

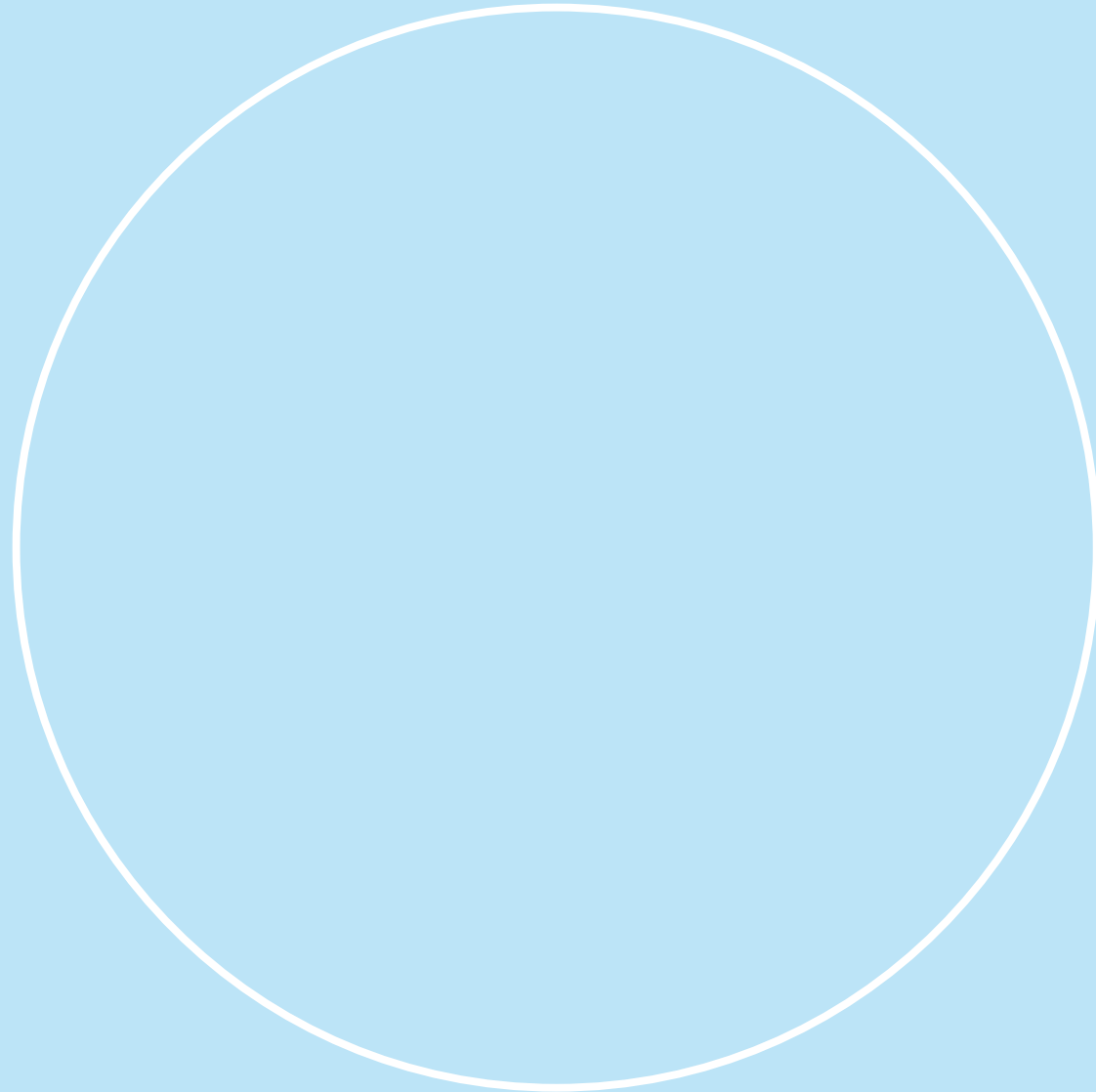
BROCHURE

Building Technologies and Construction



Safety. Science. Transformation.™

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Advancing **safety, performance, security** and **sustainability** in buildings, construction and connected technologies

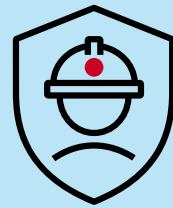
Regulatory authorities, occupants and environmental conditions demand more from today's buildings, from protection against fire and extreme weather to enhanced indoor air quality to reduced resource consumption and waste.

UL Solutions' testing, inspection, certification, verification and validation services can help you demonstrate that your building products and systems meet requirements and live up to expectations. As you transform buildings into high-performing, connected and autonomous ecosystems, our software and advisory offerings connect you with data-driven insights to illuminate what's possible and guidance to show you how to get there.

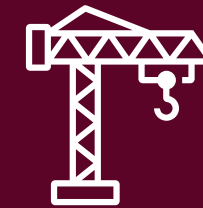
Safer building products and systems



Building infrastructure safety and performance



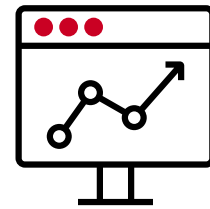
More sustainable building materials and construction



Healthy and sustainable buildings



Effective utility management and optimization



Smart and secure building technologies



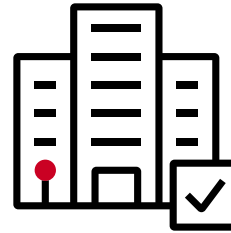
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Introduction

Environmental, economic and societal factors are now driving several industry changes:

- Innovative materials and techniques, increased deployment of smart and autonomous technologies, and changing use of spaces impact requirements and potential risks regarding safety, fire and security.
- To meet occupant demands and increase return on investment, building operations and the indoor environment are being optimized to improve occupant health, well-being, productivity and comfort.
- A greater incidence of severe weather events is putting building structures under increased stress.
- Regulators are demanding that action is taken to reduce energy consumption and advance sustainability in the built environment.



