3.1.2 S-Type Pitot. Same as Method 2, section 3 (40 CFR part 60, appendix A).

3.1.3 Sample Line. Use thick wall flexible plastic tubing (e.g., polyethylene, polypropylene, or polyvinylchloride) about ¹/₄ in. to ³/₈ in. ID to connect the train components. A combination of rigid plastic tubing and thin wall flexible tubing may be used as long as neither tubing collapses when leak-checking the train. Metal tubing cannot be used.

3.1.4 Impingers. One quart capacity "Mason" glass canning jars with vacuum seal lids are used. Three impingers are required: the first is for collecting the absorbing solution, the second is empty and is used to collect any absorbing solution carried over from the first impinger, and the third contains the drying agent. Install bleak-tight inlet and outlet tubes in the lids of each impinger for assembly with the train. The tubes may be made of approximately 1/4 in. ID glass or rigid plastic tubing. For the inlet tube of the first impinger, heat the glass or plastic tubing and draw until the tubing separates. Cut the tip off until the tip orifice is ³/₃₂ in. in diameter. When fabricating the first impinger, place the tip orifice 3/16 in. above the bottom of the jar when assembled. For the second impinger, the inlet tube need not be drawn and sized, but the tip should be approximately 2 in. above the bottom of the jar. The inlet tube of the third impinger should extend to about 1/2 in. above the bottom of the jar. Locate the outlet tube end of all impingers about 1/2 in. beneath the bottom of the lid.

3.1.5 Manometer. Inclined/vertical type, or equivalent device, as described in section 2.2 of Method 2 (40 CFR part 60, appendix A).

3.1.6 Critical Orifice. The critical orifice is a small restriction in the sample line (approximately $\frac{1}{16}$ in. in diameter) that is located upstream of the vacuum pump and sets the sample rate at about 0.75 cfm. An orifice can be made of ³/₃₂ in. brass tubing approximately ⁹/₁₆ in. long sealed inside larger diameter, approximately ⁵/₁₆ in., brass tubing to serve as a critical orifice giving a constant sample flow. Materials other than brass can be used to construct the critical orifice as long as the flow through the sampling train is approximately 0.75 cfm.

3.1.7 Connecting Hardware. Standard pipe and fittings, ¹/₄ in. or ¹/₈ in., are used to install the vacuum pump and dry gas meter in the sampling train.

3.1.8 Pump Oiler. A glass oil reservoir with a wick mounted at the vacuum pump inlet lubricates the pump vanes. The oiler should be an inline type and not vented to the atmosphere.

3.1.9 Vacuum Pump. Gast Model 0522– V103–G18DX, or equivalent, capable of delivering at least 1.5 cfm at 15 in. Hg vacuum.

3.1.10 Oil Trap. An empty glass oil reservoir without wick is mounted at pump outlet to prevent oil from reaching the dry gas meter.

3.1.11 Dry Gas Meter. A Rockwell model 175-s test meter, or equivalent, with a thermometer installed to monitor meter temperature. The dry gas meter must be capable of measuring volume to within 2 percent.

3.2 Sample Recovery.

3.2.1 Wash Bottles. These are glass or inert plastic, 500 or 1000 ml, with spray tube.

3.2.2 Sample Containers. The first mason jar impinger of the sampling train serves as the sample container. A new lid and plastic wrap are substituted for the impinger inlet/ outlet assembly.

3.3 Analysis. Same as Method 306, section 3.3 of this appendix.

4. Reagents

4.1 Sampling. Same as Method 306, section 4.1 of this appendix.

4.2 Sample Recovery. Same as Method 306, section 4.2 of this appendix.

5. Procedure

- 5.1 Sampling.
- 5.1.1 Pretest Preparation.

5.1.1.1 Port Location. Locate the sampling ports as specified in section 2.1 of Method 1 (40 CFR part 60, appendix A). Use a total of 24 sampling points for round ducts and 25 points for rectangular ducts. Locate the sampling points as specified in section 2.3 of Method 1 (40 CFR part 60, Appendix A). Mark the pitot and sampling probe with thin strips of tape to permit velocity and sample traversing. For ducts less than 12 in. in diameter, use a total of 16 points.

5.1.1.2 Velocity Pressure Traverse. (a) Perform a velocity pressure traverse before the first sample run. Figure 306A-2 may be used to record velocity pressure data. If testing occurs over several days, perform the traverse at the beginning of each day. Perform velocity pressure traverses as specified in section 3 of Method 2 (40 CFR part 60, appendix A), but record only the Δp (velocity head) values for each sampling point.

(b) Check for cyclonic flow during the first traverse to verify that it does not exist; if cyclonic flow does exist, make sure that the absolute average angle of misalignment does not exceed 20°. If the average angle of misalignment exceeds 20° at an outlet location, install straightening vanes to eliminate the cyclonic flow. If it is necessary to test an inlet location where cyclonic flow exists, it may not be possible to install straightening vanes. In this case, a variation of the alignment method must be used. This must be approved by the Administrator.

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