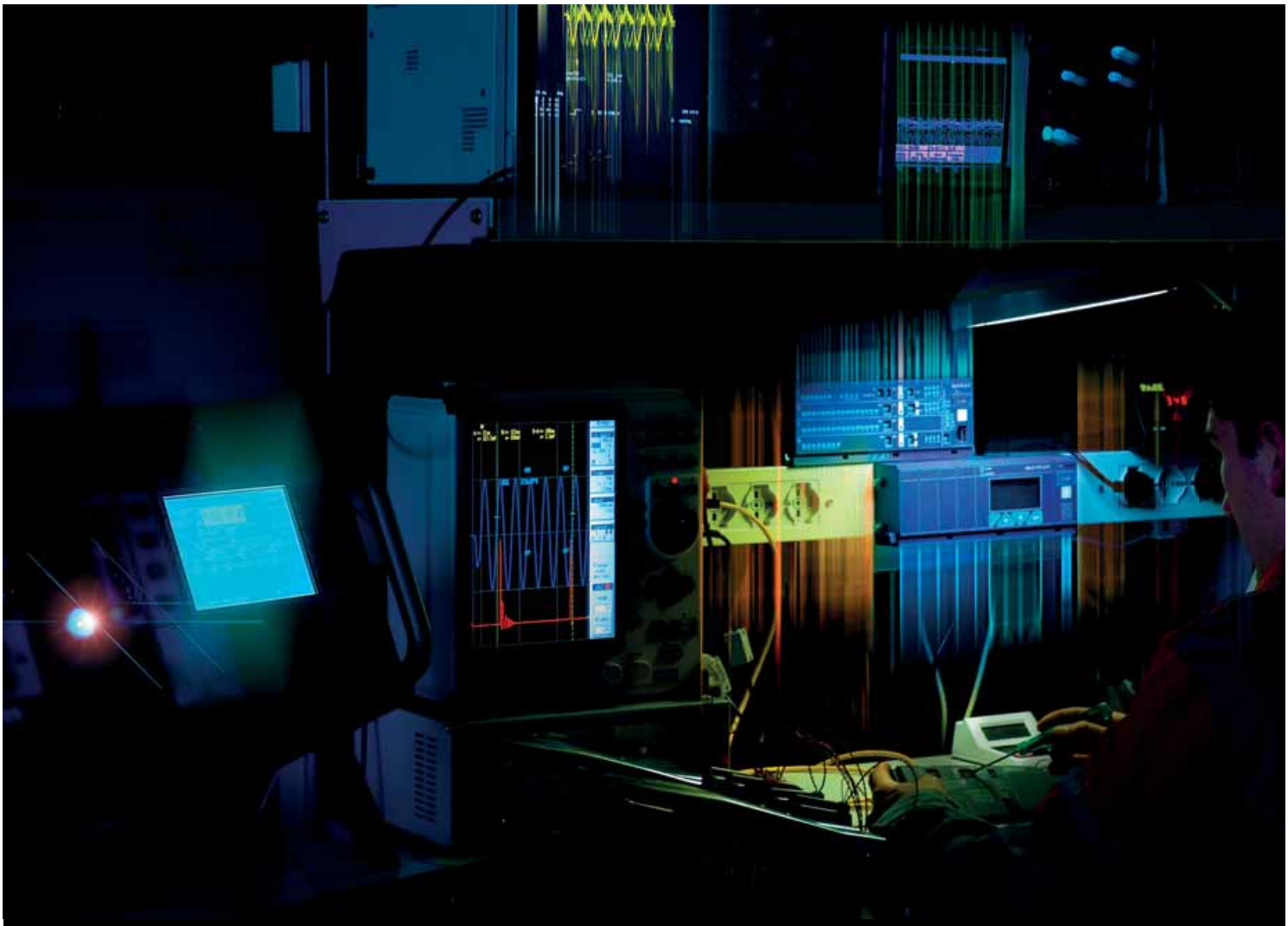


ABB SACE Division
Test Laboratories

Power and productivity
for a better world™

Long experience in the testing sector is available to you

The ABB S.p.A - ABB SACE Division Laboratory develops, certifies and performs follow-up on production for switchgear and controlgear designed and built in several production ABB sites. The Laboratory provides a wide range of facilities and experience in the field of testing electrical, mechanical, climatic and functional tests relative to low and medium voltage devices, safety and measurement.

