

A photograph of an outdoor patio setting. In the foreground, a light green wooden coffee table holds a small glass vase with white flowers, a light blue mug, and a stack of books. In the background, a wicker armchair with white cushions is visible. The scene is set outdoors with greenery in the background.

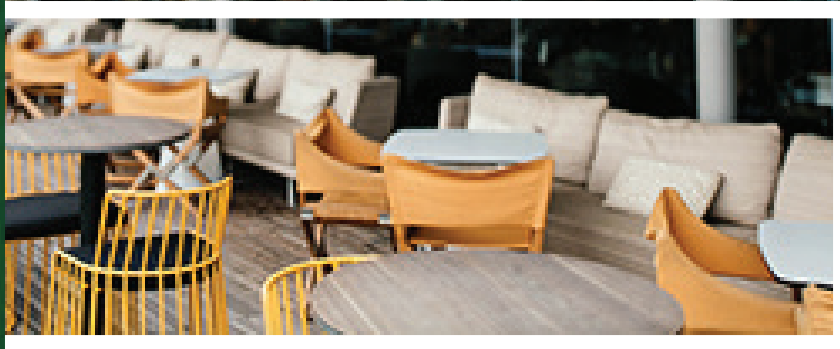
Addressing safety risks linked to outdoor furniture

Exploring UL 4041, Safety Standard for Outdoor Furniture



Empowering Trust™

Executive Summary



Outdoor and patio furniture, such as tables, chairs and chaise lounges, are generally designed to allow consumers to enjoy their outdoor spaces, patios and pools while providing the comforts and conveniences of conventional furniture. At the same time, recalls of defective or potentially unsafe outdoor furniture products now constitute a significant proportion of consumer product safety recalls in the U.S. Issues like poor or insufficient construction, lack of stability or potential pinch points can expose consumers to a variety of injuries. And unsafe outdoor furniture products also expose furniture manufacturers and retailers to potential liability issues or, at a minimum, an increase in product warranty claims and a loss of brand trust.

This UL white paper will discuss the safety hazards specific to furniture intended for use in outdoor environments and the safety requirements prescribed under UL 4041, Safety Standard for Outdoor Furniture. Beginning with a summary of recalls issued by regulatory authorities in the U.S. in connection with outdoor furniture products, the paper then describes the potential issues that are the source of safety concerns. The white paper offers an overview of the specific areas of testing addressed in UL 4041 and ends with recommendations for both manufacturers and retailers on how to effectively manage safety risks in their outdoor furniture products.

Statistics on outdoor furniture product recalls

A UL review of recall notifications posted to the website of the U.S. Consumer Product Safety Commission (CPSC)¹ has identified multiple cases of recalls or unsafe product alerts issued by regulators or manufacturers for outdoor furniture products sold in the U.S. since the beginning of 2016. These recalls and alerts account for nearly 3 million individual product units manufactured around the world and sold in major retailers and specialty stores. The assortment of recalled products encompasses a wide variety of outdoor furniture, including patio chairs, tables and benches, swivel lounge chairs, swing chairs and hammocks.²

Specifically, during the period of our review, we found recall notifications for at least 18 outdoor furniture products posted to the CPSC website. The scope of individual recalls ranged from fewer than 1,000 units to more than 2 million, with chairs, benches and other forms of outdoor seating, and lounging products, such as hammocks and hanging chairs, representing the exclusive focus of these recalls. Identified product issues include quality and durability considerations, as well as structural design and component elements that lack sufficient strength to withstand normal, anticipated use. For consumers using these products, the identified issues could potentially result in falls and lead to a variety of injuries.



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Specific instances of product recalls and alerts

Patio set chairs — About 45,200 patio set chairs manufactured in China were recalled in the U.S. in September 2017. According to the product recall notice, the fabric on the seat of the chairs can tear, posing a fall hazard to consumers. Prior to the issuance of the recall notice, the distributor had received six reports of the fabric on the chair ripping or tearing, and one report of injuries to someone's hand and back.³

Patio benches — Approximately 1,300 patio benches manufactured in China were recalled in the U.S. in February 2017. According to the product recall notice, the patio benches can collapse while in use, posing a fall hazard to consumers. By the time the recall notice was issued, the retailer had received six reports of the patio benches collapsing, and one report of a knee injury.⁴

Swivel patio chairs — An estimated 2 million swivel patio chairs manufactured in China were recalled in the U.S. in February 2017. The recall covered swivel chairs in a variety of models and sold throughout the U.S. in stores and online. According to the product recall notice, the base of the swivel patio chair can break during normal use, posing a fall hazard to consumers. Prior to issuing the recall notice, the distributor had received 25 reports of the chairs breaking, resulting in bruising and scrapes from falls.⁵

