



# Combustion Testing

Performing certifications, serving as technical experts on codes and standards, and creating new requirements for new technologies

*UL has been in the combustion testing and certification business for over 80 years. Located in the US and Canada, UL's new state-of-the-art combustion laboratories provide a variety of testing services for combustion appliances and is a one-stop-shop for safety, performance, and reliability testing.*

## Combustion Testing Capabilities (Natural Gas, Propane, Butane, Blended Gases, Fuel-Oil, & Solid-fuel)

- Global Safety Certification
- Global Energy Efficiency regulations
- ENERGY STAR®
- Custom performance testing

## Combustion Appliances and Equipment

- Burners
- Boilers
- Water Heaters
- Furnaces
- Unit Heaters
- Construction Heaters
- Heavy Duty Heaters
- Domestic Cooking Appliances
- Food Service Equipment
- Outdoor Cooking Appliances
- Hearth Products
- Barbeque Grills
- Patio Heaters & Decorative Appliances
- Camping Equipment
- Clothes Dryers

## State-of-the-Art Facility

- Test capabilities of up to 2,500,000 Btu/hr input rating
- Hydronic test capabilities of up to 50 gpm water flow
- Precisely controlled environmental conditions
- 50 or 60 Hz
- 0 to 480 VAC
- 0 to 100 Amps



For more information, please contact [UL.ProductEngineering@ul.com](mailto:UL.ProductEngineering@ul.com)

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## State-of-the-Art Equipment

- Mass flow meter measurement for water flow
- RTD temperature measurement
- Power analyzing with standby power measurement
- Automated data acquisition system
- Combustion analysis including CO, CO<sub>2</sub>, O<sub>2</sub>, and NO<sub>x</sub>
- Gas chromatograph and gas calorimeter capability
- Water hardness adjustment
- Gas Mixing System to provide a variety of test gases

## Product Safety Standards

- |                     |                    |                                       |
|---------------------|--------------------|---------------------------------------|
| • CSA B140.0        | • UL 791           | • Z21.61                              |
| • CSA B140.2.1      | • UL 795           | • Z21.63/CSA 11.3                     |
| • CSA B140.4        | • UL 2096          | • Z21.72/CSA 11.2                     |
| • CSA B140.7        | • UL 2790          | • Z21.73/CSA 11.1                     |
| • CSA B140.12       | • Z21.1            | • Z21.84                              |
| • CSA C22.2 No. 110 | • Z21.10.1/CSA 4.1 | • Z21.86/CSA 2.32                     |
| • CSA C22.2 No. 165 | • Z21.10.3/CSA 4.3 | • Z21.88/CSA 2.33                     |
| • CSA CAN1-3.1      | • Z21.13/CSA 4.9   | • Z21.89/CSA 1.18                     |
| • CSA/CGA 3.4       | • Z21.17/CSA 2.7   | • Z21.96/CSA 11.6                     |
| • UL 174            | • Z21.47/CSA 2.3   | • Z83.11/CSA 1.8                      |
| • UL 1453           | • Z21.5.1/CSA 7.1  | • Z83.18                              |
| • UL 834            | • Z21.5.2/CSA 7.2  | • Z83.19/CSA 2.35                     |
| • UL 295            | • Z21.50/CSA 2.22  | • Z83.20/CSA 2.34                     |
| • UL 296            | • Z21.56/CSA 4.7   | • Z83.4/CSA 3.7                       |
| • UL 296A           | • Z21.57           | • Z83.8/CSA 2.6                       |
| • UL 726            | • Z21.58/CSA 1.6   | • Other Standards as needed/requested |
| • UL 732            | • Z21.60/CSA 2.26  |                                       |

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## ENERGY STAR® & Performance Testing

### Boilers

- 10 CFR Part 430, Subpart B, Appendix N (Electronic Code of Federal Regulations)
- ASHRAE 103 Method For Testing For Annual Fuel Utilization Efficiency Of Residential Central Furnaces And Boiler
- IEC 62301 Household electrical appliances – Measurement of standby power. This is applicable to multiple types of products. Boilers, Furnaces, Dishwashers, Clothes Washers and Dryers.
- CSA P.2 Testing method for measuring the annual fuel utilization efficiency of residential gas-fired or oil-fired furnaces and boilers
- 10 CFR Part 431, Subpart E (Electronic Code of Federal Regulations)
- 10 CFR Part 431, Subpart G (Electronic Code of Federal Regulations)
- BTS-2000 Method to Determine Efficiency of Commercial Space Heating Boilers

### Furnaces

- 10 CFR Part 430, Subpart B, Appendix N (Electronic Code of Federal Regulations)
- 10 CFR Part 430, Subpart B, Appendix AA (Electronic Code of Federal Regulations)
- ASHRAE 103 Method For Testing For Annual Fuel Utilization Efficiency Of Residential Central Furnaces And Boilers
- CSA P.2 Testing method for measuring the annual fuel utilization efficiency of residential gas-fired or oil-fired furnaces and boilers

### Clothes Dryers

- 10 CFR 430, Subpart B, Appendix D (Electronic Code of Federal Regulations)
- 10 CFR 430, Subpart B, Appendix D1 (Electronic Code of Federal Regulations)
- 10 CFR 430, Subpart B, Appendix D2 (Electronic Code of Federal Regulations)
- CAN/CSA C361 – Test Method for Measuring Energy Consumption and Drum Volume of Electrically Heated Tumble-Type Clothes Dryers
- CAN/CSA P.5 – Test Method for measuring per-cycle energy consumption of residential gas clothes dryer

### Water Heaters

- 10 CFR Part 430, Subpart B, Appendix E (Electronic Code of Federal Regulations)
- 10 CFR Part 431, Subpart G (Electronic Code of Federal Regulations)
- CSA P.3 Testing Method for Measuring Energy Consumption and Determining Efficiencies of Gas-Fired Storage Water Heaters
- IEC 60379 Methods for Measuring the Performance of Electric Storage Water-Heaters for Household Purposes

### Pool Heaters

- 10 CFR Part 430, Subpart B, Appendix P (Electronic Code of Federal Regulations)

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## Contributory Services

- Reliability Engineering Services
- Life Testing
- Accelerated Life Testing
- Highly Accelerated Life Testing
- Multi-Environment Over-Stress Testing
- Prototyping
- Food Equipment Sanitation Services
- Performance and Health Effects Testing for Plumbing Products
- Functional Safety
- Environmental Product Declarations, Advisory Services and Claims Validations.
- Indoor Air Quality assessment & measurement
- Custom Training & Knowledge Services
- Regulatory and Compliance Essentials training courses.
- Limited Production Certification Services
- Workplace safety expertise
- Extensive In-House EHS Course Library
- Software solutions for occupational medicine clinics, health professionals, and EHS Management.