The Laboratory is certified at national level by ACCREDIA and, thanks to the recognition of important international certification bodies, such ACAE / LOVAG, ANCE, ASTA, ETL SEMKO, UL, CSA and Shipping Registers, it offers to ABB and external customers a qualified service for the execution of certification tests for devices and Low and Medium Voltage switchgear and controlgear and their Assemblies, in accordance with the respective product standards.

Our Competency

Carrying out tests and measurements correctly is a profession: a team of specialists means the laboratory can give its customers valid support, offering their long and wide-ranging experience, availability of out-of-the-ordinary experimental means, and the use of advanced measuring and testing techniques, which fully conform to the national and international standards.

The Facilities

The laboratory covers an area of more than 3,500m^2.
The testing facilities are constantly maintained and upgraded though annual investments, with the aim of increasing their testing capacity and compliance with the standards in force.
Sophisticated techniques and the precision and repeatability of the measuring methods mean that the behaviour of the apparatus, subject to development or certification tests, can be studied and verified.

Power tests

The "Power test Laboratory", assigned the task of verifying the performances of low and medium voltage equipment in presence of high current and voltage values, is equipped with three alternators, including one which is capable of supplying a short-circuit power of 2800 MVA.
The measurement systems use optic fibers for signal transmission and sophisticated digital recorders with relevant computers that provide test results. Furthermore, the laboratory is equipped with various types of loads, such as transformers, asynchronous motors, capacitors, resistances and reactances, which make it possible to obtain the widest range of conditions encountered in electrical installations.

	Test type	Short time current	Short circuit making and breaking in A.C. (50-55 Hz)	Short circuit making and breaking in D.C.	Overload	Arcing due to an internal fault
EQUIPMENT	STANDARDS					
Low voltage circuit-breakers	IEC 60947-2 CEI EN 60947-2	110kA for 1s 70kA for 3s	380V 200kA 600V 200kA 726V 100kA 1100V 80kA	250V 100kA 500V 100kA 1000V 100kA 1500V 30kA	Up to 1100V 15kA	–
Low voltage switch-disconnectors	IEC 60947-3 CEI EN 60947-3	110kA for 1s 70kA for 3s	380V 200kA 600V 200kA 726V 100kA 1100V 80kA	250V 100kA 500V 100kA 1000V 100kA 1500V 30kA	Up to 1100V 15kA	–
Low voltage contactors and motor-starters	IEC 60947-4-1 CEI EN 60947-4-1	–	380V 200kA 600V 200kA 726V 100kA 1100V 80kA	250V 100kA 500V 100kA 1000V 100kA 1500V 30kA	Up to 1100V 15kA	–
Low voltage switchgear and busbar trunking systems	IEC 60439-1 CEI EN 60439-1 IEC 61439-1 CEI EN 61439-1 IEC 61439-2 CEI EN 61439-2	110kA for 1s 70kA for 3s	380V 200kA 600V 200kA 726V 100kA 1100V 80kA	250V 100kA 500V 100kA 1000V 100kA 1500V 30kA	–	–
	IEC 60439-2 CEI EN 60439-2					
	IEC 61641 CEI 17-86					Up to 726V 100kA for 1s

	Test type	Short time current	Short circuit making and breaking in A.C. (50-55 Hz)	Overload	Active load currents	Magnetizing and inductive currents	Arcing due to an internal fault
EQUIPMENT	STANDARDS						
High voltage metal enclosed switchgear	IEC 62271-200 CEI EN 62271-200	110kA for 1s 70kA for 3s	–	–	–	–	12kV 40kA for 1s 24kV 25kA for 1s
High voltage circuit-breakers	IEC 62271-100 CEI EN 62271-100	110kA for 1s 70kA for 3s	12kV 60kA 24kV 32kA 36kV 20kA	–	–	24kV 10A 24kV 500A	–
High voltage switch-disconnectors	IEC 60265 CEI EN 17-3	110kA for 1s 70kA for 3s	12kV 60kA 24kV 32kA 36kV 20kA	–	24kV 630A 36kV 400A	24kV 10A 24kV 500A	–
High voltage disconnectors and earthing switches	IEC 62271-102 CEI EN 62271-102	110kA for 1s 70kA for 3s	12kV 60kA 24kV 32kA 36kV 20kA	–	–	–	–
High voltage contactors (also coordinated with fuses)	IEC 60470	110kA for 1s 70kA for 3s	12kV 60kA 24kV 32kA 36kV 20kA	Up to 12kV 8kA	–	24kV 10A 24kV 500A	–

