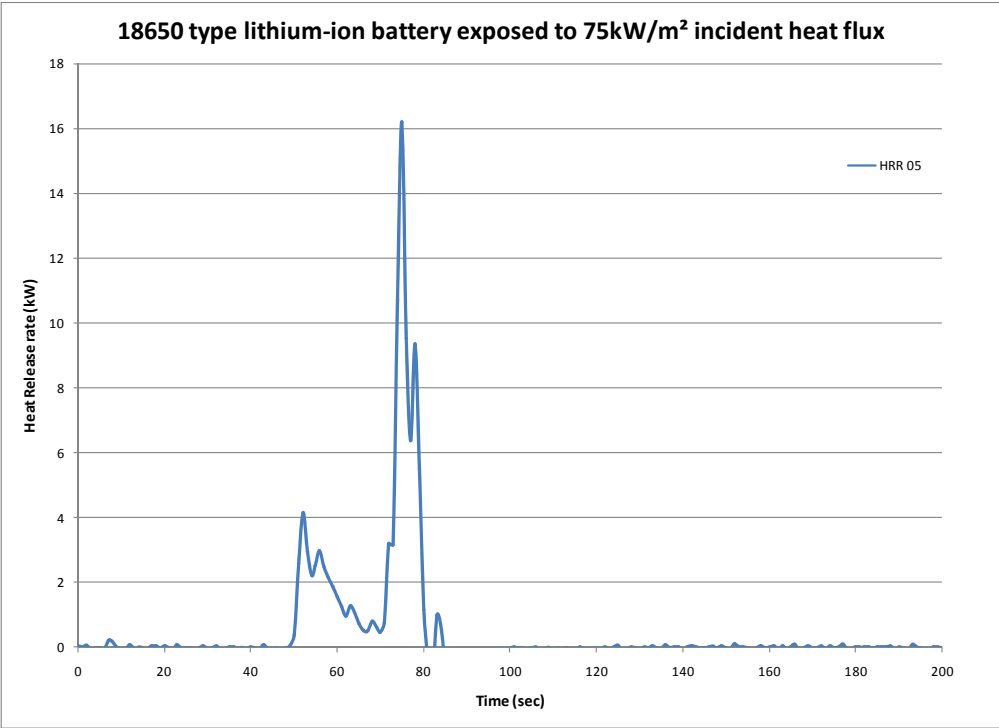
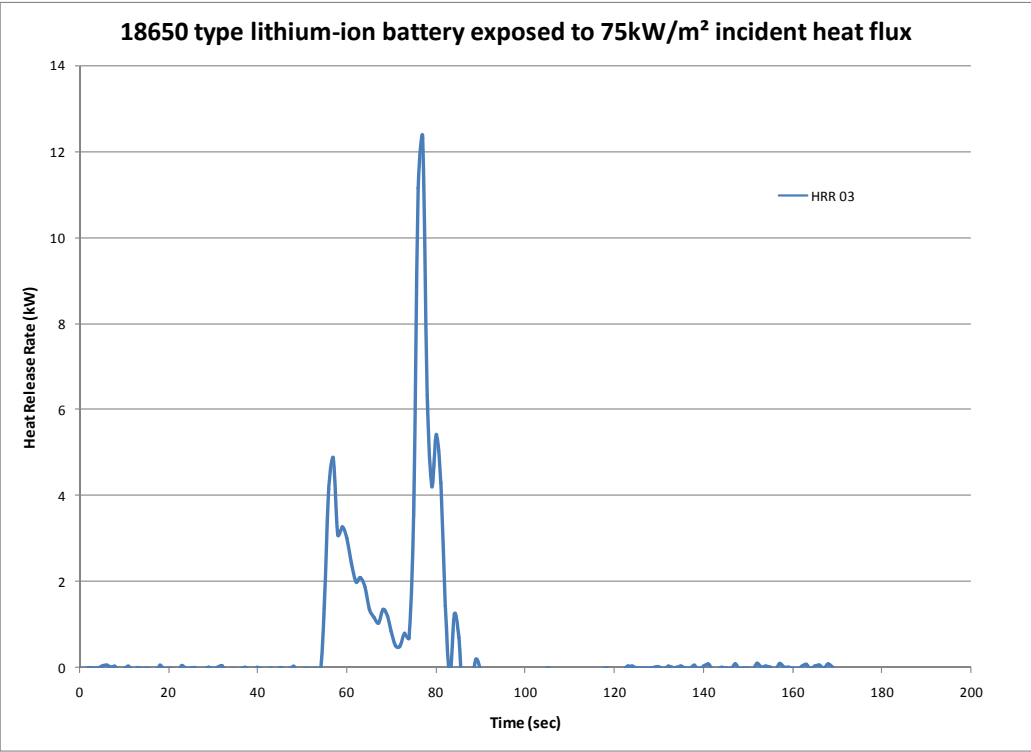


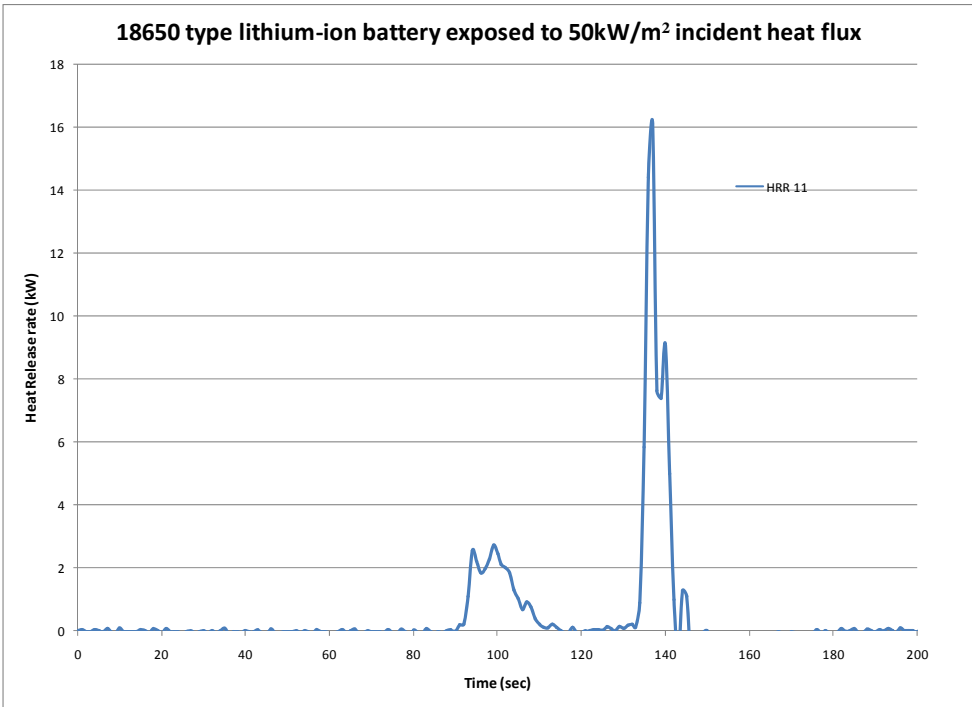
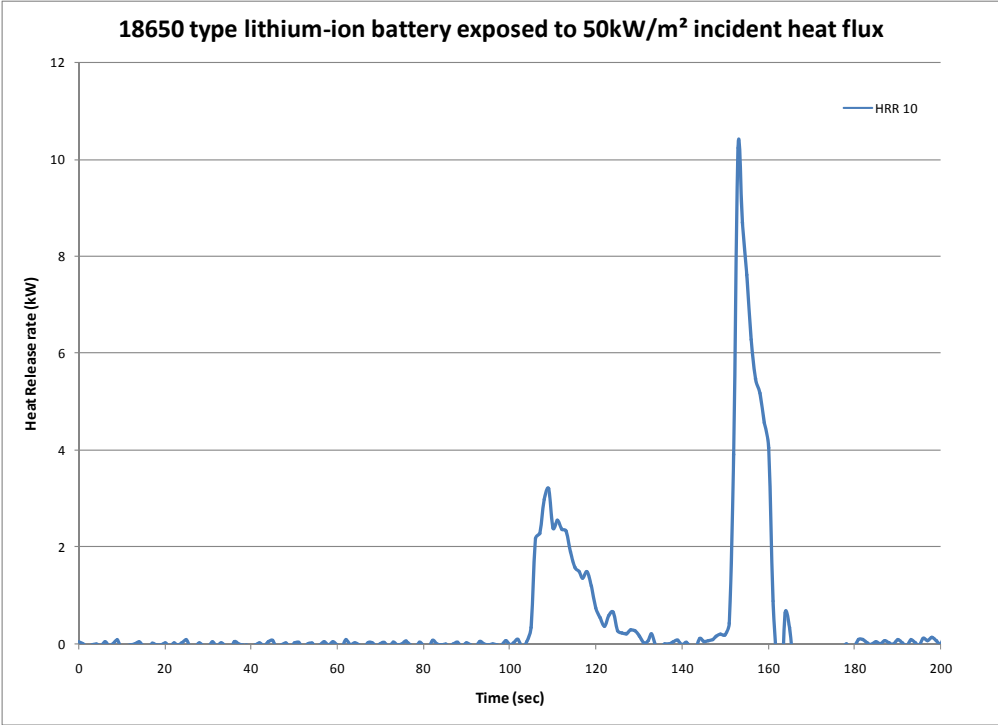
Data From Lithium, Lithium-ion and Lithium-ion Polymer Battery Fire Tests Conducted at the FAATC

