

SAFETY STANDARDS AND HARMONIZATION TESTING



ACCURATE, OBJECTIVE DATA FOR ALL YOUR SAFETY TESTING NEEDS

Meet evolving regulatory requirements and better understand the safety risks associated with your products and processes. Whether you need fast turnaround of standard tests or a novel (but industry-compliant) procedure for a unique safety testing challenge, Battelle delivers accurate, unbiased quality results to support your requirements.

Battelle brings together unmatched scientific and technical expertise and world-class testing facilities, including our High Energy Research Lab Area (HERLA). We can safely and reliably test all kinds of materials, including highly hazardous, reactive, flammable and/or energetic solids, liquids or gases. We work with a wide range of batch sizes from sample to product scale.

GHS COMPLIANCE TESTING

Get the reliable, independent data you need to meet the new global standards for hazard communication. We provide comprehensive safety testing services for all kinds of products, processes and precursors. Our experienced scientists and technicians can help you ensure compliance with the new Globally Harmonized System (GHS) for Labeling and Classification of Chemicals and other emerging national and international regulatory standards. Example data delivery include:

- Boiling Point
- Electrical Conductivity
- Corrosivity to Metals/Plastics
- Evaporation Rate
- Flammability of Solids
- Flash Point

- Self-Accelerating Decomposition Temperature Testing
- Oxidizing Properties of Solids
- pH
- Relative Density
- Reserve Acidity
- Reserve Alkalinity
- Self-Heating
- Vapor Pressure
- Viscosity

RISK ASSESSMENT AND MITIGATION

Sometimes you need more than a number to understand your test results. Our scientists can help you interpret complex or ambiguous safety testing data so you can make effective labeling and risk mitigation decisions. Our safety testing team brings together deep expertise in materials science, chemistry, energetics and a range of other related disciplines to solve your toughest technical challenges.

- Safety data analysis, evaluation and interpretation
- Labeling recommendations
- Shipping and handling recommendations

TEST DEVELOPMENT AND VALIDATION

At Battelle, we don't just run tests—we solve problems. If standard safety tests

doesn't exist for your new product or process, we can develop and validate it here in accordance with industry-required standards. We can adapt existing tests or develop new testing protocols for first-of-a-kind materials, chemicals or processes. We can also work with regulating organizations so they can review and adapt our testing procedures.

- Novel test development
- Testing protocol validation

The Battelle Advantage

- Reliable, independent analysis of replicated data
- Safe testing facilities for high energy and hazardous materials
- Experience-based problem solving approach for non-standard testing challenges
- Fast turnaround for deadline-sensitive needs
- ANAB-accredited Quality Management System
- UL registered and ISO 9001: 2008 certified



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ISO 9001



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CASE STUDIES

GHS Compliance Testing for Consumer Products and Precursors



A large consumer products manufacturer was in the process of transitioning their product labeling to meet the new Globally Harmonized System (GHS) format. They needed accurate data on the physical properties of several of their finished products and precursors to support development of new Safety Data Sheets (SDS) conforming to GHS standards. Battelle provided a diverse range of services including tests for flammability, self-accelerating decomposition temperature, oxidizing properties and self-heating. To meet their requirements, Battelle needed to accommodate large sample batch sizes and conduct tests in accordance with a variety of test standards, including those of the American

Society for Testing and Materials (ASTM), United Nations (UN), Office of Economic Co-operation and Development (OECD), and Classification, Labeling and Packaging (CLP) regulations. We completed all of their required testing under Battelle's Quality Management System (QMS), which is ISO 9001:2008 certified.

Lithium Ion Battery Risk Testing



An advanced materials organization needed to evaluate the extent to which a new protective layer mitigated the propensity of batteries to burst into flames when abused. Battelle developed and completed a series of specialized tests to evaluate battery response to various threats including nail puncture, overheating and overcharging. The reference baseline for the test was failure: battery rupture and fire. To conduct the tests, Battelle subject matter experts on Li-ion battery failure effects modes designed innovative procedures to safely capture, characterize and correlate the causes and consequences under each of the representative risk scenarios.

Explosion-Proof Testing for Use in Hazardous Locations



A U.S./Global Fortune 500 company needed to assess the adaptability of a compressor originally designed for non-hazardous (inflammable) gases for use with Class I, Division 2, Group C flammable gases. Battelle conducted UL 1203 explosion-proof compliance test procedures (modified after UL scrutiny and approval to adapt to this unique product) to evaluate the performance of the compressor with the flammable gases. High-pressure full-product tests, witnessed live but remotely by staff from both UL and the client, were conducted under ISO/IEC 17025 compliance in a high-energy containment chamber specially designed to accommodate a potential catastrophic failure. Resulting digital

data and video demonstrated that the compressor design and operation inherently contained internal overpressures from artificially induced ignition and prevented the passage of flame, thereby demonstrating UL 1203 compliance.

To solve your most pressing challenges, **Think Battelle first.**

WHAT CAN WE SOLVE FOR YOU TODAY?

Contact us to discuss your safety testing needs. 800.201.2011 | solutions@battelle.org | www.battelle.org

Every day, the people of Battelle apply science and technology to solving what matters most. At major technology centers and national laboratories around the world, Battelle conducts research and development, designs and manufactures products, and delivers critical services for government and commercial customers. Headquartered in Columbus, Ohio since its founding in 1929, Battelle serves the national security, health and life sciences, and energy and environmental industries. For more information, visit www.battelle.org.

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It can be done