

C22 Thermal Desorption Sample Collection System

This Sample Collection System permits the purging of volatiles and semi-volatile components present in solid materials and their trapping on Desorption Tubes packed with an adsorbent resin for subsequent analysis by desorption utilizing the Short Path™ Thermal Desorption System. Volatiles can be collected from sample sizes ranging from less than 0.5 gram up to 20 grams.

This technique for collecting volatiles from samples for analysis is used:

(1) To permit the analysis of trace components in larger sample sizes than could be analyzed by Direct Thermal Desorption in the Short Path Thermal Desorption System. Soil samples up to 20 grams can be sampled in the 0.5" diameter tubes.

(2) To permit the analysis of volatiles from organic samples containing high concentrations of water. Water is not retained by many adsorbents (such as Tenax™) whereas other organic volatiles would be trapped by the adsorbents. Water interferes with the GC analysis by forming plugs to block carrier gas flow thru the GC columns when the GC oven is maintained at subambient temperatures during the initial desorption of samples into the GC.

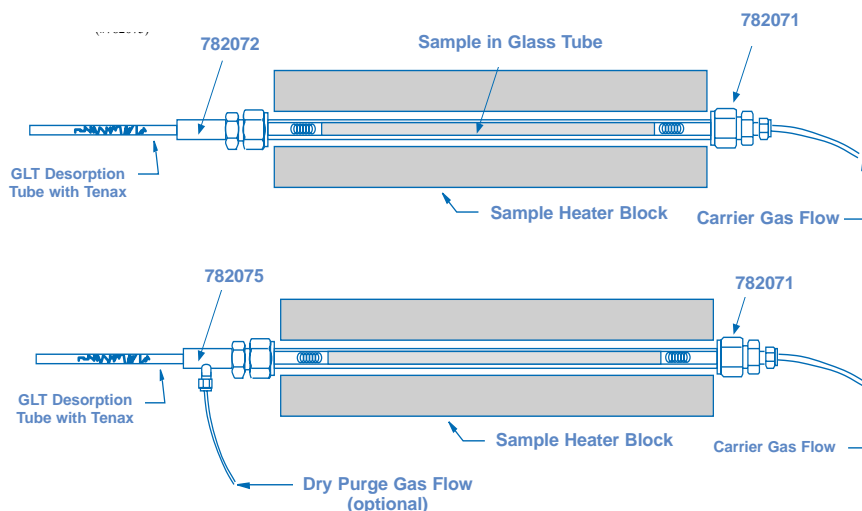
(3) To permit the analysis of volatiles emitted from the samples at different temperatures by collecting the volatiles onto Desorption Tubes at increased temperatures. It is therefore possible to set up studies to determine the temperatures of emission of volatiles and semi-volatiles from materials such as carpet fibers, packaging materials, building products, etc.

Samples to be analyzed are placed inside glass or stainless steel tubes and held in place by glass wool plugs. The system is designed to sample from 0.5" diameter glass tubes, and also from 0.25" diameter glass tubes with optional adapters. Sample tubes are 14.0" long each. When ready for sample collecting, the long tube containing the sample is placed in the sample Collection Oven, fitted at one end with a supply of carrier gas to flush out the residues, and fitted at the opposite end with a preconditioned Desorption Tube with adsorbent resin. The Oven is set for the desired temperature and the desired components are collected onto the Desorption Tubes. Oven temperatures can range from room temperature up to 250° C. The temperature used, as well as the time of sampling, depends on the nature of the samples being analyzed and the requirements of the analyst. Soil samples are typically analyzed at 80° C and sampled for 30 to 60 minutes.

The Sample Collection System consists of a sample tube oven with ports for four 0.5" diameter sample tubes. Up to four samples can be collected simultaneously with the system. Four rotameters regulate the gas flow thru each of the samples independently of one another. A Watlow precision Temperature Controller provides accurate control of the temperature of the Sample Collection Oven up to 250° C. A digital readout indicates the actual oven temperature. The actual Sample Collection Oven consists of a large aluminum plate with holes drilled for the sample tubes and is heated by cartridge heaters. Heat transfer to the sample tubes occurs via direct thermal transfer from the aluminum block to the sample tubes. Temperatures can be maintained within 1% of the full scale reading.



On the front of the Sample Collection System four quick disconnect fittings connect to a 1/8" flexible transfer line to provide gas flow thru each of the sample tubes and Desorption Tubes during sampling. By providing gas flow from a carrier gas such as Nitrogen or Helium thru the heated sample tubes and the Desorption Tubes while sampling, the volatiles and semi-volatiles will be purged from the sample and will be trapped by the adsorbent in the Desorption Tube. A single 1/8" fitting on the back of the System is provided for the attachment of the gas from its source.



Sample Collection System for the collection of thermally sparged volatile samples

Note: The S.I.S. Sample Collection System can be Modified for other Manufacturers Desorption Tubes