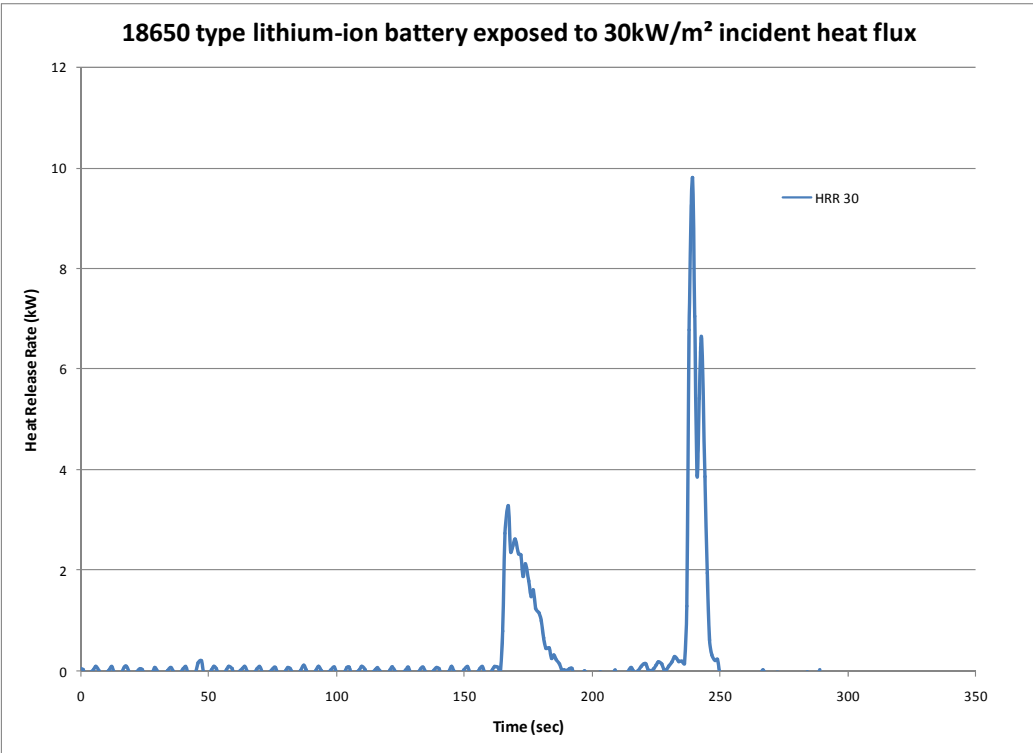
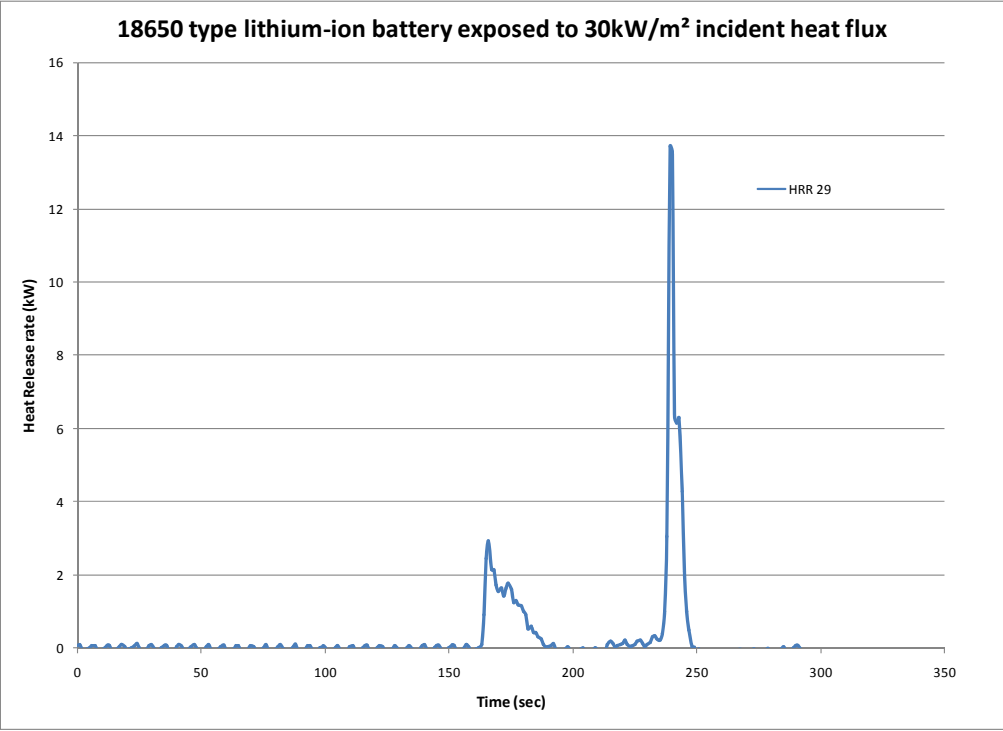
These tests were conducted using the ASTM E1354 standard for oxygen consumption calorimetry. Single battery cells were used for these tests.

