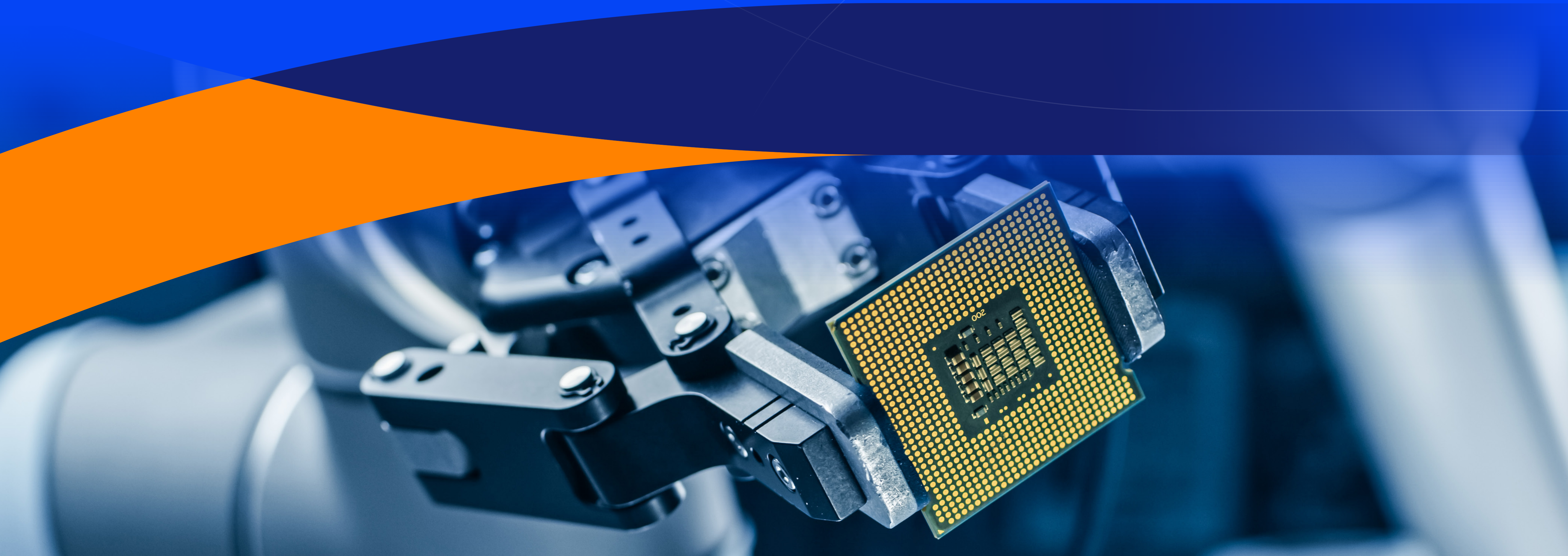


Technical Solutions



ABM Test & Balance Services: Expertise for Uptime



The TAB Expertise to Keep Growing Semiconductor Facilities Up and Running

With unplanned downtime in the semiconductor industry costing detrimental amounts of money to organizations, technical expertise to ensure uptime is vital, especially as more semiconductor sites come online.

ABM specializes in semiconductor process exhaust test and balance services (TAB). Proven over 30 years in leading semiconductor and technology facilities, the ABM process enables a wide range of semiconductor tools to be brought online without disruption to production.

“Typically, a wafer fab with a construction cost of \$7 billion would need to recover roughly \$4 million per day just to amortize the investment. Any breakdown which brings production to a halt even for a minute is highly undesirable.”





Maintaining Uptime, Safely

ABM certified technicians provide TAB services that include evaluations, verifications, and documentation to help ensure that semiconductor manufacturing facilities meet their performance expectations and increase manufacturing uptime while ensuring safety in these critical areas and across the facility. Also due to a high risk of contamination, ABM verifies that all tools are brought online without impacting any other tools in the room.

Keeping Cleanrooms Clean

In semiconductor production, TAB services are vital to managing precise cleanroom environments that require high-level filtration. While these services have been used for decades, the demand for TAB services is growing exponentially as the semiconductor industry expands. Technicians who handle testing and balancing require certified training, experience, and skill to complete their work in challenging conditions that demand safe handling of hazardous exhaust systems.

NEBB-Certified Expertise

ABM is unique in that it is certified by the National Environmental Balancing Bureau (NEBB) with technicians trained in high-quality commissioning, ventilation testing, adjusting, and balancing. ABM technicians are among only 3,200 International High-Performance Building NEBB-Certified Professionals in the world, with just a few hundred in the US. NEBB Certified firms, professionals, and technicians uphold the highest standards in building enclosure, cleanroom and fume hood performance testing. Certified experts also conduct sound and vibration measurement, building systems commissioning and processes, technical retro-commissioning of existing buildings, and testing, adjusting, and balancing.

