



Standards & Engagement

2023

# Holiday Safety Guide





# Introduction

At UL Standards & Engagement, we want to ensure that the products that make the holidays special are safer. For more than a century, we have thought about every detail when it comes to making your home safer, crafting standards that help to protect you from flipping on the light in the morning (that's UL 20, the standard for switches) to parking in the garage at night (that's UL 325, the standard for automatic garage doors).

Our mission of working for a safer world does not stop when the holidays start. It becomes more important. According to UL Standards & Engagement's inaugural 2023 holiday safety study, 92% of 2,016 U.S. adults surveyed plan to celebrate Thanksgiving and winter holidays in some way. The increased and different activities of the holidays create a change from January to October norms. During the holidays, we change the way our houses are decorated. We cook more elaborate meals. We travel away from home more. And we shop for items we do not regularly purchase.

These changes can elevate safety risks — risks that are responsible for more fires and trips to the ER during the holidays than

other times of year. The study showed some misunderstandings about safety during the holidays that could make days less merry and bright. There are reasonable steps to mitigate those risks, so your holidays are spent gathered around the tree, and not in the hospital waiting room.

For 120 years, UL Standards & Engagement has been developing safety standards. Our 1,700 standards and guidance documents are incorporated into millions of products at the top of holiday wish lists. Most safety standards are voluntary — and widely adopted by manufacturers. There are not, however, guarantees that every product on the market conforms to standards. (We have it on good authority that everything made in Santa's workshop is tested and certified to safety standards.)

This guide is designed to help you make smart decisions to reduce the risk when cooking, gifting, decorating, and traveling this season. From the standards that protect your products to the safety tips that will help you avoid injury, we are leveraging more than a century of safety expertise to make the holiday season one to remember — for all the right reasons.





1

**UL 696**  
Electric Toys

2

**UL 4200A**  
Products Incorporating  
Button Batteries or  
Coin Cell Batteries

3

**UL 8400**  
Virtual Reality, Augmented  
Reality and Mixed Reality  
Technology Equipment

4

**UL 1678**  
Carts, Stands and  
Entertainment Centers for  
Use with AV Equipment

5

**UL 2442**  
Wall and Ceiling-Mounts  
and Accessories

6

**UL 2849, UL 2272,  
UL 2850, UL 2271,  
UL 2580**  
Standards covering electrical  
systems and batteries for  
e-mobility devices

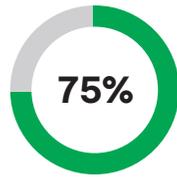
7

**UL 62368-1**  
Audio/Video, Information  
and Communication  
Technology Equipment

# Gifting



of gift buyers say they prefer to buy from well-known retailers



of gift buyers say they prefer to buy from well-known brands



of gift buyers say they are motivated by price



of gift buyers say they prefer to buy products that meet safety standards

The top electronics, appliances, and toys on this year's wish lists include items that will be carefully thought about and researched. But will that research consider safety?

Whether it is the charger that powers your devices or the makeup of a toy's battery compartment, ULSE has measures in place to prevent injuries during the holidays, including guidance on how to make battery compartments more difficult for a child to open, develop electric toys with appropriate wiring, and safeguard e-bikes and e-scooter batteries from overcharging.

More than three-quarters (76%) of Americans in ULSE's holiday safety study say they typically purchase gifts this season. Of those, 83% anticipate buying some type of battery-powered gift. Top items include electronic toys, wireless or Bluetooth headphones, small kitchen appliances, personal care products, smartphones, and portable speakers.

While a vast majority of gift buyers say they are motivated to buy from well-known retailers (79%) and well-known brands (75%), the strongest motivator is price (85%). The holidays are an expensive time of year, so

the desire for deals is not surprising. Yet only 64% say they prefer to buy products because they meet safety standards. As consumers head into stores or buy online, there are recommendations to help ensure their good deals don't bargain away safety.

## Charge Smartly and Safely



Charge with cables that come with the product.



Buy replacements or extras from the manufacturer.



Check that the chargers have been certified by a third-party testing company.

Expect the new iPhone to be a top gift for this year, potentially pushing beyond the Consumer Technology Association's estimate of [50 million smartphones sold](#) last holiday season. One of the big changes with the new iPhone is moving to a USB-C charger. The change will likely result in a bigger market for USB-C adapters — and a flood of counterfeits trying to capitalize on the change.