Date	Mfg	Battery Type	Voltage VDC	Radiant Heat Flux kw/m ²	Initial Vent (sec)	Final Vent (sec)	Peak HRR kW	Total HR kJ	Mass loss (g)	Total HR/mass loss kJ/g	Total Mass (g)	Total HR/Mass kJ/g	Comments	Data file
3/30/11	LG	18650	4.03	10	731	N/A	0.2	9	4	2.3	43.6	0.2		11030037
	LG	18650	4.03	10										
3/29/11	LG	18650	4.03	30	165	242	13.7	84	10.3	8.2	43.6	1.9		11030029
3/29/11	LG	18650	4.03	30	166	242	9.8	76	12.6	6.0	43.6	1.7		11030030
3/8/11	LG	18650	4.03	50	109	159	10.2	100.2	10.1	9.9	43.5	2.3		11030010
3/8/11	LG	18650	4.03	50	96	137	16.2	92.8	9.6	9.7	43.6	2.1		11030011
3/8/11	LG	18650	4.03	75	56	75	12.3	81.6	9.1	9.0			No shield	11030003
3/8/11	LG	18650	4.03	75	63	82							No tare	11030004
3/8/11	LG	18650	4.03	75	50	71	16.2	92.5	9.1	10.2	43.5	2.1		11030005
	Titanium Innovations	CR2		10										
	Titanium Innovations	CR2		10										
3/29/11	Titanium Innovations	CR2	3.28	30	115	148	2.8	27	3.3	8.2	10.6	2.5		11030033
3/29/11	Titanium Innovations	CR2	3.24	30	118	161	3.1	32	3.2	10.0	10.6	3.0		11030034
3/8/11	Titanium Innovations	CR2	3.25	50	77	85	3.9	20.3	3.4	6.0	10.6	1.9		11030012
3/8/11	Titanium Innovations	CR2	3.2	50	90	118	3.7	33.1	3.5	9.5	10.5	3.2		11030013
3/8/11	Titanium Innovations	CR2	3.29	75	54	65	6.5	33.5	2.3	14.6	10.6	3.2		11030006
3/8/11	Titanium Innovations	CR2	3.26	75	54	70	4.2	31.4	3.7	8.5	10.8	2.9		11030007
	Sure Fire	SF123A		10										
	Sure Fire	SF123A		10										
3/29/11	Sure Fire	SF123A	3.23	30	104	149	4.2	42	4.7	8.9	16.3	2.6		11030031
3/29/11	Sure Fire	SF123A	3.23	30	113	149	3.6	55	8.4	6.5	16.4	3.4		11030032
3/8/11	Sure Fire	SF123A	3.23	50	74	94	3.9	52.2	4.4	11.9	16.5	3.2		11030014
3/8/11	Sure Fire	SF123A	3.23	50	69	89	4.7	73.5	4.4	16.7	16.4	4.5		11030015
3/8/11	Sure Fire	SF123A	3.23	75	48	68	5.9	64	3.8	16.8	16.4	3.9		11030008
3/8/11	Sure Fire	SF123A	3.24	75	52	67	3.5	44.6	4.3	10.4	16.4	2.7		11030009
3/30/11	Powerizer	PL-553562-10C	3.83	10	500	N/A	0.2	6	5.2	1.2	23.4	0.3		11030035
	Powerizer	PL-553562-10C	3.83	10										
3/29/11	Powerizer	PL-553562-10C	3.83	30	112	N/A	9.2	57	3.3	17.3	23.3	2.4		11030025
3/29/11	Powerizer	PL-553562-10C	3.83	30	130	N/A	8.9	47	2.9	16.2	23.2	2.0		11030026
3/29/11	Powerizer	PL-553562-10C	3.83	50	38	51	6	77	5.1	15.1	23.2	3.3		11030023
3/29/11	Powerizer	PL-553562-10C	3.83	50	48	63	5.7	75	5.6	13.4	23.3	3.2		11030024
3/28/11	Powerizer	PL-553562-10C	3.83	75	14	44	7.1	109	6.1	17.9	23.2	4.7		11030017
3/28/11	Powerizer	PL-553562-10C	3.83	75	22	31	5.8	97	7.2	13.5	23.3	4.2		11030018
3/30/11	Powerizer	PL-603495-10C	3.82	10	512	N/A	0.5	0	4.3	0.0	41.3	0.0		11030036
	Powerizer	PL-603495-10C		10										
3/29/11	Powerizer	PL-603495-10C	3.82	30	64	84	7.8	156	10.2	15.3	41.4	3.8		11030027
3/29/11	Powerizer	PL-603495-10C	3.82	30	68	88	7	145	9.8	14.8	41.5	3.5		11030028
3/28/11	Powerizer	PL-603495-10C	3.82	50	35	52	8	162	11.1	14.6	41.1	3.9		11030021
3/28/11	Powerizer	PL-603495-10C	3.82	50	35	58	5.8	147	11.1	13.2	40.8	3.6		11030022
3/28/11	Powerizer	PL-603495-10C	3.82	75	19	35	8.9	165	12.1	13.6	41.3	4.0		11030019
3/28/11	Powerizer	PL-603495-10C	3.82	75	22	39	7.4	170	12	14.2	41.3	4.1		11030020

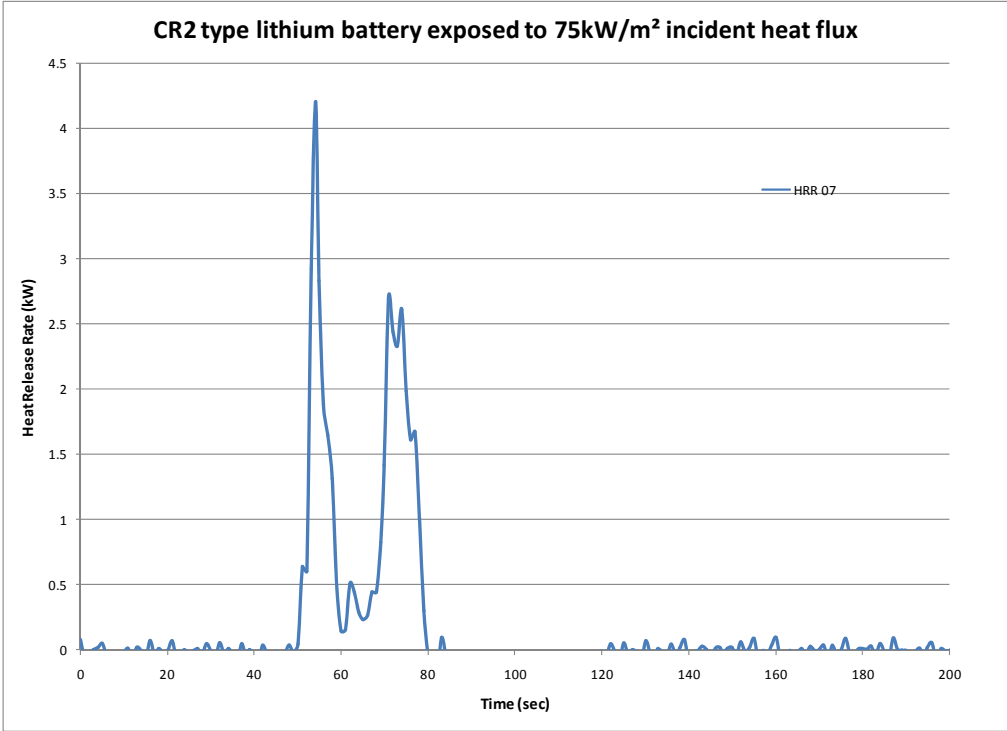
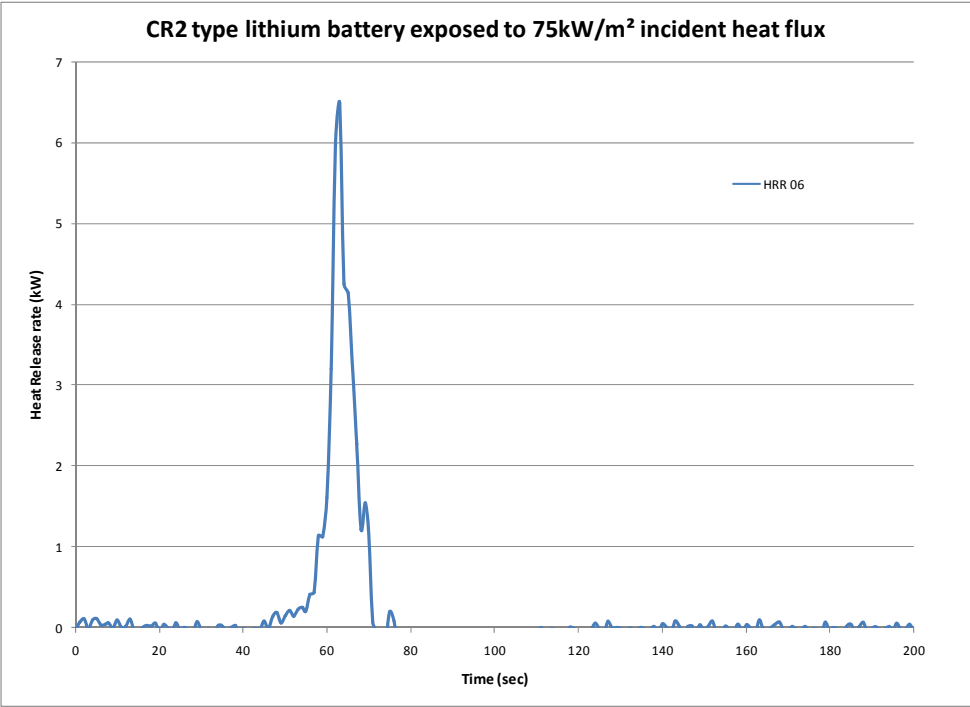
18650 type lithium-ion cells

