New Requirements Support Enhanced Safety for UVC Robotics

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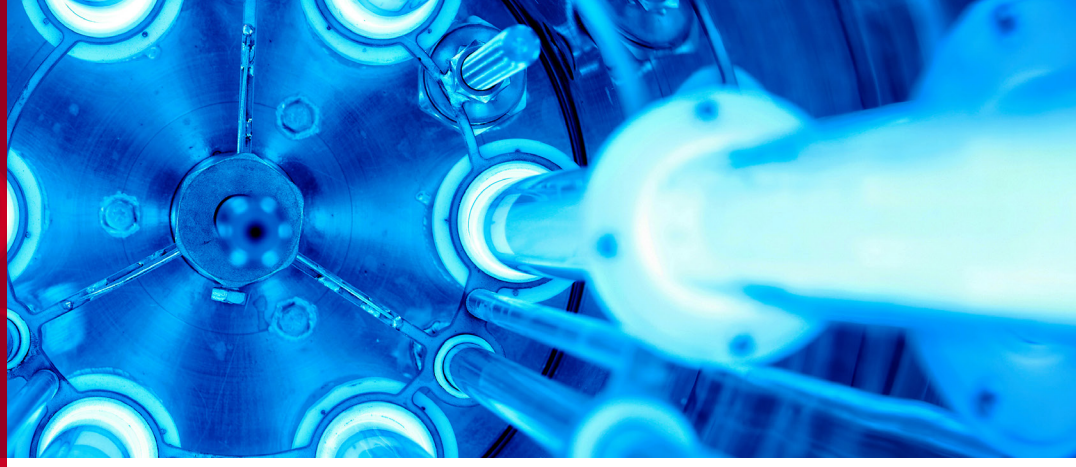

The COVID-19 pandemic highlighted the effectiveness of sanitization in preventing and containing the spread of infectious diseases. Ultraviolet (UVC) disinfection robots can help. Until now, UVC robots are typically certified to existing safety standards for luminaires and other electrical equipment. But mitigating the safety and reliability risks of this innovative technology may not always be fully addressed with existing standards.

UL 60335-2-2019, Outline of Investigation (OOI) for Robotic Germicidal Equipment, provides a set of requirements that specifically address UVC disinfection robots. Its holistic approach provides a total solution by including requirements to evaluate the robot base, UVC ultraviolet light exposure, electrical safety, wireless sensors and other critical safety systems.

Who can benefit?

Interest in technologies such as robotic devices that perform surface and air sanitizing functions using UVC radiation is growing — for both industrial and commercial applications. UVC radiation is used to supplement — not replace — physical disinfection. It is typically used to help create a safer environment in:

- Industrial and commercial buildings
- Schools
- Hotel rooms and conference spaces
- Transportation facilities and systems
- Other similar environments

First and only Outline of Investigation in the world

UL 60335-2-2019 is the first and currently only OOI in the world to specifically address UVC disinfection robots. Voluntary testing to UL 60335-2-2019 can benefit companies that make robotic germicidal equipment for commercial and similar use, university and research institutions, commercial businesses looking for a compliant solution to assist with their disinfection protocols, companies specializing in UVC disinfection products, and businesses that wish to include UL certification to UL 60335-2-2019 in their purchase requirements for these product types.

The requirements for evaluation include:

- Entire robot device - UL 60335-2-2019
- Electrical and mechanical – UL 60335-1, the Standard for Safety of Household and Similar Appliances, Part 1: General Requirements
- Electrical and mechanical – Robotic base: UL 62368-1, the Standard for Audio/video, information and communication technology equipment - Part 1: Safety requirements, and UL 3300, Outline of Investigation for Service, Communication, Information, Education and Entertainment Robots
- Electromagnetic compatibility (EMC) – IEC 61000-4, Electromagnetic compatibility (EMC) – Part 4 series: Testing and measurement techniques
- Remote software update capability– UL 5500, the Standard for Safety for Remote Software Updates
- Control Safety– UL 60730-1, the Standard for Automatic Electrical Controls - Part 1: UV radiation assessment and emissions limitation
- Sensor performance requirements for object detection and motion sensing
- Important instructions for use for the skilled staff trained in using this equipment
- UV-related safeguards – In addition to UL 60335-2-2019, UL has helped to develop requirements for a variety of UV related products, such as UL 8802, Outline of Investigation for UV Germicidal Equipment and Systems, and UL 8803, Outline of Investigation for Portable UV Germicidal Equipment With Uncontained UV Sources

Standards used for testing and evaluation

Robotic Germicidal Equipment: UL 60335-2-2019

Conjunction Standards	Robotic base	Critical components and evaluations (Highlighted)	UV related requieremements
#Electrical and Mechanical: UL 60335-1	Mobility and Safeguards: UL 3300	Control (UV and robotic base related) UL60730	UV radiation assessment and emissions limitation
	Power and Battery: UL 62368-1	Electromagnetic Immunity (EMI): IEC 61000-4 series	Sensor performance requirements for object detection and motion sensing
	Conjunction Standards	Remote software update. UL 5500 [if provided]	Important instructions for use for the skilled staff trained in using this equipment
	#Electrical and Mechanical: UL 62368-1		

Note: Combine evaluation to minimize duplicated tests.

Parts to be evaluated by this new OOI are:

- Overall equipment, except as noted elsewhere in this table
- Ozone assessment
- Photobiological assessment
- Enclosures of overall equipment
- UVC radiation effect on non-metallic materials
- Wireless control
- Motion detectors (human sensors, etc.)
- Robot base
- Object detection and avoidance (obstacle sensors, braking sensors, etc.)
- Emergency stop functions
- Motors
- Battery and charging stations
- Emitters

Why UL?

In addition to UL 60335-2-2019 being the only Outline of Investigation like it in the world, the UL Mark is one of the most widely recognized and trusted symbols of safety for manufacturers and consumers globally. It gives UL Certified products a safer path to market acceptance. UL's worldwide presence allows us to provide local service in different languages around the globe, as well as giving you access to our collaborative network of safety, regulatory and engineering experts.

To learn more about testing and certifying your UVC disinfection robot products, visit us at https://www.ul.com/services/uvc-disinfection-robots

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