

Annex 3 to BAM-GGR 024

100 %-80 %-30 % rule

General

In the future, the assessment of lithium batteries and sodium-ion batteries that can be transported on the basis of a successful fire test will be based on the classification of lithium batteries and sodium-ion batteries according to their hazardousness, which is currently being developed by the UN for the UN Recommendations on the Transport of Dangerous Goods. When this classification system comes into force, it will replace the categorisation into levels listed below.

However, in order to be able to categorise goods at present, the concept of the 100%/80%/30% rule and rough categorisation into levels described here will be used in the meantime.

The 100%-80%-30% rule can only be applied if the fire test according to Annex 2 has been passed.

The cells/modules/batteries tested in the fire test may also be transported individually as cells, as modules or as batteries in a different configuration. If several objects are transported together, each object must be separated from the others by non-combustible insulating material. Protection against short circuits must be guaranteed.

The fire load and the state of charge (SoC) of the fire test must not be exceeded.

Subdivision of cell types into different levels

The currently common cell chemistries (cathode chemistry) are categorised into different levels for the purposes required here. The amount of energy tested, and the cell chemistry selected in the fire test determine the amount of energy and the other cell chemistries that may be transported on the basis of this fire test. The following table shows the subdivision of the cell chemistries into the different levels used here:

Level Nr.	Designation				
4	NMC 6-2-2	NMC 8-1-1	NMC 9-0,5-0,5	Lithium-metal	
3	LCO	NMC 5-3-2	NMC 4-3-3	NMC 1-1-1	NCA
2	LFP	Sodium-ion			
1	LTO*				

*- This is the anode chemistry

Other cell chemistries can be categorised after consultation with BAM and can also be grouped into higher levels in the future. The table will be extended if necessary.

The following applies to NMC chemistries:

If no information is available for the cell chemistry during the fire test, the cell chemistry is categorised in level three.

If the manufacturer confirms the categorisation in a certain level, this can be used.

The following generally applies:

If no information is available for the cell chemistry during the fire test, but the manufacturer confirms the classification to a certain level, this can be used.

If no information on the cell chemistry is available during transport, a maximum of 30 % of the tested nominal energy may be transported.

If the manufacturer confirms the categorisation to a specific level, this can be used. It is possible to transport a maximum of 80% of the tested nominal energy.

1. 100 % rule

Cells/modules/batteries identical to those tested in the fire test may be transported with up to 100% of the tested nominal energy.

Cells/modules/batteries of one level may be combined for the fire test. This combination of cell chemistries and nominal energies may be transported in an identical ratio with 100 % of the tested nominal energy. The 80 % rule and the 30 % rule apply to all other cells/modules/batteries, combinations and mixing ratios.

1. 80 % rule

In addition to the cells/modules/batteries tested in the fire test, other cells/modules/batteries of the same or a lower level may also be transported with a maximum of 80% of the tested nominal energy. Combinations of several cells/modules/batteries may also be transported. This applies to any cell chemistry and cell geometry.

1. 30 % rule

Cells/modules/batteries from the next higher level of tested cells/modules/batteries may be transported with a maximum of 30% of the tested nominal energy. Combinations of several cells/modules/batteries may also be transported. This applies to any cell chemistries and cell geometries.

The transport of different cells/modules/batteries from the next higher level of the tested level together with cells/modules/batteries of the same or a lower level is possible with max. 30 % of the tested nominal energy.

Cells/modules/batteries from more than one level above the tested cells/modules/batteries and cells not classified in the table may not be transported on the basis of the relevant fire test.

Decision tree

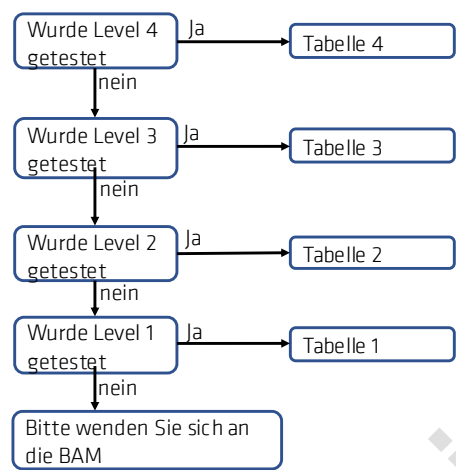


Tabelle 4	Max zul. Energie	Tabelle 3	Max zul. Energie
Level 4	100% / 80%	Level 4	30%
Level 3	80%	Level 3	100% / 80%
Level 2	80%	Level 2	80%
Level 1	80%	Level 1	80%

Tabelle 2	Max zul. Energie	Tabelle 1	Max zul. Energie
Level 4	0%	Level 4	0%
Level 3	30%	Level 3	0%
Level 2	100% / 80%	Level 2	30%
Level 1	80%	Level 1	100% / 80%