

### Rolls Series 4000

Flooded lead-acid batteries subject to test methods of IEC 61427-1:2013

**Prepared for:** Pascal Ferron, Plant Manager, Surrette Battery Company Ltd.,  
1 Station Road, PO Box 2020, Springhill, NS, B0M 1X0

**Prepared by:** Lukas Swan, PhD, Peng, Principal Investigator  
Renewable Energy Storage Laboratory, Dept. of Mechanical Engineering,  
Dalhousie University, 1360 Barrington Street, Halifax, NS B3H 4R2

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### Summary:

Surrette Battery Company Ltd. supplied Rolls Series 4000 S-480 6 volt flooded lead-acid batteries to the Renewable Energy Storage Laboratory at Dalhousie University for performance testing in accordance with International Electrotechnical Commission standard IEC 61427-1:2013 Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 1: Photovoltaic off-grid application. Section 6 Functional characteristics were carried out using the four tests 8.1 Capacity test, 8.2 Generic cycling endurance test, 8.3 Charge retention test, and 8.4 Cycling endurance test in photovoltaic applications (extreme conditions).

The battery/cell samples were prepared and accurate measurement instruments were used in accordance with Section 7 General test conditions. Test parameters were applied in accordance with Rolls Series 4000 S-480 IEC specification sheet that lists 10 hour discharge capacity of 286 Ah when discharged to 1.75 volts-per-cell in an ambient temperature of 20 °C.

### Results:

**8.1: Capacity test.** Battery discharged at 10 hour rate delivered 1st cycle temperature-corrected capacity of 311 Ah which is greater than 95% of the specification value equal to 271 Ah, and 5th cycle temperature-corrected capacity of 296 Ah which is greater than the specification value of 286 Ah. **PASSED.**

**8.2: Generic cycling endurance test.** Battery discharged at 10 hour rate, following three General Endurance Units (150 total cycles) delivered temperature-corrected capacity of 234 Ah which is greater than 80% of the specification value equal to 229 Ah. **PASSED.**

**8.3: Charge retention test.** Battery discharged at 10 hour rate after standing open circuit for 90 days delivered a retained temperature-corrected capacity of 269 Ah which equals a charge retained of 94%. (There is no declaration of pass or fail required for this test).

**8.4: Cycling endurance test in photovoltaic applications (extreme conditions).** Battery completed 4 aggregate phase A+B cycle sequences, after which the discharge at the 10 hour rate delivered temperature-corrected capacity of 223 Ah which is less than 80% of the specification value equal to 229 Ah. **PASSED.**

Each 2 volt and 6 volt L-16 model in Rolls Series 4000 product line is constructed with identical internal components and is assembled with a varying number of positive and negative plates of the same type. As such, the results of this IEC 61427-1:2013 testing are consistent and apply to all Series 4000 2 volt and 6 volt L-16 models.

Includes: Rolls S2 L16, S2 L16-HC, S2 L16-SC, S6 L16, S6 L16-HC, S6 L16-SC