UL Solutions can help you navigate these changes. Drawing on our long-standing partnership with the buildings and construction industry and deep expertise in state and local building codes, standards, regulations and requirements, we offer a comprehensive portfolio of services and software designed to help the building technologies, construction and real estate communities to:

- Understand and comply with complex and changing requirements defined in codes, standards, regulations and specifications for the safety, quality, performance, fire reaction, energy efficiency and sustainability of building materials, products and systems
- Keep pace with occupants' increased focus on sustainability
- Prove the accuracy of building product marketing claims, including environmental marketing claims
- Identify and select compliant building inputs and products to mitigate risks, costs and brand damage
- Confidently embrace the integration of connected and autonomous technologies that help buildings meet today's market demands and decrease operational costs and staffing needs
- Establish that smart building technologies meet interoperability, electromagnetic compatibility (EMC) and Matter requirements
- Protect against cybersecurity threats associated with smart building technologies
- Advance safer, more sustainable, more connected and more secure building technologies
- Build public trust in the safety of buildings and the certification process

Core challenges

Demonstrating compliance with complex safety requirements



How UL Solutions can help

- HVAC/R testing
- Lighting safety testing
- Testing and certification services for emergency lighting systems and exit systems
- Testing and certification for commercial appliances
- Building wire safety and performance testing
- CPR compliance evaluation services for cables
- Energy storage system (ESS) testing and certification
- Building inspection services, including for modular buildings
- Building envelope services and window and door/fenestration product testing
- Fire resistance testing and certification for products, systems and designs
- Fire barrier management
- Fire suppression product/equipment testing and certification
- Connected device and lighting testing and certification
- Fire alarm control testing
- Gas and smoke detector testing
- Audible/visual signaling devices

Demonstrating that products and systems meet stakeholder demands and industry specifications for safety, performance, transparency, energy efficiency and quality



How UL Solutions can help

- Testing and certification for commercial appliances
- Building wire safety and performance testing
- ESS testing and certification
- Building envelope services and window and door/fenestration product testing
- Fire resistance testing and certification for products, systems and designs
- Fire barrier management
- Smart Systems Rating Program (SSRP)

Innovating building systems and assemblies to protect against extreme weather conditions and fire



How UL Solutions can help

- Building inspection services, including for modular buildings
- Building envelope services and window and door/fenestration product testing
- Fire resistance testing and certification for products, systems and designs
- Fire barrier management
- Fire suppression product/equipment testing and certification

Keeping up with evolving codes, standards, requirements, processes and competencies for building safety, quality and fire performance for new construction methods and materials



How UL Solutions can help

- Expertise, support and resources for code authorities
- ULTRUS™ PureSafety® construction safety courses

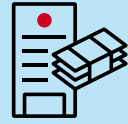
Understanding a product's environmental impact, identifying more sustainable products, components and building materials, and combatting greenwashing



How UL Solutions can help

- Environmental Product Declaration (EPD) certification
- UL GREENGUARD Certification
- ECOLOGO® Certification
- Product category rules (PCRs)
- UL SPOT Product Database
- UL Product iQ®

Maximizing building value



How UL Solutions can help

- SPIRE™ Smart Building Assessment and Rating Programs
- Green building services and certifications
- UL Verified Healthy Building Mark

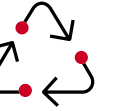
Enhancing occupants' health, comfort and productivity



How UL Solutions can help

- UL GREENGUARD Certification
- ECOLOGO® Certification
- UL SPOT Product Database
- UL Verified Healthy Building Mark
- Testing and certification services for controls
- Connected lighting
- SPIRE™ Smart Building Assessment and Rating Programs

Reducing waste and pollutants



How UL Solutions can help

- Zero Waste to Landfill (ZWTL) Validation
- UL GREENGUARD Certification

Understanding and improving building performance and reducing greenhouse gas emissions, resource consumption and operational costs



How UL Solutions can help

- ENERGY STAR® Smart Home Energy Management Systems (SHEMS) testing and certification
- SPIRE™ Smart Building Assessment and Rating Programs
- Energy services
 - American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Levels 1, 2 and 3 and Net-Zero energy audits
 - Retro and recommissioning (RCx) services
 - Ventilation assessments
 - Energy and water consumption benchmarking
 - Commissioning (Cx) services
 - Monitor-based commissioning (MBCx)
 - Energy modeling services
 - Indoor environmental quality (IEQ) services

Protecting buildings, sensitive data and occupants against cybersecurity threats



How UL Solutions can help

- Smart building cybersecurity
- Cybersecurity for Physical Security Systems (UL 2900-2-3)
 - Advisory services
 - Training
 - Testing
 - Gap analysis
 - Certification
- Smart Systems Rating Program (SSRP)

Building and adapting smart building technologies that work with one another as expected and to established standards



How UL Solutions can help

- Connected device interoperability testing
- Connected device testing and certification
- Connected lighting
- Fire alarm control testing
- Smart Systems Rating Program (SSRP)

Safer building products and systems

THE CHALLENGE

Identifying compliant building products and systems

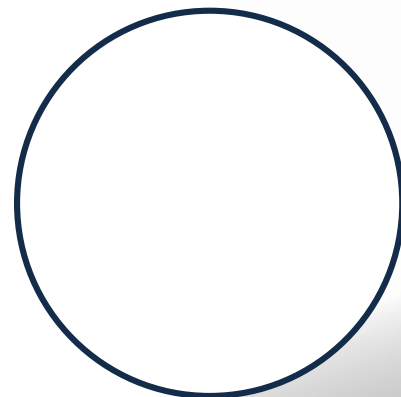
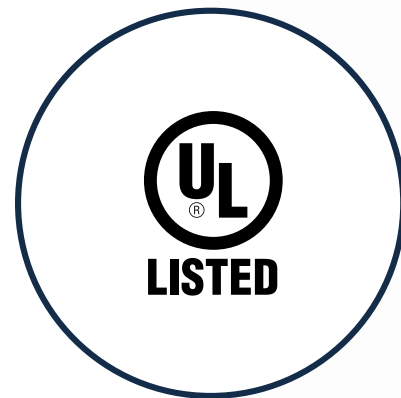
Manufacturers, architects, engineers and specifiers need to establish that the building products, systems and appliances comply with applicable safety requirements and industry specifications for performance, energy efficiency and quality.