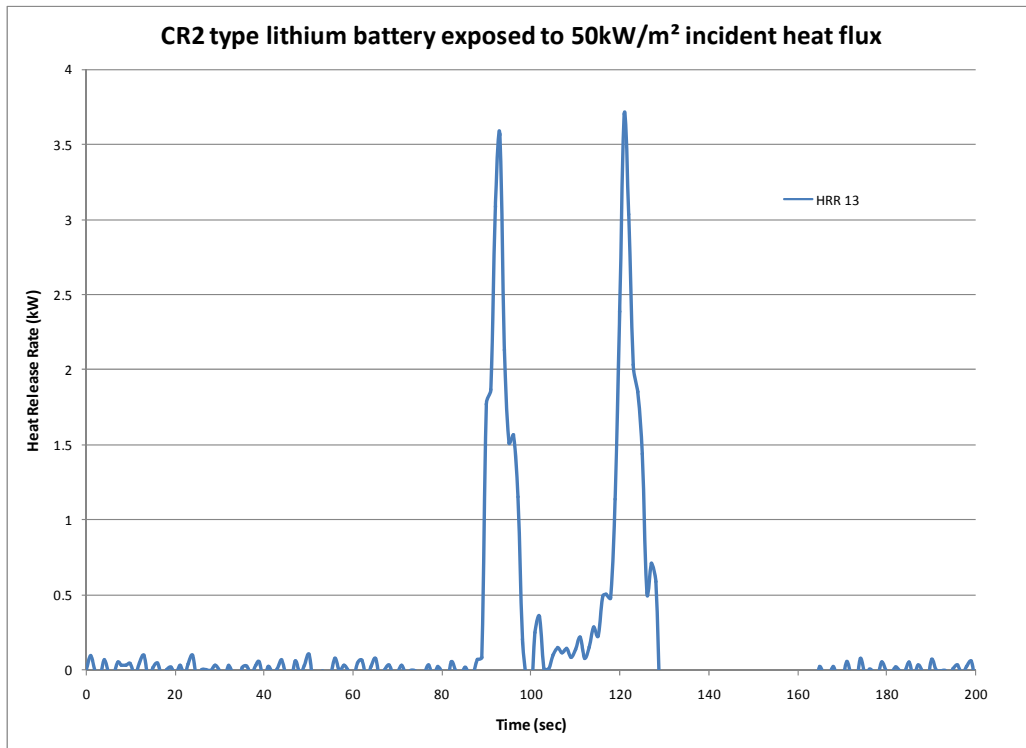
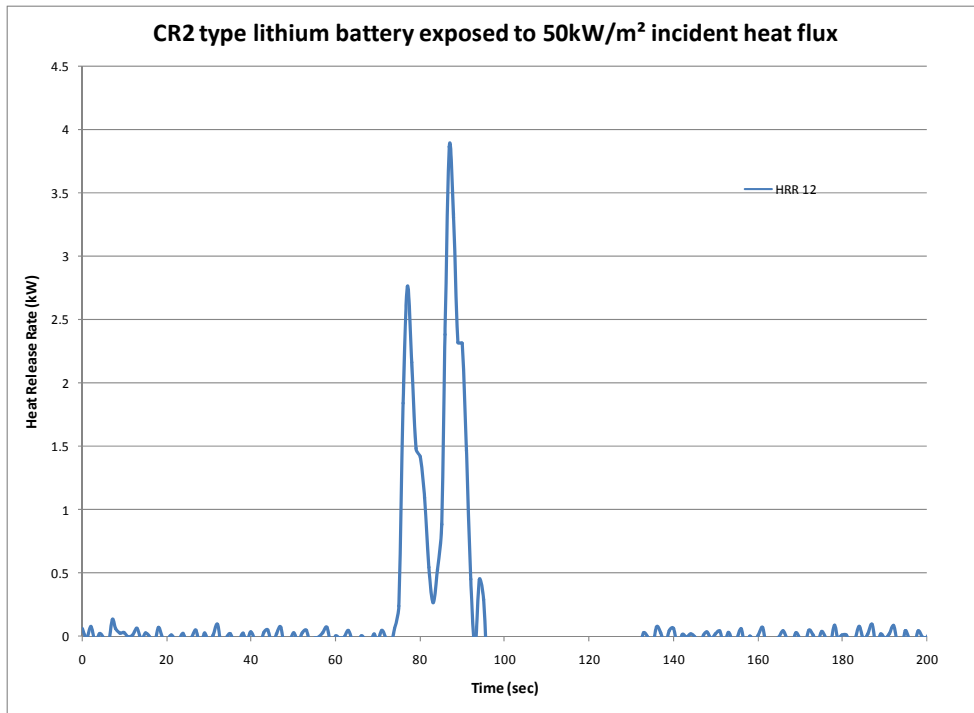


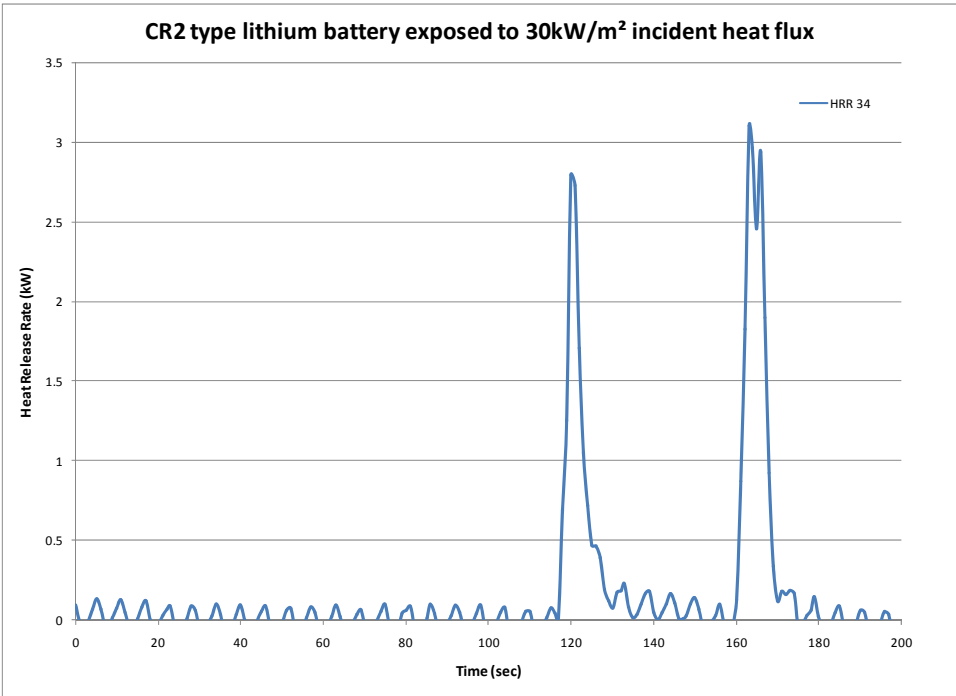
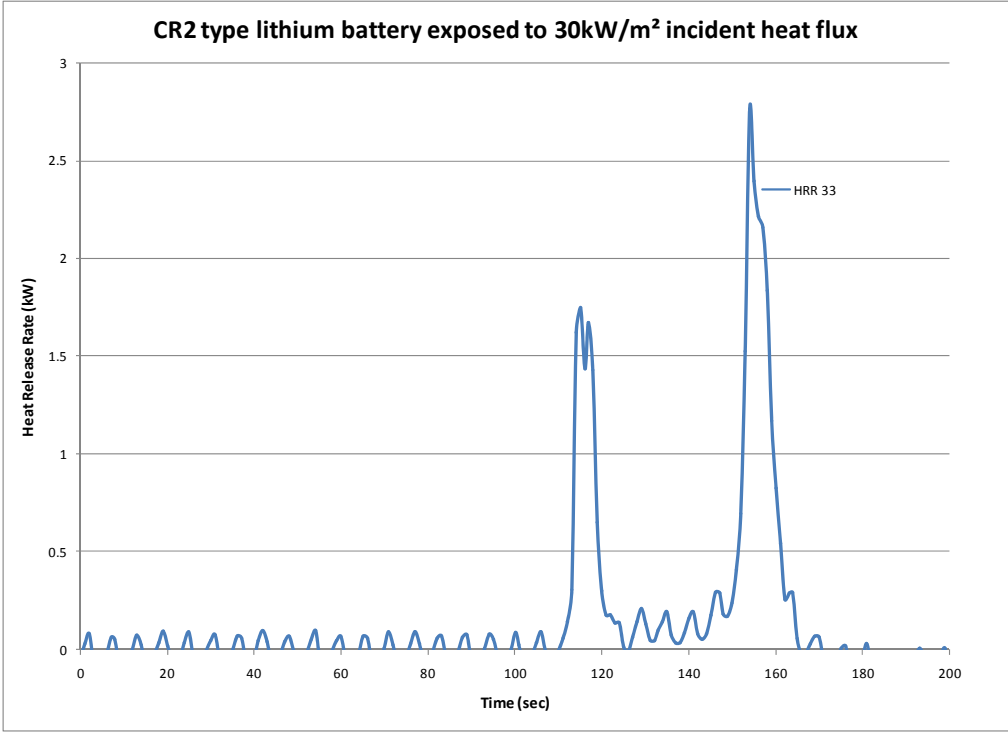




