting chamber
11.	Hot air oven.
12.	Compound research microscope.
13.	Zoom microscope.
14.	Vortex mixers
15.	Tally counters

16.	Electric stove.
17.	Autoclave
18.	Shaker.
19.	Water distillation unit.
20.	Air conditioners
21.	Humidifiers
22.	Oviposition iron cage
23.	Washing machine
24.	Racks and cabinet
25.	Refrigerators

Note: These are the general requirements of minimum infrastructure to be created by the manufacturers. However, for specific baculovirus formulation(s) and their quantum of production, requirement of manpower, space, equipment/ instrument may be needed.