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Spanish Fort Fire Rescue

Press Release

Rechargeable Batteries Pose Fire Risk

Spanish Fort Fire Rescue Issues Warning To Residents

Spanish Fort, AL: The Spanish Fort Fire Rescue Department is urging residents to use extreme caution when recharging Lithium Polymer (LiPo) batteries. LiPo batteries are now common in many radio controlled (R/C) cars, boats, aircraft, helicopters and quadcopters. The offer many advantages over Nickle Cadmium (Ni-Cd) and Nickle Metal Hydride (Ni-MH) batteries – they are lighter and hold a larger charge. Many R/C hobbyist are switching to the LiPo batteries without fully reading the safety guides resulting in overcharging of the battery which is causing the battery to explode and catch fire. Spanish Fort Fire Rescue has responded to two residential fires that are directly related to LiPo battery charging failures.

Chief Roger Few says "We are extremely concerned about the danger posed by LiPo batteries. They are very unstable during the charging process and the risk of fire is great."

Spanish Fort Fire Rescue has begun an awareness campaign to let the community know about the issue associated with LiPo batteries. Anyone using a LiPo battery should read and follow all manufacturer instructions and recommendations for use and charging. Adults should supervisor children to ensure all safety guidelines are followed.

Spanish Fort Fire Rescue has placed a downloadable LiPo Battery Safety Guild on its website (www.spanishfortfire.org) and on its Facebook page (www.facebook.com/spanishfortfire). The safety guild is also available at Fire Station 1 located at 7580 Spanish Fort Blvd.

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For Immediate Release

* *FIRE HAZARD* *

IMPORTANT SAFETY INSTRUCTIONS AND WARNINGS FOR LITHIUM POLYMER (LIPO) BATTERIES

You must read this document prior to charging and using your Lithium Polymer (LiPo) battery. Failure to read and understand the information contained in this document may result in fire, property damage, personal injury and/or loss of life.

⚠ LiPo batteries are now commonly used in many R/C cars, boats, aircraft, helicopters and quadcopters. They offer many advantages over Ni-Cd and Ni-MH batteries, however, LiPo batteries are significantly more volatile and require that you pay careful attention when charging, discharging, using and storing them. Failure to comply with the safety guidelines in this document may result in damage to your battery, property damage, fire, personal injury and/or loss of life.

⚠ When a LiPo battery is charged or discharged improperly, used improperly, or stored improperly; or if you misuse or abuse it in any way, the battery may explode and catch fire.

BY USING LIPO BATTERIES, YOU ASSUME ALL RISK AND LIABILITY ASSOCIATED WITH THEIR USE. ALWAYS USE, CHARGE AND STORE IN OR ON A FIRE-PROOF SURFACE. NEVER CHARGE UNATTENDED. ADULT SUPERVISION REQUIRED. THINK SAFETY FIRST!

General Overview, Guidelines and Warnings:

Before using your LiPo batteries, you should familiarize yourself with them. Having basic knowledge of LiPo batteries will help ensure your safety.

- Most LiPo batteries feature two different sets of wires. One set of wires (usually one black and one red) is the power lead. The connector on this lead is plugged into your ESC, receiver or charger power connector. The second set of wires feature a white balance connector. This connector is used for charging the battery with a Lithium balance charger.
- If you need to change the power connector, solder a new power connector directly to the already preinstalled power lead, making sure to carefully observe correct polarity (red is positive and black is negative). Never solder directly to the battery and always pay careful attention to the polarity when plugging the power lead into your ESC, receiver or charger power connector!

  Never solder directly to the battery or connect with reverse polarity, which can cause the battery to explode and catch fire!
- Never attempt to change the white balance connector. If the balance connector does not match the balance port on your Lithium balance charger, use an adapter (available from most hobby stores) to make the connection.
- 1S (single cell) LiPo batteries will not feature a balance connector. These batteries can be safely charged through the power lead. 2S (two cell) and greater LiPo batteries should always be charged through the balance connector with a Lithium balance charger.

  Never charge a 2S or greater LiPo battery without a Lithium balance charger or the battery will explode and catch fire!
- Hard case LiPo batteries, like those commonly used in R/C cars and trucks, often don't have preinstalled wire leads. These batteries typically use a power-charge harness. The same guidelines described above apply to these batteries as well. Pay careful attention to the polarity when plugging the power-charge harness into the battery and when plugging the power lead into your ESC or charger power connector!

  Do not connect with reverse polarity. Connecting with reverse polarity can cause the battery to explode and catch fire!
- Never allow LiPo batteries to drop below 3.0 volts per cell. When used with an ESC, make sure that your ESC is designed for use with LiPo batteries and that the cut-off voltage is set to 3.0 volts per cell or higher. 3.2 volts per cell is recommended to be safe.

  Allowing the voltage to drop below 3.0 volts per cell can result in damage to the battery. Charging or using a damaged battery can cause the battery to explode and catch fire!
- LiPo batteries feature a discharge value that's typically printed on the label (for example, 25C). This value is the maximum discharge rate the battery is rated for and it should not be exceeded. To determine the maximum discharge rate in amps of a LiPo battery, multiply battery's capacity by the discharge value and divide by 1000. For example, if you have a 3000mAh 25C battery multiply 3000mAh x 25 (25C) and divide by 1000 = 77 amps. The amp draw should not exceed 77 amps. Amp draw can be measured using a Watt Meter (available from most hobby stores).

  Using a LiPo battery in an application that draws more current than the battery is rated for can cause the battery to overheat, swell, explode and catch fire!

