SHELL ECO-MARATHON 2018
TECHNICAL INSPECTION CHECKLIST

Prototype

Race Number	Paddock No

Article		1|2 YES	1|2 NO	1|2 OK
Station 0	**Inspection Queue Entry**			
58 c	Bound/Printed documentation			
	IF Lithium battery			
24 h	Charging protection (fire blanket, Lipo bag)			
57 d iii	Charger			
Station 1	**Driver's Control**			
20 a	DRIVER WEIGHT (> 50 kg)			
	IF Ballast required			
20 c	Ballast based on lightest driver			
20 b	Ballast of suitable type, sealed			
21 a	Appropriate motorsports helmet (s)			
21 a	Helmet label readable			
21 a	Helmet has no cracks/indentations			
21 b	Visor is clear and has no cracks			
22 a, c	Racing suit (s) / Gloves			
22 a	Single piece fire retardant racing suit			
22 b, d	Shoes & Cotton/FRC socks			
4 a-g	SHELL logo front / both sides			
4 a-g	Race number front / both sides			
4 a-g	Partner sticker both sides			
4 a-g	Other stickers < 400 cm²			
Station 2	**Vehicle weight**			
39 g	Vehicle weight <140 kg			
Station 3	**Vehicle dimensions**			
39 a	Height < 1000 mm			
39 e	Width < 1300 mm			
39 f	Length < 3500 mm			
39 b	Track width > 500 mm			
39 d	Wheelbase > 1000 mm			
39 c	Maxi Height 1.25 X track width			
Station 4	**Seat Belts & Roll bar**			
29 a-b	Safety Belts ≥ 5 mounting points			
29 c-d	Safety Belts - chassis fixing			
29 b	Crotch strap under body			
29 b	Top strap at 10° angle			
29 b	Length adjustor high enough for adjustment			
29 b	Safety belt has a tight fit (no slack)			
29 d	Safety belt strength verified			
26 a	Wide/long to protect from front/side impact			
26 d	Rollbar resist 70 kg all directions			
26 b	Roll bar 50 mm > driver's head			
26 c	Roll bar width > shoulders			

Article		1|2 YES	1|2 NO	1|2 OK
Station 5	**Brakes**			
43 b	1 Front system with independent control			
43 c	1 Rear system with independent control			
	Brake rotors point in direction of wheel rotation			
43 a	Not acting on tyres			
43 b	Left & right brakes balanced			
43 c	All wheels have brakes			
43 a	Brake cable system appropriate			
43 f	Not adjustable by Driver			
43 g	Foot operated brake (2020 only)			
43 d	Ergonomy (both hands on steering mech.)			
43 e, 51 d	Effectiveness Ramp Test			
Station 6	**Visibility**			
28 a	Front visibility 180°			
28 b	Rear visibility + Mirrors > 25 cm²			
25 f	Windows material (polycarbonate/Lexan)			
31 a	Electrical automotive horn			
31 a-d	Horn sound level > 85 dBa @ 4 m			
31 d	Horn uses accessory/ propulsion battery			
33	Driver not in head-first position			
Station 7	**Exit**			
30 a-d	Driver exit < 10 seconds			
Station 8	**Mechanical Vehicle Design**			
25 k	Fully closed body			
26 a	Quality of body driver protection			
25 a ii	Front Crumple Zone ≥ 100 mm			
25 j	Solid floor & frame			
25 c, 46 i	No external appendages or sharp edges			
25 b	Body panels do not change shape in wind			
30 c	Internal/ext'l opening mech effective/intuitive			
30 c	Method of opening marked with red arrow			
30 d	No tape outside to seal body cover			
27 a-d	Bulkhead rigid & fire resistant			
25 g, 27 b	Bulkhead isolates energy/driver compartment			
34 g	Chain/belt guard			
25 a i, 25 a iii	Running wheels (Pr:3/4, UC:4)			
41 a-b	Wheel dimensions & attachment OK			
41 c	Wheels isolated from driver			
41 e	Nothing touching wheels (e.g. batt cables...)			
42 b, 47 d	No contact between tire and chassis or body			
42 d	Steering efficiency no play			
42 c	If indirect/electr, safe b/up (man. override)			
42 c	If electronic steering no joystick			

