

IFMAR AGM 2010 - Electric proposals

A.- Electric Track 1/10th & 1/12

Proposal 1

Actual rule

2.2.1 Each competitor will display his identification number in at least three positions so that they can be seen from the right and left sides and the front of the car. This number will remain the same through the entire event.

Proposed rule

2.2.1 Each competitor will display his identification number in ~~at least three positions so that they can be seen from the right and left sides and the front of the car~~ a prominent position on the car Body shell. This number will remain the same through the entire event.

Argument: The competitor number is not suitable for use as a race start number, this should always be between 1 and 10. the competitor number is useful for Technical inspection and should be retained

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 2

Actual rule

2.6.3 Practice will be organized using the "T-Time" format. Under these arrangements the following parameters will be used:

- Each segment will be restricted to 10 minutes (1/12) and 7 minutes (ISTC).
- Drivers only to be allowed to sign up for "T-Time" practice.
- A maximum of 15 cars to be allowed on the track during any one segment.
- Drivers will only be allowed one frequency per segment.
- The first "T-Time" practice will be allocated by the organizers.

Proposed rule

2.6.3 Practice will be organized using the "T-Time" format **or in heat format**. Under ~~these~~ 'T-Time' arrangements the following parameters will be used:

- Each segment will be restricted to 10 minutes (1/12) and 7 minutes (ISTC).
- Drivers only to be allowed to sign up for "T-Time" practice.
- A maximum of 15 cars to be allowed on the track during any one segment.
- Drivers will only be allowed one frequency per segment.
- The first "T-Time" practice will be allocated by the organizers.

Argument : This gives the organizers the flexibility to run practice as heats or as T-Time

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
Passed unanimously		Passed		Not passed	

Proposal 3

Actual rule

2.9.3 During Qualifications the „staggered start“ system will be used. Each car will start separately, within 5 seconds after its number is called. If for any reason a car did not start, the time counting for this car will begin automatically the moment one of the other cars has completed its first lap.

Proposed rule

2.9.3 During Qualifications the „staggered start“ system will be used. Each car will start separately, **within 5 seconds immediately** after its number is called. If for any reason a car did not start, the time counting for this car will begin automatically the moment one of the other cars has completed its first lap.

Argument: The start system relies on the driver starting when his number is called, any delay in this will cause the system to fail and crashes may happen

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
Passed unanimously		Passed		Not passed	

Proposal 4

Actual rule

2.11.5 Awards and complete introduction of competitors and their final placing will be at the awards banquet following finals.

Proposed rule

2.11.5 Awards and complete introduction of competitors and their final placing will be at an award ceremony following finals **for 1-12, and at the awards banquet following finals for 1-10.**

Argument: Currently any driver who only races 1-12 will not have an awards ceremony until many days later, this is unfair.

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
Passed unanimously		Passed		Not passed	

Proposal 5

Actual rule

4.2 BATTERIES APPROVAL

NiCd, NiMH or Lithium based (LiPo/LiFe) cells and batteries can be submitted for IFMAR Approval. Original manufacturer or their agents may request approval.

The deadline date for submitting batteries (cells) to be approved for that year's World Championship is eight (8) months prior to the date of the Opening Ceremony of the World Championship. The applications must be submitted to IFMAR together with:

The appropriate approval form (available on request as from 10 months before a WC race)

Four plus one samples of the product closely representing the weight and size range stated

A written technical specification including dimensions and weights with associated tolerances from the original cell or battery manufacturer for verification.

Lithium based batteries must be covered by their safety test certification in accordance with UN Tests, outlined in Part 3, sub-Section 38.3 of the UN Manual of tests and criteria.

Proof that a minimum of 2000 individual cells/batteries have been sold (by the original manufacturer or their agents) to commercial outlets in the retail or distribution sector of the hobby industry.

A list of telephone numbers, email-addresses and postal addresses of retail suppliers, shops in each continent from whom the cells can be purchased must be provided.

A verification of availability by means of spot-checks will be made four (4) months prior to the date of the opening Ceremony of the World Championship. Failure to this verification will result in the non-approval of the product.

One (1) sample will be tested and one (1) sample of each product and paperwork will be submitted by the IFMAR Electric Section Chairman to the appropriate IFMAR Electric Section representative in EFRA, ROAR, FEMCA and FAMAR so to be matched for compliance with the rules. If a product meets all technical specifications and IFMAR availability requirements by a majority of the voting Blocs' representatives, it will be included on the Approved Product List for use at WC events.

The submittal for approval must be conforming to the procedure current at the time for IFMAR approval. Copies of submission forms are available on request.

Proposed rule

4.2 BATTERIES APPROVAL

~~NiCd, NiMH or~~ Lithium based (LiPo/LiFe) cells and batteries can be submitted for IFMAR Approval. Original manufacturer or their agents may request approval.

The deadline date for submitting batteries (cells) to be approved for that year's World Championship is eight (8) months prior to the date of the Opening Ceremony of the World Championship. The applications must be submitted to IFMAR together with:

• The appropriate approval form (available on request as from 10 months before a WC race)

• Four plus one samples of the product closely representing the weight and size range stated

• A written technical specification including dimensions and weights with associated tolerances from the original cell or battery manufacturer for verification. **For Lithium based batteries, the specification must also include : maximum charging parameters (amps & voltage), case material, case thickness and case sealing process.**

• Lithium based batteries must be covered by their safety test certification in accordance with UN Tests, outlined in Part 3, sub-Section 38.3 of the UN Manual of tests and criteria. **Copy to be supplied with approval documentation.**

- Proof that a minimum of ~~2000~~ **1000** individual cells/batteries have been sold (by the original manufacturer or their agents) to commercial outlets in the retail or distribution sector of the hobby industry.

- A list of telephone numbers, email-addresses and postal addresses of retail suppliers, shops in each continent from whom the cells can be purchased must be provided.

A verification of availability by means of spot-checks will be made four (4) months prior to the date of the opening Ceremony of the World Championship. Failure to this verification will result in the non-approval of the product.

One (1) sample will be tested and one (1) sample of each product and paperwork will be submitted by the IFMAR Electric Section Chairman to the appropriate IFMAR Electric Section representative in EFRA, ROAR, FEMCA and FAMAR so to be matched for compliance with the rules. If a product meets all technical specifications and IFMAR availability requirements by a majority of the voting Blocs' representatives, it will be included on the Approved Product List for use at WC events.

The submittal for approval must be conforming to the procedure current at the time for IFMAR approval. Copies of submission forms are available on request.

Argument:

a) The Track classes want to delete the Nicd and the NiMH.

b) the weight specification is one of the best way to check out a cheating inside a closed box, this came from homologation office, same with the mention of the number of samples and the documentation.

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 6

Actual rule

4.3.7 1/10th cars will be driven by a maximum of 5 NiCd or NiMH cells giving a maximum nominal voltage of 6.0v., or by LiPo/LiFe batteries with a maximum nominal voltage of 7.4v. 1/12th cars will be driven by a maximum of 4 NiCd or NiMh cells giving a maximum nominal voltage of 4.8v., or a 1S LiPo/LiFe battery with a maximum nominal voltage of 3.7v.