Experimental tests

The "Experimental test Laboratory" features equipment for the verification of mechanical, electrical duration and electrical duration in normal and overload conditions.
It is also equipped with feeders for verifying overheating and the characteristics of thermomagnetic and electronic protection releases with strong currents.
In addition, the laboratory also offers climatic and temperature-controlled chambers for making accelerated life tests with synergic stresses of an environmental, mechanical and electrical origin, as well as feeders for verifying dielectric properties.

	Test type	Dielectric properties test	Main and control circuits heating test	Mechanical, electric duration and overload test	Degree of protection test	Protection releases test (thermal, magnetic, electronic)	Environmental tests	Shock resistance test
EQUIPMENT	STANDARDS							
Low voltage circuit-breakers	IEC 60947-2 CEI EN 60947-2	5kV 50Hz 20kV - 1,2/50µs	In=6300A	Vn=1000V In=6300A	IP40	6kA continuous 9kA for 120s 40kA for 0,5s	from +20 to +70°C from -40 to +180°C and UR 98%	<30g T<20ms
Low voltage switch-disconnectors	IEC 60947-3 CEI EN 60947-3	5kV 50Hz 20kV - 1,2/50µs	In=6300A	Vn=1000V In=6300A	IP40	–	from +20 to +70°C from -40 to +180°C and UR 98%	<30g T<20ms
Low voltage contactors and motor-starters	IEC 60947-4-1 CEI EN 60947-4-1	5kV 50Hz 20kV - 1,2/50µs	In=6300A	Vn=1000V In=6300A	IP40	6kA continuous 9kA for 120s 40kA for 0,5s	from +20 to +70°C from -40 to +180°C and UR 98%	<30g T<20ms
Low voltage switchgear and busbar trunking systems	IEC 60439-1 CEI EN 60439-1 IEC 61439-1 CEI EN 61439-1 IEC 61439-2 CEI EN 61439-2 IEC 60439-2 CEI EN 60439-2	5kV 50Hz 20kV - 1,2/50µs	In=6300A	Vn=1000V In=6300A	IP40	–	–	–

	Test type	Dielectric properties test	Main and control circuits heating test	Mechanical operation/duration test	Degree of protection test
EQUIPMENT	STANDARDS				
High voltage metal enclosed switchgear	IEC 62271-200 CEI EN 62271-200	Vp=30kV t=1'	In=4000A	yes	IP40
High voltage circuit-breakers	IEC 62271-100 CEI EN 62271-100	Vp=30kV t=1'	In=4000A	yes	IP40
High voltage swich-disconnectors	IEC 60265 CEI EN 60265	Vp=30kV t=1'	In=4000A	yes	IP40
High voltage disconnectors and earthing switches	IEC 62271-102 CEI EN 62271-102	Vp=30kV t=1'	In=4000A	yes	IP40

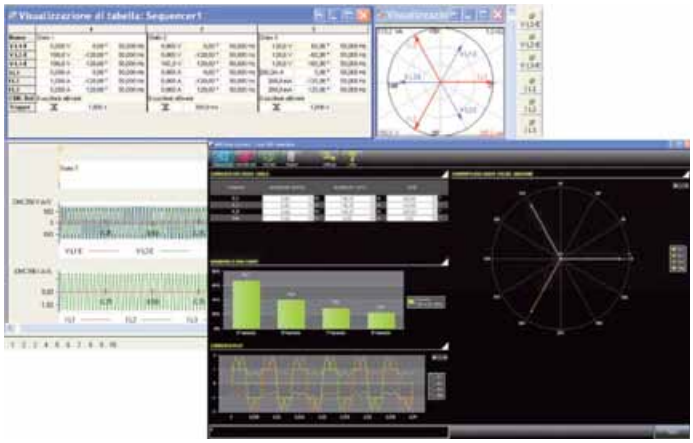
Tests on materials

The "Materials test Laboratory meets the need for information and measurements deriving from today's constant developments in metal and plastic technology. The wide range of tests that can be carried out includes evaluation of mechanical properties tensile, compression and bending, charpy impact strength, tracking resistance (CTI), flammability, electrical resistance, glass-transition and melting temperature of polymeric insulating materials. In addition, the laboratory is equipped with a metallographic microscope, FT-IR and ED-XRF analysers, a salt-mist chamber for testing corrosion resistance and equipment for testing electrical contacts and their interaction with electric arc.

