

Operating Instructions

Zefon NRD Sampler



The Zefon Personal Nanoparticle Respiratory Deposition (NRD) sampler is designed to size-selectively collect nanoparticles with an efficiency that matches their deposition in the respiratory tract system. Its lightweight, disposable design allows it to be worn easily for personal exposure monitoring while providing the convenience of a preloaded ready to use product.

Product Specifications

Housing Material:	Carbon Filled Polypropylene
Filter Material (diffusion stage):	Nylon
Collection Efficiency:	<300nm with an efficiency designed to match the efficiency at which particles deposit in the respiratory tract.
Cut-Point (cyclone stage):	4 μ m
Cut-Point (impactor stage):	300nm
Flow Rate:	2.5 LPM

How it works

3 Stages of particle removal eliminates unwanted particles



Stage 3

Diffusion Stage

Air passes through a diffusion stage consisting of a series of Nylon filters, collecting particles <300nm with an efficiency designed to match the efficiency at which particles deposit in the respiratory tract.

Stage 2

Impaction Stage

Air passes through an impaction stage where particles larger than 300nm are removed using an impaction plate.

Stage 1

Respirable Cyclone (sold separately)

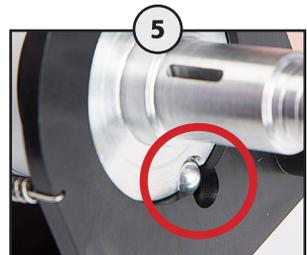
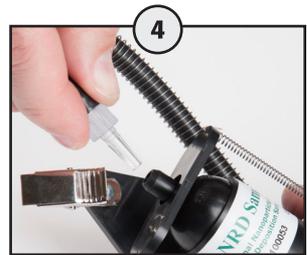
A respirable aluminum cyclone (Zefon #ZA0075) at a flow rate of 2.5 LPM is used to remove particles larger than 4 μ m in size.

Equipment Required

- NRD Sampler
- Personal sampling pump capable of a 2.5LPM flow rate at 15" H₂O Backpressure
- Calibration device for the sampling pump
- A 25mm aluminum cyclone (Zefon model ZA0075 or equivalent)
- A 25mm cyclone/cassette holder (Zefon model ZA0061 or equivalent)
- An aluminum cyclone calibration adapter or calibration jar (Zefon model ZA0011 or equivalent)

Sampling Protocol

1. Remove the black plug from the NRD sampler inlet and insert the 25mm Aluminum cyclone.
2. Place the NRD/Cyclone assembly into the cyclone holder.
3. Remove red outlet plug and pull the top retainer over the outlet of the NRD sampler.
4. Connect the tubing adapter to the outlet of the NRD cassette.
5. Check to make sure the cyclone is oriented correctly by making sure the locating nub is seated as shown.
6. Sample using a calibrated personal sampling pump at a flow rate of 2.5 LPM.



Completed Assembly



Post Sampling

1. After sampling, remove the cyclone and re-install the black plug over the inlet. Make sure to push the plug all the way in for a tight seal.
2. Insert the red outlet plug.
3. Send to laboratory for analysis. (The Zefon NRD sampler is a new concept for personal nanoparticle exposure monitoring. As such, not all laboratories have defined an analysis protocol for the Zefon NRD sampler. Please contact your laboratory before sampling to discuss analysis options.)

Laboratory Analysis

1. In the laboratory, carefully open filter cassette at the diffusion stage.
2. Remove the series of diffusion filters, digest, and process via chemical analysis.
3. The impaction stage is not designed to be analyzed and may be discarded.



Accessories

PART#	DESCRIPTION
ZA0075	Zefon 25mm Aluminum Cyclone
ZA0061	Zefon Cassette/Cyclone Holder
ZA0011	Zefon Aluminum Cyclone Calibration Adapter
ZA0046	Cassette Opening Tool



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