Proposed rule

4.3.7 1/10th cars will be driven by ~~a maximum of 5 NiCd or NiMH cells giving a maximum nominal voltage of 6.0v., or by~~ LiPo/LiFe batteries with a maximum nominal voltage of 7.4v. 1/12th cars will be driven by ~~a maximum of 4 NiCd or NiMh cells giving a maximum nominal voltage of 4.8v., or a~~ 1S LiPo/LiFe battery with a maximum nominal voltage of 3.7v.

Argument: As indicated, Class desire is only LiPo/LiFe

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 7

Actual rule

4.3.8 All LiPo/LiFe packs must be charged with a LiPo/LiFe-capable charger using the industry standard CC/CV. (Constant Current/Constant Voltage) charge profile.

Proposed rule

4.3.8 All LiPo/LiFe packs must be charged with a LiPo/LiFe-capable charger using the industry standard CC/CV. (Constant Current/Constant Voltage) charge profile.

LiPo/LiFe drive batteries must be charged in a 'liPo sack' at all times. LiPo sack is defined as a receptacle designed for the purpose of charging LiPo/LiFe batteries and of a suitable construction as to contain a LiPo/LiFe fire.

Argument

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 8

Actual rule

4.3.11 1/10th. cars using Lithium based batteries may not have a second battery on board except for the one supplied in the electronic timing device (transponder).

1/12th. cars are allowed to use an additional receiver pack, which must not supply power to the drive motor

Proposed rule

4.3.11 **13** 1/10th. cars ~~using Lithium based batteries~~ may not have a second battery on board except for the one supplied in the electronic timing device (transponder).

1/12th. cars are allowed to use an additional receiver pack, which must not supply power to the drive motor

Argument: a) wrong number at rule , typo) b) the use of Lithium becomes mandatory, so no need to mention it.

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 9

Actual rule

4.4 TECHNICAL SPECIFICATION BATTERIES

A NiCd or NiMH

1 NiCd or NiMH cells are rated at 1.2 volts nominal. The size of individual cell(s) to be:-

Diameter 23.0 mm +0/-1 mm. Overall length 43.0 mm +0/-1.5 mm.

Measurements include original manufacturers heat shrink. Overall length is the maximum length of the complete cell including the positive button before attaching/soldering any link wires or battery bars. Dimensions taken at ambient temperature and at 90 degrees to the centre-line of the cell. It is known that 'fast charging' of cells may result in cell expansion/distortion. However, cells must never exceed the above maximum dimensions when used at a WC event.

2 Weight of individual cells:-

The original manufacturers of cells are allowed a maximum of +/- 2 gr tolerance on the nominal weight of the cell stated on the technical specification/data sheet submitted at the time of approval. The min/max weights will be detailed in the IFMAR Approved Battery List, and cells must never exceed the weight tolerances stated on the IFMAR Approved List. Any changes to the technical specifications of cells after the original approval will require re-approval using the time frame as applicable.

3 1/10 cars using NiMH or NiCd will be driven by a maximum of 5 cells and 6.0 volts nominal maximum.

1/12 can use NiMH or NiCd for propulsion. The numbers of cells is limited to 4, in this case a receiver battery pack to power the receiver and Servo is allowed. Under no circumstances may power from the receiver pack contribute to the power to the motor.

B. Lithium Based (LiPo/LiFe) Batteries:

1 Lithium Based (Li-Poly/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 the exit of wires or pin type connectors.

2S Battery :- Maximum external case sizes:

Length: 139.0 mm

Width: 47.0 mm. (The max. width includes any side exit. wires).

Height: 25.1 mm. (Chassis location features additional to this dimension are allowed)

2 Saddle-Pack cells are allowed, but must comply with the above width and height.

Furthermore they must not exceed a combined length of 139.0mm max. when placed end to end.

1S Battery :- Maximum external case sizes:

Length: 93.0 mm.

Width: 47.0 mm. (Side exit wires are allowed outside this dimension).

Height: 18.5 mm. (Chassis location features additional to this dimension are allowed).

Saddle-pack cells are not allowed.

3 Individual cells used in the construction of the battery pack shall be rated at 3.7 volts nominal. Individual cells may be wired in parallel. For 2S packs: the maximum "In Series" is two to give a pack voltage of maximum 7.4v nominal. For 1S packs; the maximum "In Series" is one to give a pack voltage of maximum 3.7v nominal.

4 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, 'Female

connection tubes' to connect the power wires are allowed but the metal tubes must be well enough below the surface of the moulded case so to avoid short circuit if the pack is placed on a conductive surface. The connection points shall be clearly marked positive and negative.

5. The case must have the original suppliers label intact, clearly stating the name of the manufacturer/importer, the part number of the pack, the rated voltage, the chemistry (LiPo/LiFe), the pack capacity and the C- rating of the pack. The Brand name/logo label shall be easily readable.

Proposed rule

4.4 TECHNICAL SPECIFICATION BATTERIES

A. NiCd or NiMH

1. NiCd or NiMH cells are rated at 1.2 volts nominal. The size of individual cell(s) to be:-

Diameter 23.0 mm $\pm 0/ -1$ mm. Overall length 43.0 mm $\pm 0/ -1.5$ mm.

Measurements include original manufacturers heat shrink. Overall length is the maximum length of the complete cell including the positive button before attaching/soldering any link wires or battery bars. Dimensions taken at ambient temperature and at 90 degrees to the centre line of the cell. It is known that 'fast charging' of cells may result in cell expansion/distortion. However, cells must never exceed the above maximum dimensions when used at a WC event.

2. Weight of individual cells:-

The original manufacturers of cells are allowed a maximum of ± 2 gr tolerance on the nominal weight of the cell stated on the technical specification/data sheet submitted at the time of approval. The min/max weights will be detailed in the IFMAR Approved Battery List, and cells must never exceed the weight tolerances stated on the IFMAR Approved List. Any changes to the technical specifications of cells after the original approval will require re-approval using the time frame as applicable.

3. 1/10 cars using NiMH or NiCd will be driven by a maximum of 5 cells and 6.0 volts nominal maximum.

1/12 can use NiMH or NiCd for propulsion. The numbers of cells is limited to 4, in this case a receiver battery pack to power the receiver and Servo is allowed. Under no circumstances may power from the receiver pack contribute to the power to the motor.

B. Lithium Based (LiPo/LiFe) Batteries:

1. Lithium Based (Li-Poly/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 the exit of wires or pin type connectors.

2S Battery: - Maximum external case sizes:

Length: 139.0 mm

Width: 47.0 mm. (The max. width includes any side exit. wires).

Height: 25.1 mm. (Chassis location features additional to this dimension are allowed)

Saddle-Pack cells are allowed, but must comply with the above width and height. Furthermore they must not exceed a combined length of 139.0mm max. when placed end to end.

