



*Hoverboards 2018*

## Investigation of safety requirements during use and charging

Hoverboards must meet European safety requirements in order to prevent any risks during their use and charging. In 2018, the Netherlands Food and Consumer Product Safety Authority (NVWA) investigated whether hoverboards and their chargers were safe during charging, had a

fire-resistant enclosure and no sharp edges in the proximity of the internal wiring. Markings, instructions and the technical file were also investigated. This fact sheet presents the investigation results of the 2018 market survey.

### **Background**

The NVWA received information of hoverboards in the Netherlands and abroad catching fire and/or exploding. The NVWA therefore decided to conduct an investigation into the safety of hoverboards and their chargers. The emphasis was on the safety requirements intended to prevent the chance of fire and/or an explosion occurring.

### **Risks**

Hoverboards are equipped with a lithium-ion battery. If the battery is charged for too long, it can become 'overcharged'. The temperature in the battery rises and can exceed a critical limit. The chemical reactions that subsequently occur in the battery cause increasing heat. This leads to an irreversible process that can cause fire and/or an explosion. This in turn can have serious consequences such as a fire in the home.

## Approach

### Products

In early 2018, the NVWA takes 30 different samples of hoverboards. The brands were selected based on how often and how prominently they featured in an internet selection of hoverboards offered for sale. In addition, brands were focused on which are offered and sold by foreign websites. This provided a representative picture of the market.



Example of a random hoverboard which was not assessed by the NVWA.

### Testing

The NVWA developed a test package describing the investigation items, testing method and testing protocol. This package was presented to the entrepreneurs prior to the investigation. These documents, as well as photographs of the tested products are available on the NVWA website: [www.nvwa.nl](http://www.nvwa.nl) (use 'hoverboard' as search term).

The NVWA laboratory investigated the following aspects of the hoverboards:

- battery safety circuit with as primary sub-items: temperature protection and overcharging safety features;
- sharp edges that could damage wiring and can cause a short circuit;
- fire resistance of the enclosure which prevents a beginning fire from spreading quickly.

Also investigated was whether the insulation between the charger's input and output was sufficient.

Finally, the NVWA assessed the instructions for safe use, markings and the various sections of the technical file (in which the manufacturer must substantiate product safety).

## Legal requirements

A hoverboard must meet the European requirements for machines set out in the Machinery Directive (2006/42/EC) and the Machines (Commodities Act) Decree (*Warenwetbesluit machines*). The charger must meet the European requirements set out in the Low Voltage Directive (2014/35/EU) and the Electrical Equipment (Commodities Act) Decree (*Warenwetbesluit elektrisch materiaal*).

## Results

One of the hoverboards being investigated led to the manufacturer starting legal proceedings to prevent the research results from being published. The NVWA may not publish the inspection results while these proceedings are still pending. As a result, the fact sheet only contains the results pertaining to 29 hoverboards.

All 29 hoverboards do not meet the investigated requirements. The shortcomings are such that they could lead to serious effects, as well as very serious effects, such as fire and explosion.

The appendix describes the results for each brand and type.

Figure 1 gives an overview of the results.

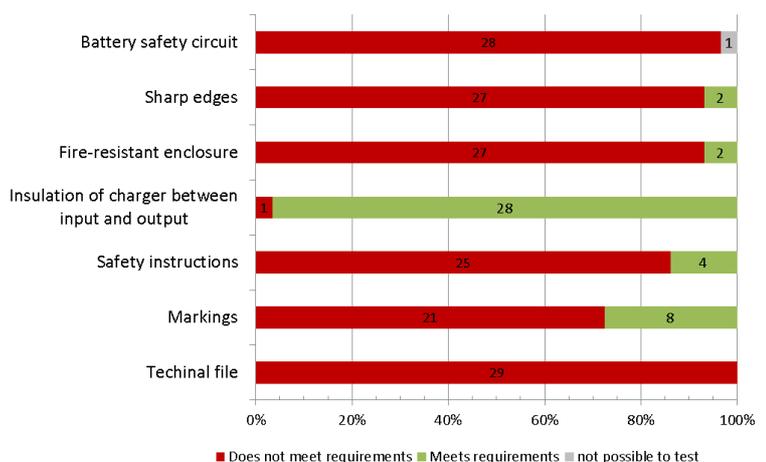


Figure 1: Overview of the hoverboard investigation results

### *Hoverboard*

The most important result is that the safety circuit of 28 of the investigated hoverboards does not meet the safety requirements. This could not be assessed in one of the hoverboards.