THE OPPORTUNITY

Partner with a trusted and experienced service provider

UL Solutions offers testing and certification services to help you demonstrate the compliance of integrated building products and systems across HVAC/R and commercial appliances, wire and cable, lighting, energy storage, and more.

Certified products earn the UL Mark, a widely recognized symbol of trust that demonstrates the product meets applicable requirements.



What we offer



Approximately 40% of a building's total energy consumption is accounted for by HVAC/R systems.

[Source](#)

HVAC/R safety, performance and energy-efficiency testing

Streamline testing with a dedicated provider and one central point of contact.

We offer Air-Conditioning, Heating and Refrigeration Institute (AHRI), ENERGY STAR®, and International Electrotechnical Commission (IEC) performance testing, as well as expanded energy efficiency compliance services for U.S. Department of Energy (DOE), California Energy Commission (CEC), National Resources Canada (NRCan), AHRI, State of Kuwait, Ministry of Electricity and Water (MEW) and other global regulatory requirements.

We also offer customized assessment services, which can include:

- Testing in accordance with a variety of HVAC/R industry standards and programs
- Full-service research and development for product prototype testing
- Performance validation for pre-compliance testing or benchmarking
- Bundled compliance services conducted at the same location where energy efficiency testing is performed
- Product safety testing and international certifications

[LEARN MORE](#)

Lighting safety testing

Get ahead of potential safety issues, avoid late-stage production problems that lead to recalls and returns, and navigate complex requirements. We'll guide you through the certification process to help you bring innovative lighting products to market more efficiently.

- UL Solutions is a leading lighting certifier in the U.S. and an issuer of IECEE CB Certificates worldwide.
- The UL Mark enjoys global recognition and wide code authority acceptance, helps lighting designers and end customers identify high-quality products, and provides an important differentiator in a crowded market.
- In Europe, we certify to EN standards and use the ENCE 15 Mark, where we are the certifying body.

[LEARN MORE](#)

Emergency lighting systems and exit systems

Evaluate emergency lighting equipment for risk of injury due to fire and electric shock and verify that it will work as intended when the need arises. We offer certification services to:

- UL 924, the Standard for Emergency Lighting and Power Equipment
- UL 924A, the Outline of Investigation (OOI) for Emergency Signs with Alternative Visual Designs
- UL 1994, the Standard for Luminous Path Marking Materials
- Other international standards

Our certification services address the need for equipment to be installed in Canada with training and documentation to close the gaps between UL 924 and CSA C22.2 No. 141. Our services facilitate seamless U.S. and Canadian certification for photoluminescent exit signs and path markers. CAN/ULC-S572 is fully aligned with UL 924 and UL 1994.

LEARN MORE

Testing and certification for commercial appliances

We test and certify commercial appliances to international, national and regional standards for safety, energy efficiency and performance. We offer gas-fired/electrical safety testing, food equipment sanitation, international certification, EMC assessment and energy certifications.

Our comprehensive portfolio of services removes the need to repeatedly submit a product to earn multiple certifications for global market access. Through our Data Acceptance Program, our customers can further reduce assessment time by conducting testing in their own approved or third-party facilities.

The UL Verified Mark program provides independent, reputable verification of marketing claims relevant to commercial appliances and can help differentiate products in the market. The UL Verified Mark can be placed on product, packaging, digital and print marketing, and [verify.UL.com](https://verify.ul.com).

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Building wire safety and performance testing

Demonstrate the compliance of wire and cabling products with nationally recognized safety standards and industry specifications for performance and quality. Our system helps improve compliance and mitigate risk across the entire supply chain. Look for the widely recognized UL Mark to identify and source compliant products.

UL Solutions Follow-Up Services help manufacturers gain a competitive edge based on quality, reputation and service — and make it more difficult for manufacturers producing noncompliant or inferior products to survive.

LEARN MORE

CPR compliance evaluation services for cables

Streamline your cable products' path to the EU and U.K. markets with Construction Products Regulation (CPR) compliance testing, quality assessments and certification services that enable CE, UKCA and UKNI marking. CPR provides unified requirements for reaction-to-fire performance for power, control, communications and optical fiber cables intended for installation in all types of construction works in the EU and the U.K.

[LEARN MORE](#)



On average, one-third of the energy used in commercial buildings is wasted.

[Source](#)

Energy storage system (ESS) testing and certification

We offer testing and certification to UL 9540, the Standard for Energy Storage Systems and Equipment, which includes electrical, electrochemical, mechanical and other types of energy storage technologies for systems intended to supply electrical energy. We also offer ESS performance and reliability testing to the following standards:

- IEC 60086-1 and IEC 60086-2: Primary Batteries – Part 1: General; and Primary Batteries – Part 2: Physical and Electrical Specifications
- IEC 61960: Secondary Cells and Batteries Containing Alkaline or Other Non-acid Electrolytes – Secondary Lithium Cells and Batteries for Portable Applications
- IEC 61951-1: Secondary Cells and Batteries Containing Alkaline or Other Non-acid Electrolytes – Portable Sealed Rechargeable Single Cells – Part 1: Nickel-Cadmium
- IEC 61951-2: Secondary Cells and Batteries Containing Alkaline or Other Non-acid Electrolytes – Portable Sealed Rechargeable Single Cells – Part 2: Nickel-Metal Hydride
- IEC 62933-5-2: Electrical energy storage (EES) systems – Part 5-2: Safety Requirements for Grid-Integrated EES Systems – Electrochemical-Based Systems

Additionally, we offer testing and certification to safety and EMC requirements applicable to different products and markets, including CE, UKCA and UKNI marking as well as self-declaration. UL Solutions can also conduct custom research to help customers identify and address unique performance and safety issues associated with ESS.