1S 'Stick' Battery :- Maximum external case sizes:

Length: 93.0 mm.

Width: 47.0 mm. (Side exit wires are allowed outside this dimension).

Height: 18.5 mm. (Chassis location features additional to this dimension are allowed).

Saddle-pack cells are not allowed.

1S 'Saddle' Batteries

Saddle-pack cells are allowed. The maximum case sizes allowed are as follows :-

Length: 93.0 mm. (Max. dimension measured with both cases placed end to end).

Width: 46.0 mm. (Side exit wires are allowed outside this dimension).

Height: 23.0 mm. (Chassis location features extra to this dimension are allowed).

2. Individual cells used in the construction of the battery pack shall be rated at 3.7 volts nominal. Individual cells may be wired in parallel. For 2S packs: the maximum "In Series" is two to give a pack voltage of maximum 7.4v nominal. For 1S packs; the maximum "In Series" is one to give a pack voltage of maximum 3.7v nominal.
3. 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, 'Female connection tubes' to connect the power wires are allowed but the metal tubes must be well enough below the surface of the moulded case so to avoid short circuit if the pack is placed on a conductive surface. The connection points shall be clearly marked positive and negative.
4. The case must have the original suppliers label intact, clearly stating the name of the manufacturer/importer, the part number of the pack, the rated voltage, the chemistry (LiPo/LiFe), the pack capacity and the C- rating of the pack. The Brand name/logo label shall be easily readable.
5. Weight of any Lithium battery is limited to +/- 4% on manufacturers specified weight. Batteries to comply with the weights specified on the IFMAR approval list.

Argument

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			
In favour		Abstention		Against	
Passed unanimously		Passed		Not passed	

Proposal 10

Actual rule

4.5.2 An approved products list of motors approved for use in the World Championships must be posted on the IFMAR website and the organizer's website (if available) four (4) months prior to the event and the list shall be included in the race acknowledgement package sent to each competitor no later than two (2) months prior to the event.

BRUSHED MOTORS

Specifications: '05' sized displacements.

Can diameter to be a maximum of 36.02mm

Can length to be Maximum of 53mm measured from the mounting face of the motor to the furthest point not including solder, tabs or lead wires.

Shaft diameter is .125 inch.

Production Tolerances allowed.

Ceramic magnets only (cobalt and rare earth magnets specifically not allowed).

Current is supplied to the armature by 2 brushes.

Armature - The rotor is to have three poles with windings.

Stack length without epoxy - minimum 21mm and maximum is 22.8mm.

Only Copper wire is to be used for the winding.

No Split rotor is allowed.

The laminations have to be one after the other without anything between.

The thickness of the stack plates is 0.35mm + 0.05mm.

The armature has to be permanently marked by the manufacturer, detailing the number of 'winds' and the name of the manufacturer

A minimum of 5,000 units must be available at the time of approval. A minimum of three hundred (300) motors must have been sold to at least three (3) distributors or hobby shops or OEM's at the time of submittal. The manufacturer has to provide an address of a hobby shop or the like, that any driver who wishes to obtain these motors at the time of approval can do so.

Approved motors may be modified by re-winding, balancing, truing of commutators, epoxying, ball bearings, brushes and custom brush systems only.

No hybrid (mixing of parts from approved motors) allowed.

BRUSHLESS MOTORS:

General definition of a Brushless Motor:

a) Sensored or sensorless motors are allowed.

b) The motor has to be rebuildable. Ball bearings are allowed.

c) If the motor is sensored:

- It must use a six position JST ZH connector model number ZHR-6 or equivalent connector with 6 JST part number SZH-002T-P0.5 26-28 awg contacts or equivalent.

Wire sequence must be as follows:

Pin #1 - Black wire ground potential

Pin #2 - orange wire phase C

Pin #3 - white wire phase B

Pin #4 - green wire phase A

Pin #5 - blue wire temp control, 10 k Thermistor referenced to ground potential

Pin #6 - red wire + 5.0 volts d.c. +/- 10%.

Compatible speed control must use the 6 position JST header part number X-6B-ZR-SMX-TF (where the X denotes the style of the header), or equivalent.

- The power connector has to be clearly marked A, B, C.

A for phase A

B for phase B

C for phase C

d) `05` size specifications

Can:

Overall maximum diameter is

36.02mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires.

Overall minimum diameter is

34.00mm measured at whatever point yields the minimum dimension, excluding solder tabs or lead wires.

Maximum length is

53.00mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, lead wires or original manufacturer's logo or name.

Minimum length is

50.00mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, lead wires or original manufacturer's logo or name.

Motor mounting holes must be on 1.00- inch (25.40mm) centers.

Stack/Stator:

The Stack or Backiron must be continuous. The laminations have to be one after the other without anything in between. Stack/Backiron minimum length 19.30mm, maximum 21.00mm. The thickness of the Stack/Backiron laminations is 0.35+/-0.05 mm. All laminations must be of the same material. Inside diameter of Stack or Windings equals the central space between the laminations or assembly of windings and must accept 'plug' gauges of 12.5 mm minimum, 16.0 mm maximum. These dimensions to be measured with the centre of the 'plug'

gauge in-line with the centre of the motor Can. (ie. Concentric to can).

Winding:

Delta and Y wound stators are permitted. Only circular (round) pure copper wire permitted. No turn limit.

Rotor:

Shaft diameter must be 0.125 inches (3.175mm). Only one piece, two pole bonded Neodymium or Ferrite magnetic rotors are permitted. Magnet minimum length 23.00mm, maximum 27.00mm. Magnet minimum diameter 12.00mm, maximum 5.50mm.

e) All motors must have the original manufacturer's logo or name moulded into the end bell.

f) A minimum of two thousand (2000) brushless motors must be available at the time of approval. A minimum of three hundred (300) brushless motors must have been sold to at least three (3) distributors or hobby shops or OEM's at the time of submittal. The manufacturer has to provide an address of a hobby shop or the like, that any driver who wishes to obtain these motors at the time of the approval can do so. No hybrid (mixing of parts from approved brushless motors) allowed.

Proposed rule

4.5.2 An approved products list of motors approved for use in the World Championships must be posted on the IFMAR website and the organizer's website (if available) four (4) months prior to the event and the list shall be included in the race acknowledgement package sent to each competitor no later than two (2) months prior to the event.