## Top Rechargeable Holiday Gifts

- 29% Electronic toys
- 27% Wireless or Bluetooth headphones
- 26% Small kitchen appliances
- 23% Personal care and wellness products
- 22% Smartphone
- 18% Portable speakers
- 18% Game controllers
- 18% Tablet
- 17% Portable charger/power banks
- 16% Smartwatch
- 16% Laptop
- 15% Battery-powered power tools
- 14% Portable gaming console
- 12% Portable lights or flashlight
- 11% Rechargeable batteries
- 11% Digital camera
- 10% Cordless or robot vacuum cleaners
- 8% Wireless computer keyboard or mouse
- 7% E-cigarette or electronic vaping device
- 7% Battery-powered home security camera
- 7% Other smart wearables
- 6% Virtual or augmented devices
- 6% Electric scooter
- 6% Electric bike
- 6% e-reader
- 5% Hoverboard
- 5% Battery-powered lighter
- 5% Battery-powered lawn care products
- 3% Smart luggage with removable batteries
- 3% Medical devices
- 11% Other
- 17% None of the above

\*Multiple responses allowed

Our affiliate, UL Solutions, [tested 400 counterfeit Apple adapters](#) and found that only three of 400 passed its tests — a 99% failure rate. The investigation report said, “All but three failed our basic safety tests and were fire and shock hazards. Twelve were so poorly designed and constructed that they posed a risk of lethal electrocution to the user.”

Whether it’s USB-C or USB, use the charger that came with the product and check that it is certified by a third-party testing company to reduce the risk of fire or electric shock. Purchasing chargers directly from the manufacturer also limits the hazards.

### Know the Rechargeable Risks



Educate yourself on thermal runaway.



Know which products contain lithium-ion batteries (almost anything rechargeable).



Keep lithium-ion powered devices from blocking your exits in the event of a fire.

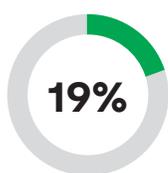
Many of the most coveted electronics are rechargeable. These devices are typically powered by lithium-ion batteries, and it’s important to buy both products and batteries that adhere to safety standards and are designed to prevent thermal runaway. Thermal runaway is a state of uncontrollable heat that can result in fire or explosion if the lithium-ion battery is damaged, overcharged, or defective.

Unfortunately, a separate August 2023 study conducted by UL Standards & Engagement found that 44% of Americans were not aware of the thermal runaway risk with lithium-ion batteries. In fact, only 19% said they were “very aware” of the risk. It is an awareness gap that can become a safety threat.

Lithium-ion batteries are in countless products and can be a clean, rechargeable source of energy. While a majority (64%) of Americans reported they were aware that smartphones, laptops, tablets, and e-readers contain lithium-ion batteries, the same ULSE August survey found that awareness declines for other top gifts that rely on their rechargeable power – like e-bikes and scooters, hoverboards, power and lawn tools, and more.

Even with hundreds of e-bike fires across the globe and lots of media coverage of the problem, an alarming number of consumers are still unaware of what powers their devices. While many of these fires are due to shoddy third-party or counterfeit lithium-ion batteries in the e-bikes, 43% of e-bike owners were not even aware that lithium-ion batteries power those devices.

E-bikes and other products like lawn care equipment and power tools require larger lithium-ion batteries. With increased size comes increased risk. Nearly half (49%) of Americans are not aware that lithium-ion batteries are the energy source for their battery-operated power tools, like cordless drills and saws. For a family in Walden, VT, it was a [battery fire from tools](#) that led to the loss of their home.



Only 19% of Americans said they were “very aware” of the risk of thermal runaway



51% of e-bike owners are unaware that there are safety standards for lithium-ion batteries

## Unaware of Lithium-Ion Battery Use

Small kitchen appliances	83%
Wireless keyboard or mouse	74%
Medical devices	72%
Wireless headphones	70%
Portable speakers	68%
VR or AR device	66%
Game controllers	65%
Hoverboard	60%
Portable charger	60%
Smartwatch	56%
Tablet	50%
Battery-powered power tools	49%
EV or hybrid vehicle	47%
Rechargeable batteries	46%
Laptop	45%
Battery-powered lawn care items	45%
Electric scooter	45%
Electric bike	43%
Smartphone	41%

## How long do you have to escape a home fire?



**30 years ago**  
17 minutes



**Today**  
3 minutes



**Lithium-ion battery**  
20 seconds

These are avoidable tragedies. With holiday shopping underway, look for products that are certified by a nationally recognized testing lab and follow best practices like not overcharging or charging overnight when a fire could take off too fast to escape.

Lithium-ion battery fires are intense, fast and difficult to extinguish. [Researchers found](#) that 30 years ago, you had about 17 minutes to escape a house fire. With more synthetic materials in the furniture and different construction materials, the estimate is now three minutes. With lithium-ion battery fires, it may be only seconds.

