HVAC/R EQUIPMENT

Energy Efficiency Testing for HVAC/R
Helping you comply with energy efficiency regulatory programs

As global demand for energy consumption continues to increase, the race to build more energy efficient products intensifies. HVAC/R equipment manufacturers in particular are being pressured to meet more demanding mandatory efficiency regulations in North America, and around the world. UL offers you the testing services you need to clear the path to energy efficiency compliance while helping you design next-generation products that keep you ahead of the curve.

Energy efficiency evaluations by UL

UL provides HVAC/R manufacturers with expanded energy efficiency compliance solutions for Department of Energy (DOE), California Energy Commission (CEC), National Resources Canada (NRCan), (AHRI) Air-Conditioning, Heating, and Refrigeration Institute, State of Kuwait, (MEW) Ministry of Electricity & Water, and other global regulatory requirements. In addition, UL is an EPA-recognized CB and EPA-recognized Laboratory for the enhanced ENERGY STAR® program. Our scope for energy efficiency testing for HVAC/R equipment, as well as R&D prototype testing for HVAC/R equipment, includes:

- Unitary air-conditioning and air-source heat pump equipment
- Package terminal air-conditioners and heat pumps
- Water source heat pumps
- Ground source closed-loop heat pumps
- Commercial and industrial unitary air-conditioning and heat pump equipment
- Commercial and industrial unitary air-conditioning condensing units
- Single package vertical air-conditioners and heat pumps
- Force-circulation air-cooling and air-heating coils
- Room fan-coils
- Water-chilling packages using the vapor compression cycle
- Automatic commercial ice-makers
- Ice storage bins
- Direct geoexchange heat pumps
- Indoor pool dehumidifiers
- Heat pump pool heaters
- Commercial refrigerated display merchandisers and storage cabinets
- Mini-split air-conditioning and heat pump equipment

For more information please contact, email HVACinfo@ul.com or call 1.630.736.7500
State-of-the-art facility

Located in the Metro-Dallas area, UL’s energy efficiency test center is a modern, high-tech center of excellence staffed by experts with years of experience in the HVAC/R industry. The 33,000 square-foot facility carries the latest equipment and full test capabilities including:

- Multi-chamber psychrometric testing (5 dual-cell chambers)
- Max HVAC testing capacity up to 30-tons
- Air-to-water and water-to-water cooled testing capabilities
- International or domestic powered units
- Single or three phase
- 50 or 60 Hz
- 0 to 700 VAC
- 0 to 210 Amps
- Fan or blower RPM readings
- Total input power readings including Volts, Amps, Watts, & Frequency
- Individual components Volts, Amps, and Watts readings
- Total or individual component watt-hours
- Chamber temperature ranges from -10ºF to 135ºF
- Airflow measurements up to 12,000 CFM
- Water flow rate up to 90 gallons per minute
- Refrigerant flow rate up to 250 lbs. per minute
- Maximum of 16 pressure transducers per room
- Up to 384 individual thermocouple readings
- Data collection speeds up to 2 seconds
- Private offices for visiting clients with secure internet, phone, and remote viewing of tests being performed
- Remote real-time data tracking, chat communication, and observation of tests being performed via the internet for customers world wide

Full suite of compliance solutions for your HVAC/R equipment

UL can create customized assessment services to suit your needs.

- Testing in accordance to a variety of HVAC/R industry standards and programs
- Full-service research and development capability for product prototype testing
- Performance validation for pre-compliance testing or benchmarking
- Bundled compliance solutions available at the same location energy efficiency testing is performed: product safety certification testing and international certifications

State-of-the-art instrumentation

- Micro Motion Coriolis Flow Meters
- Rosemount Differential Pressure Transmitters
- National Instruments Data Acquisition Systems
- LabVIEW System Design Software
- Yokogawa Power Analyzing Equipment
- Staco Variable Transformers

List of ISO 17025 accredited HVAC/R performance standards and programs

**ENERGY STAR® Program Requirements**

- Commercial Ice Machines
- Commercial Refrigerators and Freezers
- Dehumidifiers
- Geothermal Heat Pumps
- Light Commercial HVAC
- Refrigerated Beverage Vending Machines
- Residential Air Source Heat Pump (ASHPs) and Central Air Conditioner Equipment

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• Residential Refrigerators and/or Freezers
• Water Coolers

**Code of Federal Regulations**

• 10 CFR 430, Subpart B, Appendix A — Energy Consumption of Electric Refrigerators and Electric Refrigerator-Freezers
• 10 CFR 430, Subpart B, Appendix A1 — Energy Consumption of Electric Refrigerators and Electric Refrigerator-Freezers
• 10 CFR 430, Subpart B, Appendix B — Energy Consumption of Freezers
• 10 CFR 430, Subpart B, Appendix B1 — Energy Consumption of Freezers
• 10 CFR 430, Subpart B, Appendix M — Energy Consumption of Central Air conditioners and Heat Pumps
• 10 CFR 430, Subpart C — Commercial Refrigerators, Freezers and Refrigerator-Freezers
• 10 CFR 430, Subpart F — Commercial Air Conditioners and Heat Pumps
• 10 CFR 430, Subpart H — Automatic Commercial Ice Makers
• 10 CFR 430, Subpart Q — Refrigerated Bottled or Canned Beverage Vending Machines

