

## Test Report    Physical Test Laboratory

V7760  
Version: 1

Prepared by:  
Patrick Schluer

Date: 28.03.2018

Released by:  
Dr. David Engemann

Page 1 von 6

# Typetest

## sun | power VR M

### Product Range solar.bloc

## DIN EN 61427 – 8.4

### Cycle endurance test in photovoltaic applications



Version	Reason for changes	Date
0	First edition	22.08.2017
1	Implementation new product names Update report design	23.03.2018

## Test Report Physical Test Laboratory

V7760  
Version: 1

Prepared by:  
Patrick Schluer

Date: 28.03.2018

Released by:  
Dr. David Engemann

Page 2 von 6

### Result summary:

**The bloc reached 21 units  
(150 cycles A and B),  
respectively 3150 cycles**

Remark: HOPPECKE Batterien GmbH & Co. KG renamed the cells with solar.bloc design to its new brand **sun** | power VR M. The names of solar.bloc and sun | power VR M are referring to each other directly and there is no technical difference. The present type test was carried out with solar.bloc design and this name conversion has no influence on the test itself.

## Test Report    Physical Test Laboratory

V7760  
Version: 1

Prepared by:  
Patrick Schluer

Date: 28.03.2018

Released by:  
Dr. David Engemann

Page 3 von 6

<b>Test:</b>	<b>Cycle endurance test in photovoltaic applications</b>
<b>Test location:</b>	<b>HOPPECKE Batterien GmbH &amp; Co KG, physical test field</b>
<b>Reference documents:</b>	<b>IEC 61427                      Clause 8.4</b>
<b>Test object:</b>	<b>1 bloc solar.bloc 12V 150</b>
<b>Test procedure:</b>	<b>1. 10h initial capacity test 2. Solar cycle</b>
<b>Nominal temperature:</b>	<b>20°C/ 68°F</b>
<b>Test equipment used:</b>	<b>see PUMA</b>

## Test Report Physical Test Laboratory

V7760  
Version: 1

Prepared by:  
Patrick Schluer

Date: 28.03.2018

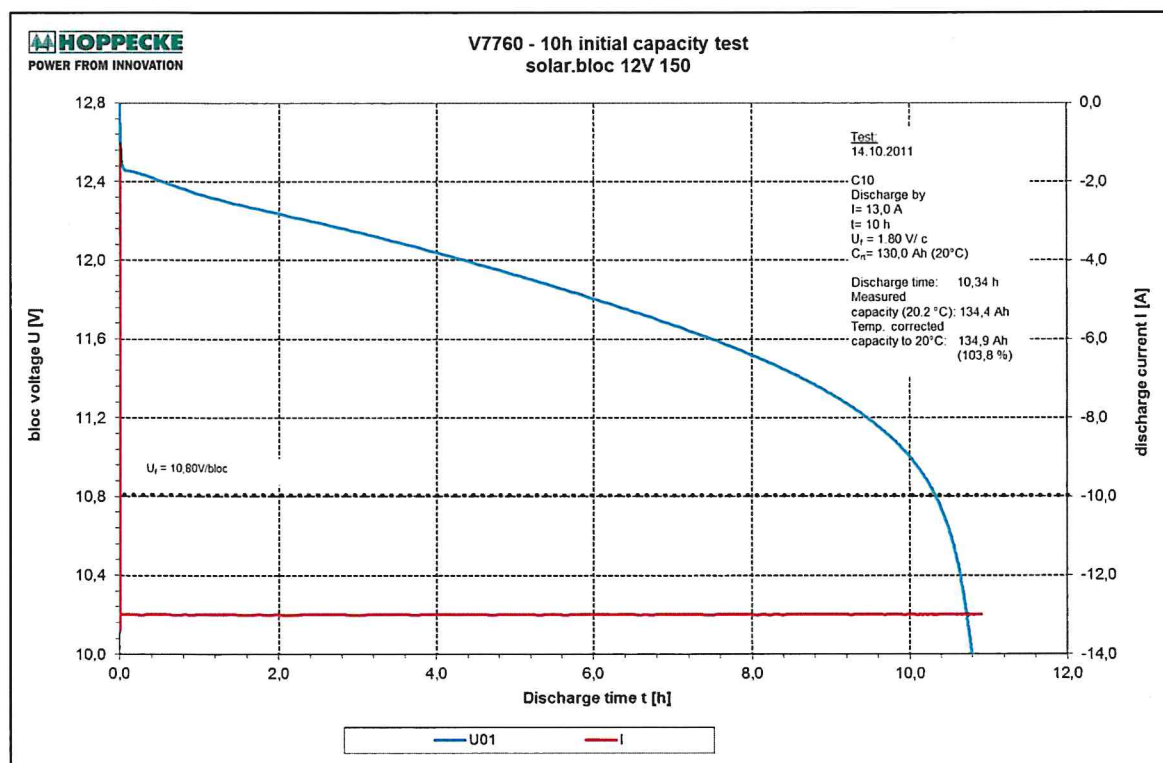
Released by:  
Dr. David Engemann

Page 4 von 6

### Test results:

#### 1. 10h initial capacity test

Date	14.10.2011	
Discharge current	I [A]	13.0
Cut off voltage	U [V/cell]	1.80
Nominal capacity (20°C)	C <sub>Nenn</sub> [Ah]	130.0
Measured capacity (20.0°C)	C [Ah]	<b>134.9</b>
C <sub>a20.0°C</sub> / C <sub>Nom</sub>	[%]	<b>103.8</b>



