

## **PACKAGING MANUAL for CELL SUPPLIERS**

**PURPOSE:** This manual is clarifying what are EMBS expectations regarding packaging data, identification and transportation documentation for cells suppliers.

### I. Transportation standards

#### 1. Pallet material:

- Non-wood material ("processed" wood, i.e. chips, plywood.) or wood with IPPC certificate -> (LVL wooden pallets)
- Relevant information about pallet material shall be in shipping documents
- Supplier can include pallet picture in Packaging data sheet: example:



#### 2. Height of pallet with material:

- Air transport: do not exceed 1 m
- Road/sea transport: do not exceed 1,5 m

#### 3. Pallet maximum weight: 900kg

#### 4. Pallet size: 1200x800 EURO standard

#### 5. Labelling

- Proper labeling on boxes relevant to current edition of transportation law in transportation mode used - UN Recommendations on the Transport of Dangerous Goods - Model Regulations

Air transportation labelling picture:



Road/sea transport labelling picture:



Nr	PART NAME
1	Transport Information
2	9a dangerous goods label
3	Package label
4	Lithium ion battery operating label
5	Cargo aircraft label

Clarification for point 1 (Transportation Information) -> in this area is an additional transport information, if such one is required or expected by the supplier or recipient or indicated by the regulations relevant in this case – e.g „shipper” i „consignee” required by IATA.

6. Cardboard

- Packaging shall meet the current requirements specified in the transport regulations appropriate for the type of transport used

7. Other

- Stacking -> If the supplier determines that the pallets cannot be stacked, appropriate marking or protection is required.
- Pictures -> supplier shall send pictures marking on boxes and supplier to send pallets packaging overview (top, side, labelling overview)

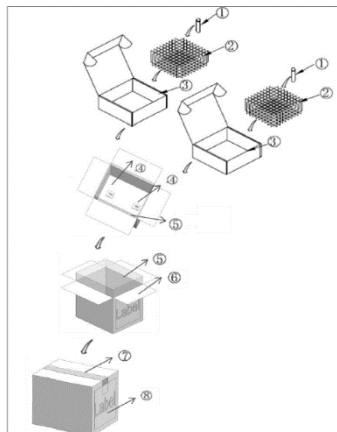
II. Identification.

1. Suppliers shall confirm for which cell model packaging data sheet is prepared

- cell description
- cell model number

2. Supplier should show how the single box is filled by cells and how it fits to main packaging box

- picture overview, see example:





- table overview with material used, dimensions and quantity, see example:

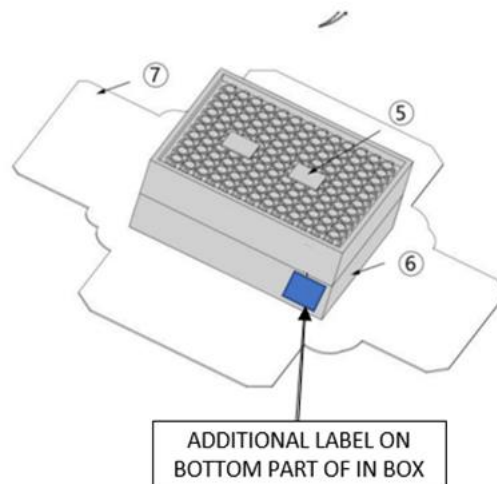
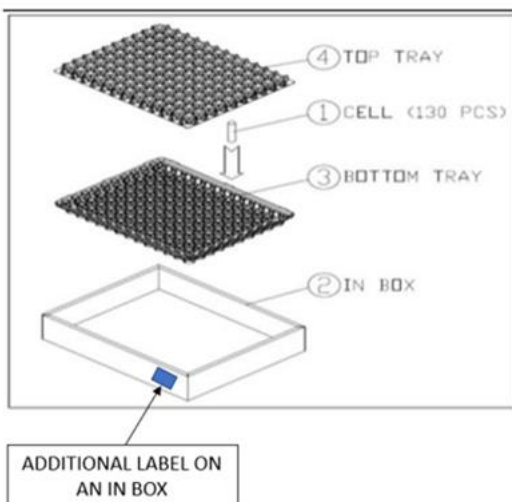
NO	PART NAME	MATERIAL	MATERIAL DIM (mm)	QTY
1	INR18650	INR18650/2	φ18.45, H65.15	200
2	Package Guide	Manila	L227 x W227 x H67	36
3	Package Case 1	K3K Single Wall	L235 x W235 x H68	2
4	Silica Gel	Silica Gel	L45 x W55 5g	2
5	PE Bag	PE	L365 x W296 x H595 x T0.04	1
6	Package Case 2	H=H Double Wall	L350 x W280 x H270	1
7	Tape	PE	W60 x T0.05	/
8	Label	Art Paper	L70 x W100	5