The Fire Safety Research Institute of UL Research Institutes conducted an e-bike fire test in partnership with the FDNY, finding that it [took less than 20 seconds](#) from when the first smoke appeared from the bike to the room being totally engulfed in flames. Keeping e-bikes and scooters — and any lithium-ion powered devices — from blocking escape routes in your home can help ensure you are not trapped inside in the event of a fire.

What is worse than realizing you do not have the right batteries for the new toy your child had at the top of her wish list? Not knowing the risks small batteries in poorly contained compartments can pose or that substandard lithium-ion batteries could lead to thermal runaway.

More than one-third (35%) of gift buyers in the ULSE holiday study plan to buy a gift for a

### Consider Safety Differences for Children and Teens



Buy micromobility devices like e-bikes, scooters, and hoverboards that are tested and certified to reduce the risk of battery fire and injury.



Inspect gifts that use button or coin cell batteries to ensure the battery compartment cannot be easily opened by a child or pop open by accident.



Pay attention to manufacturer instructions that offer important tips for safe operation.

child aged six years or younger this season. Another 26% have children seven to 12 on their lists. With a total of 61% of gift-givers buying for children, it is important to be thoughtful about safety when making purchasing decisions.

Some of the most coveted gifts for older children are hoverboards, e-scooters, and e-bikes. They can be great for getting to school or just having fun. They can also be injury or fire hazards if you don't know what to look for.

A Consumer Product Safety Commission report [found that](#) hoverboards, powered skateboards, and scooters were responsible for six times as many injuries from December 24 to December 31 than an average day in the first weeks of December.

[The CPSC also issued a recent report](#) that found that e-scooter and e-bike injuries increased nearly 21% in 2022, with children 14 years and younger more than twice as likely to be injured than average. CPSC recommended that consumers “only use micromobility products that have been designed, manufactured, and certified for compliance with the applicable consensus safety standards.”

Electronic toys topped our list of top rechargeable tech products this year, with 29% of gift buyers saying they planned to purchase at least one gift in the category. For younger children, be on the lookout for coin and button cell batteries — and not necessarily in their toys. Toys already require battery compartments that are more difficult for children to access or for batteries to fall out. But coin and button cell batteries are widely used and not only in toys. Batteries from remotes, key fobs, and other common household items were contributing to a concerning number of battery ingestion emergencies. According to CPSC, an estimated [70,322](#) battery-related emergency department visits occurred from 2010 to 2019, nearly doubling the 1990 to 2009 estimate of

[40,400](#) in half the time. The majority of these incidents occurred among children under the age of six.

By next holiday season, the risk of accidental battery ingestion should be fading. In September, the CPSC made conformance to UL 4200A, the standard for products incorporating button and coin cell batteries, mandatory to [comply with Reese’s Law](#), named for Reese Hamsmith, who lost her life at 18-months-old to accidental battery ingestion. By making it more difficult for batteries to fall out or be accidentally removed by children, the risk to young children will be reduced. Until then, look for battery compartments that use a screw or two-step process to open, rather than those that can easily pop open if dropped.

Virtual reality and augmented reality devices are another big item, with 6% of gift buyers saying there is one on their list to purchase. Our new standard for VR, AR, and mixed reality devices, [UL 8400](#), was recently released with input from major manufacturers including Apple, Microsoft, Meta, and Sony, as well as from government groups like CPSC. It will make these products safer for users, though it is new enough that products are not likely to be certified to the standard yet. However, you can look for features if buying a VR device that will keep the adults and teens — or mostly teens, as the recommendation is these should be for ages 12 and up — on your gift list safer in the real world.



In 2022 e-scooter and e-bike injuries increased nearly 21%, with children 14 years and younger more than twice as likely to be injured.

The standard specifically addresses issues like motion sickness, skin sensitivity, heat exposure to the eye, among other potential negative reactions. For consumers who want to buy VR headsets this season, make sure that the device fits the head well and offers a restricted use area to reduce the likelihood of falls or collisions. Following the manufacturer recommendations for appropriate ages and taking time to read the instructions for safe operation will also support protecting your gift recipient.



**1** **UL 588**  
The Standard for  
Seasonal and  
Holiday Decorations

**3** **UL 60730-2-7**  
The Standard for  
Automatic Electrical  
Controls for Timers

**5** **UL 1363**  
The Standard  
for Relocatable  
Power Taps

**7** **UL 127**  
The Standard  
for Factory-Built  
Fireplaces

**2** **UL 943**  
The Standard  
for Ground-Fault  
Circuit-Interrupters

**4** **UL/ULC 2115**  
The Standard for  
Processed Solid-  
Fuel Firelogs

**6** **UL 103**  
The Standard for  
Factory-Built  
Chimneys

**8** **UL 2358**  
Outline of Investigation  
for Fire Tests of Pre-Lit  
Seasonal Decorations

# Decorating

Nearly 161 million Americans say they typically decorate their homes with lights, trees, wreaths, menorahs, or all of the above for the holiday season.