Otherwise, 27 of the hoverboards had sharp edges in areas where wiring was present. In addition, 27 of the hoverboards did not have a sufficiently fire-resistant enclosure.

### *Charger*

One of the hoverboards had a charger with insufficient insulation between the input and output.

### *Instructions, markings and technical file*

The instructions for safe use was not in Dutch for 25 of the hoverboards. With regard to the substance of the instructions, two had shortcomings. In addition, the markings of the hoverboards was incorrect. All technical files also had shortcomings.

### **Measures**

The NVWA has imposed a measure on all of the companies involved and instructed that they are required to end sales and inform their customers and end customers as quickly as possible about the serious risk. The sale of these products is forbidden.

### **Conclusion**

All 29 hoverboards do not meet the essential safety requirements. The shortcomings are such that they could lead to serious effects, as well as very serious effects, such as fire in the home or an explosion. The most important shortcoming is that for 28 hoverboards the charging does not stop when the battery is fully charged. This has as consequence an increased risk of spontaneous combustion of the battery.

For all hoverboards, the technical file was incorrect or incomplete, while most hoverboards had sharp edges near wiring and an insufficiently fire-resistant enclosure. Instructions for safe use were also often lacking.

The NVWA has imposed a measure on all of the companies involved and instructed that they are required to end sales and inform their customers and end customers as quickly as possible. The sale of these products is forbidden.

### **Recommendation**

The NVWA recommends that consumers not use the 29 hoverboards which have been investigated. In this regard, take note of the general safety warnings and directly related messages of the manufacturers and distributors.

With regard to hoverboards which were not investigated by the NVWA, the NVWA recommends that they only be charged under supervision so that immediate action can be taken if necessary. This means they should not be charged while sleeping or when not at home. Once the hoverboard is charged, it should be disconnected from the charger to avoid its being connected to the electricity network for too long.



## Annex 1: Results for hoverboards and their chargers

<b>Brand</b>	<b>Type/Identification</b>	<b>Assessment and action</b>
Alfa Smart Wave	ASW-605	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
CELECT	CELS6-0-RED	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
Cool&Fun	BG-P001/6.5	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
Cool&Fun	EL-ES01(JD-6.5)	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
DENVER	DBO-6501 white MK2	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
Doc Green	Hoverboard HB8000	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
GoClever	CityBoard SUV Black LG CBLSSBEU	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
HAKAL	Glideboard	Serious safety risk. As a result a fire can develop. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
I'm not a robot	R2, purple model	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
I'm not a robot	R2, white model	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
IO Hawk	925-IO-HAWK 1	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
LENV	Hoverboard	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
Lucas Electronics	Hoverboard APP function	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.

MP man	Gyropode G1	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
Ali Impex	Hoverboard 6.5 inch	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
Wuyi Sanli Tools Co.	HT-NNC-V20	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
unknown	Smart Balance Wheel	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
Trendfield	P10	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
unknown	S6 Basic	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
Allstock Hoverboard	FCA131 - 4215	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
unknown	Hoverboard Chrome red	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
TheBalancewheel	Hoverboard Spiderman LED	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
OXBOARD	Go (item No.020B)	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
Ridd Hoverboard	Urban, RDD HB65BU	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
Smarty Casablanca	Offroad, CHIC-D07	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
SWEELS(s)	78500.01	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
The Scootershop	unknown	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.

Vinz Hoverboards	Type BIS213 – 217	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.
YUBIX	K5 7.5 inches	Serious safety risk. The overcharging safety feature of the battery package is lacking. This could lead to fire developing and/or an explosion occurring. Sales are forbidden. The NVWA has demanded a public warning and corrective measures.

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