



Safety after the storm

Field evaluations for water-damaged equipment

UL offers services to evaluate industrial/commercial equipment that has been water damaged as a result of a storm or flooding, and that may have been subjected to a reconditioning process. This service is being offered without cost to the Authorities Having Jurisdiction (AHJ) in those areas affected by natural disasters.

Key considerations for water-damaged equipment

When evaluating water-damaged equipment, the following factors should be considered:

- The extent of the water damage
- The effect of contaminants on the equipment
- The effects of corrosion
- The overall age and condition of the equipment
- The function the equipment serves and where it will be used (life safety vs. general control, residential vs. industrial/commercial)

Reconditioning water-damaged equipment

Certain types of industrial and commercial equipment are constructed in such a manner that allows trained personnel to recondition the equipment if damaged by water. It is important that such reconditioned equipment be subject to appropriate controls. This includes:

- A thorough review of the reconditioning process
- An inspection with basic field testing of the reconditioned equipment, if applicable

In addition to the electric shock and fire hazards associated with water-damaged equipment, chemical and biological hazards also exist. Therefore, it is imperative that the equipment be reconditioned by the original equipment manufacturer (OEM), personnel qualified by the OEM or by recognized third-party businesses with established expertise. It is strongly recommended that the OEM develop the reconditioning process within a formal risk-management system.

Types of equipment suitable for reconditioning

The following list indicates some of the equipment for which reconditioning is possible.

Note that while the overall equipment may be reconditioned, many of the components may need to be replaced.

- Panelboards
- Manual and magnetic motor controllers
- Motor control centers
- Switchboards and switchgear
- Motors

The following list indicates equipment that should not be reconditioned and should be decommissioned:

- Gas-fired equipment
- Appliances (washing machines, ovens, refrigerators, toasters, televisions, etc.)
- Solid-state controllers
- Molded case circuit breakers
- Fuses
- Dry-type transformers
- Receptacles, GFCIs, AFCIs and switches
- Transient voltage surge protective devices
- Wiring not suitable for wet locations
- Solid-state or electronic equipment such as controls, signaling and security

For more information, visit www.UL.com/stormsafety



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Water-immersed Type NM cable

Type NM-B nonmetallic-sheathed cable (commonly called "Romex®" in the industry) is Certified (Listed) by UL for use in normally dry locations in accordance with the National Electrical Code®. Decades ago, the outer jacket of this cable (Type NM) changed from an impregnated, braided covering to polyvinyl chloride (PVC).

The older, braided, jacketed version of this cable has less resistance to water ingress than newer, PVC-jacketed version. If subject to immersion, such as from flooding, the suitability or continued use is unknown. Any cable of this type that has been subjected to flooding should be replaced without question.

In general, cables with PVC insulation and jacket can withstand immersion in clean water for a short period of time without being damaged as long as the ends are not immersed. If the ends of the cable are immersed for any period of time, however, the internal paper wrapping around the bare equipment-grounding conductor will absorb and transfer the water into the cable assembly. The water may then start degrading the insulation or possibly corrode the conductors. If the cable comes into contact with contaminated water, the contaminants may also act on the insulation or conductors. Over time, failures can occur.

The safest approach is to replace any nonmetallic-sheathed cable that has been immersed in water for any period during the flooding.

The devastation of a flood is enormous. As the contaminated waters recede, there may be even more threats to your personal health and safety. By taking basic precautions, you can help prevent many injuries. UL urges you to always put the safety of your family or employees first.

Temporary use of critical equipment

While it is UL's goal to assist the AHJs by evaluating the suitability of the long-term use of reconditioned equipment, UL recognizes that some types of critical equipment may need to become temporarily operational until replacement equipment can be installed. This equipment includes (but is not limited to) food refrigeration units and generators. In these cases, the OEM should ensure that any residual risks are clearly identified. Food refrigeration equipment must also be sanitized after a complete cleaning.

Due to the difficulties in refurbishing and monitoring equipment in residential settings, it is recommended that all water-damaged residential equipment be decommissioned and replaced with new equipment.

Contact

For more information on UL Field Evaluation Services, please visit UL.com/field or contact us at (877).854.3577, #2 or at field@ul.com.

Resources

CDC: Storm, Flood and Hurricane Response

CDC: Hazard Based Guidelines: Protective Equipment for Workers in Hurricane Flood Response

About UL

UL helps create a better world by applying science to solve safety, security and sustainability challenges. We empower trust by enabling the safe adoption of innovative new products and technologies. Everyone at UL shares a passion to make the world a safer place. All of our work, from independent research and standards development, to testing and certification, to providing analytical and digital solutions helps improve global well-being. Businesses, industries, governments, regulatory authorities and the public put their trust in us so they can make smarter decisions.

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