



VENTILATION OF OPERATING ROOMS AND HOSPITAL WARDS

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One of the aims of the air conditioning systems is the elimination of any contamination in hospital areas, guaranteeing at the same time that they are not a source of contamination and infection themselves. In order to, and according to the existing regulations (RD 1027 de 2007 Part II), indoor air quality is defined depending on the building use, requiring for hospitals optimum indoor air quality.

Designing a hospital wards, consists in determining if they are air controlled rooms; establishing later the level of risk for each area.

Based on this consideration and their location, air distribution is executed in order to assure the differences in flow -between driven and suction flow- so as to achieve the appropriate air flow directions. This ensures the overpressure / depression of the rooms, allowing air circulation between high to low local demand and compensating possible leakage through doors and locks. It is important not to leave doors open; avoiding the simultaneous opening of them by means of locking mechanisms; as well as ensuring airtightness of closures themselves. In general, the design of these rooms is performed at overpressure –sometimes at depression-to avoid polluted air escaping from the controlled room.

Thermohygrometric comfort, Standard UNE 100713, which includes a temperature and relative humidity 20°-24°C and 45%-65% respectively, except situations where the patient or operation requires special conditions, such as infant cardiac surgery where the temperature needs to be 18°C or 80% relative humidity in major burn units.

"It is precisely the possibility of realizing a dream that makes life interesting."

Air filtering is also an important point. According to Standard UNE 100713, there are two kinds of rooms in hospitals:

Class 1: It is more demanding. Contains 3 filtration levels. Includes operating rooms, immunodeficiency patient rooms, labs, etc.

Class 2: Contains 2 filtration levels.

The two first filtration levels are set in the UTA, meanwhile the third one - absolute filtration level- is installed as closed as possible to the room. In the case of class I, it is just on the supply air terminal unit. Specially, in operating theatres, an isle is made so that air runs through absolute filters, obtaining a laminar flow in the area of operation.

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Standard UNE-EN ISO 14644-1:2000

Standard UNE 100713:2005

Table showing the classification of different types of operating theatres and the particular conditions required:

Type	UNE 100713: 2005	UNE 14644-1:2000	Flow Regimen	Renovations / hour	Outdoor air	Type of operating theatre
A	Class I	ISO 5	Laminar	Minimum 35 renov./h	Re-circulation probability	High Technology theatres. Specialized surgery
B	Class I	ISO 7	Turbulent	Minimum 20 renov./h	100% outdoor air	Conventional theatres
C	Class I	ISO 8	Turbulent	Minimum 15 renov./h	100% outdoor air	Ambulatory surgical theatres

As to outdoor air, it is only possible to re-circulate from class 1 to class 1 enclosures. For that purpose, air flows through an outdoor inlet, it is filtered (F7), conditioned (hot or cold), humidified (if necessary), filtered again (F9) to pass through a pipe ending in a High Efficiency or absolute Filter HEPA H13 or H14.

The minimum for operating theatres is 2400 m³/h when they are equipped with a broadcasting system air mixture.

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