Article		1|2 YES	1|2 NO	1|2 OK
Station 8	**Mechanical Vehicle Design**			
32 a-c	Extg 1 kg - fixed, valid cert/ <3yrs fr manuf			
	If ICE			
35 a,b	Exhaust system evacuates outside			
35 c,d	Exh. solid/no fatigue/leak, OK for high temp			
59	4 stroke engine			
34	Clutch effective			
34 e	Interlock for manual clutch			
62 c	Nothing in the fuel line (no filters, etc)			
62 e	Fuel injection only			
64 a	Electric Starter Only for ICE			
60 a	No electrical fuel pump			
60 d	If liquid cooling system, pure water			
60 c	No auxiliary energy sources			
60 a	Pneumatic energy for fuel injection only			
62 f	Air intake free of obstruction/ foreign objects			
62 f	No blow-by gas recycling			
Station 9	**Electrical Vehicle Design**			
	Electrical System			
58 c	Correct vehicle electrical schematic			
57 k	Electrical wiring organized and safe			
57 e	Elec system has proper fuse protection			
57 j	Electrical enclosures - transparent			
	Battery			
57 b	Only one Battery			
57 a	Max 48 V nominal (60 V Peak)			
57 c	Batt mount firm, behind b/head, not under seat			
57 e	Main fuse < 300 mm from +ve terminal			
	IF Non-BE			
57 h	**Accessory Battery**			
57 h i, iii	Acceptable electrically powered devices			
57 d	**IF Lithium battery**			
57 d iii	Charger built for battery			
24 h	Charging protection (fire blanket, Lipo bag)			
57 d vi	Solid metal containment tray OR Lipo bag			
57 d iv	Capacity < 1000 Wh			
57 h ii	Load Analysis (battery can last > 1 attempt)			
63	**If Hybrid / H2 with energy store**			
57 j	Supercapacitor (SC) for energy storage			
57 e	Fuse on +ve of SC, <300 mm, size OK			
57 a	Super Cap voltage > system V			
63 c	External connectors			
57 f	Electrical Isolation from body/frame			

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Article		1|2 YES	1|2 NO	1|2 OK
Station 9	**Electrical Vehicle Design**			
	If Hydrogen			
65 l ii	Fuse on +ve of FC, <300 mm, size < surf area			
65 l i	Accessory circuit isolated from propulsion			
Station 10	**Energy Verification ICE**			
61 a	1 Shell fuel tank 30/100/250/350 cc			
60 b i	Safety valve at 5 bars			
61 g	Translucent hoses			
61 c	Fuel tank vertical position			
61 c	Fuel tank easy to refill (with burette)			
SEM internal *	Fuel volume calculation			
SEM internal *	Fuel system detachable for weighing			
64 a	Electric Starter Only for ICE			
64 c	Starter Red light is visible			
64 c	Starter Red light works properly			
64 a-b	Starter cannot propel vehicle			
37	**Emergency Shutdown**			
37 a-c	Efficiency of emergency shutdown			
37f	Internal/External Estop Switch			
37 g	Latching push button (no push/pull levers)			
37 h	Dead man's switch			
37 f (iii)	Blue triangle sticker			

Article		1|2 YES	1|2 NO	1|2 OK
Station 11	**Energy Verification H2**			
58 c, 65 a	Doc'n (schematic, H2 flow, fuel cell)			
65 a	Correct system design			
65 f	Pipe H2 suitable, S.Steel (1.5b), PTFE (<1.5b)			
65 f	Connectors H2 OK (comp type, no teflon)			
65 c	2 ventilation holes 5 cm^2			
65 d	Hydrogen sensor at highest point			
65 e	Normally closed solenoid valve			
65 b v, vi	Hydrogen cylinder firmly installed			
65 f	No leaks			
65 a	Flowmeter installed and functioning			
65 g	Purge pipe vents outside or not used			
37	**Emergency Shutdown**			
37 f	Internal/External Estop Switch			
37 g	Latching push button (no push/pull levers)			
37 a-c	Efficiency of Estop (3 methods, valve/MC)			
37 h	Dead man's switch			
37 f (iii)	Blue triangle sticker			

Article		1|2 YES	1|2 NO	1|2 OK
Station 12	**Energy Verification BEV**			
58 c	Doc' n (schematic, Batt/BMS, m.controller)			
57 d	**Li-Ion Battery System**			
57 b	Only two terminals			
57 f	Batt + and - isolated from frame and body			
57 d ii	Self-built batt - cell level current protection			
57d i	In-vehicle Battery Management System			
67 a	**Motor/Controller System**			
67 a	Purpose built motor controller			
37	**Emergency Shutdown**			
37 f	Internal/External Estop Switch			
37 g	Latching push button (no push/pull levers)			
37 d	Physical Estop			
37 a-c	Efficiency of emergency shutdown			
37 h	Dead man's switch			
37 f (iii)	Blue triangle sticker			
56	**Joulemeter**			
56 c	Installation in engine compartment			
56 c ii	Read/reset from outside			
56 d i-ii	Position in circuit (Pr:B4 MC, UC:B4 elec sys)			