Insulation resistance of 301S-KAP50 as a function of voltage and temperature

The insulation resistance of a 1m sample of 50 Ohm coaxial cable was measured for temperatures up to 290°C and voltages up to 5KV.

Measurement:

All tests were done in air, measuring resistance between the inner conductor and the outer shield.

Values in black were measured with an Ohmmeter with an upper limit of 20 GOhm at voltages from 100 to 500V and 200 GOhm from 1000 to 5000V DC; values in blue were measured with a single-voltage (500V DC) Teraohmmeter.

Test results:

	100V	250V	500V	1000V	2500V	5000V	500V
25°C	>20 GOhm	>20 GOhm	>20 GOhm	>200 GOhm	>200 GOhm	>200 GOhm	5,5 TOhm
100°C	>20 GOhm	>20 GOhm	>20 GOhm	>200 GOhm	>200 GOhm	>200 GOhm	10 TOhm
200°C	>20 GOhm	>20 GOhm	>20 GOhm	>200 GOhm	>200 GOhm	>200 GOhm	650 GOhm
250°C	2,05 GOhm	1,84 GOhm	1,59 GOhm	1,13 GOhm	493 MOhm	270 MOhm	1,5 GOhm
290°C	49 MOhm	47 MOhm	44,5 MOhm	34,5 MOhm	16,7 MOhm	---	---

Remarks:

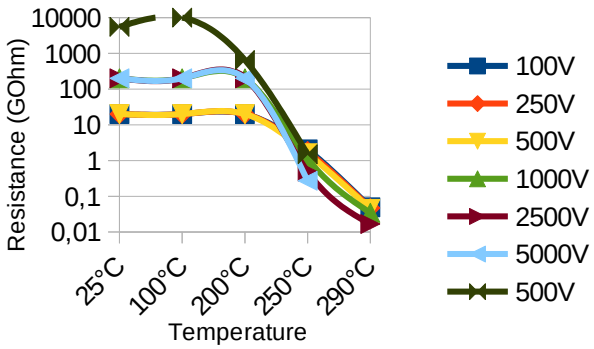
As measurements were done in air the resistance increased at 100°C due to water removal.

The Teraohmmeter showed 1 order of magnitude lower resistance at 200°C than at room temperature.

Conclusion:

The use of the cable up to 200°C is possible up to the given voltage rating of 10KV
Above 200°C the max. voltage has to be reduced.
A voltage >1KVDC is not recommend above 250°C.

Please note: this data is intended as a guideline only and is not to be considered a specification.



Resistance vs. Temperature for different Voltages

Data from Dupont for Kapton®:

Volume resistivity	@23°C	~$2x10^{17}$ Ohm cm
	@200°C	~$3.7x10^{14}$ Ohm cm

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