

Function

## Logistics Brose Group

Document type

## Manual

Document name

## Procurement Logistics – Logistics requirements for suppliers

Status	Valid from 01/01/2021
Version	Index 120 – 01/12/2020 - Modifications to index 119 are highlighted in red.

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## List of abbreviations

AIAG	-	<b>A</b> utomotive <b>I</b> ndustry <b>A</b> ction <b>G</b> roup
ASN	-	<b>A</b> dvanced <b>S</b> hipping <b>N</b> otification
AWG	-	German law on foreign trade and payments ( <b>Au</b> ßen <b>w</b> irtschafts <b>g</b> esetz)
AWV	-	German foreign trade and payments regulation ( <b>Au</b> ßen <b>w</b> irtschafts <b>v</b> erordnung)
BN	-	<b>B</b> rose <b>N</b> orm / standard
BroTAP	-	<b>B</b> rose <b>T</b> ransport <b>A</b> dvice <b>P</b> ortal
BTM	-	<b>B</b> rose <b>T</b> ransport <b>M</b> anagement
CCRA	-	<b>C</b> anadian <b>C</b> ustoms <b>R</b> evenue <b>A</b> gency
CET	-	<b>C</b> entral <b>E</b> uropean <b>T</b> ime
Cp.	-	<b>C</b> ompare
Chap.	-	<b>C</b> hapter
DAP	-	<b>D</b> elivered <b>a</b> t <b>P</b> lace (Incoterm)
DDP	-	<b>D</b> elivered <b>D</b> uty <b>P</b> aid (Incoterm)
DIN	-	<b>D</b> eutsches <b>I</b> nstitut für <b>N</b> ormung (German Institute for Standardisation)
EDI	-	<b>E</b> lectronic <b>D</b> ata <b>I</b> nterchange
EDL	-	<b>E</b> xternal service provider
E.g.	-	For example
EPAL	-	<b>E</b> uropean <b>P</b> allet <b>A</b> ssociation e.V.
ESD	-	<b>E</b> lectrostatic <b>D</b> ischarge
EU	-	<b>E</b> uropean <b>U</b> nion
EU-VO	-	<b>E</b> uropean <b>U</b> nion <b>R</b> egulation
EXO	-	<b>E</b> xpendable <b>O</b> verseas
FCA	-	<b>F</b> ree <b>C</b> arrier (Incoterm)
FIFO	-	<b>F</b> irst-In, <b>F</b> irst-Out
FWO	-	<b>F</b> orwarding <b>O</b> rders (number)
GADSL	-	<b>G</b> lobal <b>A</b> utomotive <b>D</b> eclarable <b>S</b> ubstance <b>L</b> ist
GLT	-	Large load carrier (German: Großladungsträger)
GST	-	<b>G</b> oods and <b>S</b> ervices <b>T</b> ax
GTCP	-	<b>G</b> lobal <b>T</b> erms and <b>C</b> onditions of <b>P</b> urchase
GTL	-	<b>G</b> lobal <b>T</b> ransport <b>L</b> abel
HPE	-	German Federal Association Holzpackmittel, Paletten, Exportverpackung e.V.
HR	-	<b>H</b> igh rack
HU	-	<b>H</b> andling <b>U</b> nit
IBC	-	<b>I</b> ntermediate <b>B</b> ulk <b>C</b> ontainer
ICC	-	<b>I</b> nternational <b>C</b> hamber of <b>C</b> ommerce
ID	-	<b>I</b> dentification
IPPC	-	<b>I</b> nternational <b>P</b> lant <b>P</b> rotection <b>C</b> onvention
ISO	-	<b>I</b> nternational <b>O</b> rganization for <b>S</b> tandardization
ISPM 15	-	<b>I</b> nternational <b>S</b> tandards for <b>P</b> hytosanitary <b>M</b> easures <b>P</b> ublication No.15
JIS	-	<b>J</b> ust in <b>S</b> equence
JIT	-	<b>J</b> ust in <b>T</b> ime
KLT	-	Small load carrier (German: Kleinladungsträger)
LT-Management	-	<b>L</b> oad carrier management
NAFTA	-	<b>N</b> orth <b>A</b> merican <b>F</b> ree <b>T</b> rade <b>A</b> greement
pcs.	-	<b>P</b> ieces
PDS	-	<b>P</b> ackaging <b>D</b> ata <b>S</b> heet
SWP	-	<b>B</b> rose <b>S</b> upplier <b>W</b> orkplace
THC	-	<b>T</b> erminal <b>H</b> andling <b>C</b> harge
VDA	-	<b>V</b> erband der <b>A</b> utomobilindustrie (Automobile industry association)
WD	-	<b>W</b> orking <b>d</b> ay
ZIP	-	<b>Z</b> IP code

## 1 INTRODUCTION

The following guidelines and provisions shall be regarded as supplementary contractual agreements to the General Terms and Conditions of Purchase (GTCP). Parts (production material and goods) shall be delivered to Brose in accordance with the current version of these specifications, the associated individual agreements with receiving plants and the Brose GTCP. This manual provides Brose suppliers with Brose's logistical requirements and their responsibilities.

## 2 GENERAL CONDITIONS

### 2.1 Delivery concept

Delivery to Brose is based on the agreed logistics data. These are broken down in detail and documented in the logistics data sheet and/or contract. Brose reserves the right to change the agreed delivery conditions with one month's notice. The supplier shall ensure that further variants developed by Brose can be integrated without any problems.

The delivery concept is composed of the following delivery conditions:

Incoterm, named place, annex to Incoterms, delivery address (Brose location, "deliver to"), shipping address of the supplier (if different from the order address), abbreviation for packaging responsibility (packaging key), delivery frequency, container type of the supplier, quantity per packaging unit, number of packaging units per loading unit, packaging policy (method), container circulation in working days (WD).

The delivery conditions are agreed between the receiving Brose plant and the respective supplier for the entire range of parts.