Beach chairs — About 33,400 beach chairs manufactured in Bosnia and Herzegovina were recalled in the U.S. in January 2017. According to the product

recall notice, the chairs can collapse, posing fall and fingertip amputation hazards. Before issuing the recall notice, the retailer reported receiving 13 reports of incidents worldwide, including 10 injuries, six of which resulted in fingertip amputation. A recall was also ordered in the European Union (EU), where an unknown number of chairs were affected.⁶

Swing chairs and stands — Approximately 260,000 swing chairs and stands manufactured in China were recalled in the U.S. in January 2016. According to the product recall notice, the suspension hardware on the chair and stand can break, or the stand can become unstable during use, posing a fall hazard. By the time the recall notice was issued, the retailer received 101 reports of incidents related to the chairs and stands, including a total of 27 reported injuries.⁷

Hammocks — An estimated 9,700 hammocks manufactured in China were recalled in the U.S. in October 2016. According to the product recall notice, the cinch buckles that come with the hammock and suspension kit can fail, causing the straps to detach from the hammock, posing a fall hazard to consumers. Prior to the issuance of the recall notice, the company had received three reports of cinch buckles breaking and one report of a laceration injury.⁸



Safety and performance challenges associated with outdoor furniture

As the prior examples help to illustrate, safety challenges associated with outdoor furniture products generally fall into one of two categories, which we discuss below.



Mechanical issues

Mechanical-related safety issues cover those aspects of an outdoor furniture product that could result in a structural or mechanical failure. Specific types of mechanical safety issues include:

- **Component quality and integrity** — Like components used in indoor furniture products, the quality and integrity of components in furniture products intended for outdoor use are essential to reduce the risk of breakage or premature component failures. Components designed with substandard materials or that are incorrectly produced or assembled compromise the overall safety of the furniture product and can result in injuries.
- **Structural strength** — In addition to poor quality components, many outdoor furniture products do not possess the necessary structural strength to fulfill their intended function. For example, chairs, seats and lounges may not have sufficient strength to safely support the weight of a user, while tabletops are frequently not strong enough to bear reasonable but unevenly distributed loads.
- **Mechanical safety** — Mechanical safety issues include exposed sharp points and edges in structural element components or finish materials that can result in cuts. Adjustable or collapsible tables and chairs typically feature areas where surfaces fold or separate, creating gaps where fingers or other human appendages can be accidentally squeezed, pinched, entrapped or amputated.

Performance issues

Performance-related safety issues linked to outdoor furniture products are those that result in product failure under reasonably foreseeable use conditions. Specific types of performance safety issues include:

- **Stability** — Outdoor furniture products are often designed without sufficient stability to maintain their intended positions in outdoor environments. Specifically, placements on uneven surfaces, like dirt, grass or paved patios, can destabilize furniture products that would otherwise be unaffected on even floors found indoors. Aesthetics and other considerations can also sometimes result in tabletops that are disproportionately too large for the accompanying table base, increasing the likelihood of tip-overs.
- **Durability** — Because outdoor furniture products are exposed to a wider range of environmental conditions than comparable indoor products, they may be more susceptible to the effects of light, variations in temperature and moisture, either from rain or snow. Under such conditions, materials and components may degrade more rapidly, resulting in the potential for premature failures. While not a safety issue, prolonged environmental exposure can also lead to premature fading or discoloration, lessening the appeal of the product.
- **Other performance-related issues** — Unlike indoor furniture, outdoor furniture may be subject to frequent moving or relocation, such as when consumers move furniture products to and from seasonal storage areas or when they transport portable furniture products to different outdoor locations. This movement can place additional stress on the materials and components used in these products, which may not be adequately accounted for in the design of the product.



The consequences of unsafe or poor-quality outdoor furniture



Data from the CPSC and the U.S. National Electronic Injury Surveillance System (NEISS) help to illustrate the potential risks associated with the use of unsafe or poor-quality outdoor furniture products. According to UL's own review of NEISS records, approximately 3,000 people were examined in hospital emergency rooms in 2017 alone for injuries related to outdoor furniture, a number that has steadily increased over the past 10 years. Outdoor furniture products frequently involved in these injuries included tables, beach and folding chairs, and umbrellas. Fortunately, most of the reported injuries were minor and typically involved cuts or lacerations, bruises and fractures, and the vast majority of emergency room visitors were treated and released.⁹