[LEARN MORE](#)

THE CHALLENGE

Rebuilding trust in the safety of buildings while meeting evolving compliance requirements

Building structures today experience significant pressure from both environmental conditions and public scrutiny. Increasingly erratic weather patterns demand more from building envelope products, systems and structures, and tragedies such as the Grenfell Tower fire of 2017 highlight the need for greater accountability in the process to evaluate building safety, quality and fire performance.

Alternative construction techniques and building materials are increasingly employed, and codes, standards and requirements are evolving to address imperatives for safety, quality, performance and transparency.

THE OPPORTUNITY

Confidently navigate this shifting landscape

UL Solutions offers testing, inspection, certification and training services to help manufacturers, architects, engineers, specifiers and code authorities keep up with evolving compliance requirements for building infrastructure.



It took only about 20 minutes for the Grenfell Tower to escalate from its point of origin on the fourth floor to the top of the 24-story building.

[Source](#)

What we offer

Building inspection services

As an independent, impartial provider with a deep heritage of expertise in building and fire safety, we conduct fire, life safety, and security plan reviews and inspections to applicable building codes. We help identify compliance gaps so that you can make any necessary improvements to your fire, life safety and security systems. Our building inspection services support the entire industry, including:

- **Planners/designers** – Concept review, document review, risk assessment and level of protection
- **Installers/integrators** – Compliant specifications for installation and construction compliance
- **Consultants** – Verification of code-compliant options
- **Management companies** – Assessment of data quality, verification of up-to-date safety policies and mapping policies to standardization maintenance
- **Building owners** – Validation of commissioning, maintenance, service and self-assessment data quality and assistance in identifying gaps and future cost investments

LEARN MORE

Modular building inspection services

Prove to architects, building manufacturers, building owners and code officials that modular buildings meet or exceed code requirements. UL Solutions witnesses the construction of the modular unit before shipping, observing various building systems in operation to assess whether buildings and fire, life safety, mechanical, plumbing and electrical systems meet applicable code requirements. Our inspection process results in an objective report of compliance gaps to empower informed decisions. Relevant codes and standards are based on international and local regulations, such as:

- ICC building, fire, mechanical and plumbing codes
- National Electrical Code® (NEC®)
- NFPA 5000®, Building Construction and Safety Code®
- NFPA 1, Fire Code
- NFPA 101®, Life Safety Code®
- NFPA 855, Standard for the Installation of Stationary Energy Storage Systems
- UL 3223, Outline of Investigation for Data Center Certification

LEARN MORE

Building envelope services

UL Solutions experts can help you select the optimal envelope system characteristics, test building envelope product and system performance, and navigate complex regulatory requirements. We offer a broad range of building performance testing, certification and advisory services. Our laboratories can simulate wind-driven rains, hurricane and tornado winds, as well as extreme hot and cold temperatures, to assess and verify the performance of building envelope products and systems before, during and after construction.

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In November 2024, 514 U.K. high-rise residential and publicly owned buildings 18 meters in height and taller were identified as having aluminum composite material (ACM) cladding systems that were unlikely to meet building regulations.

[Source](#)

Building envelope window and door/fenestration product testing

Validate the performance and compliance of fenestration products prior to final installation on site using lab-based testing and modeling. We offer testing for compliance with industry-recognized standards, including those for weather tightness, air tightness, thermal properties, structural and mechanical performance, security impact, operation, strength and durability.

We evaluate safety, performance and security to applicable standards, regulations and industry benchmarks, including:

- Secured by Design
- U.K. Building Regulation Approved Document Q
- American Architectural Manufacturers Association (AAMA, now FGIA)
- Window and Door Manufacturers Association (WDMA)
- Keystone
- National Accreditation & Management Institute, Inc. (NAMI)
- Canadian Standards Association (CSA)
- Miami-Dade, Florida, Validation Services
- Texas Department of Insurance (TDI)
- National Fenestration Rating Council (NFRC)
- UL Solutions Windstorm Certification Program

We offer laboratory testing for fenestration windows and doors (for Europe and North America); hardware; hurricane, impact and cycling; manufactured housing; security; and thermal — as well as physical endurance testing for doors and frames.

LEARN MORE

Fire resistance testing and certification for products, systems and designs

We offer third-party testing and certification services to support manufacturers, specifiers, designers, asset owners and code authorities in demonstrating the compliance of building and construction materials, systems and assemblies with fire and smoke safety and environmental sustainability requirements.

Our services also help prove the safety, performance, reliability and security of fire-resistant rated designs used to achieve code-compliant installations where building codes require hourly rated designs. We test assemblies to international standards, establishing an hourly rating to provide evidence of compliance with code requirements. Suitable fire-resistance-rated constructions are also listed in [UL Product iQ®](#).

LEARN MORE

Fire barrier management

We offer inspections of firestopping systems, fire doors and fire dampers, leveraging our extensive understanding of these life safety systems throughout the entire construction process. Contractors can demonstrate compliance and quality through the UL Solutions Qualified Firestop Contractor Program (QFCP) and our Master Audit Certificate of Compliance (MACC) Program.

LEARN MORE

Fire suppression product/equipment testing and certification

We support manufacturers, regulatory authorities, building owners and insurance companies with certification and customized testing services for a variety of suppression equipment, including products for residential and commercial sprinkler systems. We test and certify sprinklers and nozzles to the requirements of ANSI/UL 199, the Standard for Safety of Automatic Sprinklers for Fire-Protection Service, and EN 12259-1, Requirements and Test Methods for Sprinklers.

LEARN MORE

Expertise, support and resources for code authorities

The Code Authority® community has been designed to support code authorities as they advance a safer future for the built environment. Its comprehensive Knowledge Hub contains resources covering topics ranging from fire safety to building regulations and electrical standards. Our calendar of events shows where our regulatory and code experts will be presenting or attending.

LEARN MORE

ULTRUS™ PureSafety® construction safety courses

ULTRUS™ PureSafety® construction safety courses, leverage the industry-leading LearnShare™ learning management system (LMS) to empower professionals to manage health, safety and risks more efficiently and effectively. Built by safety experts and adult learning specialists, PureSafety® construction content encompasses more than 50 courses covering topics ranging from asbestos hazards to crane operator safety to heat stress.

