

INCH-POUND

A-A-50504

28 February 1992

COMMERCIAL ITEM DESCRIPTION

ANALYZERS, FLUE-GAS, ORSAT-TYPE, PORTABLE

The General Services Administration has authorized the use of this Commercial Item Description (CID) as a replacement for Military Specification MIL-A-18218B which is cancelled.

Abstract. This CID covers portable Orsat-type analyzers for the measurement of the volumetric percentage Of CO₂, O₂, and CO occurring in flue-gases.

1. Classification. Flue-gas analyzers shall be of the following sizes, as specified in the contract or order:

Size 1 - 100 milliliters (mL).

Size 2 - 50 mL.

Salient characteristics.

1. Description. The analyzer shall be a metal-frame-mounted, portable assembly, consisting of a jacketed burette, manifold with control valves, absorption pipettes with integral or close-coupled reservoirs for absorption chemicals, an expansion bag(s) or chamber(s), a leveling bottle, a dirt-excluding protective enclosure, necessary connectors, flexible tubing and stoppers, an aspirating bulb, sampling line, filter, and absorption chemicals.
2. Design. The analyzer shall be designed to withstand rough usage and for easy and trouble-free manipulation, rapid and thorough gas absorption, easy readability, and portability as a unit. Jars and bumps, such as those encountered during transportation and under the conditions of intended use, shall not cause breakage, misalignment, loosening of components, or leaks. The burette and pipettes shall be arranged in a row, from right to left, as follows: Measuring burette, CO₂ pipette, O₂ pipette, and CO pipette. The bottom of the frame, or the support points, shall touch a flat supporting surface simultaneously. With the analyzer standing on a flat surface, the long axis of each burette and pipette shall be essentially vertical.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer (Code 156), Naval Construction Battalion Center, Port Hueneme, CA 93043-5000.

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3. Leakage. Chemicals shall not leak or creep past or through seals, connectors, valves, or cocks.
4. Burette, jacket, and scale. The burette and jacket shall be of clear, high grade materials free of striae, whorls, or other imperfections which would result in false indications of liquid levels or scale reading. The materials shall not become fogged or discolored with age. The burette shall be of glass thoroughly annealed after being formed. The jacket shall be of clear glass or of clear plastic. Changes in cross-sectional area in the burette shall be made with generously rounded curves. Wall thickness shall be substantially uniform in each portion, and changes in wall thickness between different-diameter portions shall be uniform. On or adjacent to the lower portion of the burette, there shall be a scale marked with parallel division lines. The division lines shall be sharply defined and shall be of a deep dark color. The lines at integral points shall be somewhat longer than the intermediary lines. The scale intervals shall be 0.2 percent for both size 1 and size 2 burettes. The scale range shall be zero to 50 percent for size 1 burettes and zero to 20 percent for size 2 burettes. Scales shall be etched and filled in with a fusible material on the burette or shall be marked in enamel on a corrosion-resistant metal strip. The latter, when used, shall be assembled with the burette in such a way that the whole length of scale will remain in contact with the burette, and so that the scale will not move with respect to the burette because of vibration or other movement of the analyzer, or because of changes in dimension due to temperature.
5. Manifold and valves. The manifold and valves shall be of nonbrittle, nonfragile materials which shall not be affected chemically and shall not deteriorate physically as a result of contact with air or flue-gas, or with the liquids used in the analyzer. Glass manifolds and glass stopcocks will not be acceptable. Means shall be provided for easy cleaning of gas passages without extensive disassembly. Valve control knobs and handles shall be designed for easy and interference-free manipulation. Valves shall close gas-tight with light seating-pressure and shall not stick or bind in normal use.
6. Absorption pipettes and reservoirs. Absorption pipettes may be integral with or separable from reservoirs. When they are separable, assembly shall be effected by means of a compression-type fitting, which shall provide a leak-tight joint without breaking the pipette. The absorption space shall be filled to the neck of the pipette capillary with contact-extending material, or shall be provided with a bubbler, having at least four bubbling openings, approximately 1 mL in diameter, near the bottom of the pipette and equipped with an automatic valve. Contact-extending material shall be so arranged that jostling and jarring during transport and handling will not cause the material to pack or fall through the bottom of the pipette or otherwise to become dislodged. Bubbler pipettes shall be so constructed that all gas will have to pass through the absorbing solution and during the absorbing operation no liquid, which