## Test Report    Physical Test Laboratory

V7760    Prepared by:  
Version: 1    Patrick Schluer

Date: 28.03.2018

Released by:  
Dr. David Engemann

Page 5 von 6

### 2. Solar cycle

(Evaluation according to IEC 61427)

Capacity test with  $U_f = 1.8\text{V/cell}$ ,  $I = 13.0\text{A}$ ,  $C_{rt} = 130.0\text{ Ah}$ 

Date	Test unit	cycles A and B	$C_{10}$ in %
14.10.2011	0	0	103.8
24.12.2012	1	150	110.9
14.02.2012	2	300	114.1
11.04.2012	3	450	114.1
19.06.2012	4	600	112.8
16.08.2012	5	750	112.1
10.10.2012	6	900	111.3
06.12.2012	7	1050	110.0
29.01.2013	8	1200	108.9
27.03.2013	9	1350	108.9
22.05.2013	10	1500	107.9
16.07.2013	11	1650	106.8
13.09.2013	12	1800	105.9
05.11.2013	13	1950	105.1
31.12.2014	14	2100	103.6
23.02.2014	15	2250	102.6
18.04.2014	16	2400	102.3
12.06.2014	17	2550	100.8
17.08.2014	18	2700	97.3
09.10.2014	19	2850	93.0
02.12.2014	20	3000	85.5
23.01.2015	21	3150	72.3



## Test Report Physical Test Laboratory

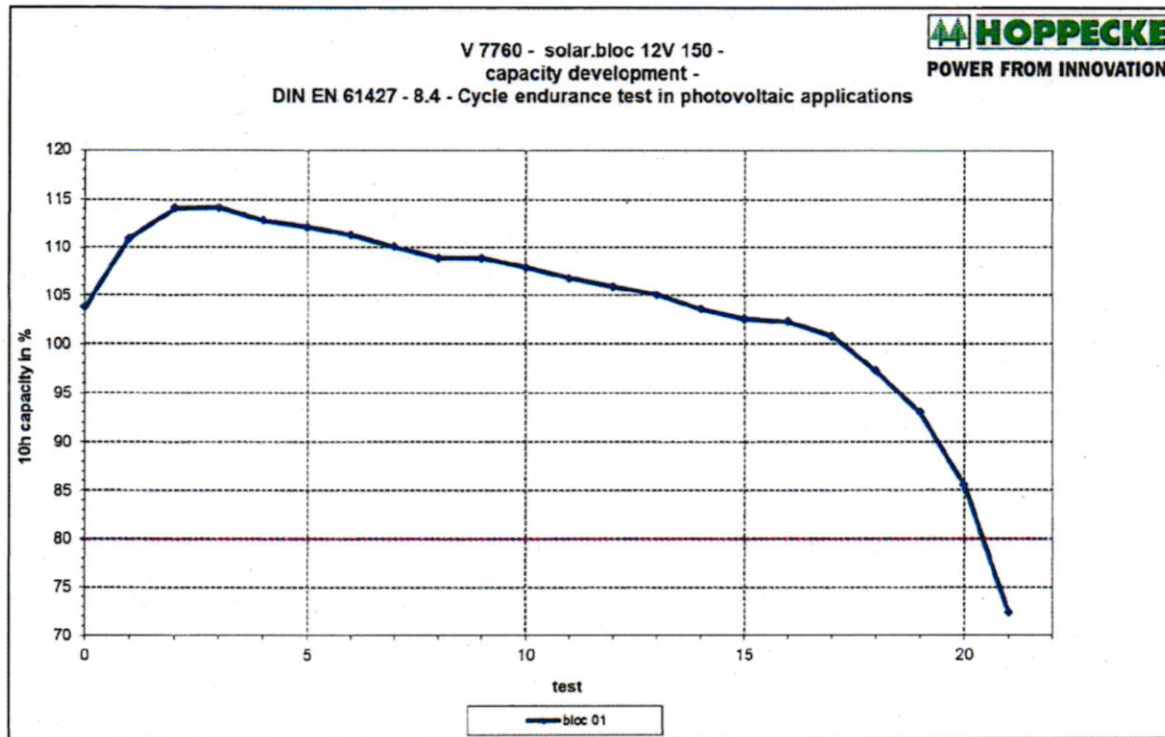
V7760  
Version: 1

Prepared by:  
Patrick Schluer

Date: 28.03.2018

Released by:  
Dr. David Engemann

Page 6 von 6



### Signatures:

#### HOPPECKE representatives

Released by:

HOPPECKE Batterien GmbH & Co. KG  
Physikalisches Labor  
Bontkirchener Str. 1  
59929 Brilon, Germany  
28.03.2018

*A. A. D. Engemann*  
p. p. Mr. Dr. David Engemann

Physical Laboratory

Prepared by:

*P. Schluer*  
p. p. Mr. Patrick Schluer

Physical Laboratory