LEARN MORE



More sustainable building materials and construction

THE CHALLENGE

Identifying more sustainable building products

Greenwashing abounds, with some manufacturers of building materials capitalizing on vague terms and making unsupported (and often unsupportable) label claims regarding factors such as chemical content, product stewardship, off-gassing, carbon footprint/greenhouse gas (GHG) emissions and more.

THE OPPORTUNITY

Prove your commitment through third-party services

UL Solutions offers testing, certification and verification to manufacturers seeking to provide trustworthy and transparent product information and to empower buyers genuinely seeking more environmentally friendly building materials to find them.

Additionally, we bring stakeholders together to develop product category rules, support life cycle assessments and verify environmental product declarations for green building materials. These independent services are meaningful to the community of building and construction manufacturers, regulators, buyers/suppliers, specifiers, architects, green building program owners and more.



The built environment has been identified as the leading consumer of energy and contributor to carbon emissions, currently responsible for one-third of the world's energy consumption and 40% of annual carbon emissions.

[Source 1](#), [Source 2](#)

What we offer

Environmental Product Declaration (EPD) certification

An EPD is a summary of the life cycle assessment (LCA) for a product, from material extraction to production, shipping, consumption and disposal. The LCA is developed according to product category rules (PCRs), product-specific calculation requirements and methodologies that support consistent data collection and analysis during LCA creation. EPDs transparently summarize an LCA of a product in a single, comprehensive report, which we verify against ISO 14025. UL Solutions is a leading ISO 14025 program operator for independent, third-party verification of EPDs.

LEARN MORE

Product carbon footprint verification

Leverage our trusted brand and tools that support materially correct calculations to help reduce the risk of carbon calculation data error, demonstrate transparency regarding the climate impact of your products, and build the confidence of interested parties that your product GHG statement meets international standards. Select from multiple product carbon footprint verification options to suit different goals or requirements.

LEARN MORE



Product Category Rule (PCR)

tells you how to do a



Life-Cycle Assessment (LCA)

which gets summarized in a



Environmental Product Declaration (EPD)

1

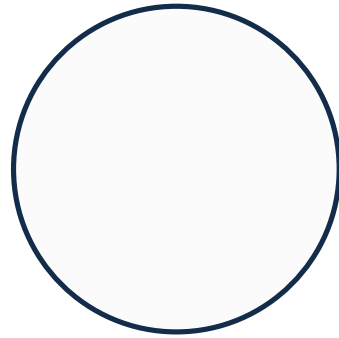
UL Solutions can create PCRs when one doesn't exist.

2

The LCA can be done by the manufacturer or independent LCA practitioner.

3

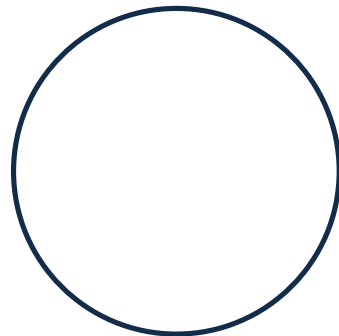
During the verification process UL Solutions verifies both the LCA and EPD met international standards.



UL GREENGUARD Certification

Over 450 government purchasers and retailers around the world recognize, refer to and look for UL GREENGUARD Certified products, which are scientifically proven to meet rigorous third-party chemical emissions standards and screened for more than 15,000 volatile organic compounds (VOCs). There are more than 90,000 UL GREENGUARD Certified products that span 32 product families.

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ECOLOGO® Certification

These multi-attribute, life cycle-based environmental certifications indicate a product has undergone scientific testing and exhaustive auditing to demonstrate compliance with third-party environmental standards for a range of criteria, including materials, energy, manufacturing and operations, health and environment, product performance and use, and product stewardship and innovation.

[LEARN MORE](#)

Product category rules (PCRs)

UL Solutions can certify EPDs using existing PCRs created by any program operator. When no PCR exists for a product group or geography, we can work with stakeholders to establish one or address regional requirements for existing PCRs created for another market.

[LEARN MORE](#)

UL SPOT Product Database

Our comprehensive, credible and collaborative product search database helps architects, manufacturers, retailers and purchasers find information about more than 130,000 products' sustainability attributes, certifications and more.

[LEARN MORE](#)

Healthy and sustainable buildings

THE CHALLENGE

Making and demonstrating progress toward sustainability goals

Building and construction professionals need trustworthy information to create actionable plans that advance the healthy and sustainable qualities of their buildings. While occupants benefit from improved environmental conditions, enhancing these attributes can also help conserve energy and water, reduce GHG emissions and provide a marketable distinction from other buildings.

It's not enough to claim that a building offers the kind of environment an occupant seeks. Today's discerning occupants want data-driven proof that a building's interior, exterior and systems meet health, wellness and performance expectations.

THE OPPORTUNITY

Take a science-driven approach to assessing sustainability and health metrics

UL Solutions has developed its own rigorous assessment programs, and we provide a wide array of expert-led testing services that explore the sustainability, health and wellness aspects of indoor spaces.

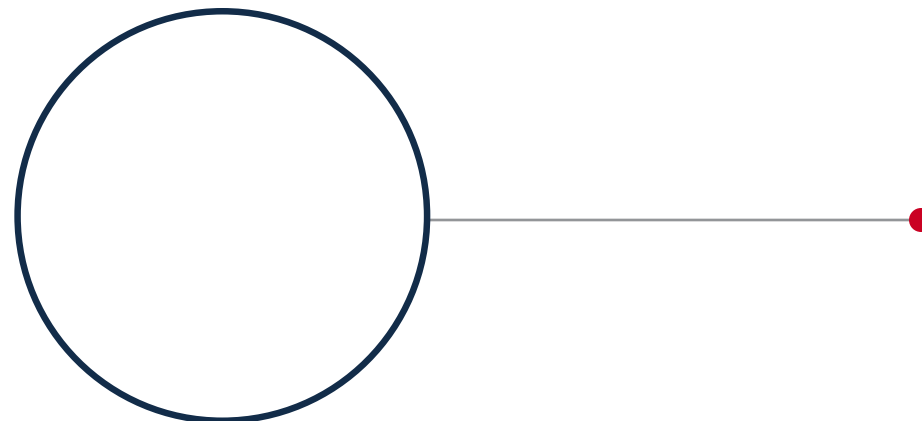
For building owners or managers in pursuit of third-party green building certifications such as LEED, BREEAM, WELL or Fitwel, UL Solutions offers end-to-end guidance and close customer collaboration to create a holistic, cost-effective path that furthers greater sustainability success.

