

<b>Product Responsibility Best Practices</b>	<b>SUBJECT</b> Technology Products: AudioVisual/Bluetooth®/Laser Pointers		<b>LAST UPDATE</b> July 2018
	<b>APPLIES TO</b> • Suppliers • Distributors	<b>FOCUS ON</b> The need for safety certification and what you must know when sourcing and selling audiovisual, Bluetooth® and laser pointer devices.	
	<b>QUICK LINKS</b> <ul style="list-style-type: none"> <li>• PPAI Corporate Responsibility: <a href="http://ppai.org/corporate-responsibility">http://ppai.org/corporate-responsibility</a></li> <li>• UL: <a href="http://industries.ul.com/premiums-promotional-and-licensed-goods">industries.ul.com/premiums-promotional-and-licensed-goods</a></li> <li>• Consumer Product Safety Commission: <a href="http://www.cpsc.gov">www.cpsc.gov</a></li> </ul>		<b>Intended for intermediate compliance programs</b>

*Italic grey text indicates a hyperlink listed in the Online Resources section of this document.*

## Audiovisual Background

Audiovisual devices are gaining in popularity as a segment of the tech product category. At the same time there are inherent risks that come with these products. Professionals in the promotional products industry that source and sell tech products must be aware of the risks and understand their obligation to follow the law, protect their customers brand and protect consumers from serious injury.

In order to mitigate issues that could lead to fines, liability claims, injury, and/or brand damage, it is important for companies to address the critical need for safety and certification when sourcing electronic products in today's complex regulatory environment. The absence of certification may open a company or individual to a product liability claim. This is the area of law in which the entire supply chain – manufacturers, distributors, suppliers, retailers, and others – are held responsible for the injuries caused by those products.

Products that fall within the audio/visual category include:

- Bluetooth® wireless devices
- Headsets/ear buds
- Vehicles
- Speakers
- Gaming devices
- Wearable devices
- TVs, cable boxes, cell phones and accessories

With all electronics there are inherent product safety risks to consumers that everyone in the supply chain has a responsibility to address prior to placing these products on the market. These potential safety issues include:

- Electrical shock or fire
- Burn hazards
- Radiation
- Implosion or explosion
- Mechanical instability
- Acoustic pressure (earbuds/headsets)
- Accessibility of coin/button cells and safety of Lithium-ion (Li-ion) batteries within these devices
- Large pool of users (children to business professionals)

## Audio/Visual Standards

Standard organizations like *ASTM*, *CSA Group*, *ISO*, *UL*, and others facilitate the development of voluntary standards for individual consumer products through voluntary standards committees. These committees bring together industry groups, technical experts, government agencies, and consumer groups to gain consensus on best practices for consumer product safety.

These voluntary standards are considered industry best practices or “industry consensus” standards. The most important thing to understand about voluntary standards is that there is nothing voluntary about them. Voluntary simply means they are not contained in a statute. Thus, they are not optional according to the *Consumer Product Safety Commission (CPSC)*.

Third-party certifications and safety standards for the workplace may be mandatory as required by *OSHA*. However, for the general public, there are few federal mandatory safety requirements. Most mandatory standards are those regulated state-by-state, military specification, or local jurisdiction.

There are several standards that were established to address electrical, mechanical, and fire safety. While they are all similar, each individual standard has slightly different requirements based on voltage ratings, current, and power source.

### Audio/Visual

There are international harmonized standards for audio/visual and other electronic devices. *UL/IEC 60065 - Standard for Audio, Visual and Similar Electronic Apparatus - Safety Requirements* and *UL/IEC 62368-1 - Audio/Visual, Information and Communication Technology Equipment - Part 1: Safety Requirements*. UL/IEC 60065 was developed by the *Consumer Technology Association (CTA)*, formerly the Consumer Electronics Association (CES), in response to field incidents involving injuries and fatalities of small children due to the ingestion of lithium coin/button cell batteries. UL/IEC 62368-1 covers the safety of electrical and electronic equipment within the field of audio, visual, information and communication technology, and business and office machines with a rated voltage not exceeding 600V.

### Bluetooth® Qualification and Declaration

Bluetooth® technology is the global wireless standard that enables connectivity between devices that allows the sharing of voice, data, music, and other information wirelessly. Companies must first *register with Bluetooth SIG*. Then qualification and declaration is a *two-step process* required for wireless devices that incorporate this technology and specialized testing (on a software and physical basis) to Bluetooth® requirements that is necessary to allow the product to carry the Bluetooth® trademark.