### 2.2 Explanation of the delivery conditions

#### 2.2.1 Incoterms

Since January 1, 2012, Brose has been using the Incoterms (trade clauses) published by the International Chamber of Commerce (ICC) and referred to as "Incoterms 2010" in procurement. The Incoterms generally applied by Brose are presented in the table below. Deviating Incoterms will only be agreed upon after additional approval of the relevant Brose logistics planning if this can lead to cost reductions. The Incoterm DDP "delivered duty paid" can only be used with the approval of Central Logistics, Taxes and Finance. Brose generally insures all transports commissioned by Brose itself and waives any additional insurance coverage by the supplier (waiver customer).

Table 1 - Overview Incoterms Brose

Clause	Export paperwork	Import paperwork	Transport contract	Place of delivery	Transfer of risk and cost
DAP (delivered at place)	Seller	Buyer	Seller	Place of destination	Place of destination
FCA (free carrier)	Seller	Buyer	Buyer	Place where the load is handed over to the carrier	Place of delivery

#### 2.2.2 Named place

Incoterms always apply in conjunction with the "Named Place". This is generally the place where the costs are transferred to the buyer according to the chosen Incoterm.

### 2.2.3 Annex to Incoterms

The annex to Incoterms will be applied if additional logistical conditions are necessary, that are not covered by the standard-Incoterms.

#### Additional logistical condition: Consignment warehouse

In case of the additional logistical condition "Consignment warehouse", Brose maintains a consignment warehouse where the allocation of stocks and scheduling to suppliers takes place within a cooperative system. In addition to the respective Incoterm, the features of the consignment warehouse concept at Brose, described in 7.2, apply.

### 2.2.4 Delivery Address

In communication with the supplier, Brose uses the unloading point as a five-digit alphanumeric code for the corresponding delivery address. The code and translation for the respective address can be found in the table under **Appendix 9.II**. In case of changing delivery addresses and deviations from this table, the latest delivery address communicated by Brose shall be binding.

### 2.2.5 Supplier's Dispatch Address

Shipping addresses of the supplier must be recorded in the logistics concept if different from the order address.

If the supplier's loading point changes (e.g. due to relocation), the supplier must give notice six weeks prior to the change.

### 2.2.6 Packaging Responsibility

The packaging regulations are agreed upon with the receiving Brose plant and the supplier for all parts alike.

The area of responsibility for empties corresponds to the point of transfer of risk according to the incoterm. If the exchange of empties takes place via a crossdock (Brose Supply Net) named by Brose, the area of responsibility for empties ends at the point of transfer to the crossdock.

Ownership of the containers is recorded through credits and debits in the container accounts (cp. chap. 3.6.3). The standard containers used in the supply chain between supplier and Brose are described in the catalogue of standard packaging items in chap. 8.7. Moreover, the following shall apply:

- Deviations from the standard Brose containers must be reconciled with the responsible Brose logistics planner or the logistics department of the respective plant.
- The supplier is responsible for the use of the agreed containers. If the agreed containers are not available, delivery must take place with the agreed alternate packaging. The responsible party is charged the resulting additional costs.
- Both partners maintain a container account. When no other timespan has been agreed upon, the supplier sends the container status to the Brose container schedulers monthly.
- In case the supplier requires additional containers due to increased short-term call-offs, it must be coordinated with the Brose schedulers.
- Small load carrier (KLT) are generally only provided in complete loading units.
- Brose offers its suppliers the opportunity to buy standard containers from several manufacturers for the Brose negotiated prices. In return, Brose will accept this price as a limit for the container costs (cp. chap. 2.3.2). For details, please reach out the respective purchasing department.
- With regard to empties, Brose generally only provides and accepts clean, operational empties and only accepts clean operational pool containers for deliveries (chap. 3.6.4). Containers, which do not meet this standard, must be reported or rejected at the defined point of transfer of risk. The resulting expenses for cleaning or repairing are charged to the partner from who's responsibility the containers come from.
- The supplier is responsible for the procurement of one-way packaging material requirements.

#### 2.2.6.1 Container Circulation Stock

Brose assumes an average consumption of 240 WD (annual planning quantity) as the basis for calculating the container requirement. This average consumption divided by the container capacity results in the number of containers needed per working day. This quantity is multiplied by the number of working days resulting from the following overview. The listed additional requirements are to be considered as approximated values. For batch production, the supplier's entire range of parts must always be considered because mostly the average range across the entire spectrum is less than the total ranges of the individual batches per ID number (Brose's experience: 80 % of the mathematical value is sufficient. Different requirements must be justified correspondingly). For collapsible empties, there must always be a counter check as to whether it is more economical to increase



the stock in circulation or to replace the empties 1:1 and thereby accept higher transport costs. If there are any deviations from these requirements, these must be justified in writing.

**Table 2 - Formulas for determining container requirements**

Circulation share	Formula	Example 3
Basic requirement, supplier	1.5 x delivery frequency [wd]; for lifecycles $\leq 2$ wd: 2x delivery frequency [wd]	$1.5 \times 10 = 15$
Requirement, Brose	For direct delivery = basic requirement, supplier. For delivery via VMI: 1 wd.	1
Transport of finished goods to the named place according to the delivery term	1 wd for every 500 km distance to the defined point according to the delivery condition	$300/500 = 0.6$ $\rightarrow 1$
Transport of empties from the named place according to the delivery term	1 wd for every 500 km distance to the defined point according to the delivery condition	$300/500 = 0.6$ $\rightarrow 1$
Additional requirement (batch production), supplier	For batch production, if: (range of finished batch) - (basic requirement, supplier) $> 0$ , then: (difference of the values x 80 %).	$7.600/417 - 15$ $= 3.2 \times 0.8$
Additional requirements for collapsible containers	(Delivery frequency [wd] x compression factor) - (Delivery frequency [wd]). Evaluation: higher transport cost for 1:1 exchange	0
<b><math>\Sigma</math></b>		<b>21.2</b>