One of the best ways to make sure your decorations sparkle — not spark — is to buy and use products that conform to safety standards. UL Standards & Engagement has standards for many of the electrical products that help to make the holiday season bright. However, sometimes even the safest products can have problems from inherent hazards or operator error. Safety standards are based on conditions — and those conditions do not include overloaded outlets or putting the tree inches from the fireplace.

## Maintain Holiday Trees All Season



Water natural trees daily and choose artificial trees that are fire resistant.



Employ a timer or turn off tree lights, as fires are more likely to occur at night.



Place trees at a safe distance from heat sources.

Christmas tree fires are a known risk, and fortunately, according to the [National Fire Protection Association](#), have enjoyed a downward trend over the years. With nearly 90 million Americans in our holiday safety survey saying they typically decorate their homes with a holiday or Christmas tree, NFPA's reported [average of 160 tree fires](#) per year is low. That said, being smart about what tree and décor to



87% of Americans who typically decorate report that they display a holiday tree

buy and how to use it correctly can drive that number even lower and ensure you are not contributing to a rare statistic.

The vast majority of holiday decorators typically display an artificial tree, but worryingly more than half (52%) say they did not check or are not sure if they checked to see if the tree had a “fire resistant” label on the package. Trees certified to UL 2358 will have been tested for response to fire, reducing the risk.

Fire resistant trees may also offer more time for escape if a fire occurs, particularly if it happens while you are asleep. NFPA reported that tree fires were most common between 3 p.m. and midnight.



# 54%

More than half of respondents said they would plug multiple power strips or extension cords together to connect their lighted decorations.



The placement of a tree can also influence safety. More than [two-in-five home decoration fires](#) happen because decorations are placed too close to a heat source like fireplaces or open-flame candles. The idyllic scene of the Christmas tree next to a roaring fire is achievable, provided the tree follows clearance requirements, which the NFPA puts at three feet. UL Standards & Engagement has standards for everything to keep your fire safe and cozy, from several standards that support building of safe chimneys and fireplaces to those that cover processed fire logs like Duraflame (UL 2115).

When it comes to lighting the home for the holidays, our holiday study found most Americans who decorate with string lights are making mostly good choices. Eighty percent say they typically inspect lights for broken sockets, frayed wires, or loose connections. Another 80% said the same for inspecting power strips and extension cords for damage. Nearly as many (77%) say they usually check to make sure outdoor lights are plugged into weatherproof, GFCI outlets, and 74% say they make sure their outside lighted decorations are certified for outdoor use.

The cause for concern, despite the behavior above being practiced by strong majorities, is that more than half (54%) said they typically plug multiple power strips or extension cords together to connect their lighted decorations, also known as “daisy-chaining.”

Consumers in the market for new indoor or outdoor holiday lights should be comforted to know that those certified to UL 588 are put through rain tests, water immersion tests, UV exposure tests, and several more.

### Display Sparkling Not Sparking Lights



Do not overload outlets and power strips or connect multiple power strips together, and choose weatherproof GFCI outlets for outdoor lights.



Inspect string lights, extension cords, and power strips for visible damage like frayed wires, broken sockets, or loose connections.



Ensure powered decorations are turned off when away from home or asleep.

## Seasonal Decoration Safety Practices

When putting up lighted holiday decorations, do you typically take any of the following actions?

Inspect lights for broken sockets, frayed wires, or loose connections

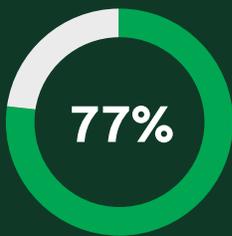
80%

Inspect power strips or extension cords for damage

80%

Use one or more light timers that automate on/off functionality for lighted decorations

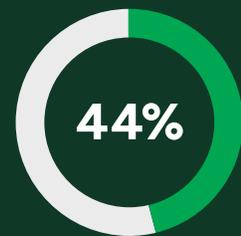
51%



Check to make sure outdoor lighted decorations are plugged into weatherproof outlets



Check to make sure outdoor lighted decorations are rated for outdoor use



Turn off power to the outdoor outlets before plugging in lighted outdoor decorations

