

# COMBINATION - PROBE

**CWS 104**

**to control the oxygen content and the temperature profile in compost material with only one probe**

## Composting

The prerequisite for the production of high-quality finished compost is optimal conditions for decomposition. Here particular attention must be paid to the factors of oxygen content and temperature. In the aerobic process of decomposition, organic waste is converted by bacteria and fungi and the addition of oxygen into carbon dioxide and water according to the formula  $C_6H_{12}O_6 + 6 O_2 \rightarrow 6 CO_2 + H_2O + \text{energy}$ . The role played by the amount of oxygen in this process is particularly clear. The activity of micro-organisms is reduced in direct proportion to the extent that the low oxygen content is available for other composting factors. The degree of oxygen saturation can therefore also be understood as the degree of efficiency of the composting process.

Since the process described above is exothermic, energy is additionally set free in the form of heat. Temperatures of well over 70°C can occur. If these temperatures can be maintained over a certain period of time, pathogens and seeds capable of germinating can be effectively killed. On the other hand, excessively high temperatures can cause overheating of the compost material and consequently a disadvantage for the process of degradation.

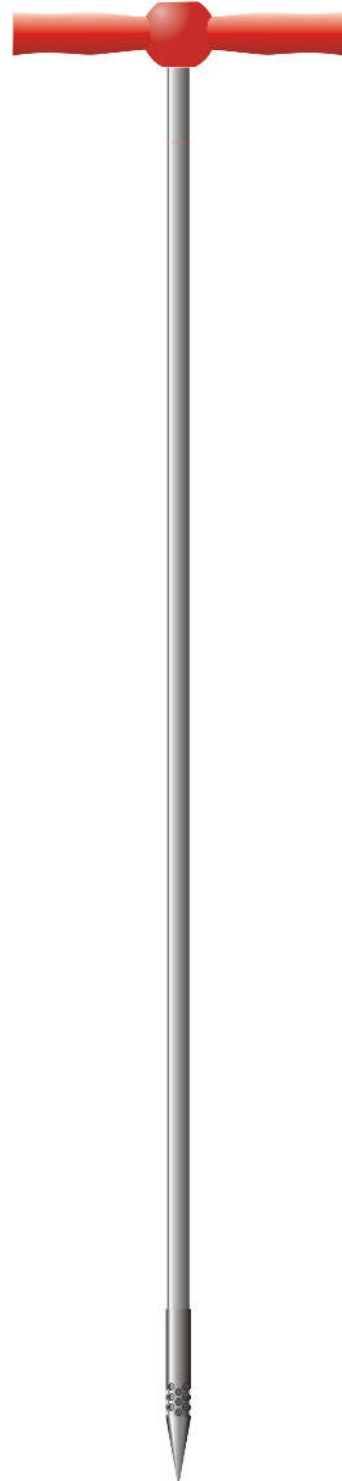
With the measuring probe introduced here for the first time it is possible to measure both the oxygen content directly in the material and the temperature profile of the windrow with only one probe.

## Oxygen-measurement

A special oxygen sensor (amperometric membrane-covered Clark cell) allows the O<sub>2</sub> content so vital for the effect of the micro-organisms on the compost material to be measured and monitored **directly inside** the pile.

## Measurement of the temperature profile

The measurement of the temperature profile in the pile is carried out by a special pricking probe, which is made of corrosion-free high-grade steel. The pricking probe supplies six measured values, that are distributed over the whole length of the probe and that are transferred via a high quality special cable and a water-proof plug connection to the hand measuring device.



Thus, a maximum in the functioning safety is guaranteed even when the system is in operation outdoors in extreme conditions. Because of its robust structure, the probe can also remain in the compost material.

Connection of the probe to the measuring device is by means of a high-quality special cable as well as a splash proof plug connector permitting a high degree of functional reliability when operating the system outdoors under extreme conditions.

### **Technical Data:**

oxygen- probe material high-grade steel WS 1.4571 (DIN 17440), diameter 22 mm (shaft), ca. 28 mm (top), length 1 m, weight ca. 2,5 kg, length of the connecting cable 9 m

oxygen sensor amperometric Clark-cell  
measuring range: 0...25 Vol.-% oxygen  
operating range: max. 80°C  
sensibility against: carbon dioxide: to 50 vol.-%=0  
propane: to 20 vol.-% within measuring precision  
hydrogene, carbone monoxide=0  
adjustment period  $t_{90}$ : about 20 min  
Features: Sensor element changeable (plugs)

temperature profile  
operation temperature: max. 100°C  
adjustment time  $t_{90}$ : about 10 min