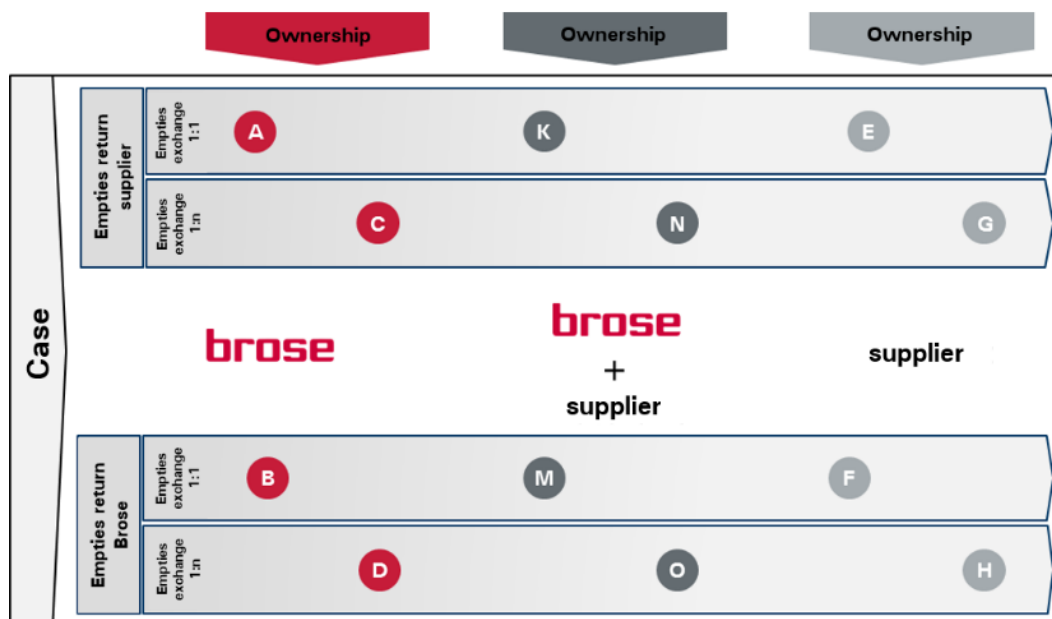
**Table 3 - Sample calculations for container requirements**

	Sample calculations:		
	Example 1	Example 2	Example 3 Supplier to VMI warehouse
Delivery rhythm	Once a week	Every 2nd day	Every two weeks
Annual requirement:	100,000 pieces	100,000 pieces	100,000 pieces
Compression factor:	1 : 2	not collapsible	not collapsible
Distance:	550 km	100 km	300 km
Container capacity:	200 pcs./ loading unit (LU)	200 pcs./ loading unit (LU)	200 pcs./ loading unit (LU)
Lot size:	5,000 pcs.	1,600 pcs.	7,600 pcs.
Calculation of daily requirement:	$100,000 \text{ pcs} / 240 \text{ wd} =$ $(417 \text{ pcs/wd}) / (200 \text{ pcs/LU}) =$ 2.085 LU/ wd	$100,000 \text{ pcs} / 240 \text{ wd} =$ $(417 \text{ pcs/wd}) / (200 \text{ pcs/LU}) =$ 2.085 LU/ wd	$100,000 \text{ pcs} / 240 \text{ wd} =$ $(417 \text{ pcs/wd}) / (200 \text{ pcs/LU}) = 2.085$ LU/ wd
Container requirement in loading units:	$2.085 \text{ LU/ wd} \times 25.1 \text{ wd} =$ <b>52 LU</b>	$2.085 \text{ LU/ wd} \times 10 \text{ wd} =$ <b>21 LU</b>	$2.085 \text{ LU/ wd} \times 20.6 \text{ wd} =$ <b>43 LU</b>

The delivery cycle calculated here in working days should consider the supplier's total delivery volume to the respective Brose plant. The frequency stated serves as the basis for calculating the freight costs.

#### 2.2.6.2 Description of the packaging responsibility based on various examples

The following chart shows the ownership ratio, responsibility of the empties returns and empties exchange at 1: n or 1:1 ratio between Brose and the supplier. Cases A, B, C, D, E, F, G, H, K, M, N, and O serve as the basis for determining the difference between logistics conditions depending on the ownership ratio, the responsibility for empties returns and empties exchange. Cases P and Q govern the disposable packaging and rented empties.



Container Procurement	Ownership	Procurement	Procurement Quantity
	Brose (100%)	Brose (100%)	Quantity for total container circulation
	Supplier (100%)	Supplier (100%)	Quantity for total container circulation
	Brose & Supplier	Supplier	Quantity transit (return) + quantity container circulation supplier
		Brose	Quantity container circulation Brose
	Freight responsibility is determined by the agreed incoterm		

#### Case P and Q:

##### P – expendable packaging:

- Valid for suppliers that deliver expendable packaging only

##### Q – rented empties:

- The supplier requests the empties at his own expense from the service provider, in accordance with his general conditions
- The supplier triggers rebookings, analogous to the transfer to the named place, in accordance with the guidelines of the service provider

**Illustration 1 - Case examples of packaging responsibility**

## 2.2.7 Transport Procedure

The quantities declared must be packaged appropriately in accordance with Brose's requirements and instructions for transport, loaded onto suitable vehicles, stowed and secured by the sender in accordance with applicable statutory provisions. Subsequent modifications are permissible only after prior consultation with the plant logistics. For transports in Europe these kind of changes must also be communicated to the BTM (Brose Transport Management) team (cp. chap. 2.2.7.1) immediately.

### 2.2.7.1 European Transport Registration

If delivery terms FCA supplier are agreed upon, the supplier must register and provide the following information timely according to a defined scheme. In Europe, the supplier must register deliveries via Web-EDI in the notification portal BroTAP (Brose Transport Advice Portal) (<https://extranet.brose.com/>) before 11:30 am (CET) on the working day (Monday - Friday) before loading. Loading days are taken from the corresponding routing instructions.

For a successful registration in BroTAP, the following inputs are required in chronological order:

1. **Delivery type**
  - Fulls
  - Empties
2. **Sender**
3. **Receiver**
  - Plant
  - Unloading point
  - etc.
4. **General Information**
  - Identification number
  - Delivery note number
  - etc.
5. **Pick-up / Delivery time window**
6. **Cargo information**
  - Amount
  - Weight
  - Packaging type
  - Measurements
  - Stackability
  - etc.
7. **Attachments**
  - Documents for freight forwarders or plants (only .pdf or .jpeg)
  - etc.

In order to guarantee a smooth holiday planning in transport management, each supplier is obligated to maintain the corresponding closing days in Brose Extranet (<https://extranet.brose.com/>). The call-offs of the Brose plants remain binding and the supply must always be ensured.

