



Choose certainty.  
Add value.

## Type test - Ultracapacitor 型式认证 —— 超级电容器

### Your challenges

To export to new markets, ultracapacitor must comply with various legal and technical requirements of the specific country. Understanding the wide range of directives and regulations involved is the most important challenge you face in order to bring your product to market.

### What is Ultracapacitor?

Ultracapacitor often means EDLC (Electric double layer capacitor) element. An electric double-layer capacitor element utilizes the ability to accumulate electric charge in an electric double layer which is formed at the boundary surface between an electrode material (electronic conductor) and an electrolyte. This capacitor is essentially designed for operation with direct current voltage.

### 您所面临的挑战

超级电容器出口到新的市场必须符合相应国家多项法规和技术要求。为了将产品打入市场，您将面临着理解大量的相关指令和规则的严峻挑战。

### 什么是超级电容器？

超级电容器通常指EDLC（电气双层电容器），双电层电容器利用形成在电极材料（电导体）和电解质之间的边界表面的双电层积累电荷的能力。该电容器是主要设计用于直流电压进行储能。



### How can we help you?

TÜV SÜD has extensive expertise in ultracapacitor testing solutions. Our experienced and specially trained engineers will guide you through even the most comprehensive ultracapacitor project.

### One-stop service for ultracapacitor

TÜV SÜD is a leading global expert in testing ultracapacitor. We offer testing services to ensure that your product meets the highest levels of quality and safety.

- **Life cycle testing:** Verify the shelf life of the ultracapacitor and demonstrate the quality of the product to customers. These tests include cycle life testing and calendar life testing.
- **Abuse testing:** Simulate extreme environmental conditions and scenarios to test your ultracapacitor beyond its limits, such as pressure relief test, passive flammability test and external short-circuit test etc.
- **Performance testing:** Demonstrate the capacitance, internal resistance, leakage current, self-discharge, specific power and specific energy of ultracapacitor. Our experts can customize testing to suit specific customer requirements such as performance testing under various climatic conditions.
- **Environmental and durability testing:** Demonstrate the quality and reliability of your ultracapacitor. Our tests include vibration, shock, thermal cycling, rapid change of temperature, and damp heat tests.

### 我们能帮到您什么?

TÜV南德意志集团在超级电容器的测试解决方案上具备丰富的专业知识。我们经验丰富，受过专门训练的工程师将帮助您完成复杂的超级电容器测试项目。

### 超级电容器认证一站式服务

TÜV南德意志集团超级电容器实验室具备国际领先的超级电容器测试专家。我们为您提供测试服务，以确保您的产品符合最高标准的质量和um安全要求。

- **循环寿命测试:** 评价超级电容器的使用寿命为客户提供产品质量保证。测试项目包括循环寿命测试和日历寿命测试。
- **安全测试:** 模拟极端环境条件和情况来评估超级电容器在滥用条件下的极限，例如泄压测试、燃烧测试、外部短路测试等
- **性能测试:** 评价超级电容器的静电容量、内阻、泄漏电流、自放电、比功率和比能量等。我们的专家也可根据客户的要求为客户量身定制测试计划，比如不同气候条件下的性能测试计划。
- **环境和可靠性测试:** 评价超级电容器质量和可靠性。测试项目包括振动测试、冲击测试、温度循环测试、快速温度变化测试和湿热测试等。