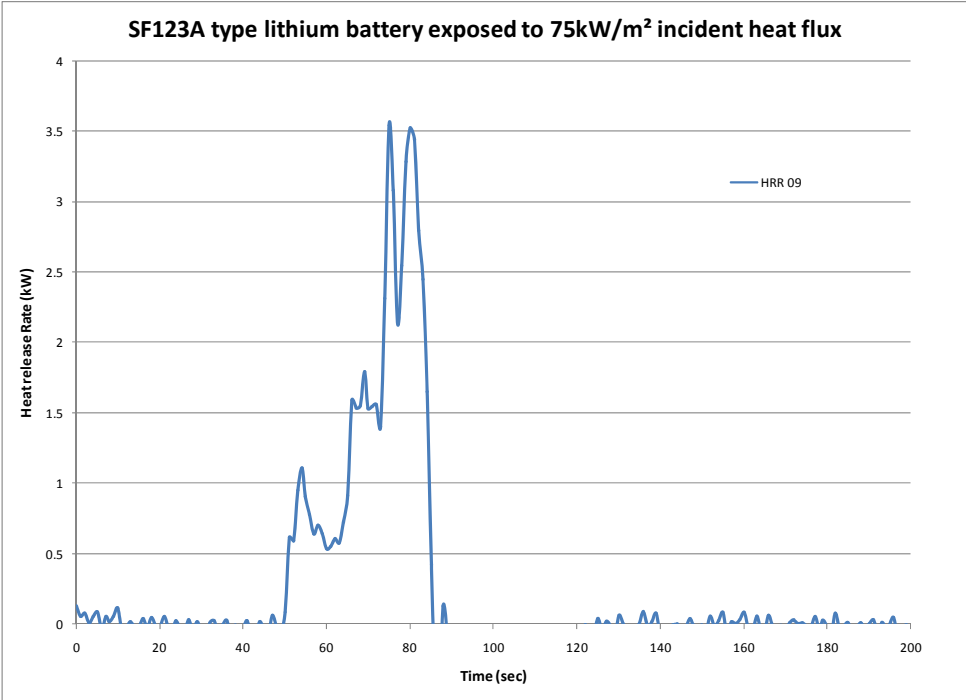
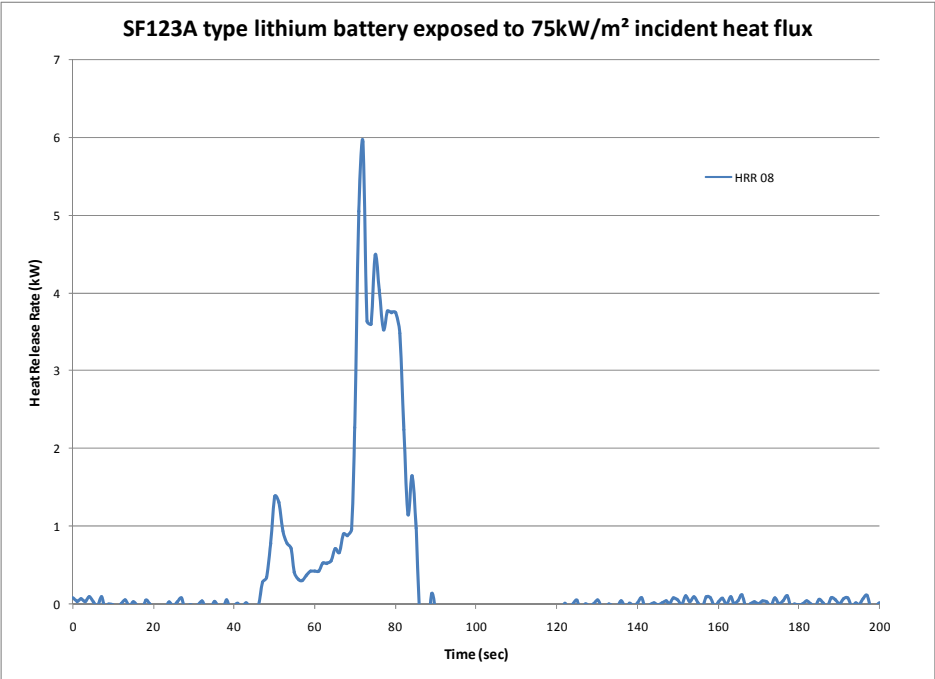
CR2 type lithium cells

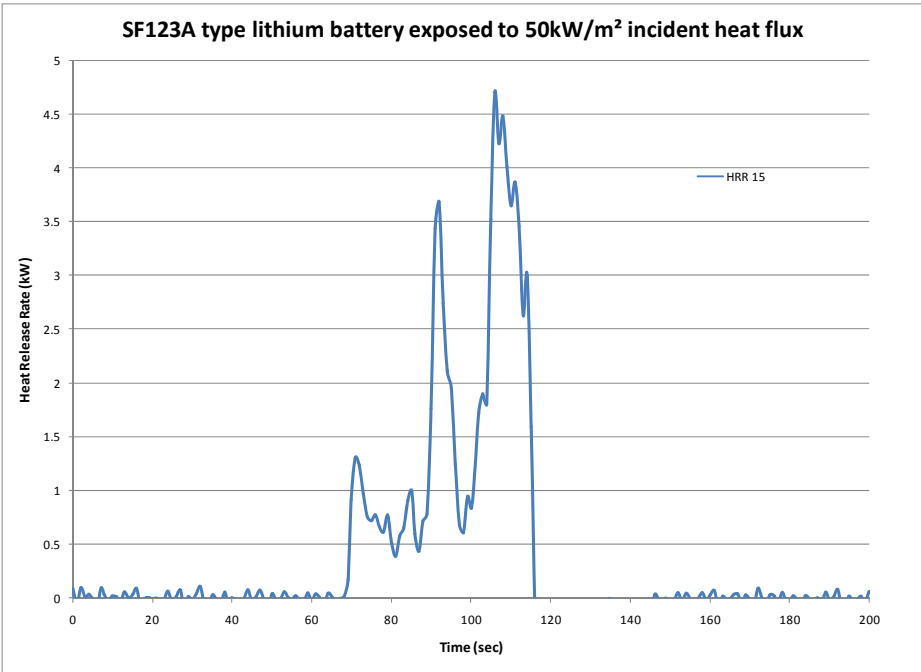
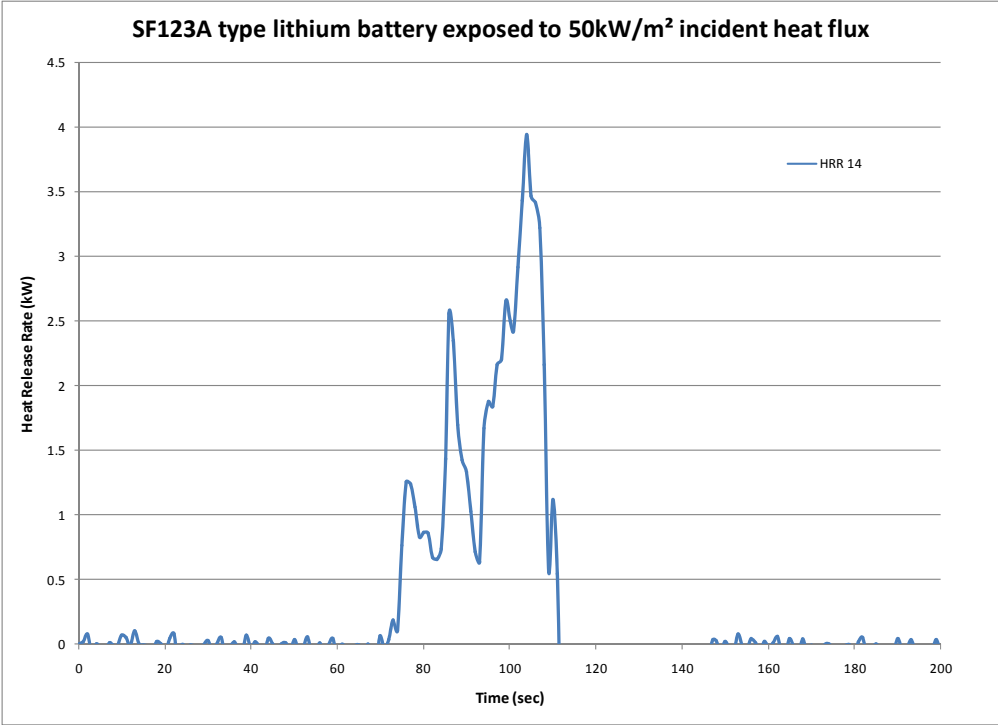