However, despite the magnitude of the risk, U.S. safety regulations applicable to outdoor furniture are limited. Under the terms of the U.S. Consumer Product Safety Act, manufacturers have a general duty to ensure the safety of products that they place on the market. But the extent of requirements specific to outdoor furniture is currently limited to the use of lead in paint and similar surface coatings in some consumer furniture products intended for use by adults and children.¹⁰ In addition to certifying compliance with the limits on the amount of lead in surface coatings in their furniture products, manufacturers must also obtain certification based on third-party testing for lead in paint and similar surface coatings in all furniture products intended for use by children.¹¹

For retailers operating in the U.S. market, this lack of more detailed safety requirements applicable to outdoor furniture complicates otherwise good faith efforts to ensure the safety of products sold through their stores and websites. Instead of simply requiring compliance with safety regulations applicable in the U.S., retailers must either rely on the reputation of their suppliers or their assurances regarding product safety claims or undertake the complex task of establishing their own independent safety criteria and arranging for third-party testing to verify compliance with those criteria.

Unfortunately, the sale of potentially unsafe products imposes a number of burdens on manufacturers and retailers alike. Of course, companies that are linked with the manufacture or sale of unsafe products that result in injuries may be exposed to legal action brought on behalf of consumers. Even when products that have been found to be unsafe are not linked to injuries, the process of recalling such products after they have been placed on the market is expensive and time consuming for everyone involved. And any association with unsafe products can adversely affect an organization's reputation in the marketplace and damage the value of established brands with consumers.

And the challenges go beyond safety considerations. In 2016, U.S.-based manufacturers across all industry sectors paid nearly \$25 billion to settle product warranty claims.¹² Although there are no hard statistics regarding the estimated costs associated with claims filed against manufacturers of outdoor furniture products, rectifying claims associated with even a single, poor-quality product that fails within the established warranty period can amount to millions of dollars. Clearly, products that fail to live up to expectations regarding their durability under actual use can extract a significant cost.



About UL 4041

In recent years, UL has worked directly with both manufacturers and global retailers in an effort to more effectively evaluate safety considerations related to outdoor furniture products. That work has led to the development of UL 4041, a 200-plus page Standard that details requirements for the construction and testing of many types of outdoor patio furniture products, including tables, tables with umbrellas, chairs, loveseats, chaise lounges, benches and hanging chairs. UL 4041 details specifications related to a furniture product's mechanical and performance-related safety aspects, thereby facilitating a comprehensive safety and quality assessment of that product.

Under UL 4041, the specific tests applicable to a given furniture product are determined by the type of product being evaluated. For example, tables are evaluated for leg strength, as well as overall stability and load-bearing characteristics under varying conditions. All chairs are tested for stability, back and armrest strength, and component durability, while chairs with pedestal bases undergo separate testing for the durability of the chair base. A different but comparable set of tests is applicable to chaise lounges, while a separate test method is specified to assess the integrity of suspension hardware and fixtures used with swinging and hanging chairs.



While safety issues were a paramount consideration in the development of UL 4041, evaluating products for system durability was also an important factor. In testing conducted by UL of more than 300 different outdoor furniture products, between 30-40 percent of products failed to meet durability requirements consistent with their expected life. As a result, significant attention in the Standard is given to durability testing to help ensure both user safety and to reduce the potential for product failures that could result in warranty claims.

Finally, UL 4041 also specifies requirements for permanent product markings that provide detailed information about the product model, the location and date of manufacture, and other details that can be used to aid in the identification of specific outdoor furniture products in the event of a future product recall. The Standard also includes requirements regarding the detail and formatting of safety information and instructions that must accompany the product.

IN TESTING CONDUCTED BY UL OF MORE THAN

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BETWEEN

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Recommendations for manufacturers, suppliers and retailers

The introduction of UL 4041 sets a new threshold for safety for outdoor furniture products and provides manufacturers, suppliers and retailers with an important tool to help reduce the development and spread of unsafe outdoor furniture products. Manufacturers who have their products tested and certified in accordance with UL 4041 requirements demonstrate their commitment to the safety of their products and the protection of consumers. UL 4041 certification can also help manufacturers to distinguish their products in the marketplace.

For retailers, the use of UL 4041 certification by manufacturers can streamline the procurement process for outdoor furniture products, eliminating the need for more detailed procurement requirements as well as third-party testing. Outdoor furniture products certified to the requirements of UL 4041 are also subject to ongoing surveillance and testing by UL under our Follow-Up Services (FUS) program, thereby providing retailers with knowledge of the ongoing compliance of the products they sell. Procuring only UL 4041-certified outdoor furniture products also sends a clear signal to both manufacturers and consumers regarding the company's commitment to product safety, providing an important competitive advantage in a highly commoditized market.