BRUSHED MOTORS

~~Specifications: '05' sized displacements.~~

~~Can diameter to be a maximum of 36.02mm~~

~~Can length to be Maximum of 53mm measured from the mounting face of the motor to the furthest point not including solder, tabs or lead wires.~~

~~Shaft diameter is .125 inch.~~

~~Production Tolerances allowed.~~

~~Ceramic magnets only (cobalt and rare earth magnets specifically not allowed).~~

~~Current is supplied to the armature by 2 brushes.~~

~~Armature - The rotor is to have three poles with windings.~~

~~Stack length without epoxy - minimum 21mm and maximum is 22.8mm.~~

~~Only Copper wire is to be used for the winding.~~

~~No Split rotor is allowed.~~

~~The laminations have to be one after the other without anything between.~~

~~The thickness of the stack plates is 0.35mm + 0.05mm.~~

~~The armature has to be permanently marked by the manufacturer, detailing the number of 'winds' and the name of the manufacturer~~

~~A minimum of 5,000 units must be available at the time of approval. A minimum of three hundred (300) motors must have been sold to at least three (3) distributors or hobby shops or OEM's at the time of submittal. The manufacturer has to provide an address of a hobby shop or the like, that any driver who wishes to obtain these motors at the time of approval can do so.~~

~~Approved motors may be modified by re-winding, balancing, truing of commutators, epoxying, ball bearings, brushes and custom brush systems only.~~

~~No hybrid (mixing of parts from approved motors) allowed.~~

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a) Sensored or sensorless motors are allowed.

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c) If the motor is sensored:

- It must use a six position JST ZH connector model number ZHR-6 or equivalent connector with 6 JST part number SZH-002T-P0.5 26-28 awg contacts or equivalent.

Wire sequence must be as follows:

Pin #1 - Black wire ground potential

Pin #2 - orange wire phase C

Pin #3 - white wire phase B

Pin #4 - green wire phase A

Pin #5 - blue wire temp control, 10 k Thermistor referenced to ground potential

Pin #6 - red wire + 5.0 volts d.c. +/- 10%.

Compatible speed control must use the 6 position JST header part number

X-6B-ZR-SMX-TF (where the X denotes the style of the header), or equivalent.

- The power connector has to be clearly marked A, B, C.

A for phase A

B for phase B

C for phase C

d) `05` size specifications

Can:

Overall maximum diameter is

36.02mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires.

Overall minimum diameter is

34.00mm measured at whatever point yields the minimum dimension, excluding solder tabs or lead wires.

Maximum length is

53.00mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, lead wires or original manufacturer's logo or name.

Minimum length is

50.00mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, lead wires or original manufacturer's logo or name.

Motor mounting holes must be on 1.00- inch (25.40mm) centers.

Stack/Stator:

The Stack or Backiron must be continuous. The laminations have to be one after the other without anything in between. Stack/Backiron minimum length 19.30mm, maximum 21.00mm. The thickness of the Stack/Backiron laminations is 0.35+/-0.05 mm. All laminations must be of the same material. Inside diameter of Stack or Windings equals the central space between the laminations or assembly of windings and must accept 'plug' gauges of 12.5 mm minimum, 16.0 mm maximum. These dimensions to be measured with the centre of the 'plug' gauge in-line with the centre of the motor Can. (ie. Concentric to can).

Winding:

Delta and Y wound stators are permitted. Only circular (round) pure copper wire permitted. No turn limit.

Rotor:

Shaft diameter must be 0.125 inches (3.175mm). Only one piece, two pole bonded Neodymium or Ferrite magnetic rotors are permitted. Magnet minimum length 23.00mm, maximum 27.00mm. Magnet minimum diameter 12.00mm, maximum 5.50mm.

e) All motors must have the original manufacturer's logo or name moulded into the end bell.

f) A minimum of two thousand (2000) brushless motors must be available at the time of approval. A minimum of three hundred (300) brushless motors must have been sold to at least three (3) distributors or hobby shops or OEM's at the time of submittal. The manufacturer has to provide an address of a hobby shop or the like, that any driver who wishes to obtain these motors at the time of the approval can do so. No hybrid (mixing of parts from approved brushless motors) allowed.

Argument: As with battery technology, motor technology has moved on Brushless is now the standard technology, the rules should reflect this. WC events should be brushless only

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			
In favour		Abstention		Against	
Passed unanimously		Passed		Not passed	

Proposal 11

Actual rule

5.1.1 For the purpose of the IFMAR World Championships, GTP, Le Mans Prototypes (LMP675 & LMP900), World Sports Cars (WSC) and FIA GT Racing Classes 1 & 2 (GT1 and GT2) bodies only are allowed.

Proposed rule

5.1.1 For the purpose of the IFMAR World Championships, ~~GTP, Le Mans Prototypes (LMP675 & LMP900), World Sports Cars (WSC) and FIA GT Racing Classes 1 & 2 (GT1 and GT2)~~ LMES / ALMS / LMP / WSC prototype bodies only are allowed.

Argument: later on

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			
In favour		Abstention		Against	
Passed unanimously		Passed		Not passed	

Proposal 12

Actual rule

5.1.3 Only body shells which are registered with IFMAR may be used. Body shell manufacturers may register at any time, but not less than four months prior to that years' IFMAR World Championship to be eligible for that event.

One sample of a body shell, together with photographs of the full-size car on which the body shell is based, must be sent to the IFMAR Electric Section Chairman. When registered by IFMAR, the body shell will be added to the register of body shells allowed for use at IFMAR World Championship events for that class.

The body shell must be a reasonable, realistic, facsimile of the full-size car on which it is based, with particular attention to realistic height, cockpit area, scoops, vents, wings and aerodynamic devices.

5.1.4 All open-cockpit body shells must have a realistic driver figure fitted in an appropriate position in the cockpit at all times when racing. The driver figure must consist of at least a driver's head/helmet, shoulders and arms and should be reasonable scale size.

The driver figure must be painted in a realistic appearance, color and garb.

5.1.5 All closed cockpit cars must have transparent windshields and/or side windows and/or rear windows.

Open or painted windshields and/or side windows and/or rear windows are not allowed. This will be determined by reference to the photographs submitted by the manufacturer when registering the body shell.

Proposed rule

5.1.3 Only body shells which are registered with IFMAR may be used. Body shell manufacturers may register at any time, but not less than four months prior to that year's IFMAR World Championship to be eligible for that event.

One sample of a body shell, together with photographs of the full-size car on which the body shell is based, must be sent to the IFMAR Electric Section Chairman. When registered by IFMAR, the body shell will be added to the register of body shells allowed for use at IFMAR World Championship events for that class.

