

Global Market Access – Global Mark Service in Asia

Traditionally UL has its own ANSI (American National Standard Institute) approved standards for more than several hundred standards depends on the application and UL standards were different from IEC standard. However, UL has been adopting IEC standard as a UL standard with USA national deviation especially for office equipment, audio and video equipment, medical equipment and housing equipment.

And recently UL has adopted IEC standard for industrial equipment as a UL standard with USA national deviation and following standards are IEC harmonized standards for industrial equipment. With IEC harmonized standards in place UL now can provide not only for UL & cUL services but also GMA services such as CE, CB to our customers.

Please refer to the table below for your reference and it shows us the portfolio of our GMA services we can provide.

1. Inverter Drive: UL 508C will be replaced by UL 61800-5-1. We can provide CE, CB, D-Mark and UL-EU mark per IEC/EN 61800-5-1
2. Process Control Equipment: UL 508 will be replaced by UL 61010-1 & 61010-2-201. We can provide CE, CB, D-Mark and UL-EU per IEC/EN 61010-1 & 61010-2-201
3. Low-voltage Control-gear Equipment: UL 508 will be replaced by UL 60947-1, -4-1, -5-1, -7-1. We can provide CE, CB, D-Mark and UL-EU per IEC/EN 60947-1, -4-1, -5-1, -7-1

For more detail, see attachment, 'Table 1' and 'Table 2'.

U.S. DOE announces SunShot Initiative awarded to UL

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[UL \(Underwriters Laboratories\)](#), a global safety science organization, is proud to announce that the [U.S. Department of Energy SunShot Initiative](#) has [awarded \\$1.35 million funding to UL](#) to further develop new scientific methods for predicting PV module material performance and reliability over time. In partnership with several leading research companies and institutions, this project seeks to provide data on polymeric backsheets (part of the PV module) that correlates long-term field reliability with accelerated laboratory testing. There have been many reports of PV modules with visibly degraded backsheet in early years of installation. This is due to the market pressures on keeping costs down while maintaining aggressive product development that are driving use of materials and combinations of materials with unproven durability characteristics, as well as reliance on current testing that does not factor in long-term durability in actual installed environmental conditions. This SunShot Initiative Award will fund laboratory accelerated testing correlated to actual backsheet degradation in fielded PV modules. The results will benefit module manufacturers to optimize design strategies. Additionally, the results of this project will enable deeper understanding of the reliability of backsheets and will reduce the uncertainty of PV module reliability predictions, making it of great value to owners, operators and insurers of PV power plants. "UL is pleased to gather a group of distinguished scientists to examine the performance expectations of PV materials that affects everyone from module manufacturers, and developers, to investors and insurers," states Lisa Salley, vice president and general manager for Energy & Power Technologies at UL. The backsheet is a thin multilayer plastic sheet that covers the back of a module, protecting people from the high voltage and the other parts inside the panel from damaging ultraviolet light and the elements. Polymeric backsheets play a critical role in maintaining a PV module's performance over an extended outdoor lifetime, and they help ensure electrical insulation safety. The model developed from this study of aged field installed modules and laboratory tested PV modules will enable the industry to identify the key characteristics of backsheets that will significantly impact the future reliability and durability of modules installed in various climates. Manufacturers will benefit as they determine which materials to incorporate into their PV module designs and the industry will benefit from the significant reduction in uncertainty inherent in today's straight line degradation models. Ken Boyce, principal engineer manager, Energy & Power Technologies at UL, states, "This project will examine the correlation between

data in the laboratory and data that's collected from modules in the field. This will provide some missing links so that realistic models can be built to better predict lifetime performance." UL will pursue this work with partners: 3M Company, Arkema Inc., Case Western Reserve University, the National Renewable Energy Laboratory (NREL), the National Institute of Standards and Technology (NIST), and Northeastern University. UL intends to provide interval project reporting through white papers, webinars and speaking opportunities.

