Healthcare Pressure-Relationship Mapping: Positive, Negative, and Neutral Airflow by Clinical Purpose

Field Sheet — ASHRAE 170 Room-by-Room Airflow Direction, Contamination Control & Cascading Gradients

Direct Answer (Practitioner Reference): ASHRAE Standard 170 Table 7-1 and Tables 8-1/8-2 assign every clinical space a mandatory pressure relationship — Positive (+), Negative (-), or Neutral / No Requirement (NR) — based on contamination-control purpose. Positive rooms (ORs, Protective Environments, SPD Clean Workrooms, Sterile Storage) push air outward to protect sterile fields or immunocompromised patients; Negative rooms (AII, SPD Decontamination, Bronchoscopy, Soiled Workrooms) pull air inward and exhaust outdoors to contain pathogens, moisture, and vapors. Automated pressure-switching between positive and negative is prohibited.

Clinical Space (ASHRAE 170)	Pressure	Airflow Direction	Contamination-Control Purpose	Exhaust Rule
Operating Room (Class B & C)	Positive (+)	Room -> Corridor	Protects open sterile surgical field from corridor contaminants	Recirculation permitted w/ MERV/HEPA
Protective Environment (PE)	Positive (+)	Room -> Corridor/Anteroom	Protects severely immunocompromised patients from airborne spores	HEPA-filtered supply; no switching
Airborne Infection Isolation (AII)	Negative (-)	Corridor/Anteroom -> Room	Contains TB, measles, varicella & airborne infectious aerosols	100% direct outdoor exhaust*
SPD Decontamination	Negative (-)	Clean/Corridor -> Decontam	Contains bioaerosols, steam & chemical vapors from instrument wash	100% direct outdoor exhaust
SPD Clean Workroom & Sterile Storage	Positive (+)	Clean -> Decontam/Corridor	Protects cleaned instruments & sterile packaging integrity	Cascades toward Decontam
Bronchoscopy / Soiled Workroom / Autopsy	Negative (-)	Corridor -> Room	Contains infectious aerosols, odors & biohazardous particulates	100% direct outdoor exhaust
General Patient Room / Exam / Corridor	Neutral (NR)	Balanced / No Requirement	Standard clinical occupancy without specialized containment	Per Table 7-1 / 8-2

Pressure-Mapping & Commissioning Verification Checklist

Verification Item	Field Check / Governing Rule	Owner
1. No Pressure Switching	[ ] Confirm automated BAS controls cannot switch a room between Positive and Negative (prohibited by ASHRAE 170 due to failure risk)	Engineering / TAB
2. Suite Cascade	[ ] Verify directional cascade in multi-room suites (e.g., SPD Sterile Storage (+) -> Clean Workroom (+) -> Decontamination (-))	TAB / Facilities
3. Permanent Monitors	[ ] Verify permanently installed visual differential pressure monitors on all AII and PE rooms	Facilities / Clinical
4. Smoke / Tissue Test	[ ] Perform qualitative airflow direction check at door undercut alongside quantitative manometer reading during TAB & rounds	Engineering / IP

*Practitioner prep/reference tool based on ANSI/ASHRAE/ASHE Standard 170 Table 7-1 & Tables 8-1/8-2. *2021/2025 exceptions permit AII exhaust tie-in only with AHJ-approved backflow/filtration safeguards. Verify state-adopted edition.*