	Verifi able characteristics	Reference standards	Laboratory capacity
Thermal analysis on polymers (with DCS)	Glass transition temperature	IEC 61006 - CEI EN 61006	Temperature range: -65 ÷ +650°C
	Melting temperature and heat	IEC 61074 - CEI EN 61074	Measurement range: ±350mW
	Crystallinity	–	–
Mechanical tests	Tensile, fl exural, compression	Various	load: 0.01÷ 50kN speed: 0.001 ÷ 500mm/min
	Charpy impact range	ISO 179	Max energy: 25 J Measurements: force, deformation, speed, energy
	Hardness/Microhardness	ISO 6506 ÷ 6508, ISO 4516	HR-HV-HB
Physical tests	Density	ISO 1183	–
	Ash content	ISO 3451	–
	Water absorption	ISO 62	–
	Ag content	–	–
	Metalling coating x-ray analisys (XRF)	ISO 3497	Material range analysis: Titanium-Uranium
	Plastics infrared spettroscopy (FT-IR)	ASTM E 1421	–
	Melt indexer (MFI)	ISO 1133	–
Electrical tests	Electric resistance	–	$1*10^{-7}\ \Omega<R<1*10^{6}\ \Omega$
	Tracking resistance (CTI)	IEC 60112 - CEI EN 60112	up to 600V
Flammability	Glow wire test	IEC 60695-2-10/13 CEI EN 60695-2-10/13	–
	Flammability	UL 94	classifi cation V0 - V1 - V2 - HB
Microscopy	With stereomicroscope	–	magnifi cation: 6x ÷ 100x reflected and trasmitted light microtome for specimen preparation
	With metallographic microscope	–	magnifi cation: 25x ÷ 1600x reflected and trasmitted light

Tests on electronic devices

The "Laboratory for tests on electronic devices" specializes in testing the electronics components on board the circuit breakers and all the accessories that make up the circuit-breaker system (communication devices, signalling, control, etc.). The laboratory is equipped with instrumentation suitable for simulating the widest installation conditions in which these electronic devices can be installed: distorted currents and voltages, operating frequencies from 0 to 1000Hz, special combinations of temperature and humidity, conducted and coupled disturbances, voltage dips, etc....
One of the laboratory's activities consists in the prototype testing of new equipment or new measuring systems in direct cooperation with the design process.



	Functional tests	Remote control and supervision system functions tests	Functional tests, field bus reliability tests and protocol functionality	Functional tests with special voltages, currents and frequences	Electromagnetic compatibility on samples
Equipment	Electronic devices on board the circuit-breakers	Electronic devices on board the circuit-breakers	Accessory electronic devices (communication, signalling, etc.)	Electronic devices on board the circuit-breakers	Electronic devices on board the circuit-breakers and accessories
Standards	IEC 60947-2 CEI EN 60947-2	IEC 60947-2 CEI EN 60947-2	IEC 60947-2 CEI EN 60947-2 Product specifications	–	IEC 61000-4-2 IEC 61000-4-4 IEC 61000-4-5 IEC 61000-4-11 IEC 61000-4-29
Range	Precision currents 1mA ÷ 2000A Precision voltages 1V ÷ 2000V	–	–	Programmable up to the 20th harmonic. Currents and voltages with frequencies from 0 to 1000Hz	Voltages up to 4.4kV dip with step 1ms

Environmental reliability test

Environmental tests are meant to verify the behavior of devices when subjected to accelerated life conditions, like: corrosive environment, thermal ageing, thermal shocks, and vibrations or a combinations of thermal cycles and vibration, in a high level environmental stress test (HALT).

