



TESTING AND MEASURING EQUIPMENT/ALLOWED SUBCONTRACTING
Heating cables with a rated voltage of 300/500V for comfort heating and prevention of ice formation
IEC 60800 Edition 3. 0 (2009-07)

R=Required by Lab
S=May be subcontracted

Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
8	Testing		
8.2	Type tests—Detailed test requirements		
8.2.1	Electric resistance of heating conductors and screen	DC resistance test equipment; Thermometer or temperature compensation to 20°C; Heating cabinet with the temperature of 100°C.	R
8.2.2	Water immersion and temperature cycling test		
8.2.2.1	General remark	Water containers with temperature controlled.	R
8.2.2.2	Dielectric test	Water tank; Voltage power supply (AC 2000V).	R
8.2.2.3	Electrical insulation resistance test	Water tank; Insulation resistance tester with DC source of 1000 V.	R



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8.2.3	Verification of rated output for parallel heating cables	DC resistance test equipment; Thermometer. or Rated output measuring system which included carbon steel pipe of 50mm diameter of greater; fiber glass insulation; a suitable heat transfer liquid; thermocouple; temperature indicator; temperature controller; in-line heater; chiller; flow meter; pump.	R
8.2.4	Verification of start-up current for parallel heating cables	Start-up current testing apparatus, Power supply(220V);stopwatch or similar time record device.	R
8.2.5	Penetration test for electrical conductive screen	A steel test pin with a diameter of 1mm; Mandrel of different diameter; Residual current device with maximum of 30mA.	R
8.2.6	Flammability test	Propane gas burner: 1 kW pre-mixed flame including system of confirmation of test flame;3-sided metallic screen 1200 mm high, 300 mm wide and 450 mm deep with open front and closed top and bottom; suitable timer; vernier caliper with an accuracy of 1mm;propane gas with prescribed purity.	R
8.2.7	Deformation test for installation classification		
8.2.7.1	General remark		
8.2.7.2	Class M1: cables intended for installation with low risk of mechanical damage	Cylindrical steel rod with 6mm diameter; flat steel support; Rigid plate of 100mm by 100mm; 600N force; Stopwatch; Voltage power supply (AC 1500V).	R
8.2.7.3	Class M2: cables intended for installation with low risk of mechanical damage	Cylindrical steel rod with 6mm diameter; flat steel support; Rigid plate of 100mm by 100mm; 1500N force; Stopwatch;	R

60800: Edition 3.0(2009-07)



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		Voltage power supply (AC 1500V).	
8.2.8	Cold impact test	Impact test apparatus; pad of sponge rubber about 40mm; suitable low temperature cabinet; hammers; caliper for measurement of the height of fall hammer; Voltage power supply (AC 1500V).	R
8.2.9	Cold bend test	Suitable low temperature cabinet; Cold bend test apparatus; Mandrel with different radius; Stopwatch; Water tank; Voltage power supply (AC 2000V).	R
8.2.10	Ageing test for insulation	Tensile machine and system for measurement of the elongation; equipment for punching dumb-bell test pieces and equipment for cutting or grinding the insulation to obtain 2 parallel surfaces; Optical measuring instrument / dial gauge; Oven with natural air flow or air flow by pressure, airflow rate: 8~20 completed air changes per hour.	R
8.2.11	Ageing test for non-metallic sheath	Tensile machine and system for measurement of the elongation; equipment for punching dumb-bell test pieces and equipment for cutting or grinding the insulation to obtain 2 parallel surfaces; Optical measuring instrument / dial gauge; Oven with natural air flow or air flow by pressure, airflow rate: 8~20 completed air changes per hour.	R
8.2.12	Compatability test	Tensile machine and system for measurement of the elongation; equipment for punching dumb-bell test pieces and equipment for cutting or grinding the insulation to obtain 2 parallel surfaces; Optical measuring instrument / dial gauge; Oven with natural air flow or air flow by pressure, airflow rate: 8~20 completed air changes per hour.	R

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8.2.13	UV resistance test	Type 1A (UVA-340) fluorescent UV lamp, Test Chamber, Radiometer, Black-standard/black-panel thermometer, Specimen holders: Condensation system.	S
8.2.14	Tensile test	Tensile machine equipped with jaws; Conductor continuity failure detector.	R
8.2.15	Reverse winding test	Mandrel with different diameter; winding machine or equivalent equipment; Water tank; Voltage power supply (AC 2000V).	R
8.2.16	Heat shock test	Mandrel with different diameters; Air oven.	R
8.2.17	Shrinkage test for insulation and sheath	Vernier caliper; air oven; support or talc bath.	R
8.2.18	Hot set test	Oven with natural air flow or air flow by pressure, airflow rate: 8~20 completed air changes per hour; grips, weights, system for measurement of the elongation.	R
8.2.19	Cyclic ageing test for the heating cable	Tensile machine and system for measurement of the elongation; equipment for punching dumb-bell test pieces and equipment for cutting or grinding the insulation to obtain 2 parallel surfaces; Optical measuring instrument / dial gauge; Oven with natural air flow or air flow by pressure, airflow rate: 8~20 completed air changes per hour; Alkaline water solution; pH meter.	R
8.2.20	Cyclic ageing test for splices and end seals	Oven with natural air flow or air flow by pressure, airflow rate: 8~20 completed air changes per hour; Alkaline water solution; pH paper or pH meter; Insulation resistance tester with DC source of 1000 V.	R
8.2.21	Checking of the durability of marking	A piece of cotton wool or cloth soaked in water.	R

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8.2.22	Abrasion test	Under consideration.	
8.2.23	Deformation test for insulation and sheathing materials	Indentation device consists of a rectangular blade with an edge $0,7\pm 0,01$ mm wide, loads (weights) and supports; air oven; Microscope or profile projector with two decimal places.	R
8.3	Routine and sample tests		
8.3.1	General remark		
8.3.2	Voltage test	Voltage power supply (AC 2.5kV or DC 3.5kV).	R
8.3.3	Heating cable resistance and output verification	DC resistance test equipment or Current measure device with specified voltage; Thermometer or temperature compensation to 20°C.	R
8.3.4	Insulation thickness	Measuring microscope or profile projector of at least 10 x magnification.	R
8.3.5	Sheath thickness	Measuring microscope or profile projector of at least 10 x magnification.	R
8.3.6	Hot set test	Oven with natural air flow or air flow by pressure, airflow rate: 8~20 completed air changes per hour; grips, weights, system for measurement of the elongation.	R