## Lighted Decoration Purchasing Habits

**75%** I typically prefer to buy from well-known retailers

**64%** I typically prefer to buy from reputable brands

**44%** I typically prefer to buy the lowest price possible and not worry about what brand it is

**42%** I typically prefer to buy the highest quality and not worry about how much it costs



**1** **UL 217**  
The Standard for  
Smoke Alarms

**2** **UL 858**  
The Standard  
for Household  
Electric Ranges

**3** **UL 923**  
The Standard for  
Microwave Cooking  
Appliances

**4** **UL 1083**  
The Standard for House-  
hold Electric Skillets and  
Frying-Type Appliances

# Cooking

Nearly 178 million Americans typically head to the kitchen during the season to make a home-cooked holiday dinner or bake treats, aiming for the Norman Rockwell scene of family gathered around the table waiting to dig into a gorgeous spread. They are not aiming to gather on the lawn as fire trucks arrive.

Unfortunately, widely celebrated holidays correlate to [significant increases in home cooking fires](#), according to NFPA. Thanksgiving shows the highest rate of increase, 240% above the daily average of 430 home cooking fires. Christmas Eve is second at 72% higher than the daily average, closely followed by Christmas Day at 71% above average.

## Give Yourself the Gift of Warning



Confirm your smoke alarms and detectors are working properly and meet UL standards.



Test your smoke and carbon monoxide alarms monthly and change the batteries every six months.



Ensure portable generators are properly placed and have a carbon monoxide shutoff that conforms to UL 2201.

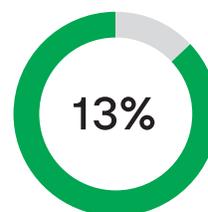
The vast majority (91%) of holiday home cooks have some form of smoke alarm near the kitchen, according to our holiday study. Chances are, those smoke alarms conform to UL standards — and specifically, UL 217 which is required by building codes in nearly [every state](#) in the U.S. UL 217 was first published in 1976, and has evolved to adapt to changing

## 2017-2021 Home Cooking Fires

Holiday	Fires	% Above Average
Thanksgiving	1,470	240%
Christmas Day	740	71%
Christmas Eve	740	72%
Daily Average	430	

home building and design techniques, new decorative materials, and, to the relief of holiday cooks, to account for [cooking nuisances](#). Smoke alarms should be installed at least 10 feet from cooking appliances to minimize false alarms while preparing meals or baking cookies for Santa.

While most kitchen areas are equipped with smoke alarms, whether they work is in question. Best practices are to test smoke alarms monthly, which 29% of the holiday cooks in our study confirmed doing. Far more, however, are not following that advice. Eighteen percent say they test only every few months; 21% say every six months; 19% say once a year or less. Concerningly, 13% of respondents admitted that they never tested (9%) their smoke alarms or didn't know how to test them (4%).



admit to not testing or knowing how to test their smoke alarm

To [test smoke alarms](#), press and hold the test button. If a loud, piercing sound does not follow, that can be an indicator the alarm is not working. It also helps to know what the various “beeps” mean. A three-pulse beep is the signal to get out of the home. Just one chirp means the battery is low.

Changing the batteries is also [recommended every six months](#). Fire professionals recommend that when you change the clocks for daylight saving time, it’s a good time to also change the batteries in your smoke alarms. Most respondents in our study are following the six-month recommendation, with 63% reporting they change their smoke alarm batteries every six months or more frequently. Another 20% say they change the batteries annually. There are, however, respondents willing to risk the dreaded chirp sound that will pull them from a long winter’s nap: 10% say they never change the batteries; 4% report doing it only every few years; and 3% say they don’t know how.

Where most holiday cooks said they have a smoke alarm near the kitchen, fewer than half (48%) said they had a carbon monoxide alarm. Carbon monoxide is found in fumes produced by furnaces, kerosene heaters, portable generators, and, importantly for holiday cooks, stoves and gas ranges. When these fumes occur, an alarm is often the first – and sometimes only – indication of a problem.

### Cook With Awareness



Stay in the kitchen while food is cooking or ask for help attending the stove and other appliances if you must walk away.

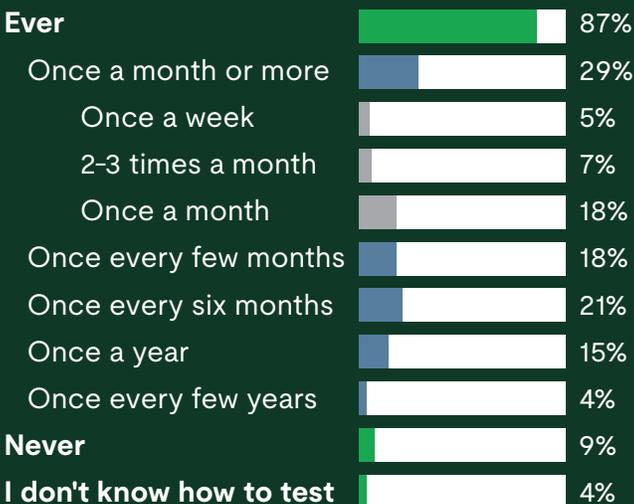


Use timers to remind you of when to turn off heat sources or to wake you up if you nod off.



