



TÜV-SÜD, Octagon House,
Concorde Way, Segensworth North, Fareham,
Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100
Website: www.tuv-sud.co.uk

COMMERCIAL-IN-CONFIDENCE

STATEMENT OF TEST

CLIENT Advance Technical Systems Limited
Units 1 and 2, Taylor Street
Cleckheaton
West Yorkshire
United Kingdom, BD19 5DZ

DOCUMENT 75949610 Report 02 SoT Issue 1

CLIENT'S ORDER NUMBER 2469, 2964, 3243 & 3244

INCOMING RELEASE NOTE No delivery documents were supplied

DATE OF RECEIPT 09 December 2020

EQUIPMENT UNDER TEST (EUT) AW65 48V 20Ah Battery Packs

PART No Type A100-1606.

SERIAL No 1 Cycle Fully Charged (x4 Packs) 25 Cycles Fully Charged (x4 Packs)
19/UKE, 20/UKE, 22/UKE, 30/UKE 14/UKE, 15/UKE, 16/UKE, 17/UKE

TEST SPECIFICATION / ISSUE Transport of Dangerous Goods manual of Tests and Criteria.
ST/SG/AC.10-Nov-Rev.7 (Section UN38.3)

DEVIATIONS FROM THE STANDARD None

DATE OF TEST 09 December to 27 February 2021

TEST(S) DESCRIPTION Environmental Testing of the AW65 48V 20Ah Battery Packs

The battery packs are classified and tested as rechargeable lithium battery packs (small) according to the requirements of Table 38.3.3. Tests T.1 to T.7 were applied as specified to the same eight battery packs and in sequential order. An additional three battery packs were also tested as reserve/spare units. Test T.6 applies only to individual battery cells and was not required for battery packs.

	Test Description	Specification Ref.	Test Parameters
1	T.1 Altitude Simulation	38.3.4.1	11.6 kPa (abs.) for 6 h
2	T.2 Thermal Cycling	38.3.4.2	Temperature varied between 6 h at +72°C and 6 h at -40°C. 10 cycles.
3	T.3 Vibration	38.3.4.3	Swept sine vibration 7 Hz to 200 Hz up to maximum of 8 g(pk). 3 h in each of three axes
4	T.4 Shock	38.3.4.4	Shock level derived by formula according to weight. Half Sine. 134.6 g(pk) 6 ms
5	T.5 External Short Circuit	38.3.4.5	Stabilise each pack at +57°C for 6 h. Apply the short circuit condition for 1 h. The BMS protection is manually reset after completing this test satisfactorily.
6	T.7 Overcharge	38.3.4.7	Maximum charge voltage is 54.6 V. Overcharge applied at 66 V. Maximum continuous charge current is 10 A. Test current at 20 A. Overcharge condition applied for 24 h. Monitor battery packs for 7 days.

RESULT(S) OF TEST

The results of all tests were satisfactory and met the requirements of section UN38.3 of the specification. In the case of tests T.1, T.2, T.3 & T.4 no leakage, no venting, no disassembly/rupture/other physical damage or smoke or fire occurred. After each test the open circuit terminal voltage remained ≥90% of the voltage at test start, and no mass loss was identified. In the case of tests T.5 & T.7 no disassembly/rupture/other physical damage, temperature increase, smoke or fire occurred.

This certificate relates only to the actual item/items tested. The test details of all tests are fully reported in the associated TÜV-SÜD document 75949610 Report 01.

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2007, clause 4.4.3 and 4.5.1.

Approved by 

G M Stephens
Authorised Signatory



Date 07 April 2021-----