Any additional costs incurred due to late or wrong delivery notification (e.g. weight differences, stackability, number of pallets, etc.) must be carried by the supplier.

### Contact BTM Team

#### Brose Transport Management

Mail: [transport@brose.com](mailto:transport@brose.com)

Phone: +420 556 84 4870

## 2.2.7.2 Routing Instruction Europe

The routing order is issued by the BTM team and describes the transport processing, transport times and the carrier used by Brose.

### Routing Instruction for Fulls

16/06/2017



By not refusing below route setup within 3 working days after receipt the concerned parties agree to the indicated routing details. Non permanent deviations due to seasonality, production fluctuations, etc. Need to be reflected in iTMS prior to the transport taking place.

route details				
effective date	20/02/2017	planned frequency per week	5	equipment
BTM route id	FTL100000	minimum transportation time [working days]	1	freight payer
related empties shipmen	no	transportation mode	FTL	version

pickup and delivery details										
	transport plan 1		transport plan 2		transport plan 3		transport plan 4		transport plan 5	
	day	time window	day	time window	day	time window	day	time window	day	time window
pickup	MON	14:00-16:00	TUE	14:00-16:00	WED	14:00-16:00	THU	14:00-16:00	FRI	14:00-16:00
delivery	MON	20:00-22:00	TUE	20:00-22:00	WED	20:00-22:00	THU	20:00-22:00	FRI	20:00-22:00

MON=Monday TUE=Tuesday WED=Wednesday THU=Thursday FRI=Friday SAT=Saturday SUN=Sunday +1=week after collection +2=two weeks after collection

consignor					recipient		
company name	Brose Fahrzeugteile GmbH & Co. KG - Wuerzburg				Brose Fahrzeugteile GmbH & Co. KG - Meerane		
Brose location identifier	2000072				2000020		
street	Ohmstr. 2a				Werdauer Allee 3		
country	zip	city	DE	97076	Wuerzburg	DE	8393
main contact person					Meerane		
phone number					Max Mustermann		
email					+49 123 45678		
Opening Hours					max.mustermann@123.com		
					MON-FRI: 10:00-18:00		
					MON-SAT: 06:00-06:00 (non-stop open)		

carrier					Brose		
company name	Carrier XY				BTM Team - Brose CZ spol. s r.o.		
street	Carrier Road				1. máje 2636		
country	zip	city	DE	1234	Musterstadt	CZ	75661
main contact person					Rožnov pod Radhoštěm		
phone number					xx		
email					+49 123 45678		
					max.mustermann@123.com		
					transport@brose.com		

#### Process Instructions

- The transport order has to be entered by the shipper into BTM System no later than 11:30 o'clock (UTC +01:00 = Berlin time) the day prior to the scheduled pick-up.
- Shipper needs to inform Brose immediately in case of any delays during loading/unloading at its entity.
- Shipper needs to inform the Brose in case of deviation of the advised volume or weight before the pick-up takes place.
- If the shipper orders empties at Brose, the order needs to be placed at Brose latest two days before the scheduled pick-up day at Brose plant (see routing details - empties).

ROUTING INSTRUCTIONS ARE HEREBY ACKNOWLEDGED

Date \_\_\_\_\_ Name \_\_\_\_\_ Signature \_\_\_\_\_

### Illustration 2 - Routing Instruction Europe

## 2.2.7.3 Transportation North America

If delivery terms are agreed as FCA supplier and shipping takes places within North America, you will either receive a routing instruction from Brose 3PL (CH Robinson) or a specific plant Logistics contact. The supplier is responsible for receiving training and be given access to CH Robinson's Web portal (Navisphere: <https://www.chrobinson.com>) in order to enter pickup requests.

#### Contact information for CH Robinson

- Brose Plant located in United states or Canada  
C.H. Robinson Metro Detroit, MI Office  
Email: brosen@chrobinson.com  
Phone #: 810-233-4222
- Brose plant located in Mexico  
C.H. Robinson Monterrey, MX Office  
Email: brosemx@chrobinson.com  
Phone #: 877-927-8007 (US) 81.81.33.56.00 (Mexico)

## 2.3 Calculation of logistics costs

### 2.3.1 Differentiation A price

The A price includes all internal logistics costs incurred at the supplier (material & information flow e.g. labelling) including packaging in the offered containers and loading onto the first means of transport. **Costs for containers and packaging are not included within the A-price.**

### 2.3.2 Differentiation B price / logistics costs components

A breakdown of logistics costs is required in the form of an offer and/or a Logistics Data Sheet.

The B price per 100 pieces must be divided between the following components:

- Transport costs to Brose or external service provider per 100 pcs
- Packaging costs per 100 pcs
- Additional external logistics service per 100 pcs
- Customs duty per 100 pcs
- Taxes, charges per 100 pcs

The respective price components are explained below. In general, the following applies:

- Deviations only with written documentation
- Calculation based on the queried conditions
- Additional proposal from supplier for a cheaper option possible (with the same calculation rules)
- Cost components may only be declared once
- Only costs, which the supplier also must pay, may be declared (according to agreed delivery conditions)

