

UL 2735

Electric Utility Meter Safety Standard and Conformity Assessment

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Agenda



Accelerating adoption

UL2735 Development Timeline

Research activities

UL2735 Requirements

Conformity Assessment Options

UL Conformity Assessment Findings

Helping to accelerate adoption



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Press Releases

UL Announces New Safety Programs to Facilitate Adoption of Smart Meters

UL offers Smart Meter safety services for manufacturers and users

NORTHBROOK, Ill., Jan. 27, 2014 - UL (Underwriters Laboratories) a global safety science leader, announced today the launch of two new safety services designed to facilitate and accelerate the adoption of smart meters. In cooperation with leading US utilities and smart meter manufacturers, and in response to numerous smart meter safety concerns from consumers and regulators, UL has established both product safety certification services for smart meter manufacturers and product safety testing services for smart meter users.

Earlier this year, UL published the Standard for Safety for Electric Utility Meters, UL2735. This standard contains requirements for the electric shock, fire, mechanical and radio-frequency (RF) emissions safety aspects of all electric utility

UL2735 Standard
Product Safety Testing Program
Product Safety Certification Program

Developing UL 2735 Requirements

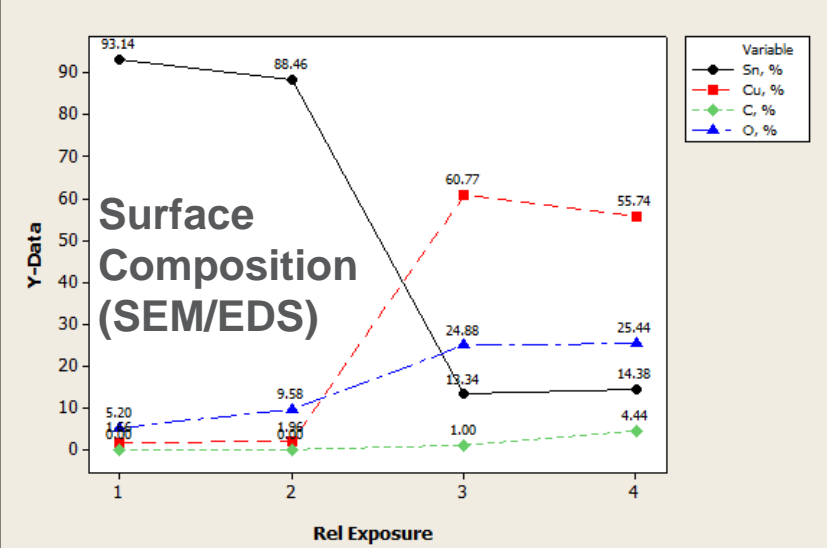
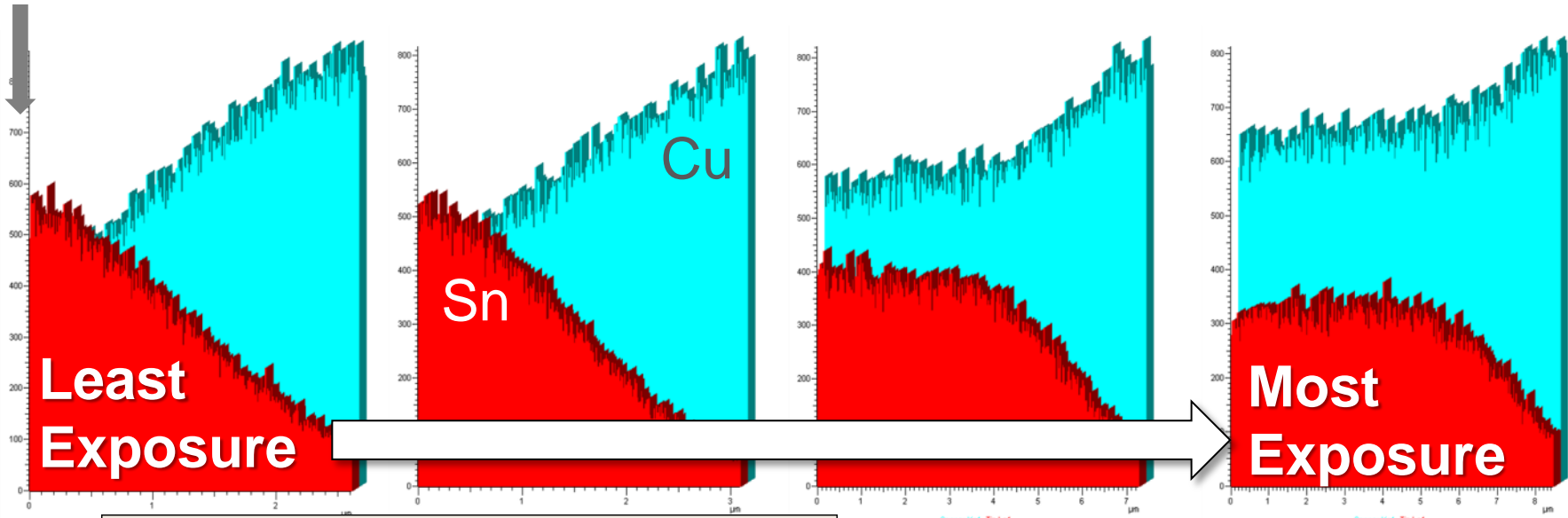


