

AIRFLOW CONTROL STRATEGIES FOR LABORATORIES



Rhine-Waal University of Applied Sciences, Kamp-Lintfort, Germany

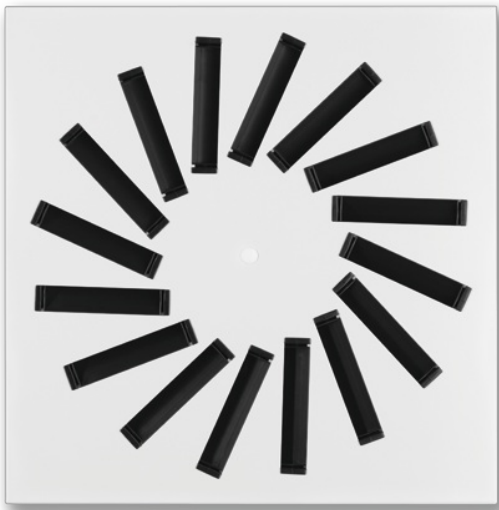
Selecting air terminal devices.

The DIN 1946-7 requirement of eight air changes per hour is a challenge to the ventilation for laboratories. When selecting a supply air diffuser, the exact installation location is as important as the cooling load of a room. If one compares a room air conditioning system to a chain, air terminal devices would be the most critical links for thermal comfort. To obtain a high degree of comfort and safety, the discharge velocity of the supply air must not be too high, yet strong enough to dilute the air in the lab.

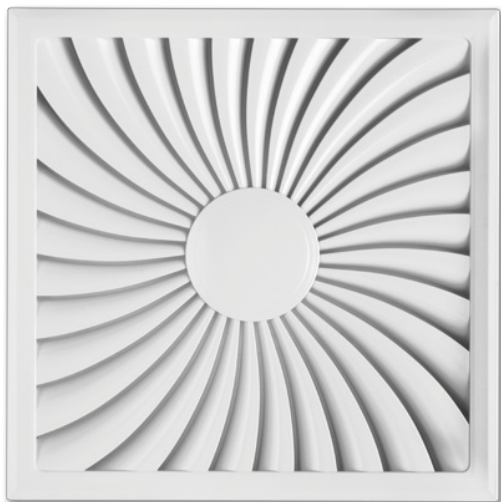
Due to the high heat loads in a lab, which are caused by the lab equipment, labs must be cooled both in winter and in summer. Yet cooling and high volume flow rates also mean high energy consumption. Cooling creates high temperature differences, which in turn adversely affect the comfort and may also be a safety problem. When cold air 'falls' from the ceiling, it may induce air from the fume cupboard, i.e. drive it into the room. This can be safely avoided, however, by an intelligent control strategy and the correct placement of suitable air terminal devices.

It is important to take the lab furniture and equipment into consideration already in the design stage in order to find the best possible installation location for air terminal devices. Furniture and equipment have an impact on the airflow in the room and can interfere with effectiveness and comfort.

The minimum air discharge velocity on diffusers in a variable air control system must be achieved to ensure comfort independent of the operating conditions. The air management system takes the type of diffuser into consideration and provides the necessary signals to ensure the minimum air discharge velocity.



VDW ceiling diffusers for high room air change rates. Supply air and extract air variants for comfort zones
7 - 470 l/s
25 - 1692 m³/h
300 - 825 mm
Ø 400 and 600 mm



AIRNAMIC swirl diffusers Ceiling swirl diffusers with fixed air control blades, for high volume flow rates at low sound power levels and low differential pressure due to innovative polymer technology

13 - 385 l/s

47 - 1,386 m³/h

300, 600, 625 mm

Circular diffuser face



RFD ceiling diffusers - higher comfort due to lower sound power levels

4 - 330 l/s

14 - 1.188 m³/h

125 - 400 mm