

UNI2-SQ • UNI2-SQP

Square Pattern Diffusers



In laying out diffusers for an open office with a perimeter zone, there are always issues with interactions between interior and perimeter zones, and in locating perimeter diffusers that comply with ASHRAE 62.1 overhead heating requirements. Additionally, there are often issues locating perimeter diffusers at the glass due to space limitations.

UNI type (plaque) diffusers have a round throw pattern resulting from the square plaque in a square backpan. While the performance characteristics for plaque diffusers, as validated in the ASHRAE RP1515 study, show great turn down capability, the complaints noted in the study occurred at the midpoint between diffusers at full design flow, typically during morning warm-up/cool down. There were no complaints at flows down to 0.2 cfm/sf.

The perimeter zones in open office spaces often utilize linear slot diffusers in order to properly "wash" several windows in heating mode, and to meet the ASHRAE Standard 62.1 requirement that the 150 fpm throw make it to within 4.5 ft. of the floor at the window. The recommendation in cooling is that the diffuser blow both towards and away from the window, as the solar load may extend into the perimeter zone. The interface between perimeter and interior zones is neither well documented nor understood. Linear slots often have quite long throws, almost always greater than the 15 ft. assigned as "perimeter" zones. In many cases in open offices, perimeter zones in heating are adjacent to interior zones in cooling and may (likely do) result in the zones fighting one another.

The UNI2-SQ and UNI2-SQP have been designed to solve these issues.

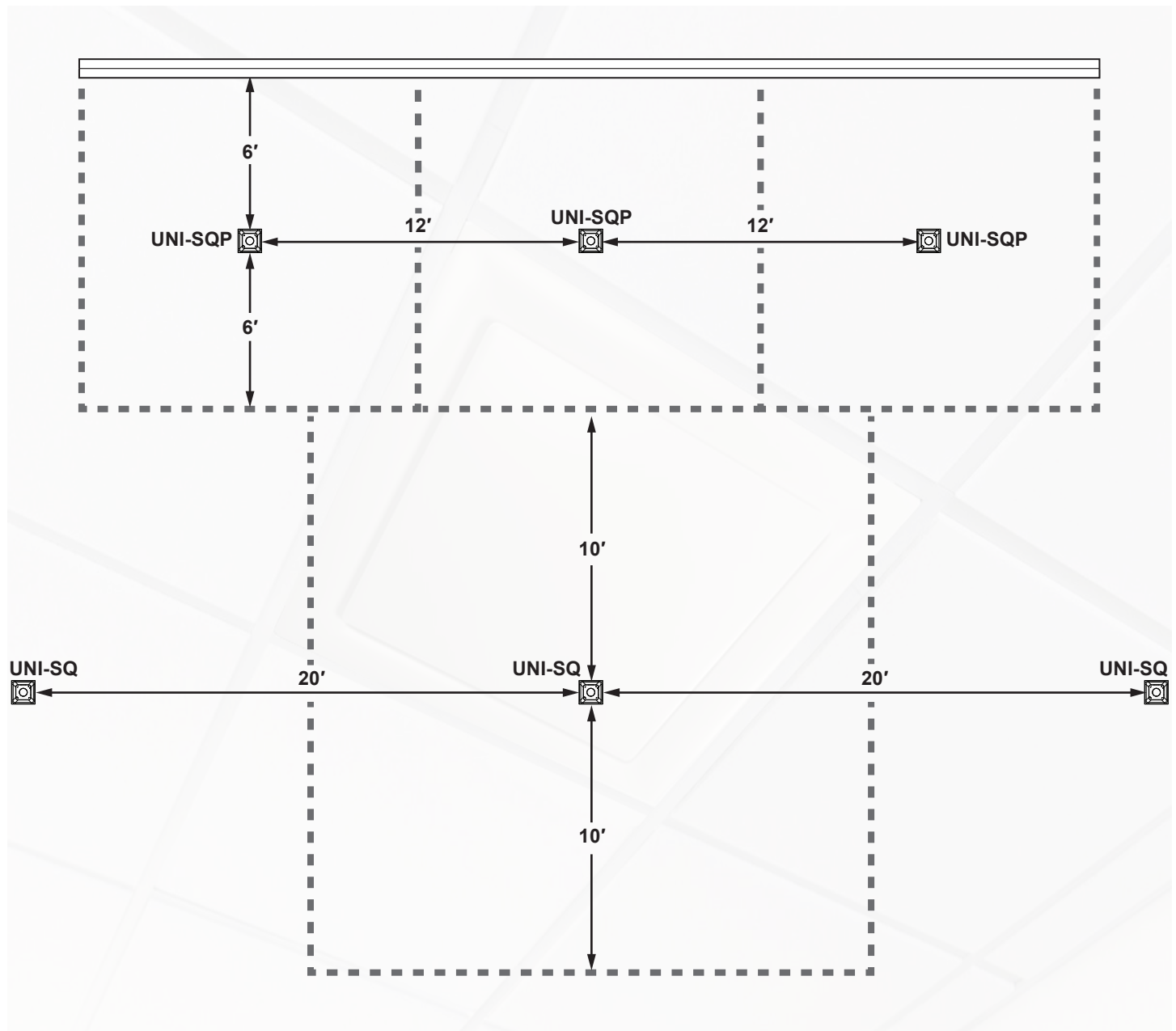
Interior zones: By placing proprietary baffles inside the UNI2 the performance of a traditional plaque-type diffuser can be enhanced. By modifying the size and shape of the baffles, different throw characteristics can be designed. To date, several of these including low temperature (UNI2-LT), very low flow (UNI2-JT), and high induction (UNI2-HI) designs have been offered.

By further modifications, more airflow will be directed to the corners, resulting in a square, rather than a round discharge pattern. A square pattern reduces the opportunity for jet collision at design flow rates, while enhancing the air distribution at low flows. The increase in pressure and sound are minimal and are similar to the UNI2-HI. This is the UNI2-SQ.

Perimeter Zones: For the perimeter, the asymmetrical baffle design results in more spread at the window, and several windows can be "washed" with a single diffuser (significantly reducing installation costs). The spread turns out to be approximately twice the distance of the diffuser from the window. Furthermore, the design delivers less air to the sides and towards the interior. This unit is the UNI2-SQP. The location of the perimeter diffuser from the window is determined by a combination of window design heat loss and diffuser sound generation characteristics. The ratio of the perimeter and interior may be easily modified for different climate zones as required.

Performance data: The catalogued performance data will include both perpendicular and corner throw distances for the UNI2-SQ, and the throws for the UNI2-SQP for both interior and perimeter perpendicular and corner throws, as well as a side -to-side throw rate. We can provide some installation/application guidance for 300 BTUH/linear ft. window and NC-35 applications.

The example here is based on a 10" inlet UNI2-SQP diffuser at 350 cfm located 6 ft. from the window, with 12 ft. between perimeter diffusers and a 12 ft. perimeter zone. The throw down the window to 150 fpm, with a 9 ft. ceiling, will come to within 4 ft. from the floor (complying with ASHRAE 62.1 overhead heating requirement). The diffuser will deliver 300 BTUH/linear ft. of wall at 15°F delta-T. The interior 10" inlet UNI2-SQ diffusers at 330 cfm are 20 ft. apart and 10 ft. from the perimeter zone, designed a 0.8 cfm sq ft..



By utilizing a combination of **UNI2-SQ** and **UNI2-SQP** diffusers, the designer will have a similar looking diffuser in both interior and perimeter zones while minimizing drafts due to jet collisions and also meeting perimeter heating requirements.