~~The body shell must be a reasonable, realistic, facsimile of the full-size car on which it is based, with particular attention to realistic height, cockpit area, scoops, vents, wings and aerodynamic devices.~~

~~5.1.4 All open-cockpit body shells must have a realistic driver figure fitted in an appropriate position in the cockpit at all times when racing. The driver figure must consist of at least a driver's head/helmet, shoulders and arms and should be reasonable scale size.~~

~~The driver figure must be painted in a realistic appearance, color and garb.~~

~~5.1.5 All closed-cockpit cars must have transparent windshields and/or side windows and/or rear windows.~~

~~Open or painted windshields and/or side windows and/or rear windows are not allowed. This will be determined by reference to the photographs submitted by the manufacturer when registering the body shell~~

Specification for approval of 1/12 Prototype Sports car body shells:

1. Lower body cut line is to be used as the reference plane for all height dimensions.
2. Minimum cockpit height – Closed cockpit – 55mm (Excluding any air scoops / air boxes)
3. Minimum cockpit width – Closed cockpit – 70mm (Measured at the point it intersects with the side pod)
4. Minimum cockpit width - 55mm (measured at the lower window line)
5. Minimum Roll bar height – Open cockpit – 55mm
6. Maximum distance from Drivers helmet to top of roll bar – Open cockpit -11mm
7. Minimum cockpit width – Open cockpit – 65mm (Measured at the point it intersects with the side pod)
8. Minimum front wheel arch height – 46mm (Including vents) (measured at a point 15mm from edge of body)
9. Minimum rear wheel arch height – 50mm (measured at a point 10mm from edge of body)
10. Maximum overall width – 176mm
11. Minimum overall width – 168mm
12. Max wing / spoiler height – 65mm
13. Max front overhang (From centre of front wheel)– 70mm
14. Max rear overhang (from centre of rear wheel) – 70mm
15. Max length overall – 340mm
16. Minimum side pod height – 30mm
17. The side dam must blend fully (disappear) into the main body shape within 110mm of the rear edge of the body/side dam.
18. Max side dam height – 72mm
19. The body side forward of the side dam must have a radiused edge, no lips or upward extensions are acceptable
20. Bodies must be a representation of a full size LMES / ALMS / LMP / WSC prototype.
21. Open cockpit cars to have twin roll bars as current LMES / ALMS
22. Open cockpit cars must have a representative drivers helmet and cockpit opening
23. The name of the prototype must be used for the homologation process.
24. The name of the prototype does not have to be used for general sales and marketing.
25. Only fins or strakes that are present on the full size prototype will be allowed.

- 26. **The body must not be cut above the lower cut line**
- 27. **Cut-outs in the shell will be allowed only if clearly defined on the full size prototype**
- 28. **Once Homologated there must be no changes to the design, trim lines, detail lines or any feature of the body. All changes will require resubmission for approval and an additional revision letter added to the part number- Example 15001A - Original - 15001B for a 2nd Rev. Etc The manufacturer's part number must be clearly marked on the shell alongside the windscreen area.**

Argument: This is a new specification for approval of 1/12 Prototype Sports car body shells. They should be used by the section chairman to enable clear and consistent application of standards for future approvals,

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 13

Actual rule

5.1.6 WINGS

5.1.6a Wings may only be fitted where they are shown on the photographs submitted by the body shell manufacturer for registration with IFMAR. Wings may be moulded in to the body shell as part of the continuous material used for the body shell, or may be attached separately.

5.1.6b One (1) separate front wing may be attached directly, and only, to the body shell. The front wing must be supplied by the original body shell manufacturer with the bodyshell as registered with IFMAR and be fitted as supplied without modification.

5.1.6c One (1) rear wing only may be used with the body shell. The rear wing may be: EITHER

Moulded in to the original body shell as part of the continuous material used for the body shell. This is defined as the part of the bodyshell, from the centre of the rear axle line extended rearwards, which sweeps upward from the horizontal.

OR

Attached directly to the body shell or chassis by separate supports. In this case the part of body shell from the centre of the rear axle line extending rearwards must be horizontal, or swept downward from the horizontal. Separate wings must conform to the sizes shown in 5.1.14. Side dams to the sizes shown in 5.1.14 must be attached directly to the separate wing only.

No part of the wing may be closer than 6.5 mm to any part of the body other than the tail fins or side dams.

5.1.7 Side dams moulded in to the original body shell, or supplied with the original body shell, registered with IFMAR, must not exceed a maximum dam length of 102 mm and maximum height of 25 mm. These dimensions include moulded-in portions of body.

Proposed rule DELETE

5.1.6 WINGS

~~5.1.6a Wings may only be fitted where they are shown on the photographs submitted by the body shell manufacturer for registration with IFMAR. Wings may be moulded in to the body shell as part of the continuous material used for the body shell, or may be attached separately.~~

5.1.6b One (1) separate front wing may be attached directly, and only, to the body shell. The front wing must be supplied by the original body shell manufacturer with the bodyshell as registered with IFMAR and be fitted as supplied without modification.

5.1.6c One (1) rear wing only may be used with the body shell. The rear wing may be: EITHER

Moulded in to the original body shell as part of the continuous material used for the body shell. This is defined as the part of the bodyshell, from the centre of the rear axle line extended rearwards, which sweeps upward from the horizontal.

OR

Attached directly to the body shell or chassis by separate supports. In this case the part of body shell from the centre of the rear axle line extending rearwards must be horizontal, or swept downward from the horizontal. Separate wings must conform to the sizes shown in 5.1.14. Side dams to the sizes shown in 5.1.14 must be attached directly to the separate wing only.

No part of the wing may be closer than 6.5 mm to any part of the body other than the tail fins or side dams.

5.1.7 Side dams moulded in to the original body shell, or supplied with the original body shell, registered with IFMAR, must not exceed a maximum dam length of 102 mm and maximum height of 2.5 mm. These dimensions include moulded-in portions of body.

Argument: it goes all togheter with all new specifications

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

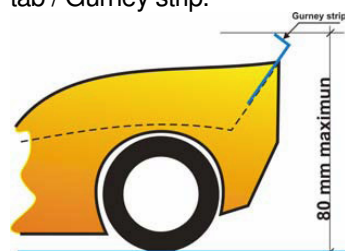
In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 14

Actual rule

5.1.8 No additional items may be fastened to the body exterior other than the rear trim tab / Gurney strip.



5.1.9 The body and chassis must be securely joined at all times when the car is on the track.

If the body comes loose or falls off during a race, the car must be removed from the track until the body shell is securely re-attached.

5.1.10 Wheel arches must be cut-out if the original full-size car ran that way. This will be determined by reference to the photographs submitted by the manufacturer when registering the body shell with IFMAR.

5.1.11 The body shell may not be trimmed higher than the lower body trim lines. When a body shell is registered with IFMAR a lower trim line must be moulded in to the

body shell, or a minimum distance from the highest point on the body shell to the lower trim line must be specified by the body shell manufacturer.

5.1.12 No part of the chassis, wheels, tyres, suspension or mechanical/electrical equipment may be visible outside the body shell when viewed in any plane.

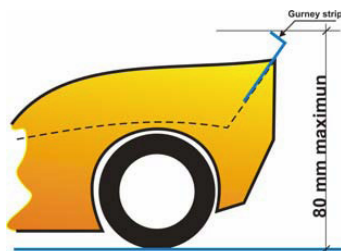
5.1.13a Openings in the body shell (e.g. scoops, vents) must be appropriate to the full-size car on which the body shell is based. This will be determined by reference to the photographs submitted by the manufacturer when registering the body shell. Additional openings in the body shell are allowed only for the original cockpit (in open cockpit cars) wing mounts, antenna, roll-over mast (if allowed) and lap recording equipment.

No other openings in the body shell are allowed.

5.1.13b Rollover antenna may be fitted. If fitted, it must have a blunt end for safety reasons. If a rollover mast and radio antenna are fitted, the antenna must be part of the mast along its length. Maximum height from ground 35 cm.