**Table 4 - Overview of logistics costs**

	Costs component	Description
Logistics costs/100 pcs	Transport costs to Brose or external service provider /100 pcs.	<b>Costs for transporting goods:</b> From dispatch address to destination, according to delivery conditions (cp. <a href="#">chap. 2.2</a> ). This includes: <ul style="list-style-type: none"> <li>• Pre-run, main run and post-run costs</li> <li>• Toll and fuel costs</li> <li>• Provision costs for containers, and</li> <li>• All transfer costs within the interfaces, such as Crossdock, THC (Terminal Handling Charge), stowing</li> </ul>
	Packaging cost /100 pcs.	<ul style="list-style-type: none"> <li>• <b>Costs for one-way packaging</b> material (package and packaging aids).</li> <li>• <b>Costs for returnable packaging</b> or returnable load carriers (for the part of the load carrier circulation that the supplier is responsible for or must purchase.)</li> </ul> Possible options are current costs, depreciation value, rental costs, transfer costs (incl. administration costs for container management). In general, the assumed circulation volume and depreciation period must be disclosed. Costs have to be reduced correspondingly at the end of the depreciation period. Costs for cleaning returnable containers if this is demonstrably process-related by the supplier
	Additional external logistics service /100 pcs.	<b>All required external logistics service costs paid by the supplier.</b> These costs include: <ul style="list-style-type: none"> <li>• Repackaging costs (from one packaging to another) if these are incurred in the supply chain and are not already included in the VMI warehouse costs.</li> <li>• Crossdock costs</li> </ul>
	Customs duty /100 pcs.	<b>All customs (export and import duty),</b> according to customs conditions of the country of export and of import, <b>All costs and fees connected with customs handling</b> (e.g. handling costs for the customs agent).
	Taxes, fees /100 pcs.	<b>All taxes,</b> according to tax legislation of the country of export and of import, which are <b>non-refundable</b> . Information concerning customs duties, taxes and fees of several countries can be obtained from the financial or customs authorities or customs agent responsible for your location of production. Applicable legal regulations must be considered when calculating the logistics costs. No costs that arise because of tax registration by the supplier through a supplier warehouse (transfer of ownership upon picking by Brose).
Σ	B price /100 pcs.	Transport costs, Packaging cost, Additional external logistics service, Customs duty, Taxes (non-refundable)

## 2.4 Information flow: EDI (Data Interchange)

Brose requires an EDI (Electronic Data Interchange) connection from all suppliers for the electronic exchange of data.

For suppliers, which cannot visualize the exchange of standard messages via EDI the use of a web-based supplier portal in the Brose Extranet (application SWP Supplier Workplace) is required.

For the electronic data interchange, Brose prefers the use of EDIFACT standard messages, alternatively in VDA (Automobile industry association) message format. Brose no longer supports new implementations of the ANSI EDI format. More information regarding the EDI-Onboarding, the approved standards and the EDI message structures can be found on the Brose homepage <https://www.brose.com/de-en/edi/>. For technical EDI questions the central EDI coordination ([EDI@brose.com](mailto:EDI@brose.com)) can be contacted. For EDI/Supplier Workplace set-ups or changes, please contact your respective logistics planner.

### 2.4.1 Call-offs

Brose provides the call-offs as an EDI-message. The call-off dates can be expressed in daily, weekly or monthly figures. If a supplier cannot process EDI messages, the delivery call-offs will be provided in the Supplier Workplace. In exceptional cases, transmission by e-mail is possible. The delivery call-off is usually sent daily in the corresponding message format.

Unless agreed differently between Brose plant and supplier, the unloading points identified in the delivery call-off shall clearly identify the delivery destination of the goods, where the ordering party receives the goods. The delivery dates indicated on the call-offs represent arrival dates at the named unloading point. Brose refers here to the VDA Standard 4905 Annex 9 Pos. 5. Applicable for compliance with delivery deadlines or the delivery date is the receipt of the goods in the named unloading point (cp. **II**). If another Incoterm than "DAP receiving plant" is agreed, the supplier shall provide the goods in an appropriate time, considering the usual time for loading, dispatch and transport. For deliveries abroad via a container storage point, the delivery date is the arrival of the goods in the container stowing point. In the occurrence of delivery problems (cp. **chap. 6**), the supplier has to inform the receiving Brose plant in advance by phone, followed by a written confirmation.

A delivery call-off confirmation is not necessary, as Brose assumes that the specified requirement quantities and delivery dates will be met. In exceptional cases, requests for changes must be coordinated immediately with the responsible materials planning department and, if necessary, confirmed with a copy of the delivery schedule.

The delivery quantities and dates communicated in the delivery schedule are binding for the supplier. When supplying stamped parts, Brose refers to DIN 6930-1:2011-10. The following tolerances apply to Brose:

**Table 5 - Tolerances Order/delivery quantity stamped parts**

Order / Call-Off	For stamped parts order quantities determined by weight: Deviations between order quantity (call-off) and delivered quantity	± 10%
Packaging instruction	Deviations from the defined filling quantity of a load carrier	± 5%
Delivery documents	Deviations between delivery documents, ASN and physically delivered quantity	± 0%

### 2.4.2 Definition of production release and material authorization

The production and material release defines the timeframe in which Brose guarantees the buy-off of the ordered parts or materials. The standard timeframe for production release is 4 weeks; the standard timeframe for the material authorization is another 8 weeks. Other release time frames have to be agreed as required. The production and material release period starts with the delivery call-off creation date and applies daily for the stated period until there is a new delivery call-off. The maximum release quantity is calculated from the goods-in serial number when creating the call-off plus the required quantities specified in the release period. The figures provided beyond the production release and material authorization periods are target figures and for information only. The quantity stated under production release is ordered. However, the delivery must be based on the latest delivery call-off. The material authorization quantity is to be used for material scheduling only, not for production. If further deliveries are in transit to Brose in addition to those listed, these quantities will be cumulated with the due deliveries. Changes (i.e. repeat-orders or initial orders of new parts as well as deadline shifts or cancellation) that are provided to the supplier as call-off changes are to be appended to the actual call-off by the supplier as long as there is no other call-off provided. A confirmation of the call-off is not necessary because Brose assumes that the quantities and deadlines stated in the call-off will be complied. In exceptional cases, changes must be agreed with the responsible material requirement planning and confirmed with a copy of the delivery call-off.

To avoid a shortfall or surplus of material it is important that the supplier checks the cumulative quantities of the call-off, because the demands are calculated according to the cumulative quantities of receivables. If there are any differences, the supplier is to inform the responsible scheduler.

### 2.4.3 Advanced Shipping notification (ASN)

Brose requires an advanced shipping notification (ASN) by EDI (alternatively through the Supplier Workplace) with every delivery. For message standards VDA 4913 and EDIFACT/DESADV, the **latest specifications** on the Brose Homepage <https://www.brose.com/de-en/edi/> shall apply. The Brose homepage also offers an ASN validation service to ensure the conformity with the Brose standards.

The data transmitted in the ASN must match exactly with the data on the delivery documents (cp. **chap. 4.1.6**, **chap. 5.2** and **chap. 5.3**) and on the attached labels (cp. **chap. 5.4**).