Keep a fire extinguisher nearby in the kitchen and educate yourself on when to use it and when to get out of the home and call the fire department.

### Frequency of Testing Smoke Alarms



### Frequency of Changing Smoke Alarm Batteries



Winter weather can be part of the holiday experience, making celebrations look like a Currier and Ives print. Sometimes it can also lead to power outages. A portable generator can save your holiday plans by offering essential power. If you must use one, look for a generator that conforms to UL 2201. [The CPSC analyzed](#) 140,000 simulations of 511 incidents that resulted in generator fatalities and found that “generators compliant with the UL 2201 standard would avert nearly 100 percent of the deaths that occurred.”

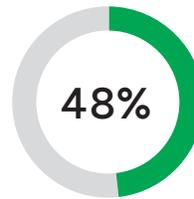
UL 2201 has requirements that limit the active CO emissions coming from the portable generator and a shutoff requirement if the product is sensing a high output of carbon monoxide. It is the layer of additional protection that can make sure that if the power goes out, you can still avoid raw turkey for your (candlelit) holiday feast.

Respondents to our study were near-universal in thinking that their gas or electric ovens were safe (98%). Caution is still necessary. NFPA data shows that most cooking fires in the home involve the stove, which is associated with 53% of the reported home cooking fires, 88% of cooking fire deaths, and 74% of cooking fire injuries.

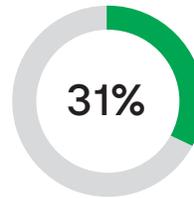
Those numbers do not mean the appliances are unsafe. Kitchen appliances conform to UL standards at high rates. There is, however, operator error and oversight to consider as part of the safety equation.

Lack of attention, whether from leaving cooking food unattended or falling asleep, can lead to tragedy. More than half (55%) of Americans who typically cook during the holidays say they do so with multiple adults. Beyond that, offers of help are common from those not preparing the meal. Give those sharing responsibility or offering to help the task of watching over the stove or other

## Holiday Cooks' Kitchen Safety



say they had a carbon monoxide alarm near the kitchen



say they do not have a fire extinguisher near their kitchen

appliances if you must walk away or are tired and need a nap.

Despite all precautions, fires do occasionally happen. Having a [fire extinguisher](#) — tested to UL 711 — handy for small flames can help get it under control. A majority (69%) of holiday cooks say they have a fire extinguisher in or near their kitchens, yet that leaves nearly one-third (31%) who do not.

Of those who have fire extinguishers at hand, 58% say they are certified to UL standards, with 33% saying they don't know, and another 9% saying they are not.

In addition to having an extinguisher present, it is also critical to know when a fire cannot be easily and quickly put out. In the event the fire is too large or growing, get out of the house and call the fire department immediately. No holiday meal is worth risking your life.

The [U.S. Fire Administration](#) has a checklist to help you know when to use a fire extinguisher vs. when to evacuate. It also has guidance on what type of fire extinguisher is best based on conditions around your home. Your local fire department is always a good resource for information and training on fire extinguishers.



**1** **UL 2056**  
The Standard for  
Power Banks

**2** **UL 2591**  
The Standard for  
Battery Cell Separators

**3** **UL 1642**  
The Standard  
for Lithium Batteries

**4** **UL 2034 | ULC 538**  
Standards for Carbon  
Monoxide Alarms

**5** **UL 2054**  
The Standard for Household  
and Commercial Batteries

# Traveling

Whether visiting family and friends or going on vacation, more than 91 million Americans say they typically travel during the holiday season, according to our study. Holiday travel offers the chance to reunite with loved ones, escape winter weather, or enjoy festive activities from skiing to visiting light displays.

Staying safe in transit and while you are at your destination will give you lasting memories of your experience that are merry, not scary.

## Take Care of Batteries When You Fly



Know the products you have with you that contain lithium-ion batteries, the warning signs of thermal runaway, and to alert a flight attendant if your device is stuck in your seat.



Never put devices containing lithium-ion batteries in your checked luggage; keep them within reach.



Avoid charging lithium-ion battery devices while in flight.

