



OPERATIONS MANUAL

PM 2.5

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PM2.5
Inlet

Welcome

Tisch Environmental, Inc. is a third-generation family owned business located in Cleves, Ohio. The owners Wilbur J. Tisch and James P. Tisch have been involved in the High Volume Air Pollution field for the last 20 years, and have remained on the forefront of the manufacturing and design of environmental testing products since the emergence of Tisch Environmental, Inc. in March 1998. Their expertise is evident in the creation and assemblage of Tisch Environmental products and in the long-standing tradition of personal business practices at Tisch Environmental. They would like to welcome you to their company and thank you for choosing Tisch.

Assistance

If you encounter problems or require detailed explanations, do not hesitate to contact Tisch Environmental offices by e-mail or phone.

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Introduction

EPA Standards

The following manual will instruct you in the unpacking, assemblage, operation, calibration, and usage of the corresponding Tisch Environmental product. For information on air sampling principles, procedures and requirements and to ensure compliance with government regulations please contact the local Environmental Protection Agency Office serving your area or visit www.epa.gov.

Patents, Copyrights, Trademarks

Tisch Environmental, Inc. instrumentation is protected by patent in the United States of America. The distribution or duplication of Tisch Environmental, Inc. products, designs, or trade secrets is prohibited without the express written consent of Tisch Environmental, Inc.

Safety Precautions

Before using Tisch Environmental products, always be sure to review the corresponding operations manuals and take all necessary safety precautions, especially when working with machinery and high electrical voltage. Tisch Environmental products are to be used only for the purposes specified by operations manuals and by Tisch Environmental personnel. Tisch Environmental cannot guarantee the safe usage of its instruments in procedures that do not adhere to Tisch Environmental guidelines and standards. If you have concerns about the safety of your product or questions about safe practices, contact Tisch Environmental by phone or e-mail to speak with a representative who can help you.

Product Description

Introduction

The Hi-Vol PM 2.5 ambient air sampler is designed to provide owners of Tisch Environmental model TE-6001 PM-10 samplers with the option of retro-fitting existing equipment rather than procuring a new family of apparatus. An adapter is placed into the model TE-6001 sampler in lieu of the existing PM-10 fractionator. The adapter has a new plate that contains multiple impactor jets, which collect particles larger than PM 2.5 aerosol on an oil-wetted surface. The PM 2.5 aerosol is transmitted through the impactor and collected on a hi-vol filter.

Applications

Ambient air enters the Hi-Vol PM 2.5 unit at a flow rate of 40 CFM (1.13 m³/min) through an opening under the weather proof hood. The air then flows into a stilling chamber and through a screen that is designed to prevent the entry of insects and large sized air-borne debris into the fractioning system. The air then flows through a set of 40 impactor jets that direct the air towards a wetted collection surface. Impaction of particles with sizes larger than 2.5 micron AD (i.e. non-PM 2.5 aerosol) takes place on a porous disc that is wetted with oil. Particles smaller than 2.5 micron aerodynamic diameter are vented from the impaction zone and flow downward to the sampling filter. The filter is standard 8 inch x 10 inch (203mm x 254mm) hi-vol collector.

Advantages of the PM 2.5 Retrofit

Tisch Environmental offers this retrofit kit because it allows characterization of PM 2.5 with existing methodologies. Neither extensive additional training is required nor is extensive additional apparatus needed.

- No need to procure expensive electronic balances for weighting filters.
- Sample flow measurement and control with the Tisch critical flow venture. Flow rate determined directly in actual m³/min, which are the units that the EPA requires for PM 2.5 data reporting.
- Existing quality assurance procedures that are used for PM-10 sampling are virtually unchanged for PM 2.5 sampling.
- Sampling methodology is essentially unchanged, so technical personal will not need to be retrained.
- The cost of retrofit to a hi-vol is only a fraction of the cost of a sampler specially designed for PM 2.5.

Assembly

TE-6001-2.5-I PM2.5 SSI (Size Selective Inlet)