The ASN must contain **especially** the following data:

- Delivery note number
- Brose order or delivery schedule number (usually: 55xxxxxxxx)
- Brose material ID number
- **Weight (gross weight, net weight), only integer values**
- **Delivery date (date of arrival at unloading point)**
- Deliveries that are registered via BroTAP must include the FWO (**Forwarding Order**) number in the Means of transport ID field of the ASN
- **Exact details must be given for each material ID number with respect to:**
  - **Quantity of the respective material ID Number**
  - **The packaging components belonging to the loading unit/package unit as well as their respective Brose packaging material ID (container code), number of pieces and filling quantity**
  - Each HU (handling unit) must be associated with a clear package identification number assigned by the supplier. The package number links the ASN data with the labels of loading units (LU)/large load carrier (GLT) and packaging units (PU)/small load carrier (KLT).
- **For material subject to documentation or with batch requirements (D-parts, material with traceability):**
  - The batch number of the material ID number
  - Each loading unit may contain only one batch of one material. If different batch numbers are delivered for one material number, a separate delivery position must be generated, packed and notified (ASN) for each batch number

Additional logistics requirements:

- Delivery note:
  - Depending on the EDI standard used, different order or delivery schedule numbers are displayed in multiple positions or separated into different delivery notes and notified.
- ASN data/structure and delivery documents
  - The ASN needs to reflect the packaging structure of the loading units. The packaging structure of the loading unit transmitted in the ASN (GLT package number/**packaging material ID** and referring KLT package numbers/**packaging material IDs**) needs to match exactly with the delivered packaging structure of the loading unit (package numbers on labels **and packaging material ID of packaging components**). Especially in case of the delivery of several loading units per material number the correct allocation must be observed.

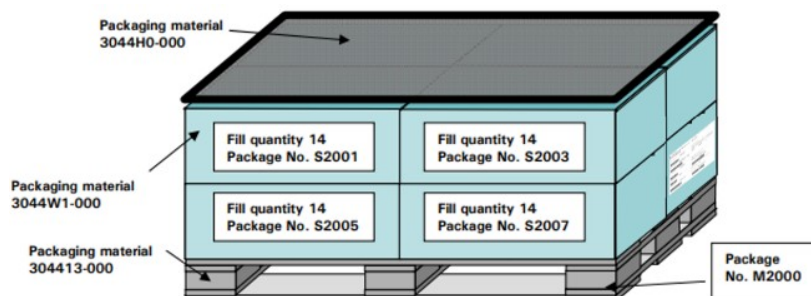


Illustration 3 - Packaging structure loading unit

## 3 PACKAGING GUIDELINES

### 3.1 Basic information

This guideline forms the contractual basis for the packaging of parts within the delivery process to Brose. They represent an addition to the General Purchasing Terms and Conditions and inform the suppliers of the packaging requirements at Brose. When determining packaging, the specified packaging systems from the **Brose Packaging Specification** have to be used. A detailed description of loading units (GLT/KLT) and their related elements is explained in this chapter. Generally, reusable packaging must be used. If the logistics calculation finds that this is not economic, disposable packaging can be used after the approval by Brose. Furthermore, regional specifications must be considered.

Basis of every packaging plan and its implementation are:

- VDA recommendations of which the current versions are available free of charge under [www.vda.de](http://www.vda.de):

**Table 6 - VDA recommendations**

VDA-5000, part 3	Proposals for designing logistics processes - Packaging
VDA 4500 et. seg.	Small load carrier (KLT) systems
VDA 4525 et. seg.	Standardized disposable packaging for sea container applications
VDA 4530 et. seg.	Disposable small load carriers (EW KLT) – System

- AIAG (Automotive Industry Action Group) recommendations under the link: <https://www.aiag.org/>
- The **Brose Packaging Specification** with the basic technical requirements for pallets, boxes and handling labels. Additionally, the standard packaging units for disposable and reusable packaging are listed here.

The objective is a rational and standardized packaging system, which prescribes a smooth material flow considering the following criteria:

- Compliance with the legal requirements of occupational and environmental safety
- Protecting resources and economic efficiency
- Securing the agreed material flow as well as the shipping and delivery quality
- Protection and conformity of the parts corresponding to the Brose specification

In the event of non-compliance with the applicable and agreed Brose Packaging Specifications and demands, the costs incurred as a result shall be charged to the originator (e.g. in the form of repackaging costs and additional container costs). Additionally, this may have a negative impact on the supplier evaluation (cp. Supplier Management Manual <https://www.brose.com/de-en/purchasing/handbooks-templates/>).

### 3.2 General Requirements

The following requirements must be met, regardless of packing type (disposable or reusable):

- Qualitative impairments (deformations, dirt, oils, greases and environmental influences) must be avoided through appropriate precautions. Cardboard packaging (e.g. EXO (expendable oversea) KLTs) can be damaged by moisture. Moist parts (oil, water, environmental influences) must therefore be packaged in a bag.
- The packaging must withstand the standard impact of the specified transport; this must be ensured irrespective of the agreed transport responsibility.
- Containers capacity must be utilized optimally. Rational, stackable loading units must be built.
- Only **similar** packaging (e.g. pallet cages/corrugated board/wooden boxes) and LUs with **identical** size shall be stacked; if there are different weights, the heavier LU must be underneath.
- Please find further information regarding packaging stability in **chap. 8.4** and information regarding packaging marking **chap. 8.5**.
- Transportability of shipping units with floor conveyers and on Brose conveyor and storage equipment.



- Compliance with the prescribed standard dimensions in national and international transportation,
- Handling-appropriate structure and ergonomic parts withdrawal
- Resource-saving design by using recyclable materials (see Chapter **3.7.2**),
- Labeling of the packaging materials used (material selection and maximum permitted loads).
- The agreed packaging units per part number must always be the same corresponding to the content and dimensions.

### 3.3 Packaging materials

A list of the permitted materials is available at **Brose Packaging Specification**. Packaging that does not comply with the conditions may only be used with agreement and written consent from Brose.

Packaging materials free from pollutants

The material comprising the packaging, repackaging, packaging aids or label may not contain materials/ substances, for which there are restrictions or prohibition of use or production.

Packaging may not be treated with hazardous materials/substances, which seep or are released from them.

