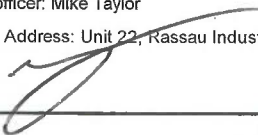


IEC 60896-21/22:2004 - Product Range Test Report												
1) General product type information												
Product manufacturer		GS Yuasa Battery Manufacturing UK Ltd										
Manufacturing site		Unit 22, Rassau Ind Estate, Ebbw Vale NP23 5SD										
Product Tested (Results below only relate to this product)		SWL1800										
Product model range		SWL										
Product comprising the above model range		SWL750, 1100, 780, 1850, 2250, 1850-6, 1800, 2300, 2500, 3300, 3800, 4300 (and FR)										
Test Selection date & Start Date		Oct-19				Dec-19						
2) Product test performance information												
Product safe operation in service		IEC 60896-21 test clause result						Product complies for all applications				
6.1	Gas emission (at the float voltage and at 2,40 Vpc) (ml gas per cell, hr, and Ah)	Float Charge 2.275vpc			At 2.40vpc overcharge voltage conditions			Yes				
		0.0403			0.0232							
6.2	High current tolerance (A)	$I_{disc} = 567A$		13.008V	13.009V	13.001V	Yes					
6.3	Short circuit and d.c. internal resistance	I_{sc} (A)	1597A	2194A	1958A	R_i (Ω)	0.008	0.006	0.007	Yes		
6.4	Internal ignition from external spark sources	Optional design feature - test pass *Test performed at an off site IEC61430 explosion test chamber at 15-30°C										
6.5	Protection against ground short propensity	Pass										
6.6	Content and durability of required markings	Pass										
6.7	Material identification	Case	Pass	Cover	Pass							
6.8	Valve operation	Before	Pass	After	Pass							
6.9	Flammability rating of materials	Case	HB / V0	Cover	HB / V0							
6.10	Intercell connector performance (°C)	IBB1800 Connector - 26°C										
Product performance in service		IEC 60896-21 test clause result										
6.11	Discharge capacity (%)	C_{10}	115.6	C_8	106.9	C_3	112.3	C	115	$C_{0.25}$	128.8	Yes
			116.7		108.1		109.3		110		120.8	
			115.3		114.4		115.3		115		126.8	
			116.2		111.6		112.3		113		130	
			114.2		116.3		111.7		115		121.6	
			112		111.5		112.3		115		129.2	
6.12	Charge retention during storage (%)	C_{rf}	89.76	90.15	90.8						Yes	
			82.87	90.24	87.39							
6.13	Float service with daily discharges (Cycles)	415										
6.14	Recharge behaviour (%)	24 h	95.45	168 h	100						Yes	
Product durability in service		IEC 60896-21 test clause result										
6.15	Float service life at 40°C	840	724	862	Days with C_3 rate test at 40 °C					Yes		
6.16	Impact of stress temperature of 55°C or 60°C	254	256	263	Days with C_3 rate test at 55 °C							
		126	168	105	Days with $C_{0.25}$ rate test at 55 °C							
6.17	Abusive over-discharge (Ah/Ah)	C_{aad}	1.01	C_{aoc}	0.99							
6.18	Thermal runaway sensitivity (°C)	$T_{2.45Vpc}$	A	28.25	$T_{2.60Vpc}$	A	46.88				Yes	
			B	28.25		B	46.88					
			C	28.25		C	46.88					
6.19	Low temperature sensitivity (Ah/Ah)	C_{als}	1.11	No damage					Yes			
			1.12	No damage								
			1.15	No damage								
6.20	Dimensional stability at elevated internal pressure and temperature		%	mm								
		A	0.43	0.93								
		B	0.009	0.02								
6.21	Stability against mechanical abuse of units during installation	Pass			Pass			Yes				
Company name: GS Yuasa Battery Manufacturing UK Ltd Company officer: Mike Taylor Test Room Address: Unit 22, Rassau Industrial Estate NP23 5SD Signature: 										 10464		
Report No. 24-001 Issue Date: 21/06/2024												
When a decision is in place IEC60896-22 is used *Unless otherwise stated all tests are performed at 20°C End of Results												