Materials can be key to differences in module durability

Defect assessment - DuPont Photovoltaic Solutions recently completed a five-year study of commercial crystalline silicon PV systems, amassing a wealth of new information about PV system field experience and PV module defects. Principal investigator Alexander Bradley discusses the findings, which, in addition to supporting the company's ongoing analysis of materials performance, are expected to provide benefits across the industry. Building on the industry knowledge pool contributes towards the standardization of performance expectations across the solar industry, enables the development of more stringent risk mitigation techniques, and helps purchasers of solar power systems make educated and informed materials assessments.

Testing solar modules in a laboratory setting provides valuable information, but the most representative performance data can only be achieved by measuring solar module performance under real-world conditions, in different climates and settings, and over an extended period of time. In turn, these real-world results help researchers develop realistic and representative methods for conducting accelerated durability testing in the laboratory. The DuPont study, presented recently at the IEEE Photovoltaic Specialists Conference [1], was extensive. More than 60 global solar installations were reviewed, ranging in size from 1kW to 20MW projects, representing 1.5 million solar modules and a total power output of over 200MW. Modules at sites of all ages were examined, from brand-new installations to those with over 30 years in service. The study surveyed residential, commercial and utility-scale installations, roof- and ground-mounted, across Asia-Pacific, the European Union and North America. In addition, over 400 modules, from 45 different module manufacturers, were analyzed in the lab. Selected modules were subjected to non-destructive and destructive testing in the lab, to provide more information about the chemical and physical changes to the solar module materials. Two recent developments contribute to the increasing importance of identifying defects in solar modules. As the solar industry shifts its focus from the 'design and build' stage to the operation and maintenance of systems, including asset optimization and energy harvest, visual defects are becoming key markers, along with the evaluation of safety and power output, in determining the value of a PV system.

(Referenced – Module Performance Special by pv-tech.org - September 2015)