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could be drawn into the manifold if the flow direction were reversed, shall be trapped by the valve. The valves of bubbler pipettes shall easily unseat when gases are withdrawn to the burette. It shall not be necessary to tap any pipette to release the last traces of free gas. Edges on the ends of pipettes shall be made smooth. In the upper part of each reservoir there shall be suitable means for the combined purpose of connecting the reservoir with an expansion bag or chamber by means of flexible rubber or synthetic rubber tubing, and for filling with absorbing solution. When the connection between the reservoir and the expansion bag or chamber is not of permanent nature, then a suitable means shall be provided to make the reservoir opening airtight and leakproof when the analyzer is out of use. Glass parts shall be fully annealed and all parts shall be free of any tendency to warp, become brittle, crack, or otherwise deteriorate with normal aging. Pipette and reservoir shall be readily removable as a unit.

7. Expansion bag or chamber. The expansion bag(s) or chamber(s) shall have sufficient capacity to accept the gas displaced by the liquid-rise in the reservoir during analysis. They shall be leakproof and shall not deteriorate rapidly due to contact with air or the gases released by the absorbing solution.
8. Leveling bottle. The leveling bottle shall be made of a transparent material which shall not become fogged or discolored with age. Provided at or near the bottom shall be a narrowed extension or neck, for connection to flexible rubber or synthetic rubber tubing. The extension or neck shall be so formed that the connection tubing will not easily work loose due to normal manipulation.
9. Protective enclosure. The protective enclosure shall be of rigid material and construction. It shall provide a snug closure so that dirt will be excluded. Positive means shall be provided to ensure that the analyzer and protective enclosure will not separate when the assembly is lifted by its upper end. When the enclosure is removed, the apparatus shall be completely open so all parts can be seen.
10. Connectors, flexible tubings, and Stoppers. Connectors, flexible tubing, and stoppers shall be of the highest grade material and manufacture available for the intended use. They shall not check, or become brittle or swollen and pasty with normal aging or due to contact with the operating liquids and gas samples.
11. Aspirating bulb. The aspirating bulb shall be equipped with leakproof, nonsticking valves. It shall be quick-acting and shall be easily workable with one hand.
12. Sampling line. The sampling line shall be of rubber, or synthetic rubber tubing.
13. Filter. The filter shall effectively prevent the entrance of soot, fly ash, and water condensate into the analyzer without the introduction of appreciable resistance to the flow of gas. It shall be readily cleanable.

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14. Absorption chemicals. Absorption chemicals shall have high absorption capacity and shall not deteriorate in storage. Powder and the necessary acid for the CO absorption solution shall be mixed.

Contractor certification. The contractor shall certify, and maintain substantiating evidence, that the product offered meets the salient characteristics of this CID and that the product conforms to the producer's own drawings, specifications, standards, and quality assurance practices. The government reserves the right to require proof of such conformance prior to first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

Metric products. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units, provided they fall within specified tolerances using conversion tables contained in the latest revision of FED-STD-376, and all other requirements of this CID are met. If a product is manufactured to metric dimensions and those dimensions exceed the tolerances specified in the inch-pound units, a request should be made to the contracting officer to determine if the product is acceptable. The contracting officer has the option of accepting or rejecting the product.

Regulatory requirements. In accordance with Section 23.403 of the Federal Acquisition Regulations (FAR), the Government's policy is to acquire items composed of the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing the supplier's employees to undue hazards from the recovered materials.

Packaging. Unless otherwise specified in the contract or order, the preservation, packing, and marking shall be in accordance with ASTM D 3951.

ASTM Standards are available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

MILITARY INTERESTS:

Custodians

Navy - YD
Air Force - 99

User Activity

Air Force - 82

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

PREPARING ACTIVITY:

Navy - YD

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