Selection Procedures

Throw

Achieving the proper throw for a specific application is critical to proper outlet selection. Throw data is usually presented at terminal velocities of 150 [0.75], 100 [0.50] and 50 fpm [0.25 m/s]. Generally outlets should be selected so that the throw at 50 fpm [0.25 m/s] terminal velocity equals the distance from the outlet to the boundary of the conditioned space. In most cases this criteria will produce acceptable results.

When an air stream strikes a surface it tends to spread and follow the surface until the velocity dissipates. The total horizontal and vertical distance travelled by the air stream is equal to the tabulated throw of the outlet (**Figure 23**). For high ceiling applications it may be desirable for the throw to exceed the space boundary (ceiling) and travel down the wall toward the occupied zone. However, penetration of the occupied zone should usually be avoided.

In addition to physical boundaries created by walls or partitions, boundaries can be created by the collision of two air patterns (**Figure 24**). Where two patterns will meet, the outlets should be selected so that the throw is equal to one half the distance between the outlets. For high ceiling applications it may be desirable for the throw to travel downward toward the occupied zone. Throw is again equal to the horizontal and vertical distance travelled by the air stream.

It should be noted that most catalog throw data is presented for isothermal conditions (i.e., supply air temperature equals room temperature). During cooling the denser supply air will shorten the horizontal throw to approximately 75% of tabulated values (multiply by 0.75), assuming a temperature differential of approximately 15 °F [7.5 °C].

The cataloged throw data for most diffusers and grilles is developed with the outlet mounted in or adjacent to a ceiling. The ceiling or Coanda effect allows the supply air jet to be in contact with the ceiling longer, reducing induction of room air and consequently resulting in a longer throw than if the outlet was mounted in free space. If an air outlet is mounted in free space or more than 2 ft [610 mm] from a surface, the cataloged throw data should be reduced by approximately 30% (multiply by 0.70) (**Figure 25** and **Figure 26**).

When selecting outlets for VAV application, both minimum and maximum air quantities must be considered for throw. Although many models of outlets provide excellent horizontal air pattern at extremely low flows, throws may be reduced below acceptable limits.

In many applications it is desirable to limit the throw due to ceiling layout, walls, partitions or other boundaries which may obstruct the air pattern and cause unacceptable velocities in the occupied zone. There are several methods which may be used to minimize throw from outlets, including spreading the air pattern, reducing air volume per inlet and selecting the appropriate air pattern. More information on these methods will be presented on the following pages.

PRODUCT TIP

Slot diffusers and light troffer diffusers tend to maintain reasonable throws at low air volumes, and are therefore a good choice for VAV applications.

Figure 23: Throw of outlet

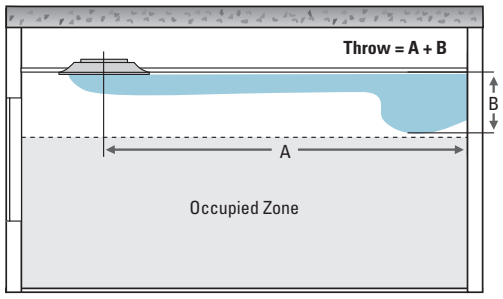


Figure 24: Boundaries created by two air patterns

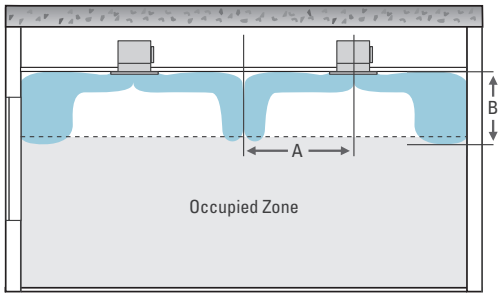


Figure 25: Ceiling diffuser free space mounting

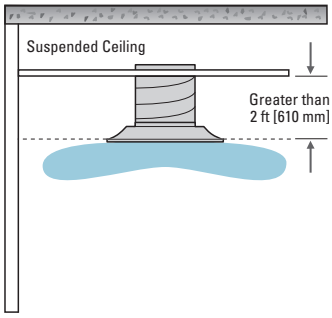
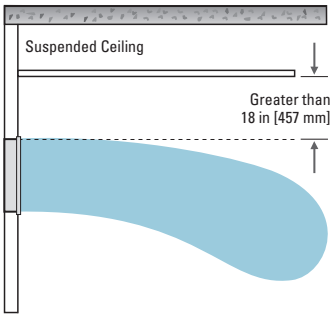


Figure 26: Sidewall outlet free space mounting



All Metric dimensions ( ) are soft conversion.
Imperial dimensions are converted to metric and rounded to the nearest millimetre.