Of those travelers heading over the river and through the wood, many will do so by air this year. If you plan to fly to your holiday destination, it is easy to move through check-in without noticing the warning about lithium-ion batteries. In fact, many passengers may not know what lithium-ion batteries are, let alone what devices they may be powering that they have on them.

Many of the devices that make travel more enjoyable, such as earbuds, tablets, cellphones, and portable chargers, are powered by lithium-



of flyers have at least one device powered by lithium-ion batteries with them

ion batteries. An August 2023 UL Standards & Engagement study of American adults found that 97% of air travelers have at least one device powered by lithium-ion batteries with them when they fly. If the batteries are defective or damaged, there is danger of thermal runaway — scary anywhere, but more so at 40,000 feet.

These incidents are extremely rare. They are also largely avoidable. Increasing awareness of the issue and what to do if lithium-ion battery powered devices heat up during the flight will help reduce the risk.

Unfortunately, that August 2023 study also found a concerning number of flyers who said they put portable chargers in their checked luggage (26%) or in the overhead bin (29%). Another 30% said they put laptops in the overhead bin. Having devices out of reach increases the risk. Keep them with you so you have more time to react and prevent a dangerous situation.

Flight attendants are trained to handle thermal runaway incidents, ideally using containment bags certified to UL 5800. Earlier this year, a flight bound for New York was [forced to return](#) to San Diego when a passenger's battery pack ignited, but the actions of the crew prioritized the safety of those on board and averted the crisis. Later this year, [another flight](#) was forced to make an emergency landing after an e-cigarette plugged into a portable charger in the overhead bin caught fire.

Knowing the signs of thermal runaway can help you protect against danger. Warning signs may include: a battery area that is hot to the touch; a swollen battery; a burning or acrid odor; smoke or fumes; or popping or hissing noises. If you detect any of these signs, alert the flight crew immediately so they can place your device in a fire containment bag.

### Stay With Confidence



Ask your hotel or rental property if it has carbon monoxide alarms; if present, test the device when you arrive at your hotel.



Bring a portable carbon monoxide alarm with you when you travel.



Know the symptoms of carbon monoxide poisoning, including headache, dizziness, nausea, vomiting, and confusion.

Nearly three-quarters (73%) of travelers in our holiday study planning to go on vacation over the holidays say they plan to stay in a hotel or rental property. Traveling to hotels during the holidays should be a fun and festive experience,

and knowing how to mitigate risks helps ensure that it is. One of the most significant, albeit unlikely, risks is carbon monoxide poisoning.

UL Standards & Engagement has a long history of working to prevent carbon monoxide poisoning. In August this year, we expanded our [standard for carbon monoxide alarms](#) — UL 2034, Single and Multiple Station Carbon Monoxide Alarms — to give coverage to non-dwelling units, namely motels, restaurants, and other indoor locations that do not have more sophisticated detection systems installed.

Carbon monoxide is found in fumes produced by furnaces, kerosene heaters, vehicles in enclosed spaces, stoves and gas ranges, portable generators, pool heaters, and more. Detection is often the first, and sometimes only, means to prevent tragedy.

An odorless and colorless threat, carbon monoxide poisoning kills at least [420 people](#) and sends more than 100,000 to the emergency department in the U.S. each year. The numbers may be higher, as symptoms — which include headache, dizziness, nausea, vomiting, and confusion — are easily

## Knowing the signs of thermal runaway can help you protect against danger.



Battery area is hot to the touch



A swollen battery



A burning or acrid odor



Smoke or fumes



Popping or hissing noises

misdiagnosed. The change to UL 2034 was proposed by Kris Hauschildt, founder of the [Jenkins Foundation](#), which she established after her parents, Daryl and Shirley Jenkins, lost their lives to carbon monoxide poisoning in a hotel room in Boone, N.C.

Less than one-third (30%) of holiday travelers say they own a portable carbon monoxide alarm, and even they may not bring it with them on their trips.

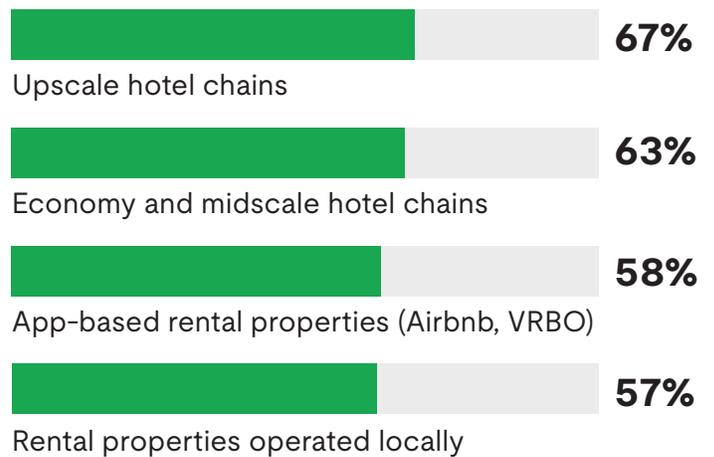
The low rates of ownership of portable carbon monoxide alarms may be the result of assumptions that hotels and rental properties have these systems in place. In fact, [only 14 states](#) require carbon monoxide detectors in hotels.

