



## **HOTBOX SULFUME**

### **INSTRUCTIONS**

The Hotbox Sulfume is designed to evaporate Sulphur in Greenhouses. It will be delivered with either 4 metres of cable fitted or 2 metres of cable and a plug.

Connect to your electricity supply. Ensure it is securely earthed. Half fill the cup with Sulphur. Either rock Sulphur, powder or flowers of Sulphur can be used. Rock Sulphur tends to evaporate more easily. The Sulphur will melt and at 119°C it will begin to evaporate. The Sulfume increases its output of vapour as the temperature increases.

The optimum temperature is 145°C to 155°C - up to a maximum of 159°C, after this the Sulphur begins to increase its viscosity and turns red and then brown. Although it becomes less viscous again at 195°C and vapour can be produced between this temperature and the boiling point of 444°C, changes in its physical structure occur allowing SO<sub>2</sub> and SO<sub>3</sub> to be produced which can be harmful to crops.

**The Hotbox Sulfume is therefore designed to operate at between 119°C and 159°C which it will produce maximum volumes of 'safe' Sulphur. This temperature regulation is automatic and will remain so even if there are major voltage fluctuations.**

Effective and safe vapourisation of Sulphur is a complex subject. It is most important to vapourise Sulphur at the correct temperature.

### **Residues**

The Sulfume evaporates Sulphur cleanly but this depends on the Sulphur being clean or pure. If the Sulphur you are using contains impurities these will be left in the cup after evaporation has taken place.

## **SULFUME TECHNICAL NOTES**

### **SULPHUR FOR EVAPORATION**

SULPHUR IS AN “INORGANIC PROTECTANT FUNGICIDE” It most commonly comes in two forms.

1) **SLATE/ROCK SULPHUR (98% PURE)**

These are solid pieces of sulphur which can easily be put (a small handful) into the cup of a sulfume evaporator. This is the most pure form of sulphur and is particularly recommended for evaporating, it will leave very little residue in the cup.

2) **POWDERED SULPHUR (80% PURE)**

This can be obtained as a ‘dry flowable’ powder or as a ‘wetable powder’. Both are designed for mixing with water so that they can be sprayed on the crop. To facilitate the mixing in water, they contain a thickening/dispersal agent (approx. 20% w/w). This added agent is inert and will not evaporate, so will remain in the cup of a sulphur evaporator. This will need to be cleaned from the cup from time to time, otherwise it will inhibit the efficient use of the Sulphur Evaporator.

To clean the unwanted dispersal agent from the cup, turn the Sulfume “on” and wait for the contents to turn into liquid form. Carefully remove the cup and pour out the unwanted contents for disposal.

**DO NOT** try to chip the unwanted material out of the cup in its solid form. You might damage the cup and distort its base.

For efficient evaporation of sulphur it is essential that the base of the cup is flat and can maintain a good contact with the heating element. Poor contact will result in poor heat transfer and lower temperatures, which in turn will reduce the effectiveness of the product.

### **SULFUME TEMPERATURES**

The temperature of the heating element in a Hotbox Sulfume is lower than the element temperatures in other models on the market. The sulphur in a Hotbox Sulfume cannot catch fire.

The surface temperature of a Hotbox Sulfume plate is :-	185° C
Due to heat transfer and loss, the sulphur temperature is :-	145° C

Auto Ignition Temperature is :-

232° C

The surface temperature of competitive products using a 100W white 220/240 has been measured in excess of :- which is above the 'auto ignition' temperature of sulphur.

280° C

#### **TEMPERATURE CHART**

DEGREES °F UP TO		DEGREES °C UP TO
246	SULPHUR REMAINS SOLID	UP TO 119
246/318	SULPHUR MELTS	119/159
	SULPHUR BECOMES MORE FLUID AND	
	EVAPORATES	
<b>293/311</b>	<b>IDEAL VAPOURISING TEMPERATURE</b>	<b>145/155</b>
318/450	SULPHUR VISCOSITY CHANGES	159/232
	UP TO 10,000 FOLD AND CHANGES TO	
	RED/BROWN	
370	FLASH POINT	188
450	AUTO INFLAMMABILITY OCCURS	232/261
482	SULPHUR TURNS BROWNISH/BLACK	250
500/832	SULPHUR VAPOUR CAN CONTAIN OXIDES	261/444
	OF SULPHUR. CHANGES IN STRUCTURE	
	CAN PRODUCE S3, S6, SO2 AND SO3	
832	SULPHUR BOILS AND VAPOUR BECOMES	444
	ORANGE/YELLOW	

#### **ADVICE ON CHEMICAL USAGE WITH THE SULFUME**

Stainless steel cups can be used and will give you temperatures 80-100°c.

Some chemicals can be vapourised in a Sulfume but a stainless steel cup should be used (available as an extra). Temperatures will be around 80-100°c depending on the ambient temperature.

Regulations on the vapourising of chemicals vary from country to country/state to state. We suggest the local authorities be contacted to advise on the legality of vapourising any particular chemical.