Furniture products safety guide

Understanding electrical safety for furnishings to help mitigate risks and challenges in the furniture industry.

UL Solutions

Safety. Science. Transformation.™

Introduction

Aware that the furniture industry is rapidly changing and growing in several ways, leading to multiple challenges for both manufacturers and their supply chains, UL Solutions has developed a furniture product safety guide to help you with:

- An overview of the potential hazards involving furniture products by identifying common risk categories, including an overview of the various UL Solutions Standards for furnishings and how they may apply to your products

- An understanding of design for compliance and the safety details to consider when designing products, including the importance of certified components

- Suggested certification programs to help minimize the potential risks associated with furniture products
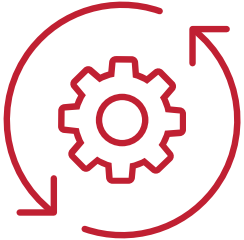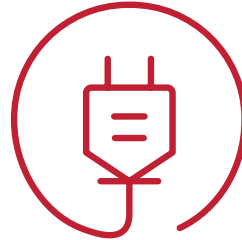
- Useful resources

Index

The problem
An overview of the potential hazards involving furniture products and the identification of common risk categories

Two of the most significant challenges in furniture product safety are:

The integration of technology in furniture

The hazards and challenges associated with this new electrification and connectivity

The boundary between work, school and home continues to blur as more people work remotely and e-learning opportunities expand. This change is fueling the demand for electrified furnishings, the need for furniture that can be easily moved around and adapted for different uses in different environments, and a new hybrid furniture segment known as "resimercial" (residential-commercial) furniture. The COVID-19 pandemic further accelerated this shift by necessitating remote work worldwide, leaving businesses, learning institutions and employees looking for solutions to improve at-home performance, support productivity and ensure safety.

In response to this ongoing trend, retailers have increased their furniture offerings, including convenient solutions to meet home office needs and flexible outdoor use while also innovating to sell products online more effectively.

As always, the safety of these products remains essential and — in addition to addressing more typical risks, including electrical, mechanical and flammability — furniture manufacturers and retailers must adapt to address the new environments (from home offices to outdoor spaces) in which consumers will use much of this furniture.

Common risks associated with furniture products

Click on each category to learn more:

Furniture

Residential | Home office furniture

Hazards

Household furniture is perhaps the broadest sub-industry and includes wooden and upholstered furniture, bedding and mattresses, children's furniture, and kitchen and bathroom cabinetry. Textiles and other upholstery materials are often incorporated into household furniture products for comfort or aesthetics. In addition, paints, varnishes, coatings and other finishes are typically applied to furniture surfaces to improve appearance and durability.

These same furniture products continue to see an increase in the use of electrical applications within the product mix. This may include functionality such as wired and wireless charging, electrical wiring and components to support accessory lighting, motion or actuation to allow for easier manipulation or adjustment by consumers, and smart applications.

Hazards from household furniture products include, but are not limited to, stability, electrical shock, poor performance based upon intended and foreseeable misuse that could lead to injury, and flammability. In a residential setting, children likely do not understand the potential hazards of moving furniture. They may remain unsupervised and play with the furniture, leading to potential tip-over hazards or other risks. Therefore, products must present no mechanical risks, such as entrapments, pinch points or protruding parts, or shock hazards due to handy electrical receptacles.

UL Solutions safety requirements

UL 962, the Standard for Household and Commercial Furnishings

UL 962 is the premier North American Standard for household and commercial furnishings and certifies that products meet electrical, flammability and personal injury safety requirements. The majority of North American distributors or integrators ask for third-party certification by UL Solutions to minimize the risk of nonconformity of products they import and gain a higher acceptance rate by regulatory authorities.

UL 962 applies to motor-operated furniture and beds, electrified and non-electrified furniture, home and office furnishings, some commercial display products and built-in bathroom cabinets rated 600 V AC or less.

