QUALITEST

ADVANCED TESTING TECHNOLOGIES

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QUALITEST™

BATTERY TEST CHAMBERS

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Qualitest provides a comprehensive range of Battery Test Chambers, engineered to meet the demanding requirements of battery environmental testing across industries such as automotive, electronics, and renewable energy. These Environmental Chambers for Battery Testing simulate real-world conditions, ensuring lithium battery test chamber solutions that comply with IEC, TIEC, SAE, UL, UN, IEEE, and other international safety and performance standards.

Designed for battery climatic testing, these chambers offer precise control over temperature, humidity, vibration, and altitude, enabling rigorous assessment of thermal stability, corrosion resistance, and mechanical durability. Whether testing individual cells, battery packs, or complete modules, our battery climatic chambers help manufacturers validate battery reliability and safety under extreme conditions.

With thermal chambers for battery testing, laboratories and manufacturers can conduct accelerated lifecycle tests, ensuring battery performance and compliance with global industry regulations. Qualitest’s battery test chambers deliver industry-leading precision, allowing manufacturers to develop safer, longer-lasting, and more efficient energy storage solutions.

THEORY & METHOD

The Intricate Physics Behind Heat Regulation

Scientific researchers frequently point out that conventional testing enclosures utilizing blown-air circulation absolutely struggle to keep the exterior surfaces of energy cells completely identical in temperature. This thermal bottleneck causes specific challenges:

- **Critical Calculation Discrepancies:** Uneven heat distribution constantly causes massive, highly frustrating errors in your crucial performance numbers.
- **High-Rate Discharge Imbalances:** Thermal imbalances worsen dramatically when operators start draining cells at exceptionally fast electrical speeds (≥1C rates).
- **Extensive Stabilization Delays:** Standard airflow setups require prolonged stabilization times, whereas highly specialized heat-absorbing metal contact plates (CTCA) can theoretically shorten wait times from 84 minutes to just 1.6

minutes.

While academic researchers evaluate those specific custom metal fixtures to map out theoretical thermal-electrochemical models, commercial manufacturing facilities require incredibly consistent, highly dependable machinery to conduct rigorous assessments of thermal stability. That is exactly where our Battery Charge & Discharge Test Chamber QualiBCDT™ Series and Walk-In Battery Rapid Temperature Change Test Chamber step in, providing precise control over temperature and humidity to accurately validate battery reliability.

The Methodology of Safely Containing Extreme Battery Failures

Deliberately pushing highly charged storage units until they violently rupture and release hazardous chemical vapors is an exceptionally volatile scientific process. To securely lock down pure, unadulterated chaos, academic documentation and laboratory studies emphasize three critical safety theories:

- **Blast Containment:** Abuse-testing enclosures absolutely must be heavily fortified to safely trap sudden explosive blasts and violently venting gases.
- **Combustion Suppression:** Flooding a contained experimental space with non-reactive inert gases heavily suppresses unexpected fires, keeping the catastrophic failure limited to thick, heavy smoke.
- **Gas Hazard Mitigation:** Safely directing the venting of highly flammable chemical vapors prevents pressure buildup from turning standard testing boxes into dangerous projectiles.

Regardless of which specific experimental atmospheric methodology you are utilizing to study battery combustion, you fundamentally require testing machinery specifically engineered for reliable and completely safe battery testing. That is precisely why safety-conscious laboratories depend on our Explosion Proof Battery Temperature Test Chamber, the QualiEx™ PBC Climatic Series, and our massive Walk-In Battery Temperature Explosion Proof Test Solution to securely contain extreme destructive testing.

Complying with Uncompromising Global Safety Standards

Earning official regulatory approval for your newly engineered energy modules means strictly satisfying those exceedingly demanding, highly stringent international safety protocols, including IEC, TIEC, SAE, UL, UN, and IEEE. The foundational operational theory relies on managing critical parameters:

- **Active Climate Fluctuations:** Equipment operators must strictly control how deeply the cell is drained and how intensely the surrounding climate is manipulated.
- **Ignition Hazard Prevention:** Scientific safety guidelines strongly dictate that the testing enclosure itself must never accidentally trigger a massive facility fire through stray electrical arcs or excessively hot internal components.
- **Real-World Environmental Extremes:** Replicating severe weather and high-voltage conditions ensures mechanical durability under extreme physical strain.

To realistically mimic brutally harsh, utterly unforgiving real-world environments while securely maintaining strict industry compliance, testing facilities heavily rely on our versatile lineup of Battery Test Chambers. By utilizing specialized machinery like the Battery Altitude Chamber, our specialized Battery Sand Dust Test Chamber, and our high-performance Two-zone Thermal Shock Chamber, battery manufacturers can successfully validate mechanical durability and severe weather resistance without ever resorting to frustrating guesswork.

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Connect with us

*Contact our **QualiTeam** today to find out how we can help your organization **select the most suitable testing solution** for your application, requirements, and budget.*

Qualitest USA (Corporate Sales Office)
Toll-Free: 1.877.884.TEST (8378) | Fax: 954.697.8211
E-mail: info@qualitest-inc.com
Address: 8201 Peters Rd., #1000,
Plantation, FL 33324, USA.

Qualitest Canada & International
Tel: +1.905.944.9825 | Fax: +1.905.944.0304
E-mail: sales@qualitest-inc.com
Address: 70 East Beaver Creek Rd., #9, Richmond Hill,
Ontario L4B 3B2, Canada.

Qualitest Latin America (Mexico and LATAM Region)
E-mail: ventas@qualitest-inc.com

Qualitest KSA (Regional Office)
Tel: +966 11 500 6659
Address: Level 7, 3.09, District 3, King Abdullah
Financial District, Riyadh, Saudi Arabia

Qualitest Singapore (ASIA PACIFIC Regional Office)
Tel: +65 6393 5480 | E-mail: singapore@qualitest-inc.com
Address: 50 Raffles Place, Singapore Land Tower,
Level 46, Singapore, 048623.

Qualitest Indonesia (Representative Office)
Tel: +62 21 2985 9522 | Fax: +62 21 2985 9889
E-mail: indonesia@qualitest-inc.com
Address: One Pacific Place Level 11, Jl. Jend. Sudirman,
Kav. 52-53, SCBD Area, Jakarta 12190, Indonesia.

Qualitest FZE (Regional GCC/ME Office)
Tel: +971 4 8819252 | Fax: +971 4 8819262
Email: gcc@qualitest-inc.com
Address: Jafza One, BB 1610, Jebel Ali Free Zone,
PO Box 261440, Dubai, UAE.

Qualitest India
E-mail: india@qualitest-inc.com
Address: 15th Floor, Dev Corpora, Pokhran Road No.1,
Eastern Express Highway, Thane, Maharashtra,
Mumbai, 400601, India

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