Proposed rule

5.1.8 No additional items may be fastened to the body exterior other than ~~the a~~ rear trim tab / Gurney strip.



5.1.9 The body and chassis must be securely joined at all times when the car is on the track.

If the body comes loose or falls off during a race, the car must be removed from the track until the body shell is securely re-attached.

5.1.10 Wheel arches must be cut-out if the original full-size car ran that way. This will be determined by reference to the photographs submitted by the manufacturer when registering the body shell with IFMAR.

5.1.11 The body shell may not be trimmed higher than the lower body trim lines. When a body shell is registered with IFMAR a lower trim line must be moulded in to the body shell, or a minimum distance from the highest point on the body shell to the lower trim line must be specified by the body shell manufacturer.

5.1.12 No part of the chassis, wheels, tyres, suspension or mechanical/electrical equipment may be visible outside the body shell when viewed in any plane.

5.1.13a Openings in the body shell (e.g. scoops, vents) must be appropriate to the full-size car on which the body shell is based. This will be determined by reference to the photographs submitted by the manufacturer when registering the body shell. Additional openings in the body shell are allowed only for the original cockpit (in open cockpit cars) wing mounts, antenna, roll-over mast (if allowed) and lap recording equipment.

No other openings in the body shell are allowed.

5.1.13b Rollover antenna may be fitted. If fitted, it must have a blunt end for safety reasons. If a rollover mast and radio antenna are fitted, the antenna must be part of the mast along its length. Maximum height from ground 35 cm.

Argument: mostly all remains but the small change of “the” and “a”

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 15

Actual rule

5.1.14 DIMENSIONS

5.1.14a Body shell dimensions in millimeters

Max Min

Overall width 172 155

Overall length 380 320

Clearance around openings 10 -

Clearance around wheel arches (except shaped wheel arches) 10 -

Rear Wing (separate) Width 172 -

Chord 52 -

Side Dams - Length 55 -

- Width 20 -

Proposed rule

5.1.14 DIMENSIONS

5.1.14a ~~Body shell dimensions in millimeters~~

~~Max Min~~

~~Overall width 172 155~~

~~Overall length 380 320~~

~~Clearance around openings 10 -~~

~~Clearance around wheel arches (except shaped wheel arches) 10 -~~

~~Rear Wing (separate) Width 172 -~~

~~Chord 52 -~~

~~Side Dams - Length 55 -~~

~~- Width 20 -~~

MEASUREMENTS AND WEIGHTS

Maximum overall width of the car: 172 mm (Excluding shell)

Minimum weight: 800 gram for 4 cell and 890gram for 6 cells.

Wing: Maximum width: 172 mm, the wing profile has to fit in a rectangle of 52mm (height) x 26mm

Spoilers: Max. Spoiler height: 25 mm, max length 35 mm. These dimensions include the moulded in portions of the body, the use of a gurney flap to extend the wing length is acceptable.

Bumper: May extend 6.5 mm beyond side of body or to 172 mm whichever is less. May extend 13 mm forward of body, but in same shape as body.

Wheel rim diameter: Minimum 29 mm and Maximum 38 mm. (Including all non-rubber parts of the wheel and tyre).

5.1.14 b

Wheel cut-outs may not be more than 15 mm larger than tyre radius (Exception - scale size and/or shape wheel cut-outs). Wheel wells must be cut out if those on the original car were cut out.

5.1.14 c Only one wing is allowed on the car unless the actual car had a second wing. The second wing must be scale within 10% in size and location. The wing may be not closer than 6.5 mm to any part of the body other than the tail fins or side dams.

Argument: The EFRA Vicechairman of the electric Section, Mr. Russ Giles, has been the prime mover for the introduction of the body regulations in place with EFRA.

These regs. were developed with input from CEFX, Protoform, Parma and CRC. There has been much discussion of the merits of the regs as they stand, it seems to raise quite a passionate response from some areas.

Trying to be dispassionate about it and balance the pro's and con's

For the new regs

- It gives a known set of key dimensions for all the manufacturers to work with.
- It takes much of the subjectiveness out of body approval and makes it an objective process
- Bodies to these dimensions are easier to fit to a typical car as there is more room for the electrics under the shell
- Three major 1-12 body manufacturers have developed shells to these specifications and proven that they can perform well, the Protoform example has won many big races in USA.

Against the new regs

- The favoured bodies of the past 7 years are not legal to these dimensions (PF Speed 12, Parma Speed 8 Blackart Audi Etc) this is not popular with some of the more conservative drivers
- It does not make the cars 'realistic'. The modern 1-12 chassis cannot be made to work with a true scale LeMans prototype shape. The shape of the shell has to be a massive compromise to enable the rest of the construction rules to remain in place.
- It causes a disproportionate amount of heartfelt discussion compared with most other regulations !

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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FINISH OF ELECTRIC TRACK (1/10TH & 1/12TH) PROPOSALS

B- Electric Off Road Proposals

Proposal 16

Actual rule

4.1.1 All cars must be presented for technical inspection at the start of the prior heat. No car will be allowed on the track surface without undergoing technical inspection.

Proposed rule

4.1.1 All cars must be presented for technical inspection at the start of the prior heat. No car will be allowed on the track surface without undergoing technical inspection **first, including Lithium Voltage checks at random for some or all cars. Penalties for overcharging are indicated at rule 4.4 (race procedures for batteries).**

Argument

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 17

Actual rule

4.2.3 Only one (1) car per driver per class is allowed. All cars must be presented to Technical Inspection for an Initial Inspection before the start of Controlled Practice. The purpose of this Initial Inspection is to determine that the car meets the IFMAR Technical Rules for this event. When the car passes this Initial Inspection, the chassis of the car will be marked by the Technical Inspector. Marks which are made by engraving, and/or removal of chassis material, are to be avoided. A driver may refuse to have their chassis marked by methods which include removing chassis material.

Once the chassis is marked, the chassis may not be changed without the approval of the Race Director. The chassis may only be changed in the case of damage which cannot reasonably be repaired.

Drivers must race the car he or she passed technical inspection with during qualifying and finals in accordance with the rules above.

Proposed rule

4.2.3 Only one (1) car per driver per class is allowed. All cars must be presented to Technical Inspection for an Initial Inspection before the start of Controlled Practice. The purpose of this Initial Inspection is to determine that the car meets the IFMAR Technical Rules for this event. When the car passes this Initial Inspection, the chassis of the car will be marked by the Technical Inspector. Marks which are made by engraving, and/or removal of chassis material, are to be avoided. A driver may refuse to have their chassis marked by methods which include removing chassis material.

Once the chassis is marked, the chassis may not be changed without the approval of the Race Director. The chassis may only be changed in the case of damage which cannot reasonably be repaired. **Any replacement must be of the same: design, specifications and material as the original chassis registered.**

Drivers must race the car he or she passed technical inspection with during qualifying and finals in accordance with the rules above.