Still, a strong majority of travelers trust that the places they are staying have carbon monoxide alarms, particularly if they are staying in an upscale hotel chain, where 67% say they do not worry about exposure. The numbers are not much lower for economy and mid-scale hotel chains (63%) or for rental property platforms like Airbnb or VRBO (58%). Not only is that not a reliable assumption, even when [Airbnb offered free carbon monoxide alarms](#) to its hosts, a separate

study by public health researchers found that only 58% of the company's hosts had them installed.

Knowing before you travel if the hotel or rental property you have booked has carbon monoxide alarms or a detection system installed can help you determine if you should bring a portable alarm with you, offering peace of mind during the season of peace.

### Amount of respondents who trust that the following have CO alarms installed on their properties



63%

of travelers staying in a hotel or rental property say they do not give thought to whether or not where they are staying has CO alarms installed.



# Conclusion

The holidays are a special time. The gifting, decorating, cooking, and traveling traditions are core to what make them unique. It brings welcome changes to our behavior and at UL Standards & Engagement, we want those changes to be made with confidence in safety.

Deck those halls. Make grandma's stuffing. Find the perfect gift. Fly to loved ones. Everything that makes the holidays enjoyable can happen more safely when we have awareness of the risks and can take reasonable steps to mitigate them.

At UL Standards & Engagement, we are always working for a safer world — during the holidays and all year long.



We wish you a safe, joyful season  
and a happy New Year

## Methodology

### Holiday Study

*This UL Standards & Engagement Insights survey measures consumer understanding, behavior, and sentiment across four thematic areas related to the U.S. fall and winter holiday season – seasonal decorations, preparing holiday meals, gifting, and holiday travel.*

*All data points, unless otherwise noted, are from this nationally representative survey of 2,016 U.S. adults was designed by ULSE and administered online by BV Insights between October 6-8, 2023. The margin of sampling error at 95% confidence for aggregate results is +/- 2.2%.*

*Conversions of the data from percentages to number of online U.S. adults (using a reference base of 240.2 million) were created using two sources of publicly available data: (1) 2020 wave of the [U.S. Census](#) for U.S. adult population estimate of 258.3 million, and (2) Pew Research Center's [Internet/Broadband Fact Sheet](#) which estimates 93% of U.S. adults use the internet, as of 2021.*

### August 2023 Lithium-Ion Battery Study

*This survey was designed and formulated by UL Standards & Engagement. It presents the findings of an online survey administered by BV Insights, among a total sample of 2,024 U.S. adults between August 28-30, 2023. The margin of sampling error at 95% confidence for aggregate results is +/- 2.2%.*

# About Us

UL Standards & Engagement is a nonprofit standards development and advocacy organization that translates safety science into practical, action-oriented standards, from toasters to life jackets, and lithium-ion batteries to solar power.

The organization also serves as a vital resource for policymakers and shares knowledge, advances partnerships, and advocates for standards and policies to create a safer, more sustainable world.

## What is safety science?

Safety science engages ingenuity of top minds across scientific fields to engineer a safer and more sustainable world in which every individual can thrive.

## What is a standard?

A standard is a document of best practices for manufacturing and testing the safety, security, and sustainability of a product or system, developed and voted on by experts across industries and interests.

## How are standards developed?

UL Standards & Engagement convenes technical committees comprised of experts from manufacturing, government, academia, nonprofits, and other relevant groups to determine a standard. Technical committee members review proposals for new or revised standards and work together to achieve consensus through balloting in a fair and transparent process.

## What happens after a standard is published?

All standards are free to view. Manufacturers and innovators can develop products, which can then be tested and certified that they conform to our standards to ensure they are as safe as possible. UL Standards & Engagement is continuously monitoring and revising standards to address a changing risk landscape and emerging technologies.

## Fast Facts



1,700+ standards and documents in use today



4,000+ individuals serve on ULSE Technical Committees



40+ countries are represented through our Technical Committees



68 MOUs with agreements in 32 countries and three regions



ULSE is the only standards organization accredited to publish for the U.S., Canada, and Mexico



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