

# RESPICON™

Particle Sampler  
*from TSI*



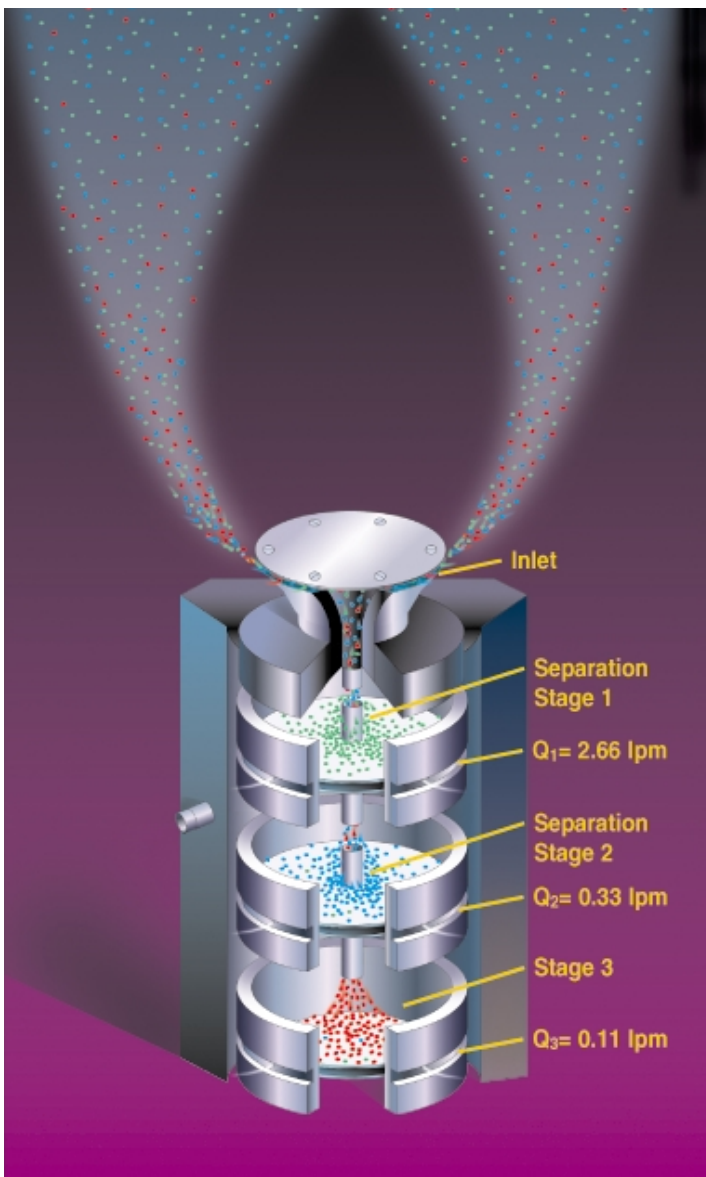
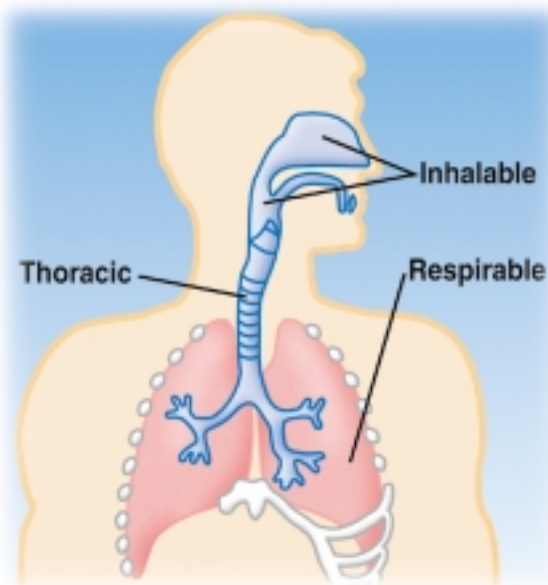
[www.tsi.com](http://www.tsi.com)



## Personal size-selective sampling made easy

The effects of inhaled particles depends on where they deposit in the respiratory tract. Exposure sampling must reflect the physiology of the human body to be useful. This can only be accomplished through the use of a particle size-selective sampling method that models the human respiratory tract.

The RESPICON™ Particle Sampler is a lightweight, compact device for measuring human exposure to airborne particle concentrations in the workplace. The RESPICON uses a single sampling head to model the human respiratory tract and simultaneously determine the three most critical particle fractions: inhalable, thoracic and respirable. These three size fractions represent the size of particles that can penetrate progressively deeper into the respiratory system.



## How it works

The RESPICON is a multi-stage, virtual impactor that traps airborne particles onto three individual collection filters. The mass of deposited particles is determined by comparing the filter weights before and after sampling.

Airborne particles corresponding to the inhalable fraction are drawn into the RESPICON through a ring-gap sampling inlet via a conventional personal sampling pump. Coarse particles pass straight through to the lower collector while other particles are aerodynamically separated onto the appropriate filter.

The first virtual impactor stage separates out and collects the particles smaller than  $4 \mu\text{m}$ . The second stage collects particles below  $10 \mu\text{m}$ , while the third stage collects the remaining particles.

The inherent design advantages of virtual impaction allow the RESPICON to avoid many of the sampling problems common to conventional impactors. You can normally sample for an extended period of time without the concern of overloading. Particle bounce losses are eliminated and there is no need for messy grease traps.