What we offer

Green building services and certifications

The pursuit of third-party sustainability certifications can help increase the value of a building, conserve resources, reduce operational costs and create a meaningful distinction in the marketplace. UL Solutions offers comprehensive support to building owners and management companies in their pursuit of building sustainability certifications — including LEED, BREEAM, WELL and Fitwel — closely collaborating with building owners' and managers' internal teams from project inception through certification submission. We take an integrated approach that focuses on cost-effectiveness, reliability and the triple bottom line: people, planet and profit.

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UL Verified Healthy Building Mark

Showcase your dedication to creating a healthy environment that helps boost employee, tenant and occupant performance while increasing your building's value, reducing risk and providing returns for investors.

The UL Verified Healthy Building program offers the real estate industry an independent source of reassurance from a respected safety science leader with 40 years of experience in indoor environment inspections. Our quantitative review process is driven by building metrics discerned through performance testing, comprehensive on-site visual inspections, and verification of policy implementation. UL Verified Healthy Building program is a manual testing program taking measurements of air, water, noise and other factors across a building, whereas our SPIRE™ program (discussed in the Smart and Secure Building Technologies section) looks to understand what technology has been put into place to automatically monitor and control these metrics.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) recognized the UL Verified Healthy Building Mark as one of 17 rating systems with the most relevance to their review criteria.

[LEARN MORE](#)



In a recent survey, MIT's Real Estate Innovation Lab found that certified and registered "healthy buildings" command rents of 4%-7.7% more per square foot than buildings without this distinction.

[Source](#)

Indoor environmental quality (IEQ) services for healthy buildings

Take a comprehensive, science-driven approach to evaluating and improving the sustainability, health and wellness aspects of indoor spaces.

UL Solutions IEQ testing services help building owners and managers:

- Provide confidence to tenants and occupants regarding the health of their indoor environment via our science-driven proactive IEQ monitoring program
- Identify and resolve indoor environmental disruptions through reactive inspection services that provide corrective action recommendations and review corrective actions already taken
- Save your organization time and money with a Healthy Building due diligence assessment that helps uncover any mold or moisture issues in a property under consideration
- Protect properties from potential liabilities related to mold, moisture and IEQ problems through our mold and moisture quality survey program
- Develop Legionella risk and water management plans to obtain compliance with ASHRAE Standard 188 and the Centers for Medicare and Medicaid Services (CMS) accreditation
- Demonstrate building performance for WELL, Fitwel and LEED certifications with on-site testing

LEARN MORE

Effective utility management and optimization

THE CHALLENGE

Understanding and reducing resource consumption

Optimizing the use of utilities can lead to many positive outcomes, including:

- Cutting operating costs
- Compliance with energy-related regulations
- Increasing market value and attracting tenants and occupants
- Reducing waste, pollutants and negative health impacts
- Creating a comfortable indoor environment with consistent temperature and lighting
- Increasing resiliency
- Adopting electrification in anticipation of the grid becoming more sustainable

But to unlock these benefits, building managers need to understand their building's resource consumption and identify opportunities to reduce it.

THE OPPORTUNITY

Access actionable insights on resource and waste management

Gain holistic, actionable insights on resource efficiency, performance and environmental impact. UL Solutions offers a comprehensive portfolio of services — including audits, commissioning, assessments, benchmarks, validation and certification — to help you understand and improve your facilities' resource consumption and waste management.

What we offer

Energy services for buildings

Take a closer look at key health-related aspects of existing buildings, new construction and major renovations. Our energy services for healthy buildings can help you identify areas for optimization in accordance with an array of sustainability goals:

- American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Level 1, Level 2 and Level 3 and Net-Zero energy audits identify conservation opportunities and create a road map for implementation.
- Retro and re-commissioning (RCx) services start by assessing building systems and performance to determine the potential to reduce resource consumption.
- Certified commissioning agents (Cx) can optimize controls, calibrate critical sensors and functional testing equipment to help reduce utility costs, improve operating performance and boost IEQ.
- Ventilation assessments determine if a building meets ASHRAE Standard 62.1 minimum standards.
- Energy and water consumption benchmarking compares a building's usage against similar buildings so owners and operators can better understand building performance and identify opportunities for conservation.
- Commissioning (Cx) services support your efforts to design, build and operate new buildings or major remodels in alignment with increasingly stringent performance targets and the owner's project requirements.
- Monitor-based commissioning (MBCx) uses continuous, real-time monitoring during design and construction to assess the performance of newly installed energy- and water-consuming systems within the project or building.
- Energy modeling services empower strategic decision-making to help maximize system efficiency, meet green building certification requirements, comply with codes, benefit from utility and financial incentives, and advance tactical building construction decisions.

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Zero Waste to Landfill (ZWTL) Validation

Vague definitions, self-declared claims and undefined procedures can make it difficult to credibly qualify and quantify your facility's efforts toward achieving zero waste. UL Solutions can help you establish and promote your waste reduction claims. Our Zero Waste to Landfill (ZWTL) and Landfill Waste Diversion claim validations recognize your efforts to manage waste in environmentally responsible and innovative ways. Each validation is clearly defined, carefully reviewed and thoroughly vetted so that businesses and their customers understand the environmental significance of your achievements.