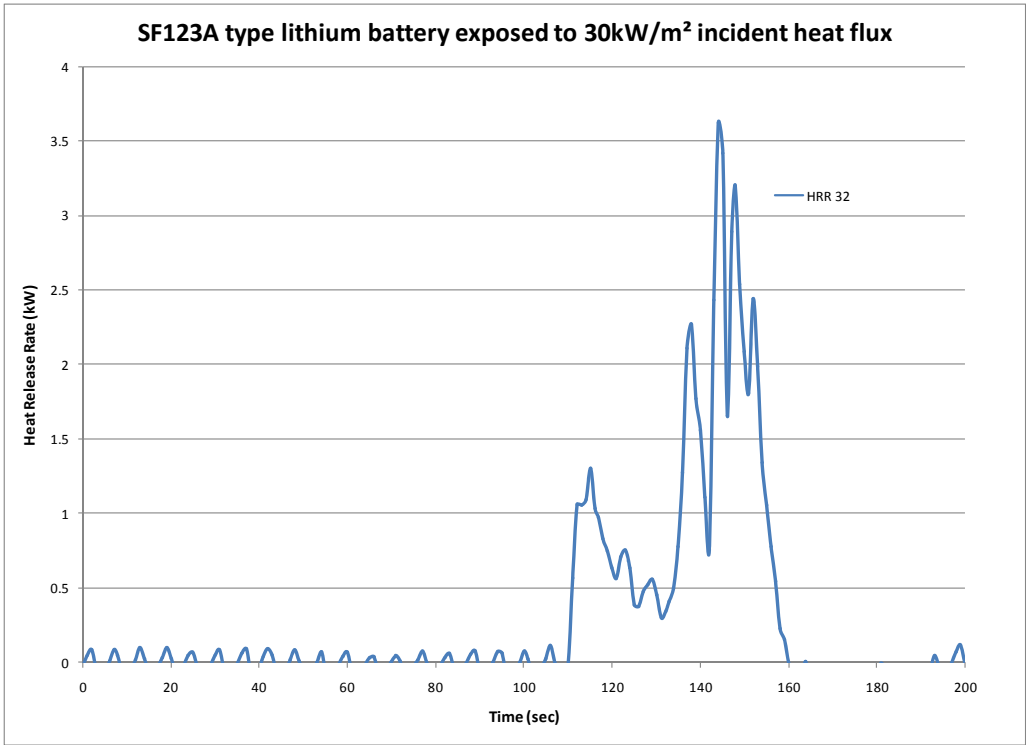
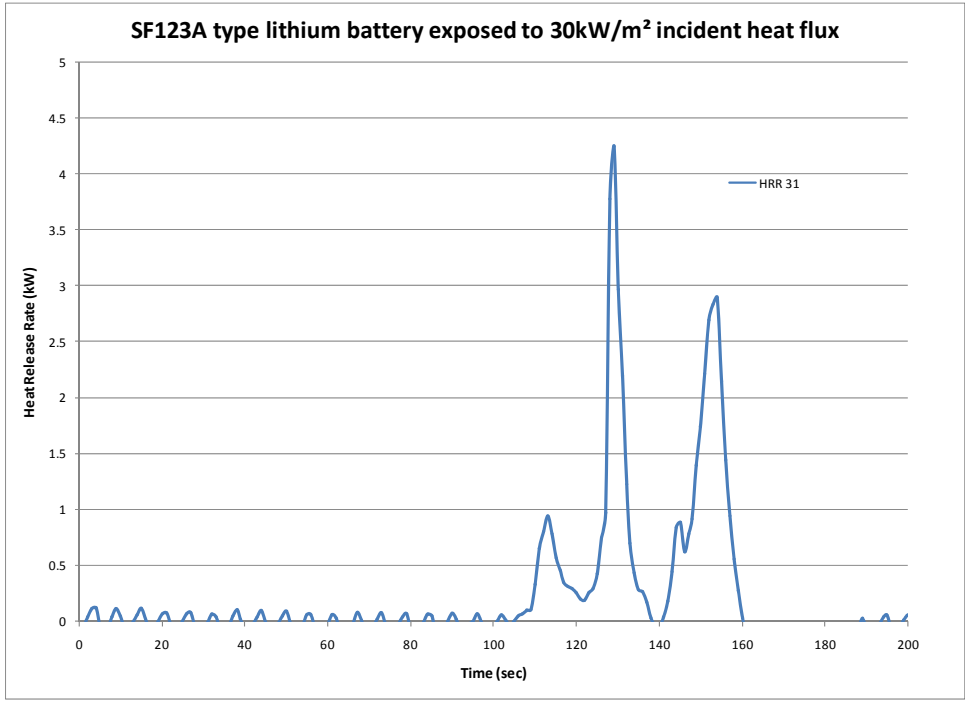




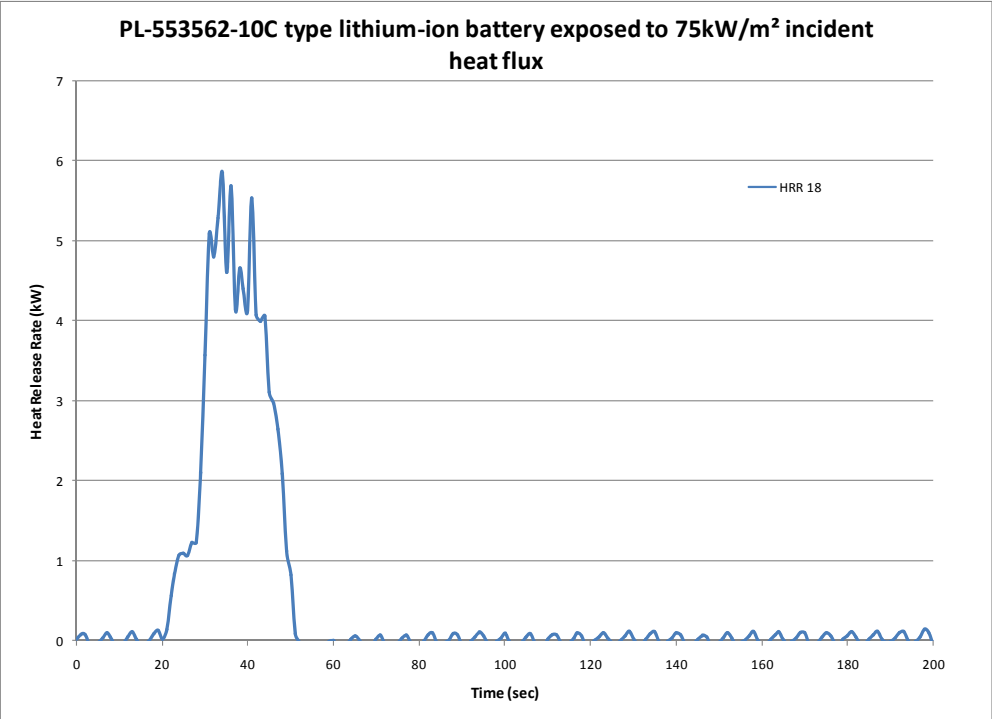
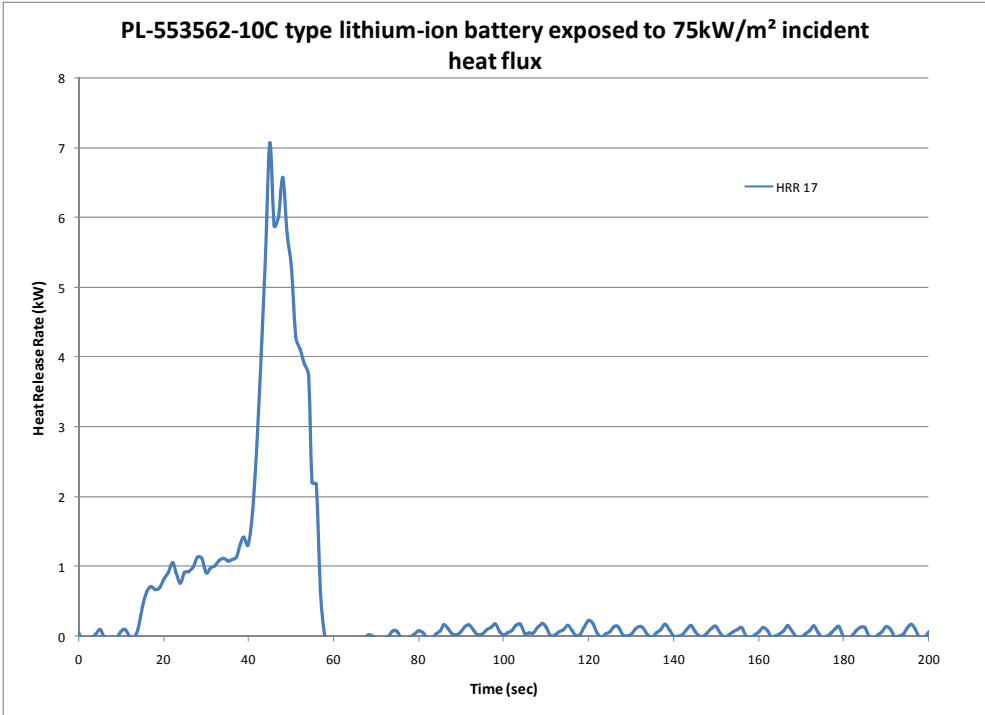
SF123A type lithium cells