Argument

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 18

Actual rule

4.2.4 Dimensional requirements (both classes);

Maximum overall length 18.00 inches (457.2mm)
 Maximum overall width 9.84 inches (250.0mm)
 Maximum height 8.00 inches (203.2mm)

Proposed rule

4.2.4 Dimensional requirements (both classes);
 Maximum overall length 18.00 inches (457.2mm)
 Maximum overall width 9.84 inches (250.0mm), **at any point of suspension travel in a vertical plane.**
 Maximum height 8.00 inches (203.2mm)

Argument

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 19

Actual rule

4.2.8 Openings in the body or cockpit floor other than appropriate to full size cars (scoops, vents, etc.) shall be kept to a minimum. Openings for wing mounts, antennas, and battery on-off switch shall provide no more than 0.250 inch in clearance. Specifically, servos, receivers, batteries, and servo savers are not allowed to protrude through original shell.

Proposed rule

4.2.8 Openings in the body ~~or cockpit floor other than appropriate to full size cars (scoops, vents, etc.)~~ **shell** shall be kept to a minimum. Openings for wing mounts, antennas, and battery on-off switch shall provide no more than 0.250 inch in clearance. Specifically: **electronic speedo's**, servos, receivers, batteries, and servo savers are not allowed to protrude through original shell.

Body shell holes/vents: The front and rear ends of the shell must retain some of the original profile of the two ends of the shell. Front and rear facing areas within the body shell surface which are 'marked' with the intention of removal to form "air scoops/ vents" are allowed to be removed, within a maximum dimension of 10mm in any direction regardless of the manufacturers marking. If no "marked" air scoops/vents are designed in the original mould to assist airflow to the motor or ESC, then material may be removed to a maximum of 10 mm. in any direction within a maximum square area of developed size 30 mm x 30 mm, in two places only. Windows are not allowed to be removed or include holes, other than for the purpose of the antenna.

Argument

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 20

Actual rule

4.3. BATTERIES APPROVAL

4.3.1 The deadline date for submitting batteries (cells) to be approved for that year's World Championship is eight (8) months prior to the date of the Opening Ceremony of the World Championship. Applications for approval must be submitted to IFMAR.

The submittal for approval must contain a written technical specification from the original cell manufacturer for verification, which must include: - dimensions and weights with associated tolerances. Samples submitted are required to closely represent the weight range stated.

A minimum of 50,000 individual cells must have been sold (by the original manufacturer or their agents) to commercial outlets in the retail or distribution sector of the hobby industry. Approval may be requested by the original manufacturer or their agents.

The submittal for approval must conform to the procedure current at the time for IFMAR approval - copies available on request.

4.3.2 A verification of availability will be made four (4) months prior to the date of the Opening Ceremony of the World Championship.

A list of telephone numbers, email-addresses and postal addresses of retail suppliers in each bloc from whom the cells can be purchased must be submitted with the application.

The manufacturer has to provide addresses of hobby shops, where any driver who wishes to obtain these batteries at the time of approval can do so.

Failure of verification will result in the non-approval of the product.

4.3.3 One (1) sample of each product and paperwork submitted for approval to be supplied by the IFMAR Electric Section Chairman to the appropriate IFMAR Electric Section representative in EFRA, ROAR, FEMCA and FAMAR to be checked that they comply with the rules. If a product meets all technical specifications and IFMAR availability requirements by a majority of the voting Blocs representatives, it will be included on the Approved Product List for use at W.C. events.

Proposed rule

4.3. BATTERIES APPROVAL

~~NiCd, NiMH or~~ Lithium based (LiPo/LiFe) cells and batteries can be submitted for IFMAR Approval. Original manufacturer or their agents may request approval.

The deadline date for submitting batteries (cells) to be approved for that year's World Championship is eight (8) months prior to the date of the Opening Ceremony of the World Championship. The applications must be submitted to IFMAR together with:

- The appropriate approval form (available on request as from 10 months before a WC race)
- Four plus one samples of the product closely representing the weight and size range stated
- A written technical specification including dimensions and weights with associated tolerances from the original cell or battery manufacturer for verification. **For Lithium based batteries, the specification must also include : maximum charging parameters (amps & voltage), case material, case thickness and case sealing process.**
- Lithium based batteries must be covered by their safety test certification in accordance with UN Tests, outlined in Part 3, sub-Section 38.3 of the UN Manual of tests and criteria. **Copy to be supplied with approval documentation.**
- Proof that a minimum of **2000-1000** individual cells/batteries have been sold (by the original manufacturer or their agents) to commercial outlets in the retail or distribution sector of the hobby industry.
- A list of telephone numbers, email-addresses and postal addresses of retail suppliers, shops in each continent from whom the cells can be purchased must be provided.

A verification of availability by means of spot-checks will be made four (4) months prior to the date of the opening Ceremony of the World Championship. Failure to this verification will result in the non-approval of the product.

One (1) sample will be tested and one (1) sample of each product and paperwork will be submitted by the IFMAR Electric Section Chairman to the appropriate IFMAR Electric Section representative in EFRA, ROAR, FEMCA and FAMAR so to be

matched for compliance with the rules. If a product meets all technical specifications and IFMAR availability requirements by a majority of the voting Blocs' representatives, it will be included on the Approved Product List for use at WC events. The submittal for approval must be conforming to the procedure current at the time for IFMAR approval. Copies of submission forms are available on request.

Argument

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 21

Actual rule

4.3.5 All cells must be submitted to Technical Inspection for checking and marking prior to being used during Controlled Practice, Qualifying and Finals. This may be completed at any time. Cells which do not bear the Organizer's mark may not be used for Controlled Practice, Qualifying and Finals.

The Organizer and IFMAR Officials may check the legality of a competitor's cells at any time during the W.C. event.

All cells must comply with the published data as contained in the IFMAR Approved Battery List.

A weight scale will be available at all times during the event for competitors to carry out weight checks on cells.

4.3.6 IFMAR shall produce an Approved Product List which lists all the cells eligible for that year's IFMAR W.C. events. This Approved Product List shall be distributed to all competitors in the race acknowledgement package no later than two (2) months prior to the W.C. event.

4.3.7 Cells may not be charged or changed during the race.

4.3.8 Cars will be driven by a maximum of six (6) cells and 7.2 volts maximum.

4.3.9 A receiver battery pack to power the receiver and Servo are allowed in any configuration.

Under no circumstances may power from the receiver pack contribute to the power to the motor

Proposed rule

~~4.3.5 All cells must be submitted to Technical Inspection for checking and marking prior to being used during Controlled Practice, Qualifying and Finals. This may be completed at any time. Cells which do not bear the Organizer's mark may not be used for Controlled Practice, Qualifying and Finals.~~

~~The Organizer and IFMAR Officials may check the legality of a competitor's cells at any time during the W.C. event.~~

~~All cells must comply with the published data as contained in the IFMAR Approved Battery List.~~

~~A weight scale will be available at all times during the event for competitors to carry out weight checks on cells.~~

~~4.3.6 IFMAR shall produce an Approved Product List which lists all the cells eligible for that year's IFMAR W.C. events. This Approved Product List shall be distributed to all competitors in the race acknowledgement package no later than two (2) months prior to the W.C. event.~~

~~4.3.7 Cells may not be charged or changed during the race.~~

~~4.3.8 Cars will be driven by a maximum of six (6) cells and 7.2 volts maximum.~~

~~4.3.9 A receiver battery pack to power the receiver and Servo are allowed in any configuration.~~

~~Under no circumstances may power from the receiver pack contribute to the power to the~~

motor

4.4 RACE PROCEDURE FOR BATTERIES

4.4.1 IFMAR shall produce an Approved Product List which lists all the cells eligible for that year's IFMAR W.C. events. This Approved Product List shall be distributed to all competitors in the race acknowledgement package no later than two (2) months prior to the WC event.