As previously noted, the requirements of UL 4041 are intended to complement those of other applicable regulations and standards. Therefore, efforts to help ensure the safety of outdoor furniture products does not end with UL 4041 certification. Manufacturers must still comply with all mandatory requirements applicable in the jurisdiction where their products are to be sold or distributed. These efforts should include verifying materials and components obtained through supply chain partners, as well as routine testing of post-production product samples.

For retailers, efforts to help ensure the safety of outdoor furniture products should include clear and detailed procurement specifications, including UL 4041 certification, that address foreseeable, safety-related considerations. Similar to the recommendation for manufacturers, retailers should also consider undertaking periodic testing of procured products to help affirm ongoing compliance with mandated requirements as well as procurement specifications. Finally, retailers should develop robust mechanisms to facilitate prompt consumer feedback on safety and quality issues, as well as continuously monitor relevant social media platforms for timely information on potentially unsafe products.

Summary + Conclusion



In recent years, a number of significant product safety recalls of outdoor furniture products have raised concerns among manufacturers, retailers and consumers, and have increased awareness regarding the need for more robust standards that address both mechanical and performance-related safety issues. UL 4041 provides a detailed framework for assessing these issues and serves as an important complement to existing regulations and standards applicable to outdoor furniture products. As such, it offers both manufacturers and retailers an important tool in their efforts to reduce potential safety risks associated with these products and helps to ensure the safety of consumers.

For additional information on UL 4041 and UL's other testing services for outdoor furniture products, visit [UL.com](https://www.ul.com). Or contact us at FurnitureAP@ul.com - FurnitureEU@ul.com - FurnitureNA@ul.com.

End Notes

1. “Recall list,” United States Consumer Product Safety Commission. Web. 15 July 2018. <https://www.cpsc.gov/Recalls>.
2. The statistics cited in this section are based on UL’s own survey of recall announcements posted to the websites of the U.S. Consumer Product Safety Commission (CPSC) and the EU Commission’s Rapid Alert System for dangerous, non-food products (RAPEX), between 1 January 2016 and 15 July 2018.
3. Recall notice posted to the website of the U.S. CPSC, September 2017. Web. 15 July 2018. <https://www.cpsc.gov/recalls/2017/nantucket-distributing-recalls-patio-set-chairs>.
4. Recall notice posted to the website of the U.S. CPSC, February 2017. Web. 15 July 2018. <https://www.cpsc.gov/ko/recalls/2017/target-recalls-patio-benches>.
5. Recall notice posted to the website of the U.S. CPSC, January 2017. Web. 15 July 2018. <https://www.cpsc.gov/Recalls/2017/Casual-Living-Worldwide-Recalls-Swivel-Patio-Chairs>.
6. Recall notice posted to the website of the U.S. CPSC, January 2017. Web. 15 July 2018. <https://www.cpsc.gov/Recalls/2017/IKEA-Recalls-Beach-Chairs>. See also “Alert number A12/0345/17,” posted to the Rapid Alert System for Non-Food Products (RAPEX), no date. Web. 15 July 2018. https://ec.europa.eu/consumers/consumers_safety/safety_products/rapex/alerts/?event=viewProduct&reference=A12/0345/17.
7. Recall notice posted to the website of the U.S. CPSC, January 2016. Web. 15 July 2018. <https://www.cpsc.gov/Recalls/2016/Pier-One-Imports-Recalls-Swingasan-Chairs-and-Stands/>.
8. Recall notice posted to the website of the U.S. CPSC, October 2016. Web. 15 July 2018. <https://www.cpsc.gov/recalls/2016/wildhorn-outfitters-recalls-to-repair-hammocks>.
9. Findings based on an analysis of NEISS records conducted by UL in September 2018.
10. For specifics about the CPSC’s requirements about lead in paint and other surface coatings, see “Lead in Paint,” website of the U.S. Consumer Product Safety Commission. Web. 15 July 2018. <https://www.cpsc.gov/Business--Manufacturing/Business-Education/Lead/Lead-in-Paint/>.
11. See “Highlights of Requirements for Furniture Sold in the United States,” brochure compiled by the U.S. Consumer Product Safety Commission, updated August 2016. Web. 15 July 2018. <https://www.cpsc.gov/s3fs-public/Highlights%20of%20Requirements%20for%20Furniture%20Sold%20in%20the%20US%20En.pdf>.
12. “Fourteen Annual Product Warranty Report,” from the Warranty Week Newsletter website, March 22, 2018. Web. 15 July 2018. <https://www.warrantyweek.com/archive/ww20180322.html>.





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