

SCOPE

- I 1.1 This practice covers materials, design and erection of the following types of shelters used for process analyzers and associated systems housed with the analyzers:
 - a. Non-enclosed walk-in type shelters.
 - b. Locally installed enclosed analyzer cabinets.
 - c. Enclosed walk-in type shelters.
- I 1.2 **An asterisk (*) indicates that** a decision is required by the Owner's Engineer or that additional information is furnished by the Owner's Engineer.

SUMMARY OF ADDITIONAL REQUIREMENTS

- I ↗ * 2.1 **Table 1** lists the practices, codes, publications, and standards which shall be used with this practice as specified by the Purchaser.

TABLE 1

PRACTICES	
IP 3-6-1	Piping For Instruments
IP 4-1-3	Design Loads for Structures
IP 15-8-3	Combustible and Toxic Vapor Detection Systems
IP 15-10-1	Instrument Transmission Systems
IP 15-12-1	Instrument Wire and Cable
IP 16-1-1	Area Classification and Related Electrical Design for Flammable Liquids, Gases or Vapors
IP 16-4-1	Grounding and Overvoltage Protection
IP 16-9-1	Low Voltage A-C Motors Up to 200 HP (150 kW)
IP 19-1-1	Paint and Protective Coatings
IP 20-1-1	Inspection of Equipment and Materials
CODES, PUBLICATIONS AND STANDARDS	
ANSI Standards	
Z97.1	Safety Glazing Material Used in Buildings
ANSI / NFPA Standards / Codes	
70	National Electric Code
496	Purged and Pressurized Enclosures for Electrical Equipment
780	Lightning Protection Code
ASTM Standards	
E 84	Standard Test Method for Surface Burning Characteristics of Building Materials
A 525 / A 525M	General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
CEI / IEC	
79-16	Artificial Ventilation for Protection of Analyzer Houses
EEMUA	
Publication 138	Design and Installation of On-Line Analyzer Systems

- S * 2.2 **Shelters shall comply** with relevant local national standards and local building codes or those listed in **Table 1** in countries with no comparable standards.
- S * 2.3 **All electrical equipment and analyzers** associated with analyzer shelters and local cabinets shall as a minimum **be certified by an appropriate local authority to the relevant local National Standards** for use in the electrical classified area (classification, gas group, and surface temperature rating) in which they are installed taking into consideration shelter ventilation and safety interlocks.
- S 2.4 Analyzer shelters and enclosed cabinets **shall not be located** in Class I, Division 1 (Zone 1) electrically classified areas.

IP 4-3-3		Shelters for Process Analyzers	
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(This practice is appropriate for attachment to Inquiry or Purchase Document)

MATERIALS

- S 3.1 **Structural load bearing materials** shall be metal or reinforced concrete to ensure structural integrity.
- S 3.2 **Materials with a flame spread classification greater than 25 per ASTM E 84** shall not be used for exposed interior or exterior surfaces.
- R,C 3.3 **Galvanized carbon steel sheets** for roofing and siding shall be **per ASTM A 525**, with a minimum weight of coating of 2 oz/ft (610 g/m) of sheet. **Austenitic stainless steel** shall be considered as an alternative.
- R,C 3.4 **Fiberglass construction** shall not use wood for the substrate material and the coating used shall dissipate electrostatic buildup and provide protection against UV degradation.
- R,C 3.5 **Roof ventilators and louvers** shall be of corrosion resistant materials.
- R,C 3.6 **Doors and frames** shall be metal or compatible with the shelter construction materials. **Locks and hinges** shall be stainless steel.
- S 3.7 **Glass shall be** laminated or tempered "safety glass" meeting the requirements of ANSI Z97.1. Glass thickness shall be 1/4 in. (6 mm). The laminated glass shall have an 0.06 in. (1.5 mm) interlayer.

DESIGN

- O,R * 4.1 The type of shelter or use of locally installed enclosed cabinets will be specified.
- C * 4.2 If the basic type of construction and materials are not specified, **proposals employing the most economical type of construction suitable** for the required service and environmental exposure shall be submitted to the Purchaser for **approval by the Owner's Engineer**. Such proposals shall cover:
 - a. Layout.
 - b. Architectural appearance.
 - c. Material selection.
 - d. Deviations from practice requirement.
 - e. Foundations and location.

In addition to masonry or metal sheet construction, proposals to use prefabricated concrete construction, fiberglass or laminated aluminum-foam-plastic-aluminum, may be submitted for consideration.
- S,M * 4.3 **Gas cylinders for calibration or carrier gases** shall be securely mounted in bottle racks. Cylinders shall not be closer than 25 ft (7.5 m) to process pumps or other hazardous process equipment. The final location shall be approved by the Owner's Engineer. Cylinders mounted on an elevated pad must have a ramp for access.
- S 4.4 **All piping, armored cable, wiring and conduit** (power, signal, control) entering enclosed shelters shall be sealed at the point of entry. The points of entry shall be on the sides or bottom of the cabinet or shelter and shall be identified with permanent tags. These points of entry shall be located **to minimize piping and fittings inside the shelter**.
- 4.5 **Doors:**
 - O a. All exterior exit doors **shall open outward**.
 - S b. All doors shall be equipped with **quick opening bars (panic bars) on the inside, which must override exterior locks**.
 - S c. Doors shall be provided with automatic closers.
- S,E 4.6 **Analyzer sample vents and discharges** shall be piped outside of the cabinet or shelter. These vents shall be further piped to a freely ventilated point more than 10 ft (3 m) above the enclosure and more than 25 ft (7.5 m) from any ventilation air intake or area where personnel may be present. **Vent lines from analyzers** which may be subject to condensation shall be heat traced and slope to a low point drain. The Owner's Engineer shall consider environmental and industrial hygiene requirements to determine whether the vents require hydrocarbon or toxic vapor scrubbing facilities.
- S 4.7 **Lines containing flammable or toxic materials or oxygen** located inside shelters or cabinets shall have a clearly labeled fire-safe ball valve located outside the shelter or local cabinet.
- S 4.8 **Clearly labeled switches and valves** to turn off power and utilities shall be locally mounted outside the shelter or local cabinet.
- S 4.9 **A manual, portable, carbon dioxide or dry chemical fire extinguisher** shall be installed near the main entrance for non-enclosed and enclosed shelters containing flammable materials.