The national law shall apply in all locations of the prescribed supply chain in assessing the danger of a material / substance and to determining the restrictions for marketing or using it and in each case EU Directive EC 1907/2006 "Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)" shall apply. If materials / substances are included in the ECHA list of Substances of Very High Concern (SVHC/ candidate list), this shall be deemed equivalent to a prohibition of use. Furthermore, the GADSL (Global Automotive Declarable Substance List) must be observed. This list is valid in its current version (<http://www.gadsl.org>). If declarable substances according to GADSL are used in packaging materials, information must be sent to [IMDS@Brose.com](mailto:IMDS@Brose.com). For further questions regarding REACH requirements, please contact the following e-mail address: [IMDS@Brose.com](mailto:IMDS@Brose.com).

### 3.4 Modular design, stackability and securing load carriers

#### 3.4.1 Modular design

Loading units combine transport packaging and load carriers to form transport and storage units. If the loading unit consists of small containers (KLT), then these must conform to the prescribed standard dimensions.





Loading unit, comprising:	Cover plate, lid	KLT (small load carrier)	Pallet-system
			

Illustration 4 - Modular structure of loading units

### 3.4.2 Stackability

Palletized loading units serve to rationalize the material flow. They must be suitable for the loads applied during transport. The weight of the load and the possible additional load of the packaging system must be visible. Incomplete layers and pyramid stacking are not permitted. If it is not possible to fill entire layers because of the call-off quantities, the last layer must be filled up with empty containers. These additional containers then must be labeled as "empty containers".




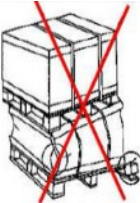
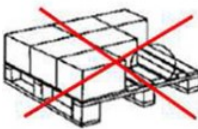


Permitted			
Not permitted		 	

Illustration 5 - Regulations for loading unit forming

### 3.4.3 Load carrier securing

To ensure shipping quality and to prevent packaging units from falling, the load must be secured with banding. Depending on the weight of the shipping unit, this is as follows:

			
1x banding for empties	Filled containers < 300kg 2x banding	Filled containers < 800kg 3x banding	Filled containers > 800kg 4x banding

Illustration 6 - Load carrier securing

The shipping of empty VDA KLT is an exception from this:

- RL KLT 6147
- RL KLT 6280

The banding can be omitted for these containers. Strapping belts must not cut into boxes and containers. Loading units must be strapped with plastic tension belts. Metal tension belts are not permitted. Shrink-wraps and stretch films are permitted only in consultation with the responsible Brose logistics planning.

#### 3.4.4 KLT 3147 configuration

As a result of an offset KLT 3147 configuration on the pallet (cp. the picture below: 16 KLT per layer, in three rows per layer, middle row arranged lengthways) the risk of the KLT slipping is reduced and therefore the stability and transport safety increased. Brose plants, which use a fully automated storage technology, can only process the configuration shown.



Illustration 7 - KLT 3147 configuration

#### 3.4.5 Stacking Position of cover plates

Cover plates must be stacked with their „opening“ on the downside onto the euro-pallets. This prevents the collection of water at the inner side of the cover plate and thus wet cover plates being placed onto the container. This measure helps to prevent the occurrence of rusty parts in the upper layer of the container and especially the KLT.

A second euro-pallet (see picture) must be used to prevent damage (i.e. by fork lifter) on the cover plate at the bottom. The complete container must be tied up with the last euro-pallet at the bottom.



Illustration 8 - Handling of stacking cover plates

### 3.5 Selecting and specifying packaging

In principle, appropriate packaging must be specified for each new product to be delivered. In general, standardized reusable containers must be used (VDA for Europe and AIAG for NAFTA (North American Free Trade Agreement)). These are listed in **Brose packaging specification**. If this is not possible, a written agreement with the responsible Brose logistics planner is required. The supplier is responsible for the use of the containers according to packaging data sheet and the contract. The loading units should always be created according to the agreed configurations (number and orientation of the containers). If the agreed container is unavailable, it must be delivered in the alternative packaging agreed in each individual case with the logistics planner. The resulting additional costs must be borne by the originator. If the supplier needs more containers due to raised delivery call-offs, he must contact the container manager of the destination plant in time.

The following steps must be observed:

- The definition and introduction of necessary packaging takes place in consultation with Brose and may only take place after a written release by Brose. Basis is the **Brose Packaging Specification**. Deviations are only permitted after release by the receiving plant or by the responsible logistics planning.
- Within the framework of the first sample (new packaging or change to an existing packaging), verification of suitability for the load carriers and storage used must be provided within the PPF/PPAP-documentation. For this purpose, the recent version of the "Packaging Data Sheet" (PDS) is used. It must be verified here that the load carrier or packaging does not affect or change the conformity of the components during transport and the required storage. To this end, we refer to VDA Vol. 2 "Production process and product approval" (VDA 2 PPF). In the event of a single packaging change a shortened PPF/ PPAP (PSW – Part Submission Warrant) sampling with cover sheet and prove of suitability is required.

### Process of packaging development

The process for launching packaging units is described below. This generally has to be complied with in the form shown unless Brose approves a different regulation.

- Supplier checks in the **Brose Packaging Specification** whether a suitable standard packaging is available for its product:
  - If this is available, it must be used
  - The conditions and sources of supply according to **Brose Packaging Specification** must be agreed with Brose
- The supplier recommends the capacity for the parts it refers to in its offer
- If no packaging is available to Brose, the supplier can suggest its own solution after consultation and assessment by Brose.
- If no packaging is available, the supplier shall develop suitable packaging itself, taking into account the general technical conditions specified in **Brose Packaging Specification**.
- The final approval shall be based on a packaging test to determine the final packing density and validate the suitability of the packaging by writing in the Brose packaging datasheet.
- For the final written packaging approval by Brose, the signed packaging datasheet is handed to Brose by the supplier during the initial sampling as proof of suitability of the load carrier.