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Table 1

CCN	Definition	UL Standard	Product examples	Pictures	IEC Standard	IEC Product Description	CB-Category	IEC standard L2 Engineers	IEC standard L3/L4 Engineers	Services we can provide
Industrial Control Equipment										
NMMS	Industrial Control Equipment; Power Conversion Equipment	508C	Motor speed controllers, AC motor drives, Dynamic braking units, RF/LC filters, Frequency Converter	   <p>Motor speed AC motor drives Frequency Converter</p>	61800-5-1	Adjustable Speed Electrical Power Drive Systems	INST	Ningbo Li (ULC) Chandrakumar S (ULI) Shunsuke Yoshimura (ULJ) Sangman Kim/Oong Lee (ULK) Cloud Chen (ULT)	Kangsik Lee (ULK)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko
NKCR	Industrial Control Equipment; Auxiliary Devices	508	Position switches, Interface modules, Pilot lights, Pump controls	    <p>Mechanical position switches Interface modules Pilot lights Pump controls</p>	60947-5-1	Low-voltage Switchgear and Controlgear; Control Circuit Devices and Switching Elements; Electromechanical Control Circuit Devices	POW	Ningbo Li (ULC) Venu Reddy (ULI) Ryuichi Ohya (ULJ) Sangman Kim/Kyungku Lee (ULK) Allan Lee (ULS) Hans Hsieh/Janice Huang (ULT)	Chandrakumar S (ULI) Kangsik Lee (ULK)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko and UL India
NRAQ	Industrial Control Equipment; Programmable Controllers	508	Central unit, Communications module, Input/output devices (cards), Programmable Logic Controllers	   <p>Communications module Input/output devices (cards) Programmable Logic Controllers</p>	61010-2-201	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use; Particular Requirements for Control Equipment (e.g. PLC's, industrial PC's, I/O devices)	MEAS	Pauline Wu (ULC) Balakrishna C.P. (ULI) Tatsuya Yamamoto (ULJ) Youngju Kim (ULK) Marisol Javior (ULS) Cloud Chen/Hans Hsieh (ULT)	Hiroyuki Tsukakoshi (ULJ) Tatsuya Yamamoto (ULJ) Kangsik Lee (ULK)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko, UL Japan, UL NBK
NRNT	Industrial Control Equipment; Switches, Industrial Control	508	Industrial control switches, Mechanical latches, Manually & magnetically operated switches	   <p>Industrial control switches Mechanical latches Switches</p>	60947-5-1	Low-voltage Switchgear and Controlgear; Electromechanical Control Circuit Devices	POW	Ningbo Li (ULC) Venu Reddy (ULI) Ryuichi Ohya (ULJ) Sangman Kim/Kyungku Lee (ULK) Allan Lee (ULS) Hans Hsieh/Janice Huang (ULT)	Chandrakumar S (ULI) Kangsik Lee (ULK)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko and UL India
NLDX	Industrial Control Equipment; Motor Controllers, Magnetic	508	Bus bar kit, Mechanical interlocking kit, Magnetic motor controller, Combination Starter & Across the line starter	    <p>Bus bar kit Mechanical interlocking kit Magnetic motor controller Combination Starter & Across the line starter</p>	60947-4-1	Low-voltage Switchgear and Controlgear; Electromechanical Contactors and Motor-starters	POW	Ningbo Li (ULC) Venu Reddy (ULI) Ryuichi Ohya (ULJ) Kyungku Lee (ULK) Allan Lee (ULS) Hans Hsieh/Janice Huang (ULT)	Chandrakumar S (ULI) Kangsik Lee (ULK)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko and UL India
NLRV	Industrial Control Equipment; Motor Controllers, Manual	508	Manual motor controllers, Short circuit indicator, Shunt release	   <p>Manual motor controllers Short circuit indicator Shunt release</p>	60947-4-1	Low-voltage Switchgear and Controlgear; Electromechanical Contactors and Motor-starters	POW	Ningbo Li (ULC) Venu Reddy (ULI) Ryuichi Ohya (ULJ) Sangman Kim/Kyungku Lee (ULK) Allan Lee (ULS) Hans Hsieh/Janice Huang (ULT)	Chandrakumar S (ULI) Kangsik Lee (ULK)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko and UL India
NMFT	Industrial Control Equipment; Motor Controllers, Mechanically Operated and Solid-state	508	Motion switches, Belt alignment	   <p>Motion switches Stop switches Belt alignment</p>	60947-4-2	Low-voltage Switchgear and Controlgear; Contactors and Motor-starters; AC Semiconductor Motor Controllers and Starters	POW	Ningbo Li (ULC) Venu Reddy (ULI) Ryuichi Ohya (ULJ) Sangman Kim/Kyungku Lee (ULK) Allan Lee (ULS) Hans Hsieh/Janice Huang (ULT)	Chandrakumar S (ULI) Kangsik Lee (ULK)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko and UL India
NRKH	Industrial Control Equipment; Proximity Switches	508	Proximity switches, Optic module	  <p>Proximity switches Optic module</p>	60947-5-2	Low-voltage Switchgear and Controlgear; Control Circuit Devices and Switching Elements; Proximity switches	POW	Ningbo Li (ULC) Venu Reddy (ULI) Ryuichi Ohya (ULJ) Sangman Kim/Kyungku Lee (ULK) Allan Lee (ULS) Hans Hsieh/Janice Huang (ULT)	Chandrakumar S (ULI) Kangsik Lee (ULK)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko and UL India
QUYX	Process Control Equipment, Electrical	61010-1	Tension measurement and controller units, Pressure controller	   <p>Temperature controller Tension measurement Pressure controller</p>	61010-1	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements	MEAS	Pauline Wu (ULC) Balakrishna C.P. (ULI) Naoki Hashimoto (ULJ) Youngju Kim (ULK) Marisol Javior (ULS) Cloud Chen/Hans Hsieh (ULT)	Hiroyuki Tsukakoshi (ULJ) Naoki Hashimoto (ULJ) Kangsik Lee (ULK)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko, UL Japan, UL NBK