	Corrosion tests (Salt mist)	Climatic tests	HALT (High accelerated life testing)	Vibration test
Description	Corrosion chamber, with controlled temperature and humidity. Test is performed on single components	Temperature-controlled chamber	Thermal cycles combined with vibrations	Monoaxial Vibration Sinusoidal and random with stress up to 67kN
Standards	ISO 9227 ISO 60068-2-52	IEC 60947-2 CEI EN 60947-2 Naval register [RINA, Loyd's register, Bureau Veritas, Germanischer Loyd, Det Norske Veritas]	–	IEC 60947-2 CEI EN 60947-2 Naval register [RINA, Loyd's register, Bureau Veritas, Germanischer Loyd, Det Norske Veritas]
Operational range	Test temperature: room T. ÷ 55°C Useful test volume: 600dm^3	Temperatura: -40 ÷ +180°C Umidità: 10 ÷ 98%	Temperature: -80°C ÷ 180°C (15°C/min) Vibration: up to 40g rms (power spectrum density 0÷20 kHz	0.4Hz ÷ 2400 Hz Max acceleration: 95g

Certification and acknowledgements

ACCREDIA (Italian Accreditation System)

ACCREDIA, created by the merger of SINAL and SINCERT, is a non-profit association whose purpose is the accreditation of test laboratories, in order to guarantee reliability and reproducibility of product compliance checks with International and National Standards. By means of annual inspection visits, ACCREDIA accredits the laboratory, for each single test, only after having ascertained the existence of precise technical and organizational requirements, so as to guarantee the metrological references, the reliability and repeatability of implemented procedures, the use of suitable instruments, the personnel's skills, the neutrality of personnel assigned to the tests and the technical evaluation issued by the Laboratory, according to the provisions of standard UNI CEI EN ISO/IEC 17025 and its prescriptions. ACCREDIA is a member of EA (European co-operation for Accreditation) and ILAC (International Laboratory Accreditation Cooperation). For the list of accredited tests, please visit the website www.accredia.it.


CERTIFICATO DI ACCREDITAMENTO
Accreditation Certificate

0062

ABB S.p.A. - ABB SACE Division

Laboratorio di Prova
Testing Laboratory

ACAE (Association for the Certification of Electrical Equipment)

ACAE is an independent product certification body whose members include independent bodies operating in the certification sector, electrical equipment users and manufacturers, research institutions and test laboratories. It is accredited by ACCREDIA for the certification of low and high voltage electric equipment in accordance with standard EN 45011 ("General criteria for product certification bodies") and it is founding member of the LOVAG (Low Voltage Agreement Group) for the mutual acknowledgement of certifications within the EU. It promotes the mutual acknowledgement of certificates of conformity issued by itself and by other Italian, EU and foreign certification bodies.


QUALIFICATION OF A TEST LABORATORY
REGISTRATION NUMBER 002

Laboratory Name: ABB S.p.A. - ABB SACE Division

Laboratory address: Via Baioni, 35 - 24123 Bergamo - Italy

Field of activity: LOW VOLTAGE AND HIGH VOLTAGE ELECTRICAL APPARATUS

ACAE/LOVAG LABORATORY CODE IA 01

The continuity of the approval is subjected to the annual audits.

First issue date: 29.07.1993
Expiring date : 15.12.2013

ACAE President
Dr.Andrea Cogliolo

SINCERT

Certification and acknowledgements

ETL SEMKO

ETL SEMKO is a world-wide body specialized in product testing, inspection and certification. ETL SEMKO verifies and certifies full compliance of the products to electromagnetic compatibility standards and to performance tests, offering manufacturers a chance to distribute their products throughout the world.

UL

Underwriters Laboratories Inc. (UL) has been a leading independent body since 1894 in safety tests and product certification; UL is the most well-known trademark in the United States, and it has become one of the most widely recognized product conformity suppliers in the world.

ASTA

ASTA was founded in 1938 as the Association of Short-Circuit Authorities. Intertek's ASTA Services team delivers leading services for the electrical industry. Their services include schemes truly recognized internationally approvals and low/medium/high voltage certification. The ASTA marks and/or type test certificates clearly indicate that the product has been independently tested to comply with the relevant clauses of the applicable standards. ASTA Certificates/Reports have International recognition, including a very high profile in Asia and the Middle East, often ‘specified’ by major end-users.

Contact us

ABB SACE
A division of ABB S.p.A.
L.V. Breakers
Via Baioni, 35
24123 Bergamo
Phone: +39 035 395.549
Fax: +39 035 395.284

www.abb.com

1SDC007093B0201 - 02/2011

Power and productivity
for a better world™