Other safety aspects

- **Flammability –** Furniture products are usually composed of materials that are potentially flammable, such as wood and upholstery, adhesives, paints and varnishes. As a result, furniture can serve as a primary ignition point or fuel source for indoor fires. For this reason, many jurisdictions require flammability testing for fabrics and upholstered furnishings. Flammability testing evaluates the suitability of materials for use in furniture products by assessing their resistance to the effects of heat or flame as well as their burn and heat release characteristics.

- **Chemical content and chemical emissions –** In the U.S., the Consumer Product Safety Improvement Act (CPSIA) bans or significantly restricts the use of certain chemicals in products intended for use by children. In the state of California, manufacturers are required to label those products that contain potentially toxic substances and exceed acceptable exposure levels under that state's Safe Drinking Water and Toxic Enforcement Act (also known as Proposition 65).

- **Chemical emissions testing –** Some chemical substances found in furniture products, such as volatile organic compounds (VOCs) and formaldehyde, are released over time. Because these emissions can contribute to poor indoor air quality, chemical emissions testing or assessment may be a condition for achieving environmentally preferable product certifications, such as UL Solutions GREENGUARD.

Commercial | Resimercial furniture

Hazards

Commercial furniture products are designed to withstand the constant use, movement and demands of various commercial settings, including educational institutions, healthcare facilities and offices. Today, commercial furniture is also working its way into the residential market as the concept of "resimercial" takes shape. Today's workplaces are changing with an eye on technology. There are increasing demands for in-build, portable office and meeting spaces, as well as electrified furniture that improves usability and comfort while also supporting electronic devices.

While children are unlikely to be present in the commercial environment, people will use the products much more than in a residential setting. Residential sofas, armchairs or tables brought into a workplace must demonstrate durability, but most residential furniture is not designed for the high levels of traffic and use. Due to demand for flexibility in the commercial space, many manufacturers strive to offer lines of residential-inspired furniture with commercial quality, including durable fabrics, since upholstery tends to be the first thing to wear.

Finally, in North America, some code authorities require Nationally Recognized Testing Laboratories (NRTLs) to evaluate office pod products. Some municipalities may also require furniture to exceed the national code standards. Additionally, office equipment is governed by the U.S. Occupational Safety and Health Administration (OSHA) mandate requiring safe working environments.

Along with meeting regulatory requirements and market demands, focusing on safety helps manufacturers and retailers build confidence with their customers while reducing the risk of product recalls, lost sales, fines and damage to the brand reputation.

UL Solutions safety requirements

UL 962, the Standard for Household and Commercial Furnishings
UL 1286, the Standard for Office Furnishings
UL 2999, the Standard for Individual Commercial Office Furnishings

UL 962	UL 1286	UL 2999
Published 1996, updated 2001	Published 1984, updated 2018	Published May 2020
Covers bookcases, curio cabinets, desks, tables, chairs, power distribution and beds	Covers panels (cubicle) systems along with the accessories that attach to them, such as work surfaces, storage compartments and electrical systems	Covers all types of individual commercial offline furnishings
Mechanical requirements within UL 962 are unique to this Standard based upon the product type	In 2009, the UL 1286 Standards Technical Panel (STP) added requirements for mechanical testing of individual office furnishings	The mechanical tests in UL 2999 reference the industry-accepted Business and Institutional Furniture Manufacturer's Association (BIFMA) standards for these types of products
Applies to some residential and some commercial furnishings, excluding individual office furnishings	Applies to commercial office furnishings systems	Applies exclusively to individual commercial office furniture products

Points to consider

UL 2999 contains some new requirements that exceed those of UL 962 and UL 1286. To help you better prepare to transition to the new Standard, below is an overview of the most common areas where additional testing, information or evaluation may be required.