## Audio/Visual Certification And Markings

Knowing what to look for makes the difference when determining compliance. Your tech products must have identification marks to be in compliance. Many labs are authorized to and will use the UL standards when applying their own marking. Always check to ensure that your lab is accredited to provide the proper marking.

### Look for Product Markings

- Company name
- Model designation
- Electrical ratings
  - Capacity (mAh, Ah or Wh)
  - Rated Voltage
  - Frequency
  - Current or power
- Certification and regulatory marks

*Note: The CE Mark is a European conformance marking signifying compliance with certain requirements for products being sold in the European Union. A CE Mark is **not a safety certification** and is based on self-declaration rather than third-party testing.*

### UL Listing

The UL Mark is one of the most common certification symbols. Products that carry the UL Mark meet all UL's safety requirements for fire, shock, and electrical safety. There are three *UL Listing Mark* variations:

- United States only
- The C-UL Mark for Canadian only
- C-UL-US Mark for both Canadian and U.S. requirements.

### Recognized Testing Labs

*Nationally Recognized Testing Laboratories (NRTL)* are independent facilities that are recognized and accredited by the *Occupational Safety and Health Administration (OSHA)* to test products against consensus product safety standards developed by standards-writing bodies. NRTLs evaluate and test products to determine compliance and are authorized to place a Listed Mark to certify passing products. NRTLs are not always accredited to perform the same tests so it is important to work with each lab to determine whether they are recognized to certify and mark the product.

### Commonly recognized NRTLs include:

- Canadian Standards Association (CSA)
- Communication Certification Laboratory, Inc. (CCL)
- Curtis-Straus LLC (CSL)
- FM Approvals LLC (FM)
- Intertek Testing Services NA, Inc. (ITSNA)
- MET Laboratories, Inc. (MET)
- NSF International (NSF)

- QPS Evaluation Services Inc. (QPS)
- SGS North America, Inc. (SGS)
- Southwest Research Institute (SWRI)
- TUV SUD
- TUV Rheinland
- UL, LLC. (UL)

### Additional Markings

Other markings may include company name, model name, product designation, international marks for voluntary or mandatory testing (EMC, wireless, safety, etc.). There are special markings for rated voltage, frequency, alternating (AC) current, direct current (DC) or power. These symbols should be adjacent to the ratings.

Items that have a battery compartment, especially those that contain a button cell or a coin cell battery, require special markings or compartment warnings such as “No User-Serviceable Parts” or “Caution Risk of Electric Shock.”



Coin cell or button cell batteries can become lodged in the esophagus where, when in contact with tissue fluids, the batteries generate hydroxide through an electrolysis reaction. This hydroxide can cause alkaline burns and perforations of the esophagus. Serious injury may occur in as little as two hours.

### Bluetooth® Markings

Meeting Bluetooth® qualifications allows for use of the Bluetooth® markings. Qualification involves a *four-step process* and is completed using the.

1. Create a qualification project
2. Perform qualification testing
3. Create and store a compliance folder
4. Submit test evidence



### Laser Pointer Background

Laser pointers are used in a variety of applications, such as presentations, alignment (leveling), and entertainment. Unfortunately, they are often misused, which can create a serious injury risk.

Potential safety issues for laser pointers include:

- Laser power is consistent along beam path even at great distances (miles or kilometers). Distance from the original source does not diminish the laser's effect. The power is the same at a far distance as it is up close.
- Temporary visual problems (flash blindness)
- Possible eye injuries
- Possible skin burns (larger laser pointers)
- Large intended and unintended pool of users

### Laser Pointer Standards

United States laser safety requirements are controlled by the *Center for Devices and Radiological Health (CDRH)* branch of government under the FDA. Before a laser product can be sold, marketed, or imported into the U.S. it must be tested to *CFR 21 1010* and *CFR 21 1040*.

The laser safety requirements outside the U.S. fall under the international product standard *IEC 60825-1 – Safety of laser products – Part 1: Equipment classification and requirements*. Manufacturers are required to show that laser products meet the *International Electrotechnical Commission (IEC)* based laser safety requirements, equipment classification and provide user guidance.

