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Rev.1 -- 1st. Oct. 2019

HOMOLOGATION OF BATTERIES, FOR USE AT 2020 EFRA SANCTIONED EVENTS.

The procedures detailed in this document comply with current EFRA rules. Any changes to rules or procedures that are accepted at the 2019 EFRA AGM (9th. Nov 2019), that impact on rules for batteries used in 2020 take precedence. This document will be re-issued if any changes are accepted.

The scope of this document covers the homologation of the following battery technologies that are allowed for EFRA sanctioned events in 2020:-

Lithium Based Batteries, with a nominal voltage not exceeding 3.80v (1S), in 'Stick' format.

Lithium Based Batteries, with a nominal voltage not exceeding 7.60v (2S), in 'Stick' and 'Saddle Pack' format.

Lithium Based batteries, with a nominal voltage not exceeding 15.20v (4S) in 'Stick' format.

Previously approved batteries remain on the approved products list for their lifespan, or until EFRA deem they are no longer applicable.

Lithium Based Batteries (1S, 2S, 4S) -- Approval requirements for use at 2020 EFRA events :-

1. A minimum of one (1) battery must be sent **at no cost to the recipient**, to the Homologation Officer at the address above. Any sample batteries arriving that require payment in any way for :- Shipment, Delivery, Taxes etc. --- **WILL BE REFUSED** and the date (if this occurs) will not be recorded or considered as an 'arrival date'.
The sample battery(s): **MUST ARRIVE from 11th. Nov. BUT NO LATER THAN - 1st. Dec. 2019.**
Batteries arriving after 1st. Dec 2019 will not be considered for approval.
Shipping documents should state: 'samples for destructive testing with zero value'.
Please email details of carrier and consignment tracking details to -- paul.g.worsley@gmail.com
All samples received (inc. late submissions) will be retained by EFRA and will not be returned to the supplier.
2. Any battery that has gained approval in previous years, that has been changed in order to comply with any current technical requirements, will be treated as a new version of battery that will require approval. Batteries in this category are required to show a distinct visual difference to previous versions with a different Part #, so they can be easily identified.
3. Each individual type of battery submitted for approval must be accompanied by :-
 - A safety test certification in accordance with:-
UN Manual of Test and Criteria ST/SG/AC.10/11/Rev.6, Part 3, Sub-Section 38.3, Tests T1 to T8.
 - A data sheet giving:- recommended charging safety criteria with **maximum recommended charging amps** and voltage. This sheet must also include safe disposal procedures.
 - A technical data sheet for each Battery Part #, giving specifications of :- sizes and **weight with tolerances.**
 - Details of :-case material, nominal thickness of case sides and sealing method (eg. Cyno, Sonic Weld etc.)
 - Name and contact details of a minimum of two (2) nominated distributors within the EFRA countries.
 - Confirmation that the battery submitted:-
If a new production version: that it will be widely available in the EFRA countries before 1st March 2020.
If already in production, approx. number that have already been supplied to EFRA countries.
 - A declaration stating that the submitted battery is not in any violation of existing World Wide patents.
This information to be supplied by an authorised representative of the manufacturer, or OEM supplier.
4. All batteries must conform with the technical details in EFRA rules – App. 4, rules 1.1 – 1.7 and 3.1 – 3.6 (below), and any EU regulations regarding Health & Safety or Disposal instructions that are current at the time when cells are supplied to EFRA member countries. **As EFRA events are International, maximum energy capacities must conform with Passenger Airline requirements.**

