

# SHIMSEN TD Tube



## Thermal Desorption

### ■ Thermal Desorption(short for TD)

A process in which a substance is heated to a certain temperature to release the adsorbed compounds. TD is commonly used as a preconcentration technique in gas chromatography(GC) to enable the analysis of low concentration compounds.

### ■ The working principle of Thermal Desorption

Firstly, volatile organic compounds(VOCs) or semi-volatile organic compounds(SVOCs) are collected on the adsorbent in the Thermal Desorption tube(TD tube). Then, the adsorbent is heated under a certain airflow to release these compounds, concentrating them into a smaller volume.

## Main Application Areas

- Indoor air quality monitoring
- Detection of fragrances and flavors
- VOCs detection in the environment
- Automobile interior air pollutants
- Emission testing from stationary pollution sources
- Gas detection from components and materials

## Thermal Desorption Injection System

- The thermal desorption injection system utilizes the heating of the TD tube to automatically desorb the target compounds that have been adsorbed inside the tube. The desorbed target compounds are then re-adsorbed onto a secondary trap, which is rapidly heated to desorb the target compounds and introduce them into GC/GCMS for analysis.
- Early thermal desorption instruments only used one-stage desorption, where the adsorbent tube is heated under a flow of gas to release the adsorbed analytes directly into the GC.
- The Shimadzu TD-30 Thermal Desorption instrument incorporates a second-stage desorption process. With the second-stage desorption, the concentration of the analytes is higher, the sensitivity is increased, and the GC peak shape is improved.



**Shimadzu TD-30 series Thermal Desorption Injection System**

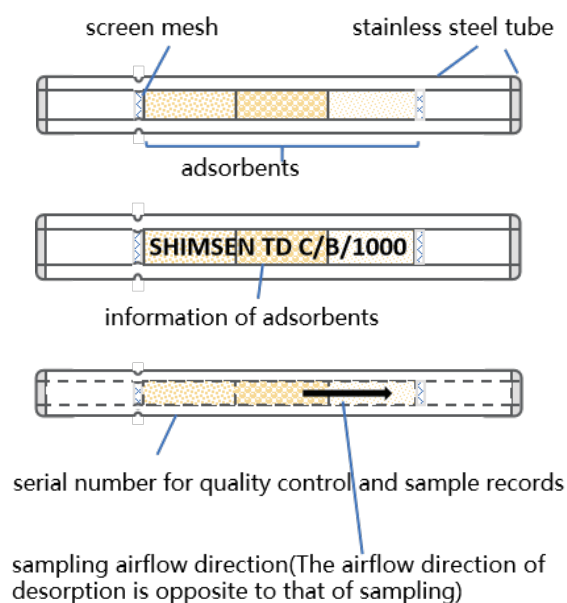


**Thermal Desorption tube (TD tube)**

High sample processing capacity, capable of accommodating up to 120 TD tubes.

## Thermal Desorption Tube(TD tube)

- The selection of an appropriate TD tube is crucial for thermal desorption analysis.
- The adsorption performance of TD tube is determined by adsorbents. Different adsorbents show different physical and chemical properties, resulting in diverse adsorption and desorption capabilities for compounds with different volatility.
- Stainless steel TD tubes are the most widely used in industries like environmental for better durability and easier transportation.
- The inner wall of TD tube has undergone inertization treatment.
- Standard 1/4 "OD \* 3.5" L TD tubes are compatible with standard Thermal Desorption Instruments like Shimadzu, Markes, PE, ULTRA-UNITY, etc.



### Tips

Before choosing the Thermal Desorption tube(TD tube), please confirm the model of thermal desorption instrument, the chamfering of compatible TD tubes may slightly vary from different instruments.



## Introduction to Adsorbents




Adsorbent	Composition	BET	Mesh	Aging Temp	Desorption Temp	Applied range (Number of carbon atoms and boiling point)
Tenax TA	2,6-Diphenylfuran porous polymer	35 m <sup>2</sup> /g	60/80	320°C	300°C	C7~C26 100°C ~ 400°C
AC 130	activated carbon	130 m <sup>2</sup> /g	60/80	350°C	320°C	C4~C12
Tenax GR	Tenax TA + 23% graphitized carbon	24 m <sup>2</sup> /g	60/80	320°C	300°C	C7~C30 / 100°C ~ 450°C
Carbopack B	graphitized carbon	100 m <sup>2</sup> /g	60/80	350°C	320°C	C5 ~ C12 / >75°C
Carbopack C	graphitized carbon	10 m <sup>2</sup> /g	60/80	350°C	320°C	C12 ~ C20
Carbopack X	graphitized carbon	240 m <sup>2</sup> /g	60/80	350°C	320°C	C3 ~ C9 / 80°C ~ 145°C
Carboxen 1000	carbon molecular sieve	1200 m <sup>2</sup> /g	60/80	350°C	320°C	C2 ~ C5 / -60°C ~ 80°C

## Ordering Information

### Thermal Desorption tube(TD tube)

Combined filling	P/N of stainless TD tube for Shimadzu	P/N of stainless TD tube with brass cap for Shimadzu	P/N of stainless TD tube with brass cap for Perkin Elmer
Tenax TA	380-00251-01	380-00251-08	380-00255-01
Tenax GR/Carbopack B	380-00251-02	380-00251-09	380-00255-02
CarbopackB/Carboxen1000	380-00251-03	380-00251-10	380-00255-03
CarbopackC/CarbopackB/Carboxen1000	380-00251-04	380-00251-11	380-00255-04
Tenax GR/AC Carbon	380-00251-05	380-00251-12	380-00255-05
Tenax TA/Carbopack X	380-00251-06	380-00251-13	380-00255-06
AC130	380-00251-07	380-00251-14	380-00255-07
Empty	380-00253-01	-	-

### Analysis and sealing cap for TD tube

P/N	Product description	Note	Product image
223-54617-41	Tube cap for TD-20, 20pcs	Shimadzu TD-20/30R special analysis cap	
380-00253-03	SHIMSEN TD Caps , brass, 20pcs	Universal sealing cap for TD Tubes	
380-00255-08	Analysis TD tube cap for PE, 20pcs	Perkin Elmer TD special analysis cap	

### Reference conditions for the use of TD tube

Combined filling	Applied range Number of carbon atoms/boiling point	Aging conditions	Desorption temperature
Tenax TA	C7 ~ C26 / 100°C ~ 400°C	N2, 100mL/min, >120min, 320°C	<290°C
AC 130	C4 ~ C12	N2, 100mL/min, >120min, 320°C	<330°C
Tenax GR / Carbopack B	C5 ~ C30 / 75°C ~ 450°C	N2, 100mL/min, >120min, 320°C	<290°C
Carbopack B / Carboxen 1000	C2 ~ C12 / > - 60°C	N2, 100mL/min, >120min, 350°C	<330°C
Carbopack C / Carbopack B / Carboxen 1000	C2 ~ C20 / > - 60°C	N2, 100mL/min, >120min, 350°C	<330°C
Tenax GR / AC Carbon	C3 ~ C30 / 75°C ~ 450°C	N2, 100mL/min, >120min, 320°C	<290°C
Tenax TA / Carbopack X	C3 ~ C26 / 80°C ~ 400°C	N2, 100mL/min, >120min, 320°C	<290°C



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