## Applications

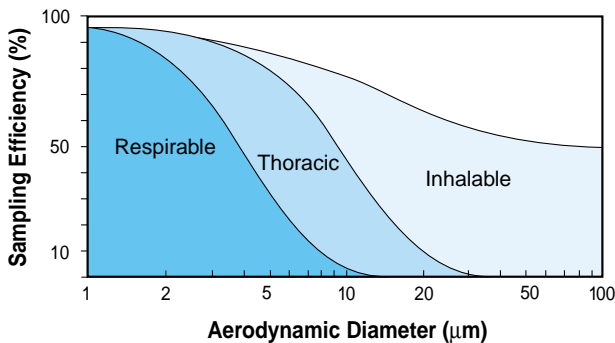
- Epidemiological studies
- Personal workplace sampling
- Area workplace sampling
- Process monitoring
- Particle size analysis

## Features

- Separates relevant dust fractions simultaneously
- Permits gravimetric, microscopic and composition analysis of samples
- Includes integrated clip for personal harness mounting
- Lightweight and compact
- Easy to use
- Threaded for tripod mounting

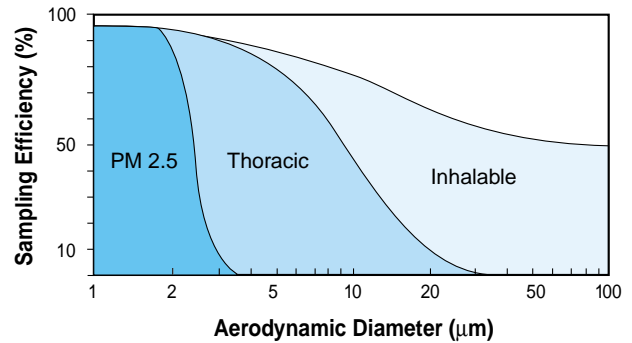
## Better than conventional samplers

The RESPICON is the only sampler that separates airborne particulates according to agreed upon criteria by ISO, ACGIH and CEN. The device matches these size fraction definitions with unparalleled precision.



Conventional curves as agreed upon by ISO, ACGIH and CEN for the inhalable, thoracic and respirable fractions (1993/94).

- Respirable fraction: 50% cut-off at 4 µm (Stage 1)
- Thoracic fraction: 50% cut-off at 10 µm (Stages 1+2)
- Inhalable fraction: 50% efficiency at 100 µm (Stages 1+2+3)



- PM 2.5: 50% cut-off at 2.5 µm Curve defined by the U.S. EPA/1997 (Stage 1)
- Thoracic fraction: 50% cut-off at 10 µm (Stages 1+2)
- Inhalable fraction: 50% efficiency at 100 µm (Stages 1+2+3)

# RESPICON Particle Sampler Models 801132 (4.0µm) and 801586 (2.5µm) Specifications

**Collection method:** Virtual impaction and collection onto 3 separate filters  
**Filter type:** 37 mm diameter fiberglass without organic binders or PVC filters with 5.0 micrometer pore size. (Other filter types are possible. Please see Application Note #ITI-049 on our website--www.tsi.com.)

## Aerodynamic particle cut size

**50% diameter:** Stage 1: 4.0 µm or 2.5 µm cut depending on inlet module used  
Stage 2: 10 µm  
Stage 3: All remaining particles  
**Note:** **Respirable fraction= Stage 1** (when used with the 4.0 µm Stage 1 cut Inlet Module)  
**Thoracic fraction= Stages 1+2**  
**Inhalable fraction= Stages 1+2+3**

**Sample flow rate:** 3.11 liters per minute (using a personal air sampling pump, not included)

**Size:** 3.22 in. H × 2.75 in. W × 2.0 in. D (82 mm × 70 mm × 50 mm)

**Weight:** 0.64 pounds (290 grams)

**Pressure drop:** 16 inches H<sub>2</sub>O (4 kPa)

**Tripod mount:** 1/4-20 threaded hole

## RESPICON Basic Sampler Models:

**801132** RESPICON Particle Sampler with 4.0 µm Stage 1 cut with filter holders and sample tubing  
**801586** RESPICON Particle Sampler with 2.5 µm Stage 1 cut with filter holders and sample tubing

## RESPICON Kits

**8522** RESPICON Particle Sampler (801132), accessory kit and Fiberglass filters  
**8522-P** RESPICON Particle Sampler (801132), accessory kit and 5.0 micrometer pore PVC filters  
**8522-25** RESPICON Particle Sampler (801586), accessory kit and Fiberglass filters  
**8522-25P** RESPICON Particle Sampler (801586), accessory kit and 5.0 micrometer pore PVC filters

## RESPICON Accesories

**8522-02** Chest harness  
**8522-03** Inlet module (2.5 micrometer, Stage 1 cut )  
**8522-04** Accessory kit includes carrying case, stage flow checker, total flow checker, filter holders, sample tubing, filter forceps, pipe cleaners, data evaluation spreadsheet, Operation and Service Manual  
**8522-05** Inlet module (4.0 µm, Stage 1 cut)

Specifications subject to change without notice. The RESPICON is manufactured in Germany by Hund Wetzlar under license from Fraunhofer-Institute and marketed by TSI Incorporated (German patent no. P4433092).



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