ENC 3246 correspondence

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| To: | Joshua McKinley |
| From: | Sean Parrell |
| CC: | Recipient names |
| Date: | 9/20/2024 |
| Re: | Analyzing Everyday Failure |
| Comments: | I recently experienced the failure of the battery in my Gotrax G5 scooter. After only a few months of use, the battery’s charge-holding capacity significantly diminished, eventually rendering the scooter inoperable. This failure occurred despite following the manufacturer’s usage guidelines, indicating a potential defect in either the design or materials used in the battery.  The failure can be traced to the premature degradation of the battery’s cells, which should have had a much longer lifespan. Upon researching applicable standards, I found that this failure might be associated with ASTM F2641-08 [1], which sets safety and performance standards for recreational powered scooters. Additionally, IEEE 1625-2008 [2], a standard for rechargeable battery systems, is relevant in ensuring the reliability and durability of battery cells used in consumer products like the Gotrax scooter.In terms of ethical responsibility, the manufacturer is primarily at fault. The premature battery failure suggests inadequate testing or poor-quality materials. Given that batteries are critical to the functionality of electric scooters, manufacturers must ensure that their products meet industry standards for safety and longevity. The failure also reflects a design flaw, as the thermal management system may not have been adequate to prevent overheating and degradation of the battery cells over time. The end-user, in this case, bears no responsibility, as the product was used according to its intended purpose.  To address and prevent similar failures in the future, I recommend that Gotrax improve the quality and testing processes for their scooter batteries. First, they should conduct more rigorous stress testing under a variety of environmental conditions to ensure that the batteries can withstand real-world usage. This testing should include temperature fluctuations, which could contribute to the premature degradation of the battery cells. Additionally, Gotrax should consider incorporating higher-quality battery cells with better thermal management features to ensure a longer operational lifespan.  Another important recommendation is to extend the warranty coverage for battery-related issues. This would not only instill confidence in the product but also provide consumers with the necessary protection should a similar failure occur. By increasing the warranty period and offering more transparent customer support, Gotrax can improve its reputation and consumer satisfaction.  By implementing these recommendations, Gotrax can enhance the overall reliability and performance of their scooters, ensuring that such failures become less frequent and extending the lifespan of their products. |

References:

[1] “Standard Consumer Safety Specification for Recreational Powered Scooters and Pocket Bikes.” *F2641*, www.astm.org/f2641-08r15.html. Accessed 20 Sept. 2024.

[2] “IEEE SA - IEEE Standard for Rechargeable Batteries for Multi-Cell Mobile Computing Devices.” *IEEE Standards Association*, standards.ieee.org/ieee/1625/4382/. Accessed 20 Sept. 2024.