

## SECTION 13 20 00 - SPECIAL PURPOSE ROOMS

### PART 1 - GENERAL

#### 1.1 SYSTEM REQUIREMENTS

##### A. Design Requirements:

1. Hyperbaric and Hypobaric Chambers:
  - a. Conform to NFPA 99.
  - b. Conform to ASME Pressure Vessel Requirements and OSHA Code of Federal Regulations 29CFR1910.430(f).
2. Dark Rooms - Photographic:
  - a. Conform to OSHA 29CFR1910.94 and .100
3. Spray Painting Rooms - Booths:
  - a. Conform to OSHA 29CFR1910.107, NFPA-30, NFPA-33 and IFC Article 45.
4. Animal Quarters:
  - a. Conform to USDA animal care.
  - b. Shall be reviewed by Director of Lab Animal Resources through the University Project Manager.
  - c. Conform to the Guide for the Care and Use of Laboratory Animals. Published by the Institute of Laboratory Animals Resources (ILLAR) of the National Research Council
5. Biohazard Locations and Containment Facilities:
  - a. Conform to the University BL3 construction standard (campus standard), that can be obtained through the University Project Manager, and CDC/NIH Biosafety Guidelines in microbiological and biomedical laboratories guidelines.
6. Food Preparation and Serving Areas:
  - a. Conform to Colorado Department of Health Standards and Regulations for Food Service Establishments, NFPA-96 and OSHA 29CFR1910.141.
7. Chemical Storage Rooms:
  - a. Conform to OSHA 29 CFR F110.1450 NFPA-30, IFC Articles 79 and 80 and IBC Chapter 9.
  - b. Rooms shall be suitable to type of materials stored (NFPA-45) in regards to specific temperature, absence of light, humidity or avoidance of any moisture, explosive conditions, ventilation, blast walls, etc.
8. Semiconductor Fabrication Facilities:
  - a. Conform to IFC Article 51.
9. Pesticide Storage:
  - a. Conform to IFC Articles 47, 80 and 86 and NFPA-43D.
  - b. Conform to Colorado Department of Health "Standards and Regulations for Any Gathering Places".
10. Chemical Laboratories:
  - a. Conform to NFPA-45 (and 99 if medical/veterinary medicine activities are involved), OSHA 29CFR1910.1450, applicable OSHA standards if an OSHA regulated substance is involved.
11. Welding Shops:
  - a. Conform to NFPA-51, 51A and 51B, OSHA 29CFR1910 subpart Q and UFC Article 49.
12. Compressed Gas Cylinder Storage:
  - a. Conform to IFC Article 74 and 80, NFPA-45, NFPA-99 and OSHA 29CFR1910.252(a).
13. Battery Rooms:
  - a. Conform to OSHA 29CFR1910.178(g), 29CFR1926.441 and NEC.
14. Child Care and Pre-school:
  - a. Conform to Life Safety Code and regulations of Colorado Department of Social Services.
15. Controlled Environmental Rooms and Cold Rooms:
  - a. Maintain temperature and humidity set-points without operation at full capacity more than 80 percent of the time under the specified ambient conditions.

- b. Recess floor slab to align the top of finished floor in the controlled environment room with the top finished floor outside the room. Ramps into the unit are to be avoided where possible.
- c. Ceiling systems are prohibited.
- d. Coordinate with the University Project Manager to determine the use of the room, quantity of occupants, and duration of use.

B. Performance Requirements

1. Controlled Environmental Rooms and Cold Rooms:

- a. Maximum horizontal temperature uniformity between any two (2) points shall be no more than plus or minus 1.0 degrees C from the set-point.

1.2 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For refrigerant systems that have been properly charged per manufacturer's instructions, record the final amount of oil and refrigerant charge in operation and maintenance manuals and on or near the data plate of the unit.

PART 2 - PRODUCTS

2.1 CONTROLLED ENVIRONMENTAL ROOM

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide products from one of the following:

- 1. Environmental Growth Chambers (preferred)
- 2. LUWA/Environmental Specialties, Inc.
- 3. Harris Environmental Systems, Inc.

