

230022-H: SUPPLEMENTAL GRILLES, REGISTERS, DIFFUSERS AND AIR BALANCING ACCESSORIES (15880-H)

Related Sections

Basis Guideline: [230022](#) - "Grilles, Registers, Diffusers and Air Balancing Accessories"
For an explanation of the use of these guidelines, see "[Design Guidelines for UMHHC Facilities](#)"

Included as part of this UMHHC guideline section are the details described within the following UM Master Specification sections:

[MS15890](#) - "Sheet Metal"

[MS15895](#) - "Sheet Metal Accessories"

The UM Master Specifications may be used as a reference and/or basis, but the A/E is completely responsible for contract specifications (meeting the intent of the UMHHC Guidelines and Preferred Manufacturers List) that are used in UMHHC projects.

UMH Standard Details:

[D230022H-1](#) "UH Smoke Control Schematic"

[T 15895 001](#) "Sample Damper Construction Schedule"

Grilles, Registers and Diffusers

Diffusers/ grilles in behavioral health applications shall conform to the latest "Design Guide for the Built Environment of Behavioral Health Facilities" published by FGI.

Supply diffusers mounted in a ceiling shall be louvered style with an adjustable air flow pattern (similar to Titus Model TMSA, TDCA or Omni). Linear supply diffusers and return registers should be similar to Titus Modulinear ML Series. In building expansion projects specify to match existing. A/E shall survey existing spaces and consult with UMHHC Mechanical Engineer.

Return/ exhaust grilles mounted in a ceiling within patient care and public areas shall be sight-proof and easily cleanable. Utilize louvered style grilles to match supply (similar to Titus Model TMS, TDC or Omni).

Perforated type grilles, registers and air diffusers shall not be used except for critical environment diffusers used for laminar flow applications in operating rooms and laboratories.

Provide ventilation effectiveness per the latest ASHRAE Standard 129.

Size grilles, registers and diffusers for a maximum space Noise Criteria/ Room Criteria of 30

Return and exhaust grille face velocities shall not exceed 450 FPM. Supply grille and diffuser face velocities shall not exceed 550 FPM.

Factory furnished opposed blade diffusers located at or in the neck of the diffuser/ grille shall not be allowed. Provide balancing damper in branch ductwork as far from diffuser/ grille as possible.

All supply diffusers/ grilles/ registers shall utilize a flexible ductwork connection to facilitate acoustical attenuation as well as installation. Flexible ductwork shall be fully insulated and utilize a full inner and outer liner encapsulating the insulation. Flexible ductwork shall be 5 ft in length to maximize the trade-off of acoustical attenuation performance versus pressure drop.

In rooms where nitrous oxide is used, locate one return air sidewall grille near floor level at furthest point from room entrance. This also applies in surgery, where low exhaust/ return grilles at floor level are required.

All low return/ exhaust grilles shall be of heavy duty and stainless steel construction to resist damage due to cleaning and abuse.

Return/ exhaust systems serving rooms utilizing low return/ exhaust inlets have proven to accumulate excessive debris generated within the space (i.e. cotton fibers, etc). Because of this, all low return/ exhaust systems shall incorporate the following details:

- All low return/ exhaust grilles shall have an integral filter rack with provisions for a disposable 25% efficient filter located behind the grille face. Grilles shall utilize a hinged access with quarter turn fasteners.
- All return/ exhaust branch ductwork from the grille to the main shall utilize smooth, radius elbows or, if space constraints do not allow the use of radius elbows, use mitered elbows with turning vanes with access doors on both sides of the elbow for duct cleaning.

Louvers

All louvers shall be designed according to the following criteria (velocity based on free area of louver, not net louver area):

- Intake: 500 FPM max
- Exhaust/ Relief: 700 FPM max

Volume Dampers

All supply, return and exhaust branch ducts shall have manual opposed blade volume dampers. An access panel or door is required to each inaccessible damper or utilize a cable operated damper (i.e. Young's Regulator).

Fire Dampers

Fire dampers should be UL approved Type B or C, of the dynamic type, suitable for either vertical or horizontal installation, with 20-gauge steel channel frames, 24-gauge tight sealing steel blades and 18-gauge steel enclosure with duct collars. All parts should have a galvanized mill finish. Fire dampers shall be constructed per Underwriters Laboratories' Standard UL 555.

Fire dampers shall have certified ratings of 1-1/2 or 3 hours, depending on required service.

All fire-dampened floor penetrations shall utilize a waterstop consisting of a 4" high concrete curb or 4" high galvanized angle w/ welded mitered corners, anchored & sealed to the floor at the floor penetration.

The Architect/Engineer must show required locations on drawing for all fire dampers in accordance with local and SMACNA practices of identification. The diamond or triangular solid arrow is preferred. This identification must clearly distinguish between 1-1/2 and 3 hour dampers.

The Architect/Engineer should require the contractor to demonstrate to the University/Health System Project Manager satisfactory operation of at least 20 randomly selected dampers after installation. The dampers are then to be reset with the fusible link.

Smoke Dampers

Smoke dampers should be UL approved, of the multi-blade pivot type, suitable for either vertical or horizontal installation. Smoke dampers shall be constructed per Underwriters Laboratories' Standard UL 555S, Class I Leakage.

Factory provided integral end switches for monitoring the position of the damper shall be specified.

The Architect/Engineer must show all required locations on drawings.

The A/E shall fully define the method of damper control. Smoke dampers in new facilities shall utilize electronic actuators.

Combination Smoke and Fire Dampers

Combination smoke and fire dampers shall meet the above requirements stated for Fire Dampers and Smoke Dampers.

Access Doors

Provide access doors to all maintainable equipment (i.e. VAV boxes, fans, valves, dampers, etc) located behind walls or above non accessible (i.e. drywall) type ceilings. Access door shall be large enough for shoulder clearance (i.e. 24"x24" min.) and for equipment removal, except where only hand access is required (i.e. balancing damper). Where duct size does not permit a 24"x24" access door, provide the largest access door the duct can accommodate x 24" (i.e. provide a 10"x24" access door in a 12"x12" duct).

All access doors in insulated duct systems shall be factory insulated utilizing inner and outer sheet metal encapsulating the insulation.

Construction of access doors shall match the ductwork construction (i.e. pressure class and material of construction).

All access doors equal to or larger than 18"x18" shall be hinged.