*Note: These standards contain laser test methods, laser classification schemes, and requirements for laser labeling, laser construction features, and user manual content.*

Class	Description
1	Safe during use, including long term viewing
1M	Same as Class 1 except may be hazardous when viewing with optical instruments (binoculars, etc.)
2	Safe for momentary exposures but can be hazardous for deliberate staring into beam
2M	Same as Class 2 except may be more hazardous when viewing with optical instruments (binoculars, etc.)
3R	Can exceed maximum permissible exposure limits under direct viewing
3B	Normally hazardous under direct viewing
4	Hazardous under direct viewing and skin exposure.

*Laser Classification Scheme Basics (IEC 60825-1) provided courtesy of UL*

Typically, but not always, the laser pointers sold in the U.S. are a class 2 or a class 3R. The FDA sets limits for the power emitted by laser pointers to 5mW (milliwatt) or the equivalent to Class 3R. Other countries may have their own power limits for these devices (example: 1mW – equivalent to Class 2). Laser pointer manufacturers can self-certify compliance to the FDA laser requirements to indicate that they comply. However, the challenge with self-certification is that the product may not actually meet the requirements and thus will pose a risk. *National Institute of Standards and Technology (NIST)* research shows that many existing ‘self-certified’ laser pointers failed U.S. FDA legal laser power limits.

- 90% of green laser pointers failed
- 44% of red laser pointers failed
- One laser pointer emitted 66.5mW (limit = 5mW) - very dangerous

### Methods for Evaluating Laser Pointer Safety

Checking the safety of laser pointers could involve one or more of a variety of evaluation types based on the specific need--from laser power testing only to full certifications to the laser safety standards. Third-party testing confirms the manufacturer's FDA self-certification of laser power and compliance with FDA laser labeling and construction requirements. As a matter of best practice, retailers and distributors would be best served by requiring a third-party certified product or report documentation from the FDA that confirms the manufacturer's own FDA self-certification process.

A complete FDA or IEC 60825-1 laser safety report documents compliance with either the FDA or IEC 60825-1 laser product safety requirements inclusive of testing, classification, evaluation of labeling, construction, user manual, and additional requirements contained in the standard. The resulting reports can be used to help meet third-party check requirements for retailers, distributors and others that may require it. The FDA report can be used by laser pointer manufacturers to support and/or confirm their own FDA laser safety self-certification. The IEC 60825-1 laser safety report can show that the product meets the IEC-based laser safety requirements (for example, to support the CE Marking in Europe).

### Labels for Laser Pointers

Class 2 lasers are considered safe for normal operation. Class 2 lasers' output power is below 1mW. All Class 2 lasers emit visible light only. In Australia, the UK, and many other countries, only Class 2 lasers can be sold as “pointers” or for pointing purposes. In the U.S., pointers can also be Class 3R.



Class 3R lasers are considered safe when handled carefully. There is only a small hazard potential for accidental exposure. For visible-light lasers, Class 3R lasers' output power is between 1 and 4.99mW. Class 3R is essentially the same as the Roman numeral “Class IIIa” that you may see on some lasers' labels



### Canada - Laser Laws

Under the *Canada Consumer Product Safety Act (CCPSA)*, “it is prohibited to manufacture, import, advertise or sell any consumer product that poses an unreasonable hazard as a result of its normal or foreseeable use. Furthermore, under the *Radiation Emitting Devices Act*, it is prohibited to sell, lease or import into Canada a laser that creates a risk to any person of genetic or personal injury, impairment of health or death from radiation by reason of the fact that it either does not perform according to the characteristics claimed for it, does not accomplish its claimed purpose, or emits radiation that is not necessary in order for it to accomplish its claimed purpose.” As a result, in order to manufacture, advertise, sell, import or lease hand-held lasers or laser pointers in Canada, they must be classified as Class 3R/IIIa or less.

### Summary

It is important for companies to understand the complex regulatory environment surrounding all tech products. This will help avoid any delays that could lead to additional fines, liability, or brand damage. In order to ensure the standards have been applied for a particular product and to protect consumers always insist on certified tech products from your suppliers and factories. Look for markings and identification: model number, ratings, file number or other unique identifier.

