ISO 12405-1:2011-08 (E)

Electrically propelled road vehicles - Test specification for lithium-ion traction battery packs and systems - Part 1: High-p ower applications

Contents

Page

Foreword iv

Introduction v

1 Scope 1

2 Normative references 1

3 Terms and definitions 2

4 Symbols and abbreviated terms 4
4.1 Symbols 4
4.2 Abbreviated terms 5

5 General requirements 5
5.1 General conditions 5
5.2 Test sequence plan 6
5.3 Tests 6
5.4 Battery pack -- Typical configuration 8
5.5 Battery system -- Typical configuration 8
5.6 Preparation of battery pack and system for bench testing 11

6 General tests 11
6.1 Preconditioning cycles 11
6.2 Standard cycle 12

7 Performance tests 12
7.1 Energy and capacity at room temperature 12
7.2 Energy and capacity at different temperatures and discharge rates 14
7.3 Power and internal resistance 17
7.4 No-load SOC loss 22
7.5 SOC loss at storage 24
7.6 Cranking power at low temperature 26
7.7 Cranking power at high temperature 27
7.8 Energy efficiency 29
7.9 Cycle life 31

8 Reliability tests 38
8.1 Dewing -- Temperature change 38
8.2 Thermal shock cycling 40
8.3 Vibration 40
8.4 Mechanical shock 45

9 Abuse tests 46
9.1 Information 46
9.2 Short-circuit protection 46
9.3 Overcharge protection 47
9.4 Overdischarge protection 48

Annex A (informative) Battery pack and system and overview on tests 49

Annex B (informative) Examples of data sheet for battery pack and system testing 53

Annex C (informative) Example of test conditions 57

Bibliography 58