UL 2799, the Standard for Environmental Claim Validation Procedure (ECVP) for Zero Waste to Landfill, requires each facility of an organization to prove at least 90% diversion through methods other than waste to energy to achieve a Silver (90%-94%), Gold (95%-99%) or Platinum (100%) Zero Waste to Landfill (ZWTL) designation. Facilities that achieve an 80%-89% diversion rate can still qualify for a certified landfill diversion claim.

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ENERGY STAR® Smart Home Energy Management Systems (SHEMS) testing and certification

With an increased focus on energy efficiency and growing adoption of smart technologies to help simplify, reduce and manage energy consumption, UL Solutions can help you evaluate your smart appliances and other products against specifications and certification requirements of official smart energy programs, including the ENERGY STAR® Smart Home Energy Management Systems (SHEMS) program recognized by the U.S. Environmental Protection Agency (EPA).

As the exclusive partner of the U.S. Environmental Protection Agency (EPA) for the ENERGY STAR® Smart Home Energy Management Systems (SHEMS) program, UL Solutions offers testing, validation and certification services covering:

- Energy efficiency
- Product safety
- EMC, wireless and cybersecurity
- Interoperability
- Functional safety

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Compared to typical buildings nationwide, ENERGY STAR® certified buildings use an average of 35% less energy.

[Source](#)

Smart and secure
building technologies

Navigating vulnerabilities and issues that smart and autonomous building technologies may introduce

In both commercial and residential settings, smart technologies have the potential to revolutionize building design, use and costs. Smart lighting products, HVAC/R systems, fire and security alarm systems, and a multitude of connected devices and appliances can improve occupant safety, security, comfort and user experience while reducing energy consumption and optimizing building operations. According to a 2023 Siemens report, 80% of commercial floor area around the world exists in low-efficiency buildings, not equipped with smart technologies. According to the same report, the introduction of artificial intelligence (AI) and machine learning (ML) in automated controls and robotics for predictive management and maintenance has the potential to enhance smart building technology power and performance, leading to 30%-40% savings.

But smart and autonomous building technologies designed to help building managers and operators advance health, safety, security, efficiency and performance goals can also introduce interoperability and EMC issues, cybersecurity vulnerabilities, and data privacy concerns. Industry professionals face challenges in establishing that smart building technologies work with one another as intended and to applicable standards, and in reducing the risks to physical security and cybersecurity associated with these technologies.

1) Siemens, Digital and sustainable transformation of buildings: increasing efficiency, preserving value, 2023.

Improve building performance, comfort and sustainability while enhancing safety, security and interoperability

Having access to comprehensive data and expert guidance can help you understand and improve your buildings' operational performance, occupant comfort and sustainability metrics. And engaging with a trusted third-party provider for training, data analytics software, and connected device testing and certification to interoperability, wireless, EMC, cybersecurity and other requirements can help you build trust in the cyber and physical security of the smart technologies integrated in your buildings.

UL Solutions offers a wide range of safety, security and interoperability testing and certification services for the products that support safer, more secure, smart building ecosystems, including smart building control systems, ventilation, appliances, water, lighting, physical access management, fire safety and more.

What we offer

Smart building cybersecurity

Our smart building cybersecurity services can help product and system manufacturers, system integrators and building owners enable security across the smart building ecosystem.

We can help you define where you are in your cybersecurity maturity, improve internal cybersecurity capabilities and processes, validate security built into products throughout the life cycle and differentiate your organization's products based on how secure they are in comparison to others in the marketplace.

Our cybersecurity offerings for smart buildings include:

- ISA/IEC 62443 services: comprehensive cybersecurity for industrial control systems
- Supplier cyber trust level
- Cybersecurity Assurance Program (CAP)
- Common Criteria certification for information technology (IT) security
- FIPS 140-2- and FIPS 140-3 testing and evaluation services

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Cybersecurity for physical security systems (UL 2900-2-3)

The cybersecurity of life safety and physical security systems must be evaluated to help validate performance and reliability, prevent damage to assets, mitigate risk, improve security, protect health and safety and establish that these systems will work as intended in an emergency. We offer:

- Cybersecurity advisory services
- Training
- Penetration testing
- Gap analysis
- Certification to UL 2900-2-3, the Standard for Software Cybersecurity for Network-Connectable Products: Particular Requirements for Security and Life Safety Signaling Systems

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Connected device interoperability testing

Our testing services include:

- Wi-Fi interoperability
- Reliability performance
- Video and log capturing capabilities
- User experience
- Feature performance

UL Solutions is an approved testing laboratory for many IoT, wireless and wired connectivity standards bodies, such as Bluetooth SIG, Thread Group, Connectivity Standards Alliance (CSA), Zigbee Alliance, USB-IF, VESA, HDMI Forum, Intel, HDBaseT Alliance and Ethernet Alliance, and we are actively engaged with key players in 5G. For these standard protocols, we can test the control systems as well as the connected devices and their accessories.

We adapt our testing services to encompass the range of ever-changing wireless and wired devices and accessories. We test interoperability in a range of product categories, including building systems, consumer electronics and appliances.

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Connected device testing and certification

To enable a truly smart building, occupants must be able to trust that connected devices will work as promised.

Our services for connected devices — which include cybersecurity, EMC, wireless functionality and interoperability testing — can help you meet that goal: deliver and adopt smart appliances and devices that connect to a network right out of the box and perform to specifications on promoted features, so you can boost your brand reputation and end users' trust.

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Testing and certification services for controls

Independent testing and certification services from UL Solutions demonstrate that building automation controls meet interoperability standards and support the safe operation of appliances with embedded control hardware and software. We provide deep technical expertise and global support across our portfolio of automation controls testing and certification services for components, end products, systems and ecosystems. Our offerings include:

- Electrical safety testing to UL/CSA/IEC 60730, the Standard for Automatic Electrical Controls, IEC 60335 and other standards
- Testing and certification according to UL 916, the Standard for Energy Management Equipment
- Services for sensors and other ecosystems
- Certification of cloud-connected controls
- Edge computing characteristics marketing claim verification for AI targeted edge devices
- Design partnership service
- Performance and reliability testing
- Functional safety assessment, testing and certification
- UL Marketing Claim Verification
- Over-the-air (OTA) software updates testing to RP 1499, UL/IEC/CSA 60730 and IEC 60335

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Connected lighting

As lighting systems and IoT smart lighting take the industry beyond functional illumination into lighting as a service (LaaS) to encompass multiple data and connection categories, the challenges of going to market are becoming increasingly complex.