Category	Details
User Guide/Installation Instructions/Markings	This area of safety evaluation is the most common noncompliance. The Standard explicitly outlines what an organization must do to comply with these requirements for user guides and instructions.
Required Plastic Ratings for Electrical Enclosures	As plastics are being selected in the design phase of product development, the specific plastic requirements should be carefully considered for the intended use.
Flammability Requirements	Any combustible component in excess of 10 square feet will be subject to a flammability test. The intent of this test is to help ensure the furniture will not exacerbate or accelerate a structure fire. This test measures the flame spread index and smoke developed index related to the combustible material. This test is performed on the combination of materials (core, adhesives, laminates, etc.), so note that any changes in the product construction will prompt retesting.
Locked Rotor Testing and Safety Challenges	For motorized products, the locked rotor test is intended to simulate the conditions of a user trying to actuate the product while something is preventing the product from moving. In many cases, manufacturers of the component may rely on software or electronics as a means to protect the product. If software or electronics is used in this manner, UL 2999 requires that the software or electronics be evaluated for reliability as a functional safety circuit.
Components	Recognized components cannot be fully evaluated unless they are in the end-use product. While some components may have been evaluated to a specific standard, it is unlikely that they have been evaluated as a part of a furnishing. Recognized components are not tested as a part of the end product.
Personal Injury Points	Height adjustable tables and other motorized furnishings may have personal injury areas. While UL 2999 allows these if the product complies with other requirements, it's important to consider all of the accessories that may be used, such as modesty panels or screens, to help ensure that all possible risk of injury points are identified.
Accessories	To help ensure that the complete furniture unit meets the standard requirements, all accessories must be evaluated with the furnishing. Even accessories that may not affect the testing should be included for testing to help ensure it does not negatively impact the safety of the product.

Other safety aspects

- **Flammability –** Due to the increased use of residential furniture in commercial environments, flammability concerns of upholstery, adhesives, paints and varnishes become a significant concern. As a result, you need to consider additional testing to address these components. Flammability testing evaluates the suitability of materials for use in furniture products by assessing their resistance to the effects of heat or flame as well as their burn and heat release characteristics.

- **Chemical content and chemical emissions –** The use of chemicals in furniture and the control of chemical emissions from furniture products are tightly regulated in many jurisdictions worldwide. European Union (EU) Regulation (EC) No. 1907/2006, also known as the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) Regulation, applies to most chemicals and chemical-containing products that are manufactured, imported or sold in the EU. In the U.S., the CPSIA bans or significantly restricts the use of certain chemicals in products intended for use by children.

  In the state of California, manufacturers are required to label those products that contain potentially toxic substances that exceed acceptable exposure levels under that state's Safe Drinking Water and Toxic Enforcement Act (also known as Proposition 65).

- **Chemical emissions testing –** Some chemical substances found in furniture products, such as volatile organic compounds (VOCs) and formaldehyde, are released from furniture products over time. Because these emissions can contribute to poor indoor air quality, chemical emissions testing or assessment may be a condition for achieving environmentally preferable product certifications or a procurement requirement.

  Furniture that has been evaluated for environmental sustainability, or is UL Solutions GREENGUARD certified, can contribute qualifying points under a number of green building certification initiatives, including the LEED Rating System.

Outdoor patio furniture | Outdoor office furniture

Hazards

Traditionally, for consumers using outdoor furniture products, risks include a variety of injuries, such as falls, pinches, lacerations and more serious finger amputations.

As people continue to seek new environments where they can safely socialize, outdoor workspaces have become increasingly popular, leading to an increase in outdoor furniture use. This also heightened the need for furniture in motion, furniture that can be easily moved around and adapted for different usage and environments. However, with people using indoor furniture in outdoor spaces or vice versa, new or increased risks may be encountered, such as electrical hazards due to computer and electrical device use near water.

UL Solutions safety requirements

UL 4041, safety requirements for outdoor furniture

UL 4041 is designed to evaluate aspects of patio furniture that could result in failure or injury during normal or reasonably foreseeable misuse. This program evaluates:

- Mechanical-related safety issues, including component quality and integrity, to reduce risk of breakage or failure, and structural strength of the unit, such as weight-bearing or unevenly distributed loads. Mechanical safety also identifies sharp edges, pinch points or other hazards that may cause injury.

- Performance issues through testing, designed to prevent product failure under reasonably foreseeable use conditions. This includes extensive durability testing to provide confidence in the product's lifetime usage.