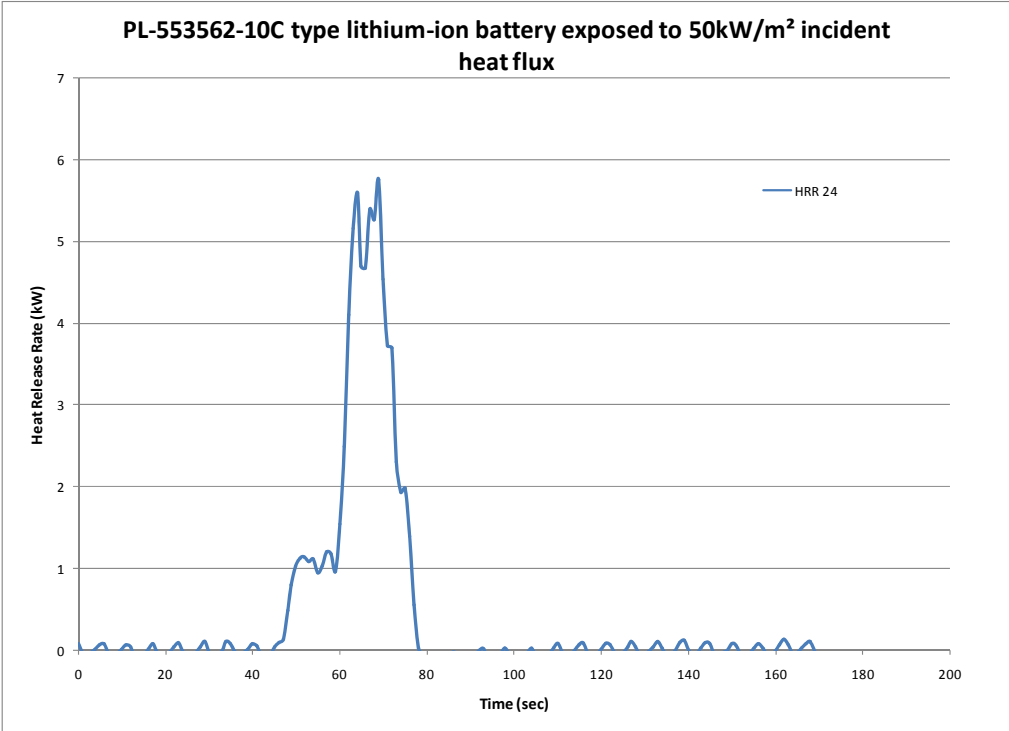
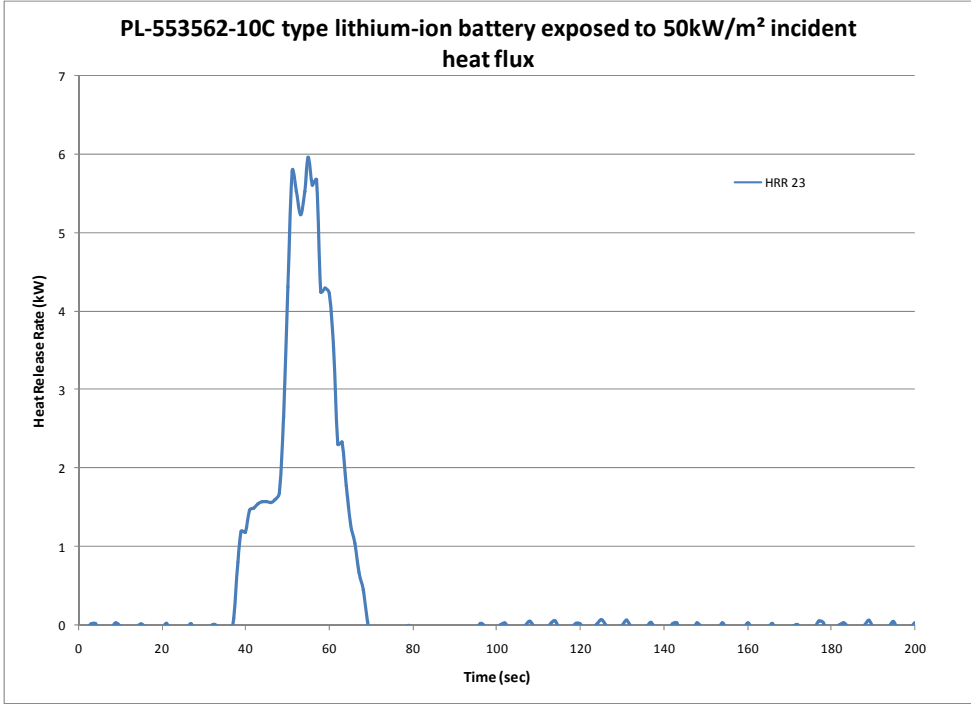