Date	Activity
2009	<ul style="list-style-type: none">• UL begins evaluation of requirements for smart meter electric, fire, mechanical and emissions safety testing
2010	<ul style="list-style-type: none">• UL develops Outline of Investigation UL Subject 2735 to evaluate electrical, fire, mechanical and emissions hazards of Type S and A utility meters
2012	<ul style="list-style-type: none">• UL was contacted by several utilities to conduct safety testing of smart meters• UL conducts safety tests on smart meters utilizing UL Subject 2735 test plan• Consumers begin contacting UL to inquire about UL mark and safety testing on smart meters• Research begins on meter installation overheating
2013	<ul style="list-style-type: none">• After limited industry review and comment UL publishes UL2735 safety standard for electric utility meters• Standards Technical Panel (STP) is formed and begins ANSI consensus process for UL2735• Several utilities adopt UL conformity assessment programs for smart meter safety• Major US meter manufacture successfully achieves UL certification on numerous smart meter models

Smart Meter Research



Surface



Understand changes in meter/meter socket interface to understand “hot socket” phenomenon

Early research confirmed physical changes in contacts

Leverage knowledge to develop standards and/or services to mitigate hazards due to hot socket issues

UL2735 Requirements - Scope



These requirements cover the **electrical safety of electric utility (revenue) meters rated up to 600 V**, which measure, monitor, record, transmit, or receive electrical energy generation or consumption information.

Meters covered by this standard **may be provided with one or two-way communication capabilities**, by means of carrier signals, telephone, cable, wireless communication, or other methods.

These meters **may additionally provide signals**, either by direct connection or wirelessly, **for the control of electrical loads or electrical power generation equipment** in response to signals received from the utility or local communication networks

These requirements cover **socket mounted plug-in (Type S) utility meters, and non-socket mounted, bottom connected (Type A) utility meters**, intended for installation in ordinary (non-classified) locations. These may or may not be intended to be under the exclusive control of the serving utility.

These requirements **also cover revenue meters that are not socket mounted (Type S) or bottom connected (Type A) meters**, including those that are intended for factory installation as components within the enclosure of complete equipment.

These requirements **do not cover** equipment intended as **test equipment or equipment intended to make measurements for analysis in a laboratory or industrial setting**.

UL2735 Requirements – Construction



Components	Electrical	Fire	Mechanical
<ul style="list-style-type: none"> • Compliance with relevant component standards • Used within their recognized ratings • Plastics, printed circuit boards, MOV's, wire, transformers, etc. 	<ul style="list-style-type: none"> • Accessibility of hazardous live parts • Electrical spacings over-surface and through-air • Isolation of current transformer secondary 	<ul style="list-style-type: none"> • Polymeric enclosure flammability • Battery protection, charging, placement and replacement 	<ul style="list-style-type: none"> • Environmental considerations of enclosure • Strength and rigidity of enclosure • Access panels • Form/size per ANSI C12

UL2735 Requirements – Performance



Electrical	Fire	Mechanical	ANSI C12.1
<ul style="list-style-type: none"> • Endurance of load control switch • Single component fault 	<ul style="list-style-type: none"> • Polymeric enclosure flammability • Single component fault 	<ul style="list-style-type: none"> • Static • Impact • Drop 	<ul style="list-style-type: none"> • Temperature rise* • Insulation resistance • HV Line Surges • Temporary Overload* • Fast Transient/Burst • RF interference • RF Conducted/Radiated Emissions • Electrostatic Discharge*





*modified in UL2735

UL2735 Requirements – Markings



UL2735 Conformity Assessment Options



	<i>Specified Requirements</i>	<i>Initial Validation</i>	<i>Ongoing Production Validation</i>	<i>Component Substitution Validation</i>
1st Party Self-Declaration	UL2735	Meter manufacturer	?	?
2nd Party Verification	UL2735	Utility	?	?
3rd Party Verification	UL2735		?	?
3rd Party Certification	UL2735			

UL 2735 Conformity Assessment Findings



Enclosure flammability – sustained burning/molten and flaming dripping

Single component failures – ejections/flames/accessibility to live parts

Endurance of service switches – welded contacts

Deficient electrical spacings

Supply chain control of safety critical components – compliance of production



THANK YOU.



Questions?