

## The TC-20 Tube Conditioner & Dry Purge Rig

### The TC-20

The TC-20 tube conditioning/dry purge system saves time and money cleaning/purging up to 20 industry standard 3½-inch x ¼-inch O.D. sorbent tubes **SIMULTANEOUSLY**.

- Offers flexibility with smaller batches of tubes being conditioned/purged without modification. Each tube connection point is designed to ensure carrier gas flow through an attached tube, even if one or all of the other tube connection points are unused.
- Up to 20 tubes can be conditioned/purged in the time it takes to treat just one tube using an analytical thermal desorber
- Purge gas costs are reduced - by separating the conditioning process from the analytical thermal desorber it becomes more convenient to use nitrogen rather than expensive helium.
- The potential for contamination of the thermal desorber is eliminated.
- The TC-20 also includes a high capacity charcoal filter to collect tube effluent and prevent contamination of laboratory air. Exhaust gas from each tube is directed to the charcoal bed. The filter is readily accessed by the user for replacement.



Figure 2. The gas manifold lowered into the oven ready to start conditioning



Figure 1. The TC-20 with tubes loaded into the manifold

### Using the TC-20 to Dry Purge Sorbent Tubes

The TC-20 can be used to remove excess water from sorbent tubes, particularly important when hydrophilic sorbents have been used. Dry purging eliminates the adverse effects water would otherwise have on mass spectrometer, electron capture and flame ionisation detectors. It also helps extend GC column lifetimes.

After sampling, tubes are inserted into a gas manifold block (figure 1) **sampling (grooved) end first**. Clean, dry carrier gas is then passed through the tubes **in the sampling direction**. Selection of flow rate and time is controlled by the gauges at the front of the instrument. Dry purging is usually carried out at ambient temperature - leaving the tubes exposed as shown in Figure 1.

## Using the TC-20 to Condition Sorbent Tubes

Tubes are inserted into a gas manifold block (figure 1) **non-sampling (non-grooved) end first**. The manifold then rotates until the tubes point vertically downwards. The tubes are then lowered inside the oven unit and locked into position (figure 2.)

The temperature controller is settable up to 400°C in 1 degree increments and the timer can be set up to 99 hours and 59 minutes in 1 minute increments.

### Background

Sorbent tubes require conditioning whenever...

- freshly packed with sorbent
- stored for more than 48 hours without adequate storage caps
- heavily contaminated during a sampling procedure
- required for trace level monitoring

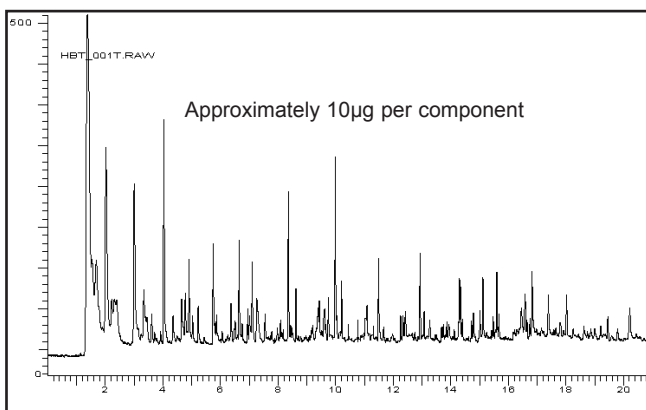


Figure 3. Chromatogram from an unconditioned sorbent tube

The rigour of the conditioning procedure will depend to a certain extent on the type of monitoring for which the tube will be used. For example, sorbent tubes used to measure levels of occupational exposure of several hundred micrograms will require less stringent cleaning than tubes used for trace level monitoring of ambient air.

Typically a laboratory will have a set of protocols which dictate the acceptable level of artifacts for a given application, for example: **“Artifacts should not exceed 10% of any of the target analytes or more than 10ng toluene equivalents of any individual artifact component.”**

Although the precise conditions of temperature, carrier gas flow and time, will vary depending on the particular sorbent in use and the nature of the work, tubes should usually be conditioned for at least as long as their standard desorption time and using, where possible, higher temperatures and faster gas flow rates. Freshly packed tubes should be conditioned for much longer than this - typically at least 2 hours.

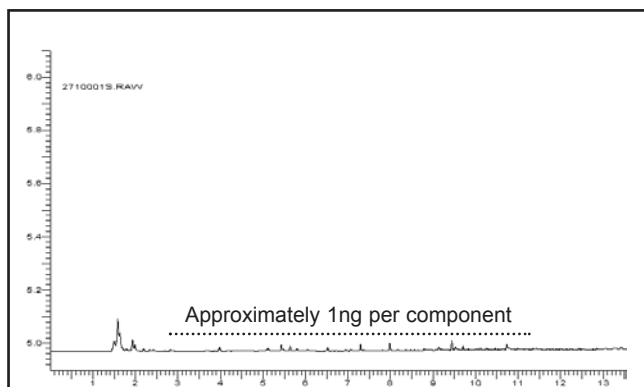


Figure 4. Chromatogram from a Chromosorb 106 tube conditioned using the TC-20

**The TC-20 Tube Conditioner/Dry Purge Rig is designed to improve tube conditioning/dry purging and minimise the time and costs involved. It is available from Markes International Limited, part number R-TC20 and is supplied with 12 months warranty. The TC-20 is user-installable**