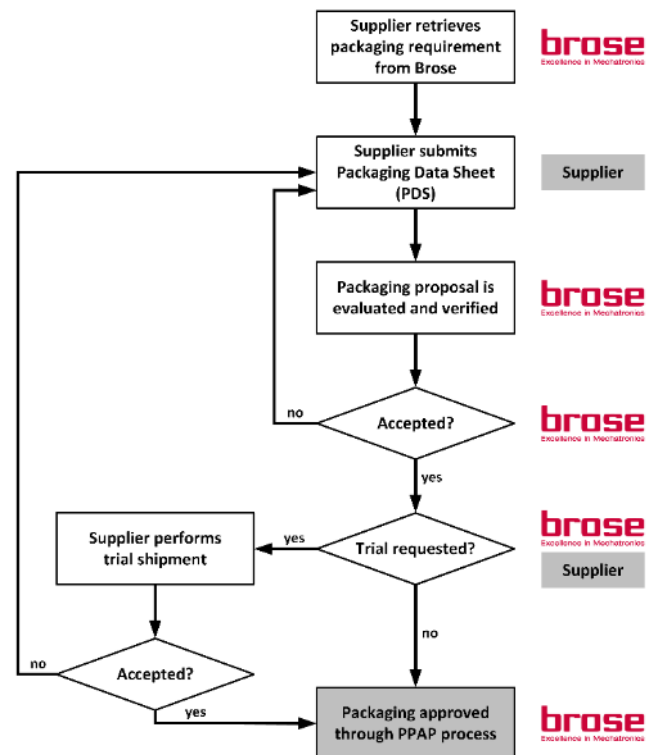


Illustration 9 - Process of packaging development

The following principles must also be considered:

- The release of packaging shall not exempt the supplier from its responsibility for damage-free delivery of parts.
- The type of container, filling quantity, cost and specifications regarding packaging constitute a part of the order or delivery contract and are to be adhered to with every delivery.
- If the supplier does not comply with the agreed packaging and packing density, Brose will reserve the right to charge the resulting handling and decant cost to the supplier respectively to change the B-price retrospectively (due to higher packing density)
- Justified deviations (e.g. alternate packaging with series ramp-ups, extraordinary buffer stocks, and insufficient load carriers from Brose) are to be agreed on in time with the responsible Brose logistics planning resp. the receiving plant. The notation "alternate packaging" is to be printed to the delivery note.

## 3.6 Reusable packaging

### 3.6.1 Use of supplier-owned reusable packaging

If the responsibility for the procurement of packaging lies 100% with the supplier (cp. [chapt. 2.2.6.2](#)), the number of circulation days must be agreed with the logistics planner. The supplier shall procure the reusable packaging on the basis of the agreed circulation days and the ordered volumes for the total container circulation. In case of volume increases, the supplier is responsible for procuring additional packaging independently and in time.

### 3.6.2 Use of (poolable) Brose reusable packaging

The supply of parts to Brose plants is based on the use of poolable containers. Poolable means that all containers, regardless of the respective supplier, are separated across the stock level to avoid costly separation by owner.

In general, Brose reusable packaging is only intended for supplying serial parts to Brose plants. As a rule, reusable packaging may not be used for internal material flows of the supplier, intermediate storage or the supply of upstream suppliers. Any exceptions must be agreed in writing with the Brose logistics planner.

### 3.6.3 Container stock management

All movements of returnable containers between supplier and the Brose plants are recorded using double entry bookkeeping with load carrier accounts and are monitored by Brose load carrier administration. Each supplier is required to reconcile the load carrier movements with the load carrier administration at the receiving plant every month. Brose container management at the plant shall provide the load carrier account statement with the recorded movements of either empties and full shipments or shall require the supplier to send these monthly.

Equally, the form of notification by the container management of the respective plant is also specified. Suppliers, which supply a plant via Crossdock from company D+S, must always compare the container movements with the empties administration at the Brose Coburg plant. **Required empties must be requested from the Brose contact person in time. Missing or untimely orders and the resulting costs for special freights shall be borne by the supplier.**

The supplier shall carefully check the account statements for any errors or incorrect bookings. The supplier must report identified booking differences. The reporting deadline for objections is two weeks from receipt of the account statements. The supplier accepts the balances reported upon expiration of the objection deadline.

Upon request from the respective empties administration, an empties inventory must be performed. The result of this inventory is then agreed between the parties involved, a subsequent change to the agreed result is not permitted.

### 3.6.4 Damage to containers, dirt and scrap

Table 7 - Regulations for condition and handling of containers

<b>Damage to containers</b>	The user must ensure that containers are not being damaged during handling. The costs incurred for repair shall be charged to the causer. Without exception, damaged load carriers shall be blocked by the respective user for further circulation and shall arrange repairs.
<b>Dirt on containers</b>	<p>Clean means "broom-clean", i.e. loose packaging residue is removed, without old labels and residual parts. For defined circulations in which containers with additional cleanliness requirements (e.g. free of dust, grease and oil) are used, or parts for which the cleanliness requirements are specified in the drawing, the requirements and the corresponding measures must be agreed separately with the receiving/providing location.</p> <p>If the cleanliness of the load carriers does not correspond to the quality requirements of the material transported therein, the supplier shall perform cleaning measures. The costs for cleaning shall be agreed with the respective Brose plant.</p> <p>If the cleanliness of the load carriers does not meet the agreement, this should be reported to the source providing the service. Quality reports (8D reports) do not have to be provided as an answer.</p>
<b>Scrapping containers</b>	Brose owned containers might only be scrapped with the written permission of the Brose container management. In the case of non-compliance, the cost for replacement shall be charged to the supplier.

### 3.6.5 Exchange criteria for EURO pallets and pallet cages

The delivery condition of EURO pallets and pallet cages is based on the exchange guidelines from the European Pallet Association (EPAL) (see [www.epal-pallets.org](http://www.epal-pallets.org)). Containers, which do not meet this standard, must be claimed. Otherwise, the respective partner, in whose responsibility the containers are, must clean the containers at its own cost.

The following delivery condition for pallet cages is not permitted:

- Fake pallet cages, which do not correspond to the original EPAL features,
- Front-wall flaps are immobile or deformed such that they can no longer be closed or opened,
- Adjustable frames, base frames or feet must be curved such that the box no longer stands on the four feet or can no longer be stacked without danger,
- A board in the base is missing or broken,
- Ripped round steel boards and cable ends protrude inwards or outwards,
- Pallet cages are dirty or corroded such that there is increased risk of contamination of the goods

### 