

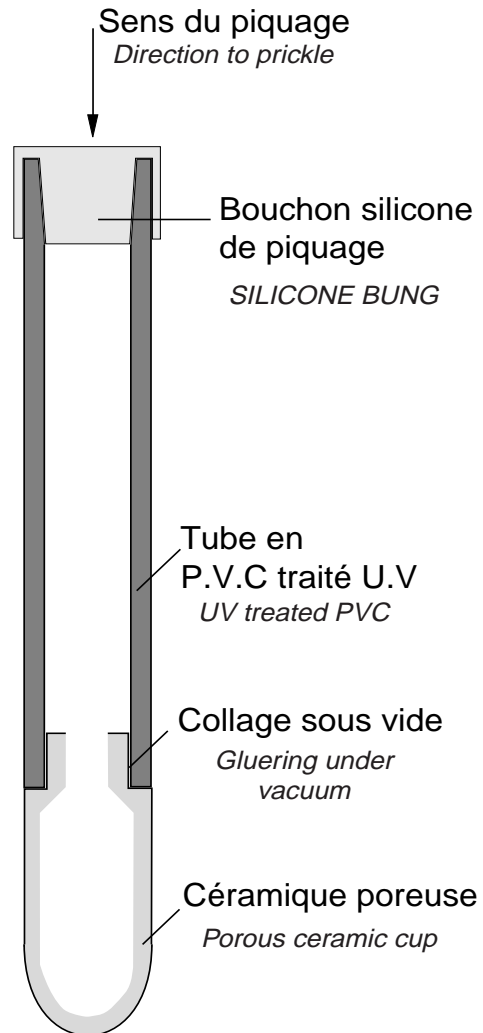
TENSIOMETRIC TUBE for ELECTRONIC TENSIMETER "SMS2500S"

1-INTRODUCTION

The SMS series tensiometric tubes are designed to be used with the electronic tensimeters SMS2500S and SMS5000. SDEC-France tensimeters are also compatible with all other tensimeters on the market (compatible outer diameter). The functioning principle of the SMS tensiometric tubes is based on the use of a hypodermic needle to measure the suction in the tube through a special septum type stopper. To make the measurement, the tensimeter is set on the top of the tensiometric tube. A special silicone stopper is used to close the tube. It is filled with a synthetic compound with "self-sealing" properties.

The tensimeter uses the needle to pierce the stopper at the top of the tube, and measures the vacuum (suction) inside. Due to its special design, the stopper remains airtight (it can stand 400-500 piercings without leaking). The porous ceramic SDEC2150 used on the SMS series tensiometric tubes enables it to make measurements over -850 mbar. No air will be able to enter in this range of vacuum, thanks to the excellent characteristics of porousness of SDEC ceramics.

The main interest, therefore, of this technique, lies in the multiplication of the tensiometric measurements at a low cost, since only one electronic transducer is needed for many tubes. This technique is especially suited for agricultural research, and soil science in particular.



CARACTERISTIQUES

- Tensiometric tube** : P.V.C traité against U.V. ray
- Tube dimensions** : Ø inside = 15,4 mm.
Ø outside = 21,5 mm.
- Weight** : from 150 to 550 grams (It is length depends).
- Porous ceramic cup** : SDEC 2150 type.
- Air entry value** : 1,5 Bar.
- Hydraulic conductivity**: $5,5 \cdot 10^{-7} \text{ cm.s}^{-1}$.
- connection ceramic/tube** : with special glue under vacuum.
- Bung** : silicone with special material as TECSIL 2034.
- Time of life of bung** : More 600 puncture for each bung

SPECIAL CARE FOR USE

- Make sure to keep the tensiometric tubes out of frost during winter season.
- Do not apply lateral shocks directly on the ceramic.
- Never touch the ceramics with fingers and avoid any contact with greasy compounds.
- Avoid scratching the inside surface of the tube. A clean surface is important to keep its airtightness.

TENSIOMETRIC TUBE for ELECTRONIC TENSIMETER "SMS2500S"

2- Preparation of the tensiometric tube

Préparation of the tensiometric tubes

Fill the tensiometric tubes with clean "degased" water. This type of water can be obtained by boiling it for 15 minutes. After it cools, slowly fill the tensiometric tubes with the water. You can also degas the water while it is already in the tube, by using a vacuum syringe fitted on the top of it. Place the whole ceramic part of the tube in water and apply vacuum with the preparation syringe. You will observe bubbling in the tube, and after several minutes, the water inside will have reached an acceptable degasing rate for the tensiometric use.

The tensiometric tubes can then be prepared in the lab, and then taken to the experimentation site.

According to the measurement principle used with the SMS series tubes, it is greatly advised to let a space free between the water level in the tube and the lowest point of the silicone stopper. It is essential for the validity of the measurement (quickness of the pressure equilibrium) that the needle of the tensimeter takes its information from the gaseous medium rather than from the liquid medium. It is advised, therefore, to leave a space of air of about 1 cm, space in which the needle will take its information.

