



by UL Solutions

# TRANSFORMERS

[WWW.CERECERTIFICATION.COM](http://WWW.CERECERTIFICATION.COM)



**CERE**, by UL Solutions is a Testing, Simulation and Certification body that was originally set up as a Certification Entity in 2015.

**CERE**, by UL Solutions was created in its beginnings as a Certification Entity for Renewable Energies, with the purpose of being the access key to the different countries where certification of components, full installations certificates, modeling and software validation of components and facilities was required.

Currently **CERE**, by UL Solutions has expanded its capabilities and is dedicated not only to Renewable Energies, but also to Electric Vehicle chargers, Industrial Machinery, Medical Devices and Electrical and Electronic Products.

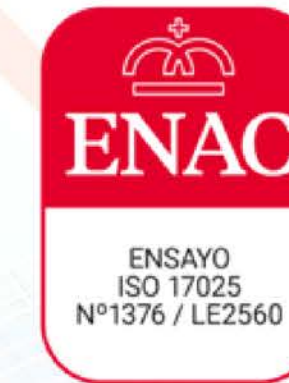


# Accreditations

We have accreditations that verify our technical competences as a Certification Body and Testing Laboratory. This fact ensures a deep knowledge of the international requirements for components and installations.

**CERE**, by UL Solutions is accredited by ENAC and a2la (IAF/ILAC members) as a Certification Body according to ISO 17065; and as an Accredited Testing Laboratory according to ISO 17025. We also belong to the IEC Scheme being CBTL Testing Laboratory and NCB Certification Entity.

In addition, we can provide solutions to countries such as North America, Israel, Colombia, Korea, Australia, etc.





# Our team

Our team has a long-accumulated experience in testing, simulation and certification for all its business areas, including an in-depth knowledge of grid integration standards, design, safety, EMC and grid quality.

All this knowledge is applicable in renewable energy generators and controllers, electric vehicle chargers, photovoltaic trackers, household appliances, industry, industrial machinery, electrical and electronic products and medical devices, among others.



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# What's CERE Transformers department?

**CERE**, by UL Solutions Transformers is a department created to cover the demand of services for transformers inside of CERE (Certification Entity for Renewable Energies)

**CERE**, by UL Solutions Transformers was created to provide support and trust at any stage of certification and testing of transformers

Our services include Testing and Certification according Safety standards.

This process includes testing, certification and verification of transformers and their components.



# Applicable Standards

**CERE**, by UL Solutions is accredited as Certification Body and Testing Laboratory for transformers according the following standards:

## SAFETY STANDARDS FOR UL MARKET

Standard UL 5085-1:2017: Low Voltage Transformers- Part 1: General requirements

Standard UL 5085-1:2017: Low Voltage Transformers- Part 2: General Purpose Transformers

Standard UL 5085-1:2017: Low Voltage Transformers- Part 3: Class 2 and Class 3 Transformers



# SCOPE ACCORDING STANDARD 5085-1:2017

These requirements cover the following types of transformers:

- ✓ Air-cooled transformers and reactors for general use
- ✓ General purpose autotransformers
- ✓ Ferroresonant transformers
- ✓ Class 2 and Class 3 transformers (which are evaluated in accordance with Part 3)
- ✓ Cord-connected transformers (which are evaluated in accordance with Part 2)
- ✓ Transformers incorporating overcurrent or over-temperature protective devices, transient voltage surge protectors, or capacitors
- ✓ Permanently-connected transformers.

These transformers are intended to be used in accordance with the National Electrical Code, ANSI/NFPA 70, or CSA C22.1, the Canadian Electrical Code, Part I. The Canadian Electrical Code defines low voltage as any voltage from 31 to 750 V inclusive and high voltage as any voltage above 750 V. The National Electrical Code, ANSI/NFPA 70, defines low voltage as any voltage up to 600 V, nominal. Therefore, low voltage transformers intended for use in Canada may be rated above 600 V up to 750 V. Low voltage transformers intended for use in the United States are rated up to 600 V. Where information in clauses and tables in this standard reference voltage ranges, the limit of 600 V applies in the United States, while the limit of 750 V applies in Canada.



# SCOPE ACCORDING STANDARD 5085-1:2017

The standard does **not cover** the following transformers:

- ✗ Direct plug-in types
- ✗ Neon; Toy; Ignition; Distribution
- ✗ Liquid-immersed; High intensity lighting
- ✗ Variable voltage (Variac)
- ✗ Low voltage landscape; Swimming pool and spa
- ✗ Fluorescent lamp types
- ✗ Transformers for welders
- ✗ Transformers intended for use in the United States with a nominal primary rating of more than 600V
- ✗ Transformers incorporating rectifying or waveshaping circuitry
- ✗ Transformers for use with radio- and television-type appliances
- ✗ Transformers intended for use in the United States having overvoltage taps rated over 660V
- ✗ Autotransformers used in industrial control equipment, which are evaluated in accordance with the requirements of the Standard for Industrial Control Equipment, UL 508, or CSA C22.2 No. 14, Industrial Control Equipment
- ✗ Other special types of transformers covered in requirements for other electrical devices or appliances.

