

## SPORE BOX

### Production of Spores

For the production of spores, in particular filamentous micro-organisms, VOGELBUSCH has developed a patented propagation system.

The Spore Box consists of two parts, a supply unit, and a sterile compartment for spore production.

The supply unit contains all necessary equipment to ensure optimal cultivation conditions, such as control of humidity, temperature, pressure and air flow rate as well as measuring instruments, recorder, ventilator and a compressor.

The production compartment has windows for optical inspection of the growth of the micro-organisms. Integrated gloves are used for all manipulations from the outside. Sterile ventilation is carried out by air flow through HEPA filter.



fig. 1: Spore Box with harvesting apparatus



fig. 2: Handling via integrated gloves

The production compartment is equipped with 60 plates, each with a utilizable area of 1,260 cm<sup>2</sup>, resulting in a total surface of 7.56 m<sup>2</sup>.

A blend of agar, molasses and mineral salts is sterilized and applied on the plates. Once the substrate is solidified, the surface is inoculated with the micro-organism.

After the cultivation period under controlled conditions the spores are cautiously dried, harvested and bottled. The bottled spores can be stored in a customary deep freezer for long periods of time.

The advantages of spore propagation in a VOGELBUSCH Spore Box are:

- | Closed system  
no outside contact from propagation and harvesting through to bottling
- | Easily controlled dosing  
the amount of dry spores is determined by weight
- | Extended shelf life of spores



fig. 3: Harvesting of spores

## Yield

### Example *Aspergillus niger*

In one spore box for instance 0.8 – 1.4 kg spores of *Aspergillus niger* (depending on molasses quality) can be grown in each production cycle. The production cycle for *Aspergillus niger* lasts about 14 days: 5 days for cultivation, 5 days of drying, 4 days for harvesting, cleaning and preparations for the next cycle. All in all some 25 kg of *Aspergillus niger* can be produced in one spore box per year.

## Scope of supply

A basic unit consists of agar preparation, a Spore Box and the harvesting apparatus. Production capacity is extended with additional Spore Boxes while using the existing set of preparation and harvesting equipment.

The harvesting apparatus comprising a separator (cyclone), a vacuum cleaner, a [safety filter for exhaust air](#) and appropriate connections is included in delivery.

The agar preparation vessel (60 liter) can be supplied optionally.

## Installation requirements

Spore Box	
net weight	770 kg
dimensions	2200 x 1370 x 1790 mm
5-phase electric power	400 V
power supply	240 V
cold water supply, outlet	R 3/8"
drain (sewer)	R 2"
Harvesting apparatus	
power supply	400 V
Agar preparation vessel	
power supply	240 V
compressed air (can be from commercial pressure cylinders)	
Oven for dry sterilization of various equipment	app. 800 l

The Spore Box has to be placed in an air-conditioned room with a temperature of  $30^{\circ}\text{C} \pm 1^{\circ}\text{C}$  at all points. A minimum of eight air exchanges per hour and the installation of coarse and fine filters in the ventilation ducts are recommended.

The air outlets should be mounted flush in the ceiling, just as the lighting fixtures. Ceiling, walls and floor should be as smooth as possible, fillets are recommended. The room should be without windows.