- Testing requirements for different kinds of furniture and their components. Applicable products covered in the document include tables, chairs, love seats, chaise lounges, benches and hanging chairs.

- Certification reports that outline the components and design of the product that has been evaluated. These will be subjected to unannounced quarterly inspections, verifying that a product bearing the UL Solutions Mark has not undergone unapproved design changes or cost reductions.

The solution
Safety considerations when designing products, including the importance of certified components

Given the broad range of furniture products and the complex and sometimes conflicting regulatory process, manufacturers may be understandably confused about how to negotiate the assessment process for furniture products. UL Solutions experts work with our customers to recommend best practices that may help.

Understand regulatory requirements and market demands – furniture products are subject to varying regulatory requirements that differ between jurisdictions. The regulatory landscape is further complicated by the various types of furniture products and how individual products are categorized under the applicable requirements. To successfully navigate this complex landscape, furniture manufacturers should develop a thorough understanding of the regulatory requirements applicable to their specific products in any targeted jurisdictions and continuously monitor regulatory developments to avoid surprises.

Read the Standard – we often find organizations have submitted products for safety evaluations without reviewing the appropriate Standard. Many organizations are not aware that the Standards can now be viewed online at no cost.

Identify required and recommended testing early in the product development phase – a number of required and recommended tests and assessments cover virtually every aspect of a given furniture product, from mechanical and electrical safety testing to assessments that evaluate a product's environmental performance. Identifying applicable tests and assessments at the earliest possible stages of the product development process can result in product design and materials selections that contribute to better test outcomes and reduce the likelihood of unexpected setbacks that require product redesign.

Seek testing efficiencies based on testing requirements – a thorough understanding of applicable regulatory requirements and the early identification of required and recommended product testing will enable a manufacturer to develop a comprehensive testing and regulatory approval plan that minimizes duplicate testing, reduces costs and results in faster time to market.

Prepare a user guide and installation instructions – one of the most common challenges we encounter with organizations who engage with UL Solutions for a safety evaluation and or assessment is the failure to provide this essential documentation. Develop this information before initiating the process, or have a clear plan in place for how you will address this information to help ensure you have a compliant product and your timeline is met.

Start with appropriate UL Solutions listed or UL Solutions recognized components – in product design and sourcing, organizations often seek the components or products that meet the desired aesthetic at the lowest price point. The challenge we see with only looking at these two areas is that the component may not have been evaluated for your intended use, meaning additional testing is required to confirm compliance. Further, when sourcing these components, organizations do not ask for nor document the proper technical information, such as conditions of acceptability (CofAs) or test reports associated with how the component was evaluated. Without this information, you may experience project delays, unanticipated cost increases and potential noncompliance. Starting with appropriate UL Solutions listed or UL Solutions recognized components helps support the successful and on-time completion of your UL Solutions certification. You can find the list of critical components with related category control numbers (CCNs) on UL Solutions Product iQ®.

The result
Certification programs to help minimize the potential risks associated with furniture products

The risks associated with safety concerns for furniture products are vast. You may face consumer complaints, costly customer service interactions and, perhaps most long-lasting, reputational damage. If consumers lose trust in your brand, it may be difficult to recover. Furniture manufacturers should consider the potential value of partnering with an independent third party with in-depth expertise in the furniture industry and broad experience in required and recommended testing and assessment of furniture products.

Successful testing to applicable standards results in a Enhanced UL Solutions Certification Mark, along with annual UL Solutions Follow-Up Services that help detect changes in your supply chain that could affect product performance. In addition, the enhanced Mark can be featured on your products and used in promotional materials. Plus, your products will be listed in UL Solutions Product iQ®, our complimentary online certification directory.

Other safety aspects

- UL.com/Furniture
- UL Product iQ®
- myUL®
- myHome
- Preparing for your product safety certification
- UL Solutions Report
- UL Solutions Follow-Up Services
- UL Solutions Follow-Up Services Start Guide
- Marks Hub
- Marks and Labels
- UL Verify
- SPOT
- Furnishings Focus Newsletter
- Global Market Access
- UL Standards
- Marking and labeling FAQs

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