1 Box 32" x 32" x 26" 62 lbs.

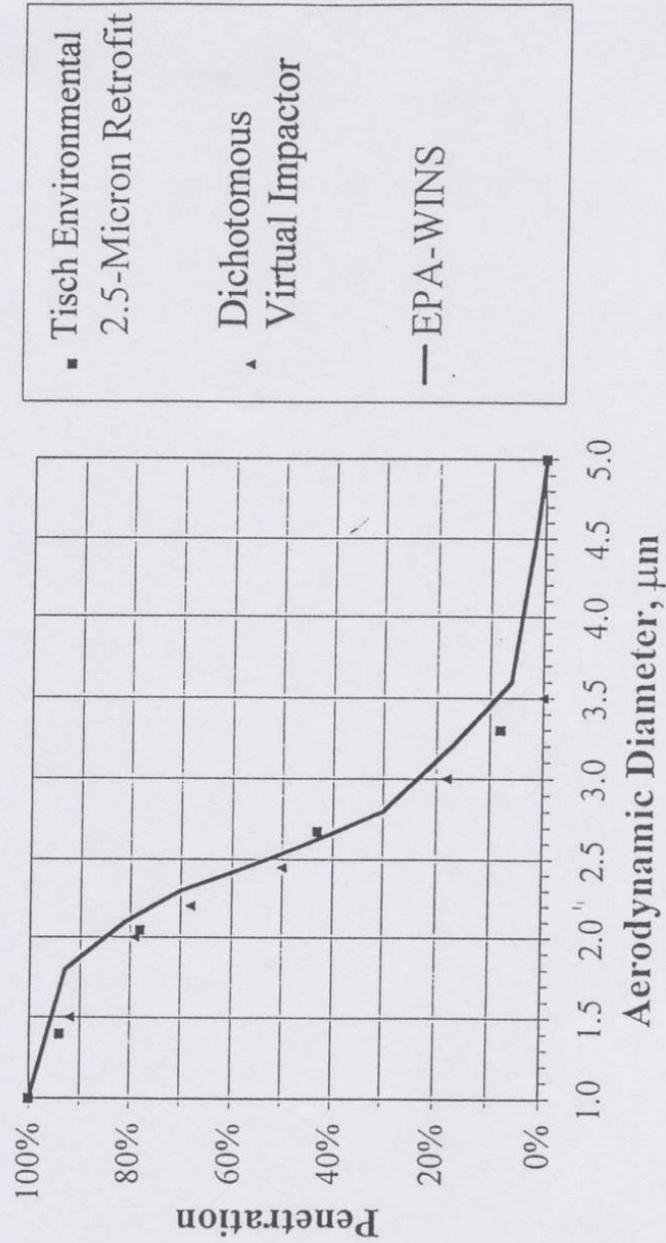
1. Lift SSI, hood, hood spacer bag, and 5 oz. bottle of Media Oil from carton and place on table.
2. Cut cable tie on bottom of SSI that is holding strut and remove shoulder bolt and large washer.
3. Align middle of strut with hole in spacer and fasten with shoulder bolt and large washer.
4. Place SSI on shelter and align shelter base pan 10-24 nutsert holes with holes in side of shelter and insert 10-24 x 1" bolts.

CAUTION: Before opening SSI, be sure that shelter is securely mounted to ground or floor. Use of out riggers to secure vertical orientation is strongly recommended.

5. Place SSI hood onto acceleration nozzle plate (top of SSI).
6. Locate hood spacer between hood and acceleration nozzle plate and **loosely** fasten with 10-32 x ½" thumb bolt, making sure plastic washer is in place. Do this **loosely** for all eight hood spacers **before tightening**.
7. Open SSI by disengaging the six catches on bottom of Shelter Base Pan and lifting the SSI into the open position.
8. Remove cardboard and rubber bands that are covering filter holder assembly opening.
9. Lower filter holder assembly down through opening, making sure 8" x 10" gasket is under filter holder and the brass bolt assembly aligns with filter holder.
10. Close the SSI and fasten the six catches.

11. Open middle section of SSI by disengaging the four hooks and lifting into the open position.
12. Remove the 2.5 cartridge and place of flat surface with screen side up.
13. From the bottom side unscrew the four captive nuts connecting oil media holder and clamp ring to the cartridge.
14. Gently lift the Jet Tube assembly over and lay on flat surface screen side down. This will avoid disrupting alignment of 40 Jet Tubes.
15. Remove the Clamp Ring from the Oil Media Holder.
16. Pour the entire bottle of Media Oil (5 ounces) onto the white porous plastic Media Ring.
17. Place the Clamp Ring onto the Oil Media Holder such that the alignment holes are in line.
18. Carefully place the Jet Tube assembly over the Oil Media Holder and attach with the four captive nuts. DO NOT spill oil.
19. Insert 2.5 cartridge into SSI. Make sure the two alignment pins are correctly inserted and aligned.
20. Close middle section and fasten with the four hooks for an air-tight seal.

Tisch Environmental, Inc. 2.5 μ m Retrofit High Volume Sampler



Warranty

Instruments manufactured by Tisch Environmental, Inc. are guaranteed by warranty to be free of defects in materials and workmanship for one year after shipment from Tisch Environmental. The liability of Tisch Environmental, Inc. is limited to servicing or replacing any defective part of any instrument returned to the factory by the original purchaser. All service traceable to defects in original material or workmanship is considered warranty service and is performed free of charge. The expense of warranty shipping charges to and from our factory will be borne by Tisch Environmental. Service performed to rectify an instrument malfunction caused by abuse, acts of god or neglect, and service performed after the one-year warranty period will be charged to the customer at the current prices for labor, parts, and transportation. Brush-type and brushless motors will carry a warranty as far as the original manufacture will pass through its warranty to Tisch Environmental, Inc. The right is reserved to make changes in construction, design specifications, and prices without prior notice.