

**TESTING AND MEASURING EQUIPMENT/ALLOWED SUBCONTRACTING
IEC 61951-1:2017, Edition 4.0**

**Secondary cells and batteries containing alkaline or other non-acid electrolytes –
Secondary sealed cells and batteries for portable applications –
Part 1: Nickel-cadmium**

“R” Required
 “S” May be subcontracted, see OD 2012
 “SPTL” Specialized Facility, see IEC 02-2
 “W” Witness testing in the categories “MED” and “MEAS”
 “3PPS” Three Phase Power Supply required

Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
7.2	Charging procedure for test purposes	Electric load.	R
		DC power supply.	R
		Temperature and humidity recorder.	R
		Timer.	R
		Multimeter.	R
7.3.2	Discharge performance at 20 °C	Multimeter.	R
		Electric load.	R
		Timer.	R
		Temperature recorder.	R
		Oven.	R
7.3.3	Discharge performance at -18 °C	Multimeter.	R
		Oven.	R
		Electric load.	R
		Timer.	R
7.3.4	Discharge performance for rapid charge cells (R cells)	DC power supply.	R
		Multimeter.	R
		Electric load.	R
		Timer.	R
		Temperature recorder.	R
		Oven.	R

Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
7.4	Charge (capacity) retention	Multimeter.	R
		Electric load.	R
		Timer.	R
		Temperature recorder.	R
		Oven.	R
7.5.1	Endurance in cycles	Multimeter.	R
		Electric load.	R
		DC power supply.	R
		Timer.	R
		Temperature recorder.	R
		Oven.	R
7.5.2	Permanent charge endurance	Multimeter.	R
		Electric load.	R
		DC power supply.	R
		Timer.	R
		Temperature recorder.	R
		Oven.	R
7.7	Overcharge	Multimeter.	R
		Electric load.	R
		DC power supply.	R
		Timer.	R
		Temperature recorder.	R
		Oven.	R
7.8	Safety device operation	Multimeter.	R
		Electric load.	R
		DC power supply.	R
		Timer.	R
		Temperature recorder.	R
		Timer.	R
		Thermo couples for temperature measurement.	R
7.9	Button cells or batteries storage, small prismatic cells or batteries storage, cylindrical cells or batteries storage	DC power supply.	R
		Multimeter.	R
		Electric load.	R
		Timer.	R
		Temperature and humidity recorder.	R
		Oven.	R
7.10	Charge acceptance at +55 °C for LT, MT or HT cylindrical cells	DC power supply.	R
		Multimeter.	R

Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
		Electric load.	R
		Timer.	R
		Temperature recorder.	R
		Oven.	R
7.11	Trickle charge acceptance for JT cylindrical cells	DC power supply.	R
		Multimeter.	R
		Electric load.	R
		Timer.	R
		Temperature recorder.	R
		Oven.	R
7.12.2	Measurement of the internal a.c. resistance	Internal resistance meter.	R
7.12.3	Measurement of the internal d.c. resistance	Electric load.	R
		Timer.	R
		Multimeter.	R
8	Mechanical tests	Vibration tester. Per IEC 61959:2004, Table 1.	R
		DC power supply.	R
		Multimeter.	R
		Electric load.	R
		Timer.	R
		Temperature recorder.	R
		Hardwood surface.	R
		Height measurement.	R
		Scale.	R