

OSM/IN DECISION

Standard:	<i>EN 50539-11:2013</i> <i>EN 61643-11:2012</i>	Sub clause:	7.2.4 (EN 50539-11) 8.1.3 (EN 61643-11)	Sheet N°:	OSM/IN 272
Subject:	Generator specification for measurement of the Front of Wave Sparkover Voltage	Key words:	- sparkover voltage - front of wave sparkover - measured limiting voltage	Meeting N°: Inquiry:	25 (2015) OSM_IN(inq)-102_2014

Question:	<p>How to improve the repeatability and consistency of front of wave sparkover measurements?</p> <ul style="list-style-type: none"> - Different generator output impedances (may) lead to significantly different sparkover voltages measured. Depending on SPD construction (e.g. triggered SPDs, multi-gap SPDs, etc.) the results may vary by a factor of up to 3 or even 4 in peak voltage measured. - The further the real test waveshape and rise time is from the 1,2μs nominal rise time value, the bigger the spread in results, because the maximum voltage steepness may vary approximately between 7kV/μs (for a 1,2μs front time at the +30% tolerance limit) and more than 15kV/μs (for a 1,2μs front time at the -30% tolerance limit) according to the standard. - Generators with “unclean” or even discontinuous waveshape in the rising portion lead to sometimes almost impossible to interpret oscillograms and to arbitrary test results, but also to poor repeatability of the measured results.
Proposal:	<p>The following improved requirement shall be applied to:</p> <p>7.2.4 (EN 50539-11) Voltage impulse used for class I and II sparkover tests 8.1.3 (EN 61643-11) Voltage impulse used for class I and II sparkover tests</p> <p>The standard voltage waveshape is 1,2/50. The tolerances of the voltage waveshape of the open circuit voltage at the points where the device under test (DUT) will be connected are the following:</p> <ul style="list-style-type: none"> • crest value ± 5 % • front time ± 10 % • time to half value ± 20 % <p>Oscillations or overshoot may occur at the crest of the impulse. If the frequency of such oscillations is more than 500 kHz or the duration of the overshoot is less than 1 μs, a mean curve shall be drawn and, for the purpose of the measurement, the amplitude of this mean curve defines the measured crest value of the open circuit voltage.</p>

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	<p>The output impedance of the test generator shall be between 400 and 500 Ohms.</p> <p>For the purpose of sparkover tests a smooth and clean rising portion of the open circuit voltage impulse, without any discontinuities or superimposed oscillations and without any bouncing effects of the trigger switch, is essential for meaningful and repeatable measurement results.</p> <p>The measuring system shall have an overall bandwidth of a least 25 MHz.</p>
Remark:	In order to comply with the future standard improvement, this decision has been requested by the CLC TC37A WG1.
Explanatory notes:	<p>From the minutes of the CLC TC37A WG1 meeting held in Frankfurt on 1st and 2nd July 2014,, the following general agreements were then achieved:</p> <ul style="list-style-type: none"> - Front-of-wave sparkover voltage measurements: - Residual voltage measurements