

5.23.60 – CENTRAL COOLING EQUIPMENT DESIGN AND CONSTRUCTION STANDARD

PART 1: GENERAL

1.01 General:

- A. This standard is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. The responsibility of the engineer is to apply the principles of this section such that the University may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be justified through LCC analysis and submitted to the University for approval.
- B. UT Austin desire is to ensure that all new refrigeration equipment delivered to campus conforms with EPA guidelines for refrigerants and is serviceable by UT Austin Maintenance Department. The goal is to have equipment provided that is designed for and provided with final replacement HFC refrigerants
- C. UT Austin desire is to standardize on refrigerant types as a means for minimizing the number of refrigerants in inventory. To accomplish this only selected refrigerants are acceptable.
- D. Areas where large quantities of refrigeration are to be stored or used shall be provided with local alarm annunciation, ventilation systems and signage.
- E. It is the intent that all refrigeration equipment be 100% serviceable by UT maintenance personnel. Exotic refrigeration systems that require specialty service equipment, refrigeration charges, or other non-standard components are not acceptable without prior approval by UT Austin Maintenance Department.

1.02 Design:

- A. UT Austin desire is to have condensing equipment located as close as possible to evaporator.
 - 1. Environmental Chambers. Where refrigeration equipment is used, condensing equipment shall be located at the chamber. Ventilation shall be provided for removal of heat from condensing unit. Adequately sized access and egress to condensing equipment shall be provided for preventative maintenance and removal of equipment. Refrigeration piping shall be designed for return of oil to compressor location. Exceptions may be approved by owner for large loads on a case-by-case basis. In such cases, owner shall approve locations of condensing compressor.
- B. Low and ultra low temperature refrigeration shall be accomplished with multiple compressors. Refrigerant for each compressor/evaporator circuit shall be independent and of types listed below. Auto-cascading refrigerant circuits are not acceptable.

PART 2: PRODUCTS

2.01 General:

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- A. The refrigerants listed in this section comply with EPA guidelines as final HFC refrigerants and conform to UT Austin inventory requirements.
- B. Manufacturer specialty refrigerant blends, refrigerant charges available only from the original manufacturer or refrigerant requiring special ordering are not acceptable.

2.02 Acceptable HFC Refrigerant Types and Application:

- A. **R134a** (replaces R12). Medium temperature applications. Packaged refrigeration and air conditioning equipment.
- B. **R404a** (replaces 502). Medium and low temperature applications. Reach-in and walk-in coolers and freezers, environmental chambers.
- C. **R404a** high stage with **R23** (replaces R13, R502, R503), **Ethane** or **Propane** low stage. Multi-stage low and ultra low temperature applications. Reach-in freezers.
- D. **R407c** (replaces R22). Medium and low temperature applications. Air conditioning equipment.

[LEED EA prerequisite 3 Refrigeration Management – Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion prior to project completion.]

[LEED EA credit 4 Enhanced Refrigerant Management - Select refrigerants and HVAC&R that minimize or eliminate the emission of compounds that contribute to ozone depletion and global warming AND do not install fire suppression systems that contain ozone-depleting substances (CFCs, HCFCs or Halons).]

PART 3: EXECUTION

3.01 Refrigerant Removal:

- A. Open discharge of refrigerants is not acceptable. All refrigerants shall be recovered utilizing appropriate recovery equipment and in accordance with current regulatory guidelines.
- B. Refrigeration equipment scheduled for demolition and removal shall have refrigerant charge removed. Technician performing removal shall be licensed under the State of Texas for such work. Technician shall provide statement indicating that refrigerant has been removed. Statement shall include date of removal, printed and signed name of technician, license number of technician and type of refrigerant removed. Statement shall be affixed to equipment with copy included with final project documents.

END OF STANDARD