- B. Equipment:

- 1. Refrigeration System:

- a. Design Evaporator and Condensing units to operate continuously, providing cooling output on demand proportioning basis in relation to desired temperature control point.
- b. Refrigerant: CFC's are prohibited. Coordinate with LEED requirements.
- c. Condensing Unit.
  - 1) Seamless steel, cleanable shell and tube or shell and coil, heavy-duty water-cooled type (using refrigerants) with removable, interchangeable cast iron water heads and 1/2 inch diameter copper tubing with aluminum fins.
  - 2) Condenser shall be designed for plant-chilled water at 45 degrees F supply, 90 degrees F return.
  - 3) Provide control valve as driven by compressor refrigerant head pressure sensor.
- d. Compressor: Reciprocating serviceable, semi-hermetic or hermetic type, with suction and discharge stop valves, automatically reversible oil pump and oil pressure gauge (for hermetic type pump), dual pressure switches, compressor over-temperature protection and a fused control circuit, designed for continuous operation. Locate on top of the Controlled Environmental Room where possible.
- e. Control System: Provide digital touch screen panel type. Network controller on the BAS or building network for temperature and other controlled variables including, but not limited to, monitoring, trending, and alarming.

- C. Materials

- 1. GALVANIZED STEEL SHEET: Hot-dip zinc-coated steel sheet, G90 coating, stretcher-leveled flatness per ASTM A 924. Type and surface preparation to be as determined by manufacturer to suit intended purpose.
- 2. STAINLESS STEEL SHEET: Type 302/304 stretcher leveled, cold-rolled, complying with ASTM A 167 and A 480. Temper, edge condition and heat treatment to be as determined by manufacturer to suit intended purpose. Finish: Number 4 general purpose polished.

3. ALUMINUM SHEET: Aluminum or aluminum alloy sheet complying with ASTM B 209. Alloy, temper, heat treatment and surface preparation to be determined by manufacturer to suit intended purpose.
4. URETHANE FOAM INSULATION: Foam shall have a density of 2.2 pcf. Thermal conductivity factor "K" shall not exceed 0.118 (BTU)(inch)/(hour)(square foot)(degree F). The U-value overall heat transfer coefficient shall not exceed 0.029 (BTU)/(square foot)(hour)(degree F). The R- value shall be 34.
5. HEAT-TREATED FLOAT GLASS: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent, flat), Class 1 (clear), Quality q3 (glazing select).

D. Accessories

1. Lights:
  - a. Basis of Design: Subject to compliance with requirements, provide Dialite Durosite Series LPK LED Linear Fixture or comparable.

E. Fabrication

1. Panel Construction
  - a. Wall and Ceiling Face Sheets.
    - 1) Unexposed Exterior Walls: Galvanized Steel Sheet.
      - a) Minimum 24 gauge thick.
      - b) Surface: Smooth.
    - 2) Exposed Exterior Walls: Stainless Steel Sheet.
      - a) Minimum 22 gauge thick.
      - b) Surface: Smooth.
    - 3) Interior Walls: Aluminum Sheet.
      - a) Minimum 0.040 inch thick.
      - b) Surface: Smooth.
      - c) Color: White.
  - b. Floor Panel Bottom Layer: Minimum No. 14 gauge thick galvanized steel sheet.
  - c. Floor Panel Top Layer: Minimum No. 16 gauge thick galvanized steel sheet.
  - d. Core: Foamed-in-place insulation. Do not use wood, metal, fiberglass or plastic forming members.
  - e. Panel Dimensions:
    - 1) Width: Multiples of 11 1/2 inches.
2. Doors: Provide solid doors with view window.
3. Electrical: Provide a minimum of two (2) 120V, 20A circuits to serve the duplex receptacles inside the room.

F. Seamless Vinyl Flooring:

1. Basis of Design: Subject to compliance with requirements, provide Altro Floors or comparable.

G. Controlled Environment Room Schedule

Room Designation	Temperature
Cold Room	4°C +/- 1°C
Controlled Environmental Room	4°C to 37°C +/- 1°C

PART 3 - EXECUTION (Not Applicable)

**END OF SECTION 13 20 00**