**Online Resources:****ASTM:** <http://www.astm.org/>**CSA Group:** <http://www.csagroup.org/>**ISO:** <http://www.iso.org/iso/home.html>**UL Standards:** <http://ulstandards.ul.com/>**Nationally Recognized Testing Laboratory (NRTL):**<https://www.osha.gov/dts/otpcanrl/>**Current List of NRTLs:** <https://www.osha.gov/dts/otpcanrl/nrtl/nrtllist.html>**UL 60065:** [http://ulstandards.ul.com/standard/?id=60065\\_7](http://ulstandards.ul.com/standard/?id=60065_7)**UL 62368-1:** [http://ulstandards.ul.com/standard/?id=62368-1\\_1](http://ulstandards.ul.com/standard/?id=62368-1_1)**Designing for Compliance to IEC 62368-1 2nd Edition:****Transition from IEC 60950 & IEC 60065:** <http://industries.ul.com/events/designing-for-compliance-to-iec-62368-1-2nd-edition-transition-from-iec-60950-iec-60065>**Bluetooth® Standards Testing Service Information:** [http://www.ul.com/global/documents/verificationservices/businesssegments/W-EMC/sell%20sheet\\_Bluetooth%20Qualification.pdf](http://www.ul.com/global/documents/verificationservices/businesssegments/W-EMC/sell%20sheet_Bluetooth%20Qualification.pdf)**Brief Tutorial on Bluetooth®:**<https://www.bluetooth.com/develop-with-bluetooth/build>**General UL.com Bluetooth® Site:**<http://industries.ul.com/wireless/bluetooth>**Safety Standards for Audio Visual Equipment (UL/IEC 60065; UL/IEC 62638):**<http://ulstandards.ul.com/standard/?id=60065><http://ulstandards.ul.com/standard/?id=62368-1&edition=2&doctype=ulcsaiec><http://industries.ul.com/blog/iec-62368-1-based-standards-updates><http://industries.ul.com/blog/why-iec-62368-1-prepare-for-the-transition>**Center for Devices and Radiological Health (CDRH):** <http://www.fda.gov/AboutFDA/CentersOffices/OfficeofMedicalProductsandTobacco/CDRH/>**CFR 21 1010:** <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=1010>**CFR 21 1040:**<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/cfrsearch.cfm?FR=1040.10>**International Electrotechnical Commission (IEC):**<http://www.iec.ch/>**IEC 60825-1:** <https://webstore.iec.ch/publication/3587>**National Institute of Standards and Technology (NIST):**<http://www.nist.gov/>**NIST Self-Certifying Laser Pointer Research:**<http://www.nist.gov/pml/div686/pointer-032013.cfm>**Laser Pointer Safety Testing Service Information:**[http://www.ul.com/global/documents/offerings/industries/hightech/resources/laser/LaserPointerSafety\\_sellsheet\\_final.pdf](http://www.ul.com/global/documents/offerings/industries/hightech/resources/laser/LaserPointerSafety_sellsheet_final.pdf)**Compliance Need for Laser Pointers is on the Rise:**<http://industries.ul.com/blog/compliance-need-for-laser-pointer-is-on-the-rise>**General UL.com Optical Radiation Site:**<http://industries.ul.com/consumer-technology/optical-radiation>**Laser Safety Facts Site (independent site):**<http://www.lasersafetyfacts.com/>**FDA Information on Radiation-emitting Products:**<http://www.fda.gov/Radiation-EmittingProducts/><http://www.fda.gov/oc/ohrt/GettingaProducttoMarket/default.htm>**MIL-STD-461 (U.S. Military Standard that describes how to test equipment for electromagnetic compatibility):**<http://snebulos.mit.edu/projects/reference/MIL-STD/MIL-STD-461E.pdf>**FCC Rules and Regulation Information, FAQs:** <https://www.fcc.gov/encyclopedia/equipment-authorization><https://www.fcc.gov/encyclopedia/rules-regulations-title-47><https://www.fcc.gov/encyclopedia/rules-regulations-title-47>**Consumer Product Safety Commission**<http://www.cpsc.gov/Business--Manufacturing/Testing-Certification/FAQs-Certification-and-Testing-for-General-Use-or-Non-Childrens-Products/><http://www.cpsc.gov/en/Business--Manufacturing/Testing-Certification/General-Use-Products-Certification-and-Testing/><http://www.cpsc.gov/Regulations-Laws--Standards/Regulations-Mandatory-Standards-Bans/#L>**RoHS FAQs:** <http://www.rohsguide.com/rohs-faq.htm>**Proposition 65:** <http://oehha.ca.gov/prop65/p65faq.html>**Hand-held Lasers or Laser Pointers in Canada:** <http://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2012/15008a-eng.php>**FDA Illuminating the Hazards of Powerful Laser Products:**<http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm166649.htm>

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