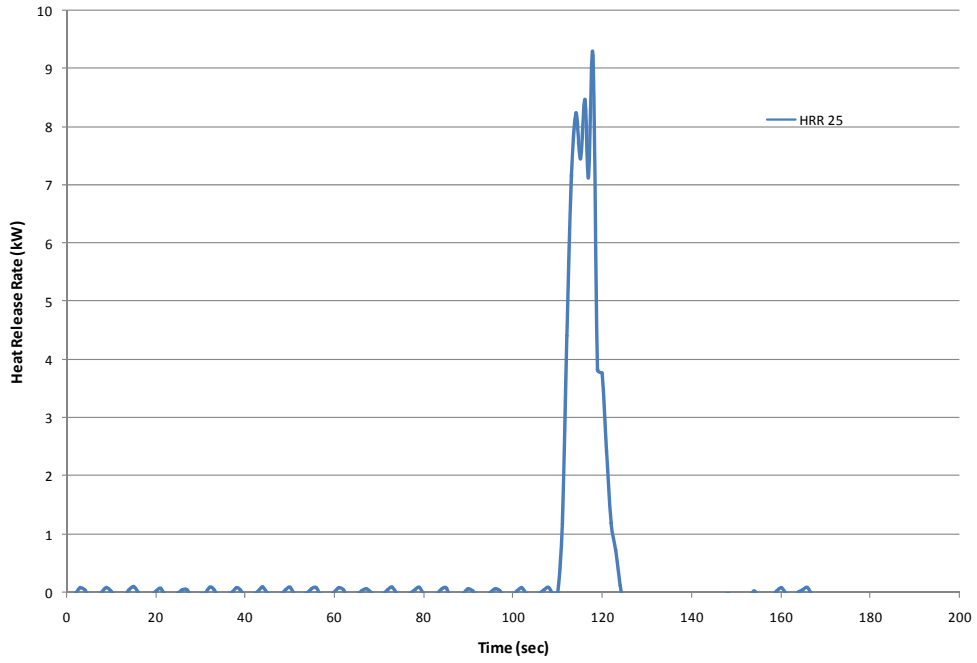


PL-553562-10C type lithium-ion polymer cells

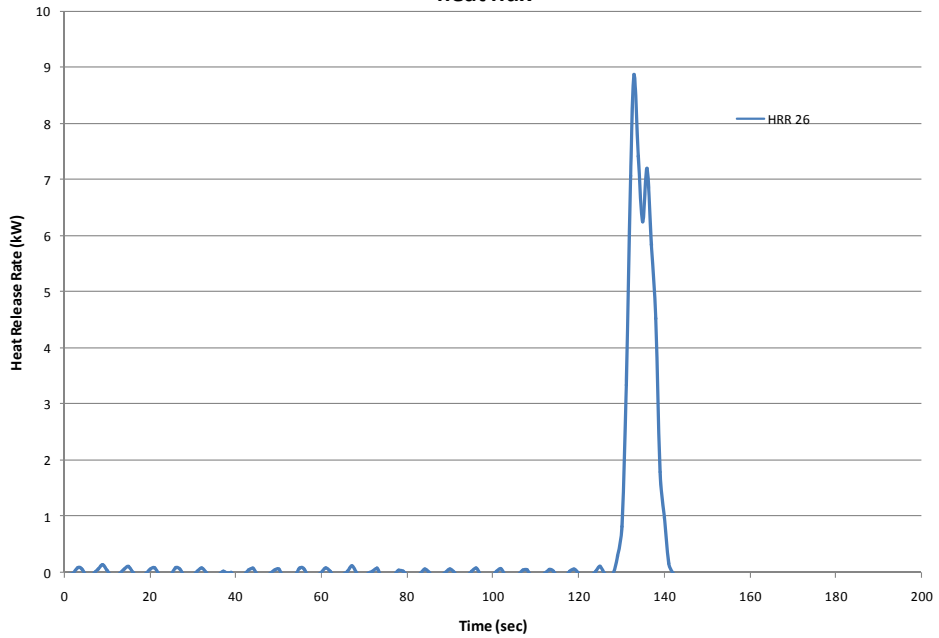




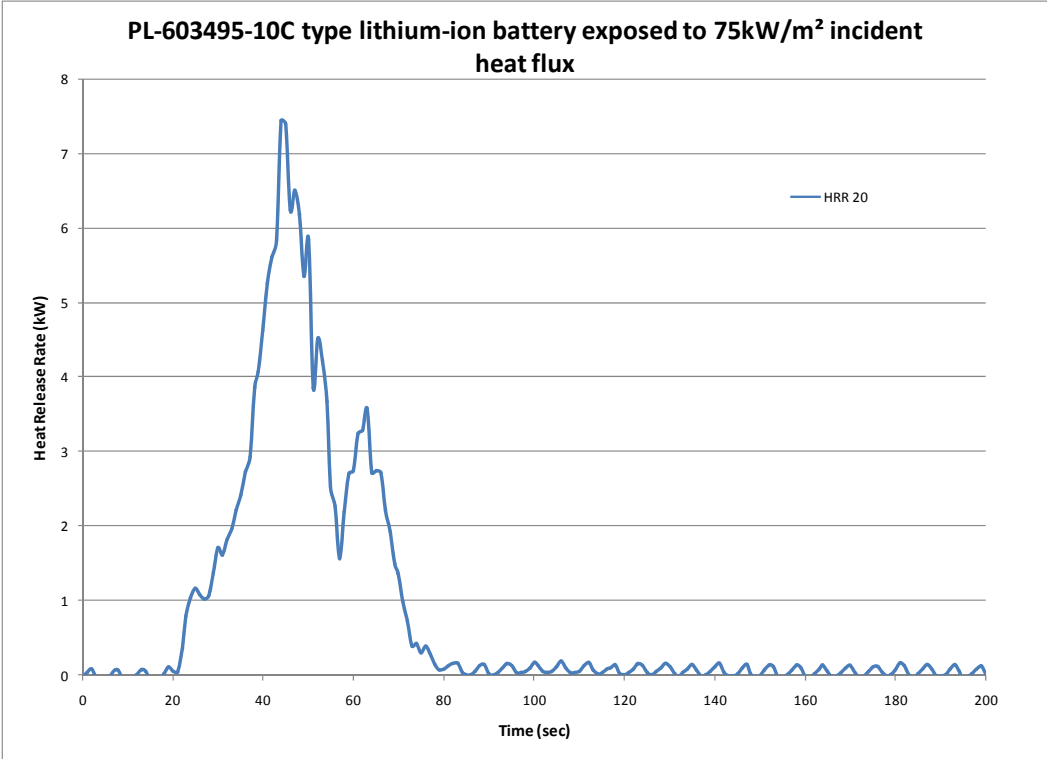
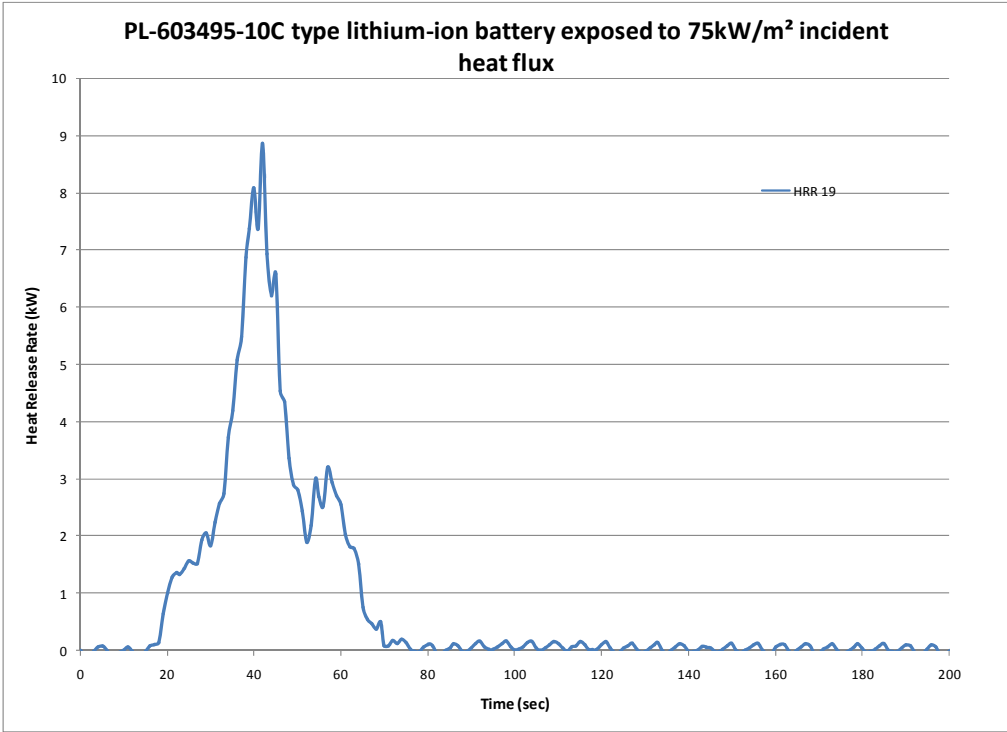
PL-553562-10C type lithium-ion battery exposed to 30kW/m² incident heat flux



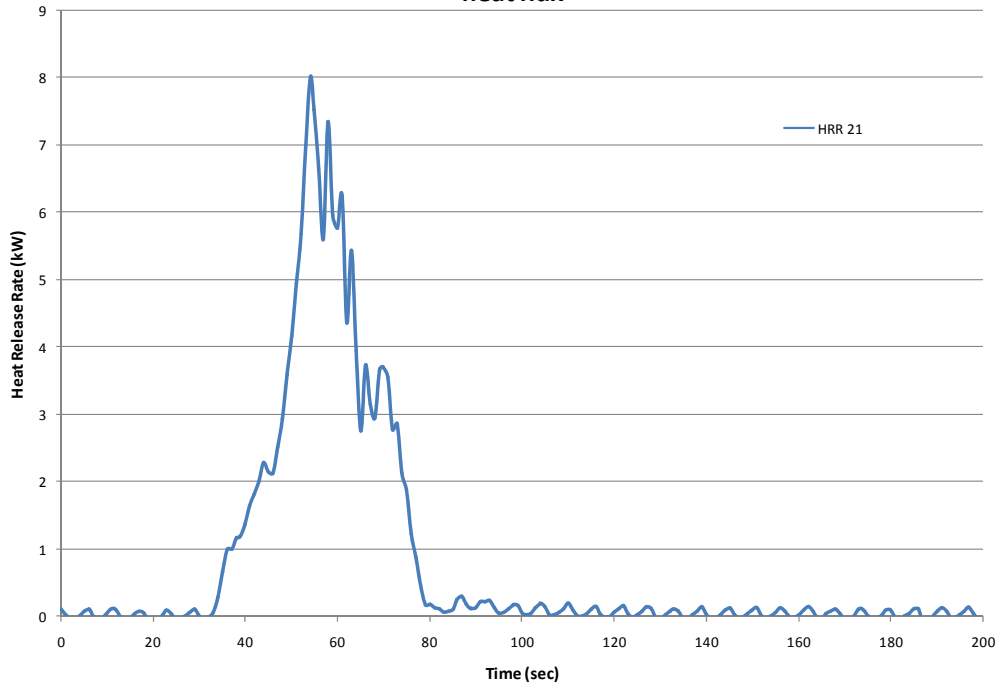
PL-553562-10C type lithium-ion battery exposed to 30kW/m² incident heat flux



PL-603495-10C type lithium-ion polymer cells



PL-603495-10C type lithium-ion battery exposed to 50kW/m² incident heat flux



PL-603495-10C type lithium-ion battery exposed to 50kW/m² incident heat flux

