Thermal propagation testing in Standards - Automotive applications

Standard	Level of test	Test title	SOC	Initiation method
SAE J2464:2009	M, P	Passive propagation resistance test	100%	Heating 1 cell until TR or 400 ºC in < 5 min *
SAND99-0497:1999	M, P	Partial short circuit test	100% (>95% after charge in 4h)	Hard short circuit with a ≤ 5mΩ conductor for 10 min
SAND2005-3123:2005	M, P	Partial short circuit test	100%	
SAND2017-6925:2017	M	Failure Propagation Test	100% (several SOCs if multiple test articles are available)	Heating, electrical (overcharge or cell short circuit) or mechanical (puncture, impact or crush) *
IEC 62660-3:2016. Ed1	C=IEC 62619:2017 Ed1=IEC62133 M, P		100%	C= Ni particle method *. M= e.g. IEC 62619:2017 (heating *) P= under consideration for ISO 12405-3
IEC TR 62660-4:2017. Ed1	C (pouch, cylindrical, prismatic)		Max. SOC specified by the manufacturer	Ceramic nail indentation
UL 2580:2013	M, P		Max. operating SOC	Heating until TR in < 10min *

* Alternative methods allowed

C: cell level, M: Module level, P: Pack level, SOC: State of charge, TR: thermal runaway