Ongoing Technician Training

ABM augments this high standard of certified training with continuing education sessions in TAB that meet and exceed OSHA standards and ABM customer specifications. Combined with ABM's comprehensive standard operating systems, this approach helps ensure that work is performed precisely to meet the specified needs of each facility.

ABM Services

Process Exhaust Test & Balance

- Performing test & balance services on all tools and individual equipment involved in the production of microchips

Cleanroom Test & Balance

- Testing & balancing services on HEPA filtration, envelope pressurization, temperature, and humidity verification

Fume Hood Performance

- Testing & balancing the fume hood for proper face velocity and total exhaust

Gas Cabinet Testing

- Testing & balancing the gas cabinet for proper face velocity and total exhaust

Duct Leakage Testing

- Performing DALT (Duct Air Leakage Testing) services, including pressurizing the duct and confirming leakage is within specified guidelines

Air & Hydronic Balance

- Testing, measuring, and adjusting all HVAC systems to project specifications

Commissioning

- Ensuring all HVAC and exhaust systems are installed to design specifications, including pre-testing, operational testing, and functional testing

Life Safety Certification

- A wide array of tests to receive a COO (Certificate of Occupancy), including testing of HVAC Smoke Fire Dampers and systems, testing of the smoke evacuation system in event of a fire, and OSA (outside air) testing to confirm the building is receiving enough outside air through the HVAC system per ASHRAE and/or ISO standards

Sound and Vibration Measurement

- Verifying HVAC systems operate within the appropriate decibel range for each project specification and measuring the acceleration, velocity, and displacement of equipment to confirm the specified levels of vibration

Stairwell Pressurization

- Testing doors on each floor of a building to determine they meet the required pressure to open during an emergency
- Delta pressures between the stairwell and adjacent spaces are also measured to confirm positive pressure, which is a requirement for building occupancy, following NFPA 92 Guidelines

Operating Room (OR) Certification

- Testing & balancing procedures are executed to ensure a sterile and safe environment for both staff and patients as OR rooms require annual certification in order to operate
- Testing is performed to verify the space is in a positive pressure, temperature and humidity are also recorded

ISO Certification

- Testing of negative pressure between the patient's room and adjacent hall is recorded once a year for ISO Room certification and to meet ASHRAE and/or ISO standards





Demanding Environments Demand Specialized Services

Test and balance services are critical for semiconductor manufacturing and other industries that produce sensitive products requiring cleanrooms and precise air filtration, airflow, and temperature standards, including:

- Bio-Pharmaceutical Plants
- Food Manufacturing Plants
- Hospitals
- School Laboratories

ABM's disciplined approach to TAB ensures that quality standards are applied consistently to serve the unique requirements of each facility.

Proven Methodologies

Test and balance services have been trusted for four decades, and today this level of rigorous testing has renewed relevance with the growth of the semiconductor industry and higher emphasis on indoor air quality, filtration, and building efficiency.

Measurable Impact

At its core, the TAB process is centered on where air and hydronic flows in a building are measured, adjusted, and documented to meet design specifications and local building codes to ensure thermal comfort, indoor air quality, and system energy efficiency are optimized. ABM technicians use test instruments, sensors, and monitors to verify appropriate temperatures, airflow, and other characteristics within the HVAC system.

ABM TAB Services in Action:

Global Semiconductor Leader

One of the world's leading and respected chipmakers depends on ABM services to:

- Test and balance tools used for microchip manufacturing
- Comply with microscopic tolerances with pressures set to within 0.01" w.g.
- Test and balance cleanrooms
- Test and balance office support and common areas

ABM's work helps maintain uptime and ensure building health throughout the facility.



ABM TAB Services in Action:

Global EV Manufacturer

For an innovative manufacturer of electric vehicles, ABM:

- Tests and balances a factory spanning multiple millions of square feet
- Supports the facility with a team of 4-6 on-site technicians for HVAC test and balance services
- Serves facility needs with an additional 200 on-site team members for cleaning and maintenance

ABM helps keep this massive enterprise running and meeting the demands of the EV market.



Get TAB Expertise That Will Grow With You

In facilities across the country, ABM TAB technicians become a critical part of teams that keep semiconductor and other environment-critical manufacturing facilities safely operating at peak efficiency and uptime.

With these industries projected to grow at a high level for years, the demand for TAB technicians will also grow.

With ABM, you gain 30+ years of TAB expertise with highly trained NEBB-Certified technicians who will work as an extension of your facility team and grow with your operation.

Talk to an ABM TAB expert today.

Call 866.488.4979 or visit abm.com/hvac



FACILITY ENGINEERING & INFRASTRUCTURE **SOLUTIONS**

ABM drives possibility through facility, engineering, and infrastructure solutions across a wide range of industries. Our diverse, inclusive teams work together to advance a healthier, more sustainable, ever-changing world. Under our care, systems perform, businesses prosper, and occupants thrive. Every day, over 100,000 of us partner with our clients to care for the people, places, and spaces important to you. We are making spaces smarter, modernizing infrastructure, and transforming facilities to become more resilient.

We are driving possibility, together.