Table 2

CCN	Definition	UL Standard	Product examples	Pictures	IEC Standard	Product Description	CB-Category	IEC standard L2 Engineers	IEC standard L3/L4 Engineers	Services
Power Distribution										
XCFR2	Terminal Blocks - Component	1059	Terminal Blocks and terminal blocks components	 Terminal Blocks Terminal blocks components	60947-7-1	Low-voltage Switchgear and Controlgear; Ancillary Equipment; Terminal Blocks for Copper Conductors	POW	Ningbo Li (ULC) Venu Reddy (ULI) Yasutaka Imamura (ULJ) Sangman Kim/Kyungku Lee (ULK) Allan Lee (ULS) Hans Hsieh/Janice Huang (ULT)	Chandrakumar S (ULI) Kangsik Lee (ULK)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko and UL India
DIVQ	Circuit Breakers, Molded-Case and Circuit Breaker Enclosures	489	Circuit Breakers	 Circuit Breakers	60947-2	Low-voltage Switchgear and Controlgear; Circuit-breakers	POW	Santosh Tripathy (ULI) Sangman Kim (ULK)	Chandrakumar S (ULI)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko and UL India
VZCA	Surge-protective Devices	1449	Transient voltage surge suppressors	 Metal Oxide Varistor Gas Discharge Tube	61643-11 61643-311 61643-321 61643-331	Low-voltage Surge Protective Devices Gas Discharge Tubes Avalanche Breakdown Diode (ABD) Metal Oxide Varistors (MOV)	PROT		Stephen Wang (ULT)	CE, D Mark, UL-EU, Type Exam Certificate, Informative Test Report
EPBU	Direct Plug-In and Cord Connected Class 2 Power Units	1310 1012	Class 2 power supplies, Power supply other than Class 2	 Class 2 power supplies	61558-2-16	Switch mode power supplies and transformers for switch mode power supplies	SAFE		Pauline Wu (ULC) Shannon Tsui (ULH) Youngju Kim (ULK) Joe Yang (ULT) Richard Lee (ULT)	CE, D Mark, UL-EU, Type Exam Certificate, Informative Test Report
YEDU	Uninterruptible Power-supply Equipment	1778	External bypass switches, Remote battery cabinet, Uninterruptible power supplies	 External bypass switches Remote battery cabinet Uninterruptible power supplies	62040-1	Uninterruptible Power Systems (UPS)	OFF	Michio Iwasaki (ULJ) Concern Chang (ULT)	Richard Lee (ULT)	CE, D Mark, UL-EU, Type Exam Certificate, Informative Test Report
XPTQ	Transformers, General Purpose	506 5085-1 5085-2 5085-3	Industrial control transformers, Insulating transformer, Reactor Class 2 transformer	 Industrial control transformers Insulating transformer Transformer	61558-2-4 or 61558-2-6	Isolating transformers for genral use ; Safety isolating transformers for general use	SAFE		Pauline Wu (ULC) Shannon Tsui (ULH) Youngju Kim (ULK) Joe Yang (ULT) Richard Lee (ULT)	CE, D Mark, UL-EU, Type Exam Certificate, Informative Test Report
FOWX2	Fixed Capacitors for Use in Electronic Equipment - Component	60384-14	X Capacitors Y Capacitors	 X Capacitors Y Capacitors	60384-14	Fixed Capacitors for Use in Electronic Equipment	CAP	Baifong Cheng (ULT)	Tom Chen (ULT)	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL Demko and UL Taiwan
ZMVV	Wire Connectors And Soldering Lugs	486A-486B	copper terminal lugs	 Copper terminal lug Through connector	61238-1	Compression and Mechanical connectors for Powercables for rated voltage upto 30kV	INST	Ashish Mathur (ULI) Venkateswaran S (ULI)	Santosh Tripathy (ULI)	CE, D Mark, UL-EU, Type Exam Certificate, Informative Test Report
ECBT2	Connectors for Use in Data, Signal, Control and Power Applications - Component	1977	Connectors		61984	Connectors – Safety requirements and tests	INST	No L2 in Asia	No L3 in Asia	CE, CB, D Mark, UL-EU, Type Exam Certificate, Informative Test Report CBTL : UL NBK
CWFT	Busways and Associated Fittings	857	Busways		61439-6	Busbar trunking systems (busways)	POW	Sophie Deng (ULC) Santosh Tripathy (ULI) Ryuichi Ohya (ULJ) Sangman Kim (ULK) Marisol Javier (ULS) Hans Hsieh (ULT)	Chandrakumar S (ULI)	Type Exam Certificate, UL Classification