Charging - Discharging Guidelines and Warnings:

Follow the information in this section to safely charge and discharge your LiPo batteries. Always follow the charging - discharging guidelines for your battery carefully and use common sense at all times. Always err on the side of safety.

- Prior to charging your LiPo battery, carefully make a visual inspection of the battery. Look for any signs of damage, such as frayed wires, damaged connectors, cracks in the heat-shrink wrap or plastic case, swelling or other irregularities. If the damage cannot be fixed and/or if the battery is swelled, it should be discarded. For more information, see the Disposal Guidelines section on back.

  If you notice any damage or if you notice the battery swelled at all, do not charge it! Charging a damaged battery can cause the battery to explode and catch fire!

IMPORTANT SAFETY INSTRUCTIONS AND WARNINGS FOR LITHIUM POLYMER (LIPO) BATTERIES, CONTINUED....

Charging - Discharging Guidelines and Warnings, Continued:

- Do not attempt to charge LiPo batteries with a charger that isn't designed specifically to charge LiPo batteries. Always use a Lithium balance charger and follow the instructions included with it carefully. Remember, use common sense and safety at all times.
- Do not leave the battery unattended during the charging process. If there is a problem with the battery during the charging or discharging process, unplug the battery from the charger immediately.
- Always charge LiPo batteries on a fire-resistant surface in an open area and never charge LiPo batteries near any flammable material. We suggest using a LiPo battery safety charging bag (available from most hobby stores).
- Always let LiPo batteries cool down to ambient temperature before charging or discharging them. Do not allow LiPo batteries to ever exceed 160ºF (71ºC) for any reason.
- Carefully verify the capacity and voltage of your LiPo battery before charging or discharging it. When selecting the cell count or voltage for charging, always select the cell count or voltage as it appears on the battery label. Double-check your selections.

  Using a different or incorrect cell count or voltage can cause the LiPo battery to explode and catch fire!
- Always select a charge rate that is 1C or less, unless otherwise explicitly noted by the battery manufacturer. Use the following formula to determine the charge rate: C = X ÷ 1000 Where X = Battery Capacity. For example, if you have a 3000mAh battery, 1C equals a 3.0 amp charge rate (3000mAh ÷ 1000 = 3.0 amps).

  Using a charge rate higher than 1C can can cause the battery to explode and catch fire!
- Never charge LiPo batteries to greater than 4.2 volts per cell and never discharge LiPo batteries below 3.0 volts per cell.

  Charging above 4.2 volts per cell can cause the battery to explode and catch fire. Discharging below 3.0 volts per cell can result in damage to the battery. Charging or using a damaged battery can cause the battery to explode and catch fire!

Warning Signs That LiPo Battery Failure and Possible Explosion Might Occur:

If you cause or observe any of the conditions described previously, such as over-charging or over-discharging, or severe damage from a crash, you can experience battery failure. If any of these things do happen, be prepared that the battery could fail.

- **Swelling of the Battery** - Swelling is caused by internal pressure that goes beyond the normal amount of pressure in every battery. This pressure makes the cell swell up like a balloon. Do not use a swelled battery! A swelled battery is a battery that has failed and needs to be discarded before explosion or fire results. Here is what to do with a battery that is on the verge of exploding or is starting to show signs of exploding:
  - **Do Not Handle Directly** - The material spitting out (if it comes to that) is spitting out at as much as 2000ºF.
  - **Try to Contain the Fire** - We recommend always charging LiPo batteries using a LiPo battery safety charging bag. If you don't use a safety charging bag, we recommend a fire-proof container with a lid be kept near the proximity of any battery being used or charged. Fill the bottom with sand. Have this ready to use at a moment's notice. If the battery looks suspicious, put it in the container and drop another large amount of sand on top, then drop the lid. Let it burn out. It will smoke and fume, but the sand will contain the sparks and reduce the transfer of heat. A fire extinguisher will help, but it will not stop the chemical reaction. The only thing that can be done is to contain the fire until the fire goes out.

Storage and Transportation Guidelines and Warnings:

It's important that you take care in the way you store and transport your LiPo batteries. Follow the guidelines below to safely store and transport your LiPo batteries, whether it's long term storage or simply transporting to and from the field or track.

- Always disconnect and remove LiPo batteries from your model when not in use. LiPo batteries should be stored in a fireproof container.
- When storing a LiPo battery for an extended period of time, it should be stored at 60% of its capacity. Use the Storage function of your Lithium balance charger to charge or discharge the battery to the ideal storage capacity. If storing for a short period of time, then leaving them with a full charge is fine. Never store LiPo batteries in a discharged state!
- Store LiPo batteries in a low humidity area that isn't near any flammable materials. For best results, storage between 40º to 72ºF is recommended. Never store LiPo batteries in high-heat conditions (80ºF and higher).
- Storing the battery at temperatures greater than 150ºF for extended periods of time (greater than 2 hours) may cause damage to the battery and result in fire!
- Do not expose the battery to direct sunlight or high-heat conditions for extended periods. When transporting or temporarily storing in a vehicle, the temperature should never exceed 150ºF.

Disposal Guidelines:

If your LiPo battery is swollen or otherwise appears damage, it must be discarded in a safe, eco-friendly manner. LiPo batteries can be discarded with household waste, but only after discharging them.

- Before discarding a LiPo battery, carefully remove the insulation from around the battery, then submerge the battery in a bowl of saltwater for 24 to 36 hours. This will completely discharge the battery. After soaking, cut off the wires, place the battery in a bag, then discard it in the trash.