



Mastering CO emission control with UL 2201 testing for portable generators



Safety. Science. Transformation.™

UL 2201: Driving safety against carbon monoxide emissions

Consider this scenario. A storm brings power outages to an urban area and a prepared homeowner places a new gasoline-fueled portable generator assembly to the front of the garage and then starts it to supply electrical power to key equipment in the home. A few minutes later, the generator assembly stops, and the residence is again without power. What's right here? The UL Certified portable generator assembly's engine shut down before carbon monoxide (CO) accumulated to dangerous levels in the surrounding air.

Why UL 2201, the Standard for Carbon Monoxide (CO) Emission Rate of Portable Generator Assemblies

The U.S. Consumer Product Safety Commission (CPSC) has identified an unreasonable risk of injury and death from CO poisoning associated with portable generator assemblies. To enhance safety, UL Standards and Engagement has developed a Standard that requires equipping portable generator assemblies with a system that shuts down their engines when elevated CO concentrations are present. In addition, UL 2201, the Standard for Carbon Monoxide (CO) Emission Rate of

Portable Generators, specifies a requirement to limit carbon monoxide emissions from generator engines.

In 2019, the U.S. CPSC reported that in 140,000 simulations of 37 different residential models with various generator locations and sizes, and when the generator was compliant with the shut off requirements outlined in UL 2201, “nearly 100 percent” of CO-related fatalities were averted.¹ Following these findings, the CPSC has proposed federal regulations featuring stricter emissions testing for regulated portable generators. The Commission estimates that, over a 30-year period, its rule would prevent “2,148 deaths (nearly 72 deaths per year) and 126,377 injuries (roughly 4,213 injuries per year).” In addition, every dollar in implementation costs will produce more than \$7 in benefits, totaling more than \$1 billion annually from mitigated deaths and injuries.²

UL 2201 specifies a wide margin of safety across diverse operating conditions, leading it to become a definitive guide for evaluating portable generator safety. The Standard applies a comprehensive two-tier strategy to combat CO safety concerns, with significant emission reductions and an advanced shut-off mechanism requirement.

¹ Federal Register / Vol. 88, No. 76 / Thursday, April 20, 2023 / Proposed Rules / p 24352 <https://www.federalregister.gov/d/2023-07870/p-100>. Accessed 10/18/2024
Ibid. p24346. <https://www.federalregister.gov/d/2023-07870/p-3>. Accessed 10/18/2024.

² Ibid. p 24362. <https://www.federalregister.gov/d/2023-07870/p-36>. Accessed 10/18/2024.



UL certification services for portable generators

Our UL 2201 certification services address the critical issue of CO emissions and provides manufacturers with confidence that their products meet the safety requirements specified in the Standard. To confirm UL 2201 compliance, a manufacturer's portable generator assembly is subjected to carbon monoxide testing in a standardized enclosed space under specified environmental conditions. Aspects of the testing process include:

- Confirming that the portable generator assembly's carbon monoxide emission rate does not exceed 150 grams per hour.
- Running the portable generator assembly through operating scenarios under differing conditions and loads to assess whether it turns the portable generator assembly engine off when CO concentrations exceed test method limits.

With over a decade of experience in assessing the performance safety of portable generator assemblies, UL Solutions offers reliable testing services to assess product safety to applicable requirements. The breadth of our experience enables UL Solutions' experts to work closely with manufacturers on adhering to safety standards and streamlining pathways to compliance.

Why choose UL certification?

UL Solutions is a globally recognized testing and certification partner committed to enhancing public safety and facilitating international trade. Our extensive expertise, impartiality and worldwide presence can assist you in achieving approvals for portable generator assemblies in the global marketplace.

- **Speed to market**

UL Solutions experts play an integral role in the technical committees that develop a multitude of standards, including UL 2201. For innovative products that do not align with existing standards, UL Solutions' Outlines of Investigation summarize safety requirements that you can follow to enter the market swiftly while adhering to safety protocols.



This European model is intended solely for display purposes.

Over a 30-year period, UL 2201 compliance is projected to prevent

**72 deaths and
4,213 injuries
per year,**

delivering more than \$1 billion in annual benefits.



- **Access to compliance expertise**

UL Solutions' experts possess in-depth knowledge of regulatory requirements. Our team of capable staff can guide manufacturers through the certification of products. By partnering with UL Solutions, a manufacturer can streamline delivery of a UL 2201 Certified technology to the marketplace while promoting carbon monoxide emission safety in compliance with industry standards.

- **Accreditation and experience**

UL Solutions is a Nationally Recognized Testing Laboratory (NRTL). Because our experts participate in a range of safety code panels, they bring a broad understanding of emerging code issues to the product certification process.

Our UL 2201 testing services include:

- CO emission rate determination
- Evaluation of shut-off capability in elevated CO environments
- Additional test programs as required for engines
- Performance testing under specified conditions
- Compliance with Federal Regulations (CFR) 40, parts 1054 and 1065
- Compliance with ANSI/UL safety standards

In addition, UL Solutions offers flexibility to provide custom test programs to support manufacturers in optimizing product design for safety. As part of our mission to promote safer living and working environments, our services and UL 2201 provide a definitive guide for evaluating portable generator assembly safety.