Operating Room HVAC: Laminar Flow, Temperature Control, Humidity Ranges, and Particulate Filtration

THE DIRECT ANSWER

Operating room HVAC under ANSI/ASHRAE/ASHE Standard 170-2025 (aligned with FGI 2026) combines a HEPA-filtered primary ceiling array with unidirectional downward flow, at least 20 total air changes per hour (including 4 outdoor ACH), positive pressure to adjacent spaces, and 68–75°F with 20–60% relative humidity. Terminal HEPA at the supply ceiling, low sidewall returns, and documented commissioning are what keep particulate load down around the surgical field. Laminar flow (OR context): Unidirectional supply air moving downward from a primary ceiling array toward low returns, sweeping particles away from the patient and instrument field.

WHY OR AIR MATTERS

- Airborne skin cells and room dust still show up in wound cultures. HVAC cannot replace sterile technique, but it limits what reaches the incision. Healthcare HVAC design under ASHRAE 170 sets minimum ACH, filtration, pressurization, and diffuser rules; your state adoption, FGI.

LAMINAR-STYLE ARRAYS AND COVERAGE

- Standard 170-2025 requires a primary supply diffuser array over the table: unidirectional downward flow, average 25–35 cfm/ft² (127–178 L/s/m²), coverage at least 12 in.

FIELD QUESTION

Where does this come from?

This sheet distills the full Healthcare Facility Hub article linked below, which carries the complete text, references, and sourcing.

From Healthcare Facility Hub - free, like everything on the site. The full article is at the link below.

Caution: codes, editions, and targets vary by facility and authority having jurisdiction (AHJ). Figures marked as common practice are facility targets, not code requirements. Confirm against your AHJ and the current code text before acting.