UL Solutions has committed to focusing on connected lighting as the technologies converge and will meet the new demands emerging around Li-Fi, smart homes and buildings and the growing emphasis on lighting as a component of a connected ecosystem.

Our services include, but are not limited to:

- Cybersecurity
- Interoperability
- Testing to protocols such as DALI-2 Certification
- EMC and wireless testing such as Bluetooth®, Zigbee and Thread

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Fire detection and security, fire alarm control panels, fire and security alarms

Fire detection and security

Our training, advisory, testing, verification, inspection and certification services for fire alarm control equipment help manufacturers get compliant products to the market quickly. Integrators and engineers help manufacturers mitigate their risks and serve their customers, end users and asset owners by helping to ensure that they are providing the appropriate standards of care and safety. Our testing verifies that regulatory authorities have validated compliance with codes.

Fire alarm control testing

We can evaluate fire alarm control technologies for interoperability, performance and reliability.

Gas and smoke detector testing

Our services can help demonstrate regulatory compliance necessary for bringing fire, smoke and gas devices to market.

Audible/visual signaling devices

We offer comprehensive training, advisory, testing, inspection and certification services for visual and audible signaling technologies.

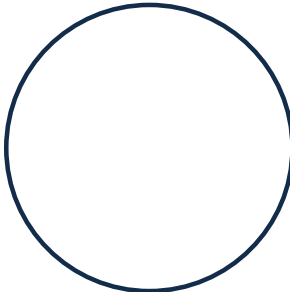
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SPIRE™ Smart Building Assessment and Rating Programs

This holistic framework provides building owners, managers and operators with actionable data and insights that can help lower costs, mitigate risks, address tenant concerns and enhance overall asset value.

The SPIRE™ program looks at overall building performance across six major criteria:

1. Power and energy
2. Health and well-being
3. Life and property safety
4. Connectivity
5. Cybersecurity
6. Sustainability



Companies can promote their status as a SPIRE™ qualified company, sell SPIRE™ assessment services and deliver SPIRE™ assessments using their own SPIRE™ qualified assessors. The assessor qualification program includes instructor-led classroom training, examination, field training and ongoing reassessment. Companies and their assessors are listed on our website to provide interested building owners and other parties access to local, expert resources.

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Smart Systems Rating Program (SSRP)

Smart technology original equipment manufacturers (OEMs) play a significant role in unifying smart building stakeholders through their offerings. The market needs independent proof that technologies work as intended and are purposely built with an operational mindset for the whole building. UL Solutions helps OEMs:

- Expand product relevance by addressing the evolving needs of your customers.
- Identify how to improve the product development life cycle through holistic assessment.
- Differentiate their products in the market with UL Marketing Claim Verification.
- Align with organizational goals.
- Verify features and smart capabilities.
- Enhance smart product transparency for building owners and purchasers.

SSRP is a UL Marketing Claim Verification program, an objective, science-based assessment that verifies the accuracy of marketing and performance claims. In the SSRP, smart building systems and products are comprehensively assessed based on six dimensions:

1. Communications and interoperability
2. Resiliency
3. Cybersecurity
4. Control and automation
5. Digital experience
6. Functional value

Smart systems that are assessed through the program receive a level rating of Smart System/Product Verified — Silver, Gold, Platinum or Diamond — based on the assessment results.

Upon successful assessment, UL Solutions will issue a UL Verification Mark that can be publicly accessed and used for marketing claims.

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Why choose UL Solutions to support the advancement of your building technologies and construction?

Long-standing history of partnering with the buildings and construction industry

Since 1894, UL Solutions has been helping safeguard living and working environments. We leverage our deep expertise, extensive resources and a trusted reputation among industry stakeholders to help our customers protect built environments, occupants and the planet.

Meaningful relationships in the built environment community

We have cultivated strong relationships with trade organizations to better understand the needs of industry stakeholders and respond to their needs and concerns. These organizations include the American Institute of Architects (AIA), Building Owners and Managers Association (BOMA) International, and International Facility Management Association (IFMA).

Global reach, local convenience

UL Solutions has 90+ sites with laboratories in key locations around the world, where we provide vital testing and certification services, and additional locations offering inspection, verification, advisory and auditing services. UL Solutions also offers field testing to analyze complex building systems against real-world conditions.

Trusted by the world's most prominent players in the building and construction industry

UL Solutions' offerings to advance building technologies and construction are designed to serve a wide range of industry professionals.

We have worked directly with high-profile buildings, managers and brands, including:

- [ABB Electrification in Frosinone, Italy](#)
- [Amazon Smart Thermostat](#)
- [Brandywine Realty Trust's Cira Centre](#)
- [Brixmor Property Group](#)
- [Brookfield Properties](#)
- [Brooklyn Bedding and Helix Sleep](#)
- [Cary, North Carolina, Fire Department](#)
- [Intermountain Electronics](#)
- [LBA Realty](#)
- [Microsoft corporate headquarters](#)
- [The Music Center in Los Angeles](#)
- [Olympic House, the headquarters of the International Olympic Committee](#)
- [1 Cal Plaza](#)
- [RMZ Corp](#)
- [Waters Corporation](#)

Science-first focus

As a global leader in applied safety science, we put the scientific method at the center of our work, and we rigorously adhere to principles of objectivity and observation that lead to discovery and innovation. Through our investments in new laboratories and strong relationships with building technologies, construction and real estate leaders, UL Solutions is part of a worldwide network of future-forward scientific excellence.

When you choose with UL Solutions, you're partnering with industry experts who work every day to help businesses meet the evolving requirements and expectations for the building ecosystem.



UL.com/building-technologies-and-construction

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