- box labelling -> each carton (outer box) and single box (inner /in box) should be labelled with a card which should meet VDA 4994 / GTL standard, including the following identification information's: EMBS specified 5-digit code, product code, product description, product quantity, production date, weight of box, production series -> lot / rank / batch / grade no) – see example:



Code	<b>000000</b>	Supplier	<b>KVZ</b>
Model	INR18650/2	Shift	B
Qty	200PCS	Date	2019-10-16
Lot	DDS	Rank	V1
Tracking	 INR18650/2 A1 DDS 0002		
Remark	<b>EMBS PN:</b> Weight: SOC 30%		

Place of label on in box:



- pallet labelling -> each pallet shall be identified by label as example below

<b>Cell Model</b>	INR18650-3		
<b>Production Plant</b>	XYZ in (Country)		
<b>Quantity in pallet</b>	15000		
<b>Loaded date</b>	day/month/year		
<b>Expired date</b>	day/month/year		
<b>Batch</b>	<b>Rank</b>	<b>Box</b>	<b>Quantity</b>
JRCAA3 BNB14	10.000	20	10.000
JRCAA3 BNB15	5.000	10	5.000
<b>Remark</b>			
<b>Internal supplier code system</b>			

**Note:** Most important is cell model, batch/rank with quantities of cell and expired date for cells.

- SOC 30% - cells should be charged max. 30% -> please add information on each box label -> se picture box labelling

### III. Digital Data Matrix requirements

1. The mass production cells delivered to EMBS should include a data matrix code on the packaging. This code is read during the battery production at EMBS and stored for better traceability. Below details the data matrix code sequence to be used for generating the data matrix code to be printed on the packaging.

2. Data matrix code sequence

The data matrix code to be printed on the packaging is as follows:

**EM#1FEMBSpartnumber#2Fcellname#3Fproductionplant#4Fproductiondate#5Fexpirationdate#6Fsuppliername#7FpackageID#8Fquantity#9Fbatchnumber#10Fcellranking#11Fcellsize#12Fbackupslot##END**



Figure 1: Data matrix code containing the above mentioned sequence.

The letters marked in red must remain unchanged irrespective of the type of cell. The **EMBSPartnumber** and **cellname** must remain same for same type of cell. The items highlight-ed in blue must be updated by the cell supplier for each new batch/lot and cell ranking.

Minimum datamatrix size is 25x25mm all data should be stored also in readable by human format on label.

The items to be updated by the supplier are explained below.

Parameter	Explanation
EMBSPartnumber	Number given by EMBS – SAP number
cellname	Model name of cell e.g. “Samsung GA2”
productionplant	Name of the plant where cells are produced and country code e.g. Ochang, KR
productiondate	Production/charging date of a particular lot (DDMMYY)
expirationdate	Date until which the cells must be used (DDMMYY)
suppliername	Supplier name
packageID	Package ID (a unique number defined by the supplier, through which the contents of the package can be traced)
quantity	Quantity of cell in one package
batchnumber	Batch/lot number (a unique number defined by the supplier, providing traceability of materials and production processes used for the cell production)
cellranking	Supplier specific cell rank/grade
cellsize	Size of cell e.g. 18650 or 21700
backupslot	Additional necessary data

Before first delivery supplier shall send to EMBS Data Matrix Code to confirm correct readability.

IV. Documentation

1. General transport requirements – All cells must be tested in accordance with the UN Manual of Tests and Criteria Part III Subsection 38.3; the packaging used must meet the current requirements for the transport of lithium-ion cells
2. Documents related to the specificity of the goods
  - a. **Lithium battery test summary** – manufacturers and subsequent distributors of cells must make available the test summary as specified in the UN Manual of Tests and Criteria, Revision 6 and amend. 1, Part III, sub-section 38.3, paragraph 38.3.5.
  - b. **MSDS** or other appropriate (adequate) document containing information regarding safety rules for cells
3. Shipping documents:
  - a. transport documents appropriate for the mode of transport used
  - b. documents suitable for completing customs formalities in transit and import

V. Additional remarks

1. The cells packed in each box shall be of the same lot and rank .
2. The same lot and rank of cells will be placed on the same pallet packaging and mark the information with label paper.
3. If there are different lot of cells on each pallet (no more than three batches), label paper will be added, cover batch information.
4. The maximum number of lot and rank of cells on each pallet is 3.
5. The minimum number of cells in "batches" from suppliers should be in accordance with the arrangements at the beginning of cooperation with EMBS in particular project.

Revision	Date	Change description	Prepared by	Approved by
A	2023-04-26	Creating the document	Anna Blimer	Grzegorz Niedzielski
B	2024-08-28	New logo, change Company name in DMC content	Grzegorz Niedzielski	Grzegorz Niedzielski