## Which standard apply to ultracapacitor 哪些标准适用于超级电容器

IEC 62576	Electric double-layer capacitors for use in hybrid electric vehicles-Test methods for electrical characteristics 混合动力汽车用电气双层电容器-电气特征试验方法
IEC 62391-1	Fixed electric double-layer capacitors for use in electronic equipment- Part1: Generic specification 电子设备用固定式双层电容器——第1部分: 通用规范
IEC 62391-2	Fixed electric double-layer capacitors for use in electronic equipment- Part2: Sectional specification-Electric double-layer capacitors for power application 电气设备用固定式双层电容器——第2部分: 分规范--电力用双层电容器
IEC 61881-3	Railway applications-Rolling stock equipment-Capacitors for power electronics- Part3: Electric double-layer capacitors 轨道交通.铁道车辆设备.电力电子设备用电容器——第3部分:电气双层电容器
UL 810A	STANDARD FOR SAFETY-Electrochemical capacitor 电化学电容器安全标准
DOE/NE-ID-11173	FreedomCAR Ultracapacitor Test Manual FreedomCAR 超级电容器测试手册
SAND2005-3123	FreedomCAR Electrical energy storage system abuse test manual for electric and hybrid electric vehicle applications FreedomCAR 电动和混合动力车辆电气储能系统滥用测试手册
QC/T 741-2014	Ultra-capacitor for electric vehicles 车用超级电容器

### Your business benefits

- **Save time and money** – with experts who assist you throughout your entire homologation process and prevent the threat of costly and time-consuming rework.
- **Access multiple markets** – by helping you understand and identify the overlaps and evolving requirements of different regulations, so that you can achieve multiple certifications within a single project.
- **Maintain a competitive advantage** – by applying our expert project management to achieve shortened lead times, streamlined processes and faster access to your key markets.
- **Minimise risks** – of product non-conformance to the requirements of national and international regulatory standards.

### 您的商业利益

- **节省时间和金钱** —— 通过充分利用TÜV南德意志集团国际认可的实验室网络，可以同时多个国家进行测试，并提供国际认证。
- **受益于全球范围的支持** —— 通过国际销售和测试网络工作，与您在关键市场携手共进。
- **获得一站式解决方案** —— 采用全方位测试和认证服务的单点联系，助力扩展从零部件到最终产品的整个价值链。
- **最大程度地降低风险** —— 充分利用独立的测试合作伙伴，以确保符合法律法规要求。

## Why choose TÜV SÜD?

TÜV SÜD is the trusted ultracapacitor testing expert. Our holistic approach and commitment to safety will optimise the reliability of ultracapacitor and other energy storage devices products. Through our expanding network of laboratories throughout North America, Germany, China, Korea and Singapore, we are ready to serve the needs of customers. This global testing network provides the full range of testing services and validation planning. We are known as a neutral and independent third-party technical service provider, with a focus on delivering value to stakeholders rather than shareholders. TÜV SÜD has a global network of experts you can rely on for international market access and in-country experience. Our interdisciplinary expertise will add value to your product development.

## Choose certainty. Add value.

TÜV SÜD is a premium quality, safety and sustainability solutions provider that specialises in testing, inspection, auditing, certification, training and knowledge services. Represented in over 800 locations worldwide, we hold accreditations in Europe, the Americas, the Middle East and Asia. By delivering objective solutions to our customers, we add tangible value to businesses, consumers and the environment.

## 为什么选择TÜV南德意志集团?

TÜV南德意志集团是超级电容器测试专家。我们对安全的整体分析和评估测试将提高超级电容器和其他电气储能产品的可靠性。TÜV南德意志集团为满足客户需求将电气储能系统服务网络拓展到北美、德国、中国、韩国和新加坡等地。全球的测试服务网络为您提供全面的测试服务和验证计划。我们作为中立的第三方技术服务机构，致力于所有利益相关方的服务。TÜV南德意志集团有遍及全球的专家网络，您可以依赖他们进入国际市场和提升在国内的竞争力。我们的跨学科的专业技术将为您的产品发展增值。

## 权威认证，创享价值

TÜV南德意志集团是一流的质量、安全和可持续性解决方案服务提供商，专业为客户提供测试、检验、审核、认证、培训和知识服务。我们在全球有800多个分支机构，我们拥有欧洲、美洲、中东和亚洲的认可。通过为顾客提供客观的解决方案，我们为企业、消费者和环境带来有形的价值增值。



\* Some of the services listed are provided due to local regulations only and may not be available in other regions. Please contact us for further details.

\* 上述部分服务可能由于当地法规的原因而无法在您的地区提供。欢迎您与我们联系咨询。

### Our branch companies or offices in Greater China:

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