

# Laminar Air Flow Compliancy

## Maquet Volista Surgical Light

Laminar air flow ceilings are essential in operating theatres to limit the levels of contaminants in the air and thus the risks of post-operative infections for patients. The vertical outflows are generated by ceiling outlets recovering the zone to be protected, and it is crucial that surgical lights do not disturb the air flow. Maquet Volista surgical lights were sent to a centre of expertise in air filtration systems, in order to determine its impact on laminar flows in actual operating theatre conditions.

### Visual tests

The lights were positioned in the center 1 m underneath the laminar flow ceiling as described in figure 1. After switching on the lights, an aerosol mist was emitted

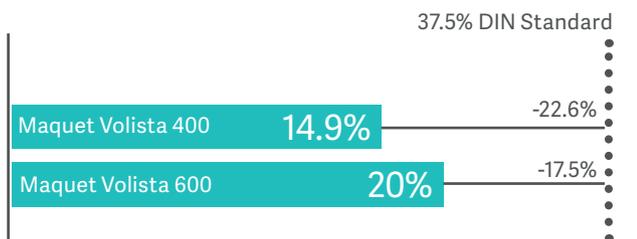


Figure 2: results for Maquet Volista surgical lights according to DIN standard 1946-4 ed. Dec.08.

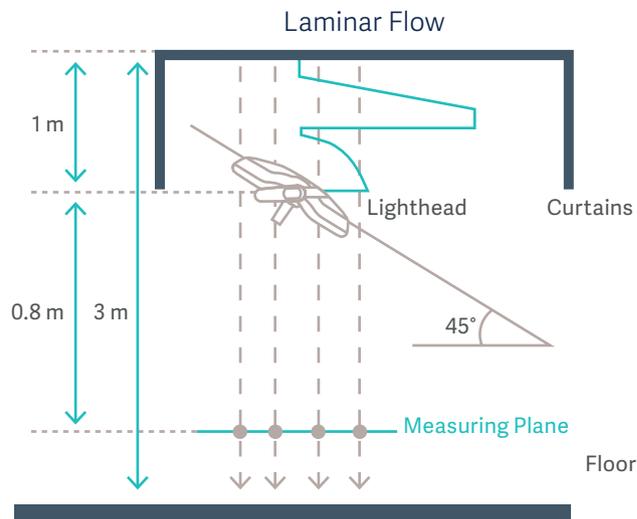


Figure 1: examination of the mist distribution above and below the light head.

50 cm above and 150 cm below the light head so that the mist distribution can be visually observed (potential lifting effects, reversal of the flow direction). This test is very important, as heat dissipation can create buoyancy (lifting effects), responsible for carrying airborne particles and germs potentially leading to infections.

### Turbulence intensity measurements

Determination of "turbulence intensity" is conducted without light, with the operating light switched OFF and ON. Three parameters such as flow velocity, temperature and turbulence degree are determined in the measuring rectangular plane 1 m below the light under surface as shown in figure 1.

**Results:** here was no visible uprise of air towards the ceiling caused by Maquet Volista surgical lights, and no flow inversion was detected by the testing fog. This confirms that the well controlled heat dissipation from Maquet Volista surgical lights does not disturb the laminar flow effectiveness. Furthermore, the turbulence degree is exceptionally far below the 37.5% limit of the DIN standard. These results demonstrate the excellent compatibility of Maquet Volista operating lights with laminar flow ceilings. Its unique design, its smooth surface and its low heat dissipation ensure an optimum operating environment for both patients and surgeons.