4.4.2 All cells/batteries must comply with the published data contained in the current IFMAR Approved Battery List.

4.4.3 All cells must be submitted to Technical Inspection for checking and marking prior to being used during Controlled Practice, Qualifying and Finals. This may be completed at any time. Cells which do not bear the Organizers mark may not be used for Controlled Practice, Qualifying and Finals.

4.4.4 The Organizer and IFMAR Officials may check the legality of a competitor's cells/batteries at any time during the WC event.

4.4.5 A weight scale will be available at all times during the event for competitors to carry out weight checks on cells.

4.4.6 Cells may not be charged or changed during the race.

4.4.7 1/10th. Off-Road cars will be driven by ~~a maximum of 6 NiCd or NiMH cells giving a maximum nominal voltage of 6.0v.,~~ or by LiPo/LiFe batteries with a maximum nominal voltage of 7.4v.

4.4.8 All LiPo/LiFe packs must be charged with a LiPo/LiFe-capable charger using the industry standard CC/CV. (Constant Current/Constant Voltage) charge profile.

LiPo/LiFe drive batteries must be charged in a 'liPo sack' at all times. LiPo sack is defined as a receptacle designed for the purpose of charging LiPo/LiFe batteries and of a suitable construction as to contain a LiPo/LiFe fire.

4.4.9 Any competitor found to be charging Lithium based cells using a charger that is not specifically designed for LiPo/LiFe cells or using a charge profile other than the industry standard CC/CV, will be disqualified from the event.

4.4.10 2S LiPo/LiFe batteries may be charged to a maximum of 8.40v(LiPo) resp. 7.40v (LiFe). Overcharging is a safety hazard and will not be tolerated.

4.4.11 Any competitor found to have charged LiPo/LiFe cells to above the voltages detailed in rule 4.4.10 will be disqualified from the event.

4.4.12 The use of any additional heating of any type to heat a LiPo/LiFe Battery is not allowed. The use of any cooling devices or "freeze" sprays of any type to cool a LiPo/LiFe battery is not allowed.

4.4.11 13 A receiver battery pack to power the receiver and Servo are allowed in any configuration. Under no circumstances may power from the receiver pack contribute to the power to the motor.

Argument

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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Proposal 22

Actual rule

4.3.4 Batteries Technical

Only NiCd or NiMH cells are approved for use. Cells are rated at 1.2 volts nominal.

The size of individual cell(s) to be:-

Diameter 23.0 mm +0/-1 mm. Overall length 43.0 mm +0/-1.5 mm.

Measurements include original manufacturers heat shrink. Overall length is the maximum length of the complete cell including the positive button before attaching/soldering any link

wires or battery bars. Dimensions taken at ambient temperature and at 90 degrees to the centre-line of the cell. It is known that 'fast charging' of cells may result in cell expansion/distortion. However, cells must never exceed the above maximum dimensions when used at a WC event.

Weight of individual cells:-

The original manufacturers of cells are allowed a maximum of +/- 2 grms. tolerance on the nominal weight of the cell stated on the technical specification/data sheet submitted at the time of approval. The min/max weights will be detailed in the IFMAR Approved Battery List, and cells must never exceed the weight tolerances stated on the IFMAR Approved List. Any changes to the technical specifications of cells after the original approval will require re-approval using the time frame as detailed in 4.3.1

Proposed rule

4.5 TECHNICAL SPECIFICATION BATTERIES

4.3.4 Batteries Technical

~~Only NiCd or NiMH cells are approved for use. Cells are rated at 1.2 volts nominal.~~

~~The size of individual cell(s) to be:-~~

~~Diameter 23.0 mm +0/-1 mm. Overall length 43.0 mm +0/-1.5 mm.~~

~~Measurements include original manufacturers heat shrink. Overall length is the maximum length of the complete cell including the positive button before attaching/soldering any link wires or battery bars. Dimensions taken at ambient temperature and at 90 degrees to the centre-line of the cell. It is known that 'fast charging' of cells may result in cell expansion/distortion. However, cells must never exceed the above maximum dimensions when used at a WC event.~~

~~Weight of individual cells:-~~

~~The original manufacturers of cells are allowed a maximum of +/- 2 grms. tolerance on the nominal weight of the cell stated on the technical specification/data sheet submitted at the time of approval. The min/max weights will be detailed in the IFMAR Approved Battery List, and cells must never exceed the weight tolerances stated on the IFMAR Approved List. Any changes to the technical specifications of cells after the original approval will require re-approval using the time frame as detailed in 4.3.1~~

Lithium Based (LiPo/LiFe) Batteries:

1. Lithium Based (Li-Poly/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 the exit of wires or pin type connectors.

2S Battery: - Maximum external case sizes:

Length: 139.0 mm

Width: 47.0 mm. (The max. width includes any side exit. wires).

Height: 25.1 mm. (Chassis location features additional to this dimension are allowed)

Saddle-Pack cells are allowed, but must comply with the above width and height. Furthermore they must not exceed a combined length of 139.0mm max. when placed end to end.

2. Individual cells used in the construction of the battery pack shall be rated at 3.7 volts nominal. Individual cells may be wired in parallel. For 2S packs: the maximum "In Series" is two to give a pack voltage of maximum 7.4v nominal.

3. 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, 'Female connection tubes' to connect the power wires are allowed but the metal tubes must be well enough below the surface of the moulded case so to avoid short circuit if the pack is placed on a conductive surface. The connection points shall be clearly marked positive and negative.

4. The case must have the original suppliers label intact, clearly stating the name of the manufacturer/importer, the part number of the pack, the rated voltage, the chemistry (LiPo/LiFe), the pack capacity and the C- rating of the pack. The Brand name/logo label shall be easily readable.

5. Weight of any battery is limited to +/- 4% on manufacturers specified weight. Batteries to comply with the weights specified on the IFMAR approval list.

Argument

	IFMAR	EFRA	FAMAR	FEMCA	ROAR
Proposer		X			

In favour		Abstention		Against	
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Passed unanimously		Passed		Not passed	
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FINISH OF THE ELECTRIC OFF ROAD PROPOSALS

FINISH OF ALL ELECTRIC PROPOSALS