5. The weights of batteries will be shown on the EFRA approval list. Samples should closely resemble the weight range stated on the data sheet. Weights do not include detachable wires or connectors. Maximum weight tolerance is +/- 4%.
6. If approval is granted, there must be no changes to the technical specification (outside allowed tolerances) or the visual appearance of the battery (including label details), from the samples submitted. Any changes will require re-approval. Failure to do this may invalidate the original approval.
7. There will be an homologation fee for each type of battery submitted. This is individual to each type (Part #) or labelled version. The fee is €500 for each type (Part #). There is a 50% discount for Associate Manufacturers to EFRA.. EFRA will invoice accordingly. **Please supply details for invoicing.**
It is recommended that batteries submitted for approval should originate from the original cell manufacturer or the OEM supplier whose name or trade-mark is depicted on the battery label.
8. Batteries gaining EFRA approval, will be published on the EFRA approved list in Jan. 2020. This list can be found on the EFRA website – www.efra.ws.
9. Approval does not engage EFRA towards any guarantees or responsibilities. The submitter will defend, indemnify and hold EFRA harmless from and against any and all liabilities, damages, losses, claims, fines, penalties, assessments, demands, actions, suits and judgments, including all fees, costs and expenses incidental thereto, that may be charged to, asserted against or incurred by EFRA by reason of any loss, damage or injury of any kind or nature whatsoever in any manner or to any extent resulting from or arising out of the articles or services approved by EFRA for use during EFRA events except to the extent resulting solely and directly from EFRA's gross negligence or wilful misconduct.
10. EFRA require that a copy of this document is returned when batteries are submitted, signed by an authorised representative of the manufacturer (or OEM supplier) showing agreement to the procedures and rules detailed. **(Disclaimer on page 4).**
11. EFRA reserve the right to remove any battery from the Approved List(s) if homologation fees are not paid or if the battery approved is not freely available on sale in the EFRA countries by 1st. March 2020.

EFRA Technical Rules. App. 4. 1.1 – 1.7. Lithium Batteries – Technical Specifications.

- 1.1 Lithium Based (LiPo/LiFe) Batteries can be approved, but must conform to the following :-
Lithium Based (LiPo/LiFe) battery packs must have a hard, protective case that completely envelopes the cell(s). The case should be made from ABS or a similar material. The two halves of the case must be factory sealed in a way that any attempt to open the case will destroy the case. The only opening in the case that is allowed, is for exit wires or pin type connections. The outline shape of the battery 'hard-case' must be 'cuboid' (six flat surfaces with all angles 90 deg.), edges and corners can be radiused and a 'step' or 'recesses' are allowed in the area of tube connectors in the interest of safety to prevent any short circuit.
- 1.2 The maximum case sizes, including any manufacturer incorporated plugs or connections are as follows:
4S Batteries:
Length: 139.0mm.
Width: 47.0mm (the max. width includes any side exit wires).
Height: 48.2mm (Chassis location features additional to this dimension are allowed).
2S Batteries:
Length: 139.0 mm.
Width: 47.0 mm, (the max. width includes any side exit wires).
Height: 25.10 mm (Chassis location features additional to this dimension are allowed).
Saddle-Pack cells are allowed, but must comply with the above dimensions. Saddle-Pack cells must have a combined dimension of 139.0mm max when placed end to end.
1S Batteries:
Length: 93.0mm.
Width: 47.0mm (Side exit wires are allowed outside this dimension).
Height: 18.5mm (Chassis location features additional to this dimension are allowed).
- 1.3 Batteries to comply with the weights specified on the EFRA homologation list, (maximum tolerance for manufacturers is +/- 4%).
- 1.4 Individual cells used in the construction of the battery pack shall be rated with a nominal voltage of no more than (LiPo 3.8v/LiFe 3.3v). Individual cells may be wired in parallel.
For 4S Packs:- the maximum connection "In Series" is four, to give a maximum pack nominal voltage of - LiPo 15.2v & LiFe 13.2v.
For 2S Packs:- the maximum connection "In Series" is two, to give a maximum pack nominal voltage of - LiPo 7.6v & LiFe 6.6v.
For 1S Packs:- cells can only be connected in parallel to give a maximum pack nominal voltage of - LiPo 3.8v & LiFe 3.3v.
NOTE: Cells with a nominal voltage of no more than 3.8v have been allowed at EFRA events since 1st April 2017. All previously approved cells with a nominal voltage of no more than 3.7v maintain their approval. **The maximum charging cut-off will remain at 4.20v per cell.**

- 1.5 The battery pack shall have leads extending from the case for the positive and negative electrical connections using wire of adequate size to handle discharge rates acceptable to racing applications. Alternatively, the case shall have internal connection points for these wires clearly marked positive and negative so the user can apply the lead wires. Any type of metal connections that are incorporated in the battery pack by the manufacturer must be substantially below the major surface of the plastic casing, to prevent any "short circuit" if placed on a conductive surface. Any type of connection adaptors added, that are conductive and protrude above the level of the plastic case must be removed before the battery is removed from the car.
- 1.6 The case must have the original suppliers label intact, clearly stating:- the Part # of the pack, the rated nominal voltage, the chemistry (Lipo/LiFe), the rated energy capacity of the pack in Wh. and the 'C' rating of the pack. The Brand name/logo shall be easily readable.
NOTE: From 2017 onwards; Saddle Pack batteries that are 'hard wired together can state the nominal voltage of the combined number of batteries, BUT Saddle Pack batteries supplied as individual batteries (not hard wired together), MUST show the correct nominal battery voltage for each individual battery on the labels, not the combined voltage.
- 1.7 As EFRA events are International, EFRA will only accept batteries for approval that comply with the maximum energy capacities required by passenger airlines.

EFRA Approval Rules. App. 4 3.1 – 3.6. Lithium Batteries.

- 3.1 From 2009, EFRA only homologates Lithium based batteries. Lithium based (LiPo or LiFe) batteries must be submitted to EFRA for approval and be listed on the EFRA homologation lists before being allowed at EFRA sanctioned events.
Manufacturers or their agents will be responsible for paying all approval fees. The approval fees for each individual battery are detailed in General Rule 3.5.7.
- 3.2 Submission dates:-
4S Batteries -- A minimum of one individual battery has to be received by 1st Dec.
2S Batteries -- A minimum of one individual battery has to be received by 1st Dec.
1S Batteries -- A minimum of one individual battery has to be received by 1st Dec.
Cells received after the above submission dates (1st. Dec.) will not be included on the EFRA approved list for the following year.
- 3.3 Each individual battery sample must be supplied with :
 - (a) Lithium based batteries must be covered by their safety test certification in accordance with UN Manual of Test and Criteria ST/SG/AC.10/11/Rev.6, Part 3, Sub-Section 38.3, Tests T1 to T8.
 - (b) Technical Spec. sheet detailing; the recommended maximum charging rate, the maximum voltage when charging, case material, case wall thickness and method of sealing the case, the battery weight (max tolerance +/- 4%).
 - (c) Name and contact details of a minimum of two appointed distributors for the batteries in EFRA member countries.
- 3.4 New batteries have to be submitted to the EFRA Battery Homologation Officer for approval. Subject to the homologation Officer being satisfied that the new battery conforms with technical specifications and commercial availability, the battery will be legal for use at EFRA sanctioned events from:
4S Batteries - the following April 1st.
2S Batteries - the following April 1st.
1S Batteries - the following March 1st.
- 3.5 Any changes to the technical specifications or visual appearance of the battery or casing after the original approval, will require re-approval.
- 3.6 All previously approved batteries may be used for their lifetime or until their specifications no longer comply with the original one that was approved. It is the driver's responsibility to prove the legality of his battery in case of doubt.

DISCLAIMER:-

I, _____ (Name).

On behalf of : _____ (Company name)

Agree with procedures and rules contained within pages one to three of this document.

_____ (Signature)

- Documents to be provided:-
 1. Copy of UN Test Certificate (as detailed above).
 2. Data sheet giving recommended charging safety criteria and recommended maximum charging amps and voltage, including safe disposal procedures.
 3. Technical data sheet for each Battery Part # giving specifications of :- sizes and weight with tolerances.
 4. Details of Case Material, case nominal thickness and sealing process.
 5. Name & contact details of two (2) authorised distributors within the EFRA countries.
 6. Details of production supply dates or numbers already shipped.
 7. Declaration that the battery submitted for approval does not violate any existing World Wide patents.
 8. Invoicing details for homologation fee.

Paul Worsley. -- (Battery Homologation Officer for EFRA).

LIST OF EFRA MEMBER COUNTRIES.

AUSTRIA	BELARUS	BELGIUM	BULGARIA	CROATIA	CZECH REP.	DENMARK
ESTONIA	FINLAND	FRANCE	GERMANY	GREAT BRITAIN	GREECE	HOLLAND
HUNGARY	IRELAND	ITALY	LUXEMBOURG	MONACO	NORWAY	POLAND
PORTUGAL	ROMANIA	SLOVAK REP.	SLOVENIA	SPAIN	SWEDEN	SWITZERLAND
TURKEY						