**Air-Conditioning, Heating, and Refrigeration Institute Standards**

• AHRI 210/240 — Unitary Air-Conditioning and Air-Source Heat Pump Equipment
• AHRI 310/380 — Packaged terminal Air-Conditioners and Heat Pumps
• AHRI 320 — Water-Source Heat Pumps
• AHRI 325 — Performance and Calibration of Reference Sound Sources
• AHRI 330 — ground Source Closed-Loop Heat Pumps
• AHRI 340/360 — Commercial & Industrial Unitary Air-Conditioning and Heat Pump Equipment
• AHRI 365 & 366 — Commercial and Industrial Unitary Air-Conditioning Condensing Units
• AHRI 390 — Single Package Vertical Air-Conditioners and Heat Pumps
• AHRI 410 — Forced-Circulation Air-Cooling and Air-Heating Coils
• AHRI 440 — Performance Rating of Room Fan-Coils
• AHRI 550/590 — Water-Chilling Packages Using the Vapor Compression Cycle
• AHRI 810 — Performance Rating of Automatic Commercial Ice-Makers
• AHRI 820 — Ice Storage Bins
• AHRI 870 — Performance Rating of Direct Geoexchange Heat Pumps
• AHRI 910 — Performance Rating of Indoor Pool Dehumidifiers
• AHRI 1160 & 1161 — Performance Rating of Heat Pump Pool Heaters
• AHRI 1200 & 1201 — Commercial Refrigerated Display Merchandisers and Storage Cabinets
• AHRI 1230 — Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning & Heat Pump Equipment

**American Society of Heating, Refrigerating and Air-Conditioning Engineers Standards**

• ASHRAE 20 — Method of testing for Rating Remote Mechanical-Draft Air-Cooled Refrigerant Condensers
• ASHRAE 29 — Methods of testing Automatic Ice Makers
• ASHRAE 30 — Method of testing Liquid-Chilling Packages
• ASHRAE 32.1 — Methods testing for Rating Vending Machines for Sealed Beverages
• ASHRAE 33 — Method of testing Forced Circulation Air Cooling and Air Heating Coils
• ASHRAE 37 — Methods of testing for Rating Unitary Air-Conditioning and Heat Pump Equipment
• ASHRAE 41.1 — Standard Method for temperature Measurement
• ASHRAE 41.2 — Standard Methods for Laboratory Airflow Measurement
• ASHRAE 41.3 — Standard Method for Pressure Measurement
• ASHRAE 41.6 — Standard Method for Measurement of Moist Air Properties
• ASHRAE 41.7 — Method of test for Measurement of Flow of gas
• ASHRAE 41.10 — Standard Methods for Volatile-Refrigerant mass Flow Measurements Using Flow Meters
• ASHRAE 72 — Method of testing Commercial Refrigerators and Freezers
• ASHRAE 79 — Method of testing for Rating Fan-Coil Conditioners
• ASHRAE 116 — Methods of testing for Rating Seasonal Efficiency of Unitary Air Conditioners and Heat Pumps
• ASHRAE 128 — Method of Rating Unitary Spot Air Conditioners
• ASHRAE 133 — Method of testing Direct Evaporative Air Coolers
• ASHRAE 146 — Methods of testing and Rating Pool Heaters
• ASHRAE 13256-1 — Water-Source Heat Pumps – Water-to-Air and Brine-to-Air Heat Pumps
• ASHRAE 13256-2 — Water-Source Heat Pumps – Water-to-Water and Brine-to-Water Heat Pumps

Saudi Arabian Standard Organization Standards
• SASO 2663 — Energy Labeling And Minimum Energy Performance Requirements For Air-Conditioners
• SASO 2664 — Energy Performance And Capacity Of Household Refrigerators, Refrigerator-Freezers, and Freezers

British Standards
• BS EN 14511-1 — Air Conditioners, Liquid Chilling Packages & Heat Pumps with Electrically Driven Compressors for Space Heating and Cooling
• BS EN 14511-2 — Air Conditioners, Liquid Chilling Packages & Heat Pumps with Electrically Driven Compressors for Space Heating and Cooling
• BS EN 14511-3 — Air Conditioners, Liquid Chilling Packages & Heat Pumps with Electrically Driven Compressors for Space Heating and Cooling

Canadian Standards Association Standards
• CSA C300 — Energy Performance & Capacity of Household Refrigerators, Refrigerator-Freezers, Freezers, & Wine Chillers
• CSA C656 — Performance Standard for Split-System & Single-Package Central Air Conditioners & Heat Pumps
• CSA C742 — Energy Performance of Automatic Ice Makers & Ice Storage Bins
• CSA C743 — Performance Standard for Rating Packaged Water Chillers
• CSA C746 — Performance Standard for Rating Large Air Conditioners and Heat Pumps
• CSA C749 — Performance of Dehumidifiers

International Standards Organization Standards
• ISO 5151 — Non-Ducted Air Conditioners and Heat Pumps – testing and Rating for Performance
• ISO 7371 — Household Refrigerating Appliances – Refrigerators With or Without Low-temperature Compartment – Characteristics and test Methods

Association of Home Appliance Manufactures Standards
• AHAM DH-1 — Dehumidifiers
• AHAM HRF-1 — Energy and Internal Volume of Refrigerating Appliances

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• ISO 8187 — Household Refrigerating Appliances – Refrigerator-Freezers – Characteristics and test Methods
• ISO 8561 — Special Compartments for the Preservation of Highly Perishable Foodstuffs
• ISO 13256-1 — Water-Source Heat Pumps – Water-to-Air and Brine-to-Air Heat Pumps
• ISO 13256-2 — Water-Source Heat Pumps – Water-to-Water and Brine-to-Water Heat Pumps

ASTM International
• ASTM F 2140 — Standard test Method for Performance of Hot Food Holding Cabinets

Product Safety Standards
• IEC 606335-2-40 (and EN 60335-2-40)
• UL 471 – Commercial Refrigeration
• UL 1995 / CSA C22.2 No. 236 – Heating and cooling equipment