Part 1, as well as Part 2 and Part 3, establish the characteristics, construction, operating conditions, markings, and test conditions for each type of transformer.

The requirements in this standard may be modified by requirements in an end product standard if a transformer is intended for use only as a component in other equipment.



# SCOPE ACCORDING STANDARD 5085-2:2017

These requirements cover the following types of transformers:

- ✓ Air-cooled transformers and reactors for general use
- ✓ Autotransformers
- ✓ Ferroresonant transformers
- ✓ Cord-connected transformers
- ✓ Transformers incorporating overcurrent or over-temperature protective devices, transient voltage surge protectors, or capacitors

These requirements do **not cover** Class 2 and Class 3 transformers (which are evaluated in Part 3).

Part 2 is intended to be used in conjunction with Part 1. The numbering of the clauses in Part 2 corresponds to the numbered clauses in Part 1. The requirements in Part 1 apply unless modified by Part 2.



# SCOPE ACCORDING STANDARD 5085-3:2017

As noted in Low Voltage Transformers – Part 1: General Requirements, UL 5085-1, or CSA C22.2 No. 66.1, Low Voltage Transformers – Part 1: General Requirements, the requirements in Part 3 cover Class 2 transformers for use with Class 2 circuits in accordance with the National Electrical Code, ANSI/NFPA 70, or the Canadian Electrical Code, Part I, CSA C22.1. They are intended for connection to essentially sinusoidal supply sources.

**Advisory Note:** For transformers intended for use in the United States, these requirements also cover Class 3 transformers for use with Class 3 circuits in accordance with the National Electrical Code, ANSI/NFPA 70, unless otherwise specified in this standard. See Annex D for Class 3 requirements.

The requirements of Part 3 do **not cover**:

- ✗ Power supplies (a transformer provided with a rectifier is considered a power supply);
- ✗ Toy transformers;
- ✗ Cord and plug connected transformers other than Class 3;
- ✗ Direct plug-in Transformers;
- ✗ Transformers intended for use in audio, radio, or television type appliances;
- ✗ Other special types of transformers covered in requirements for other electrical devices or appliances.

This part is intended to be used in conjunction with Part 1. The numbering of the clauses in Part 3 corresponds to the numbered clauses in Part 1. The requirements in Part 1 apply unless modified by Part 3.

A Class 2 transformer that includes a separate current-limiting impedance such as a resistor or a positive temperature coefficient device (PTC) is covered by these requirements.

A Class 2 transformer that includes a resonance regulating circuit is covered by these requirements.



# Applicable Standards

**CERE**, by UL Solutions Transformers has a wide expertise in the field of testing. Some of the most important projects carried out recently are located in Spain.

## **THE OFFERED TESTING INCLUDES\*:**

Overload Test (at 200% rated load)

Bonding Conductor Test (Earth current test)

Spacings and Insulation

Mechanical Assembly

Temperature (Heating) Test

Electric Test (Dielectrics withstand and Induced Potential)

(\* among other test required in the certificates)



# CERE TRANSFORMERS TESTING

- ✓ Enclosure Tests
- ✓ Impedance Test
- ✓ Lifting or Mounting Means Test
- ✓ Strain Relief Test
- ✓ Leakage Current Test
- ✓ Power Input Test
- ✓ Short Circuit Test on Transformers with Output Receptacles
- ✓ Maximum Output Power Test on Transformers with Output Receptacles
- ✓ Corrosion resistance
- ✓ Switches, Protective Devices, and Wiring Devices
- ✓ Cord-Connected Transformers
- ✓ Pullout, Bending, and Twisting Tests
- ✓ Insulating Barriers Test
- ✓ Maximum Output Power and Short Circuit Tests for Line Cord-Connected Transformers
- ✓ etc



# Laboratory Capabilities





# EMC

- ✓ Full Anechoic Chamber of 3 meters and up to 6GHz both in emission and radiated immunity.
- ✓ Complete test capacity of IEC 61000 in both radiated and conducted.





# Test Benches

- ✓ Test bench up to 500kVA for converters
- ✓ 3 test benches up to 166kVA with parallel connection capacity.
- ✓ DC voltage range up to 1500V and AC voltage range up to 800V and 400Hz
- ✓ Passive loads up to 100kVA and electronic load up to 500kVA for island testing.





# Environmental and Climate Laboratory

**TEMPERATURE RANGE FROM -40°C TO 85°C WITH  
85%RH OR 125°C WITHOUT HUMIDITY REFERENCE.**

- ✓ Low temperature chamber
- ✓ High temperature chamber
- ✓ Temperature chamber
- ✓ Dycometal temperature chamber

- ✓ Binder temperature chamber
- ✓ IP and Nema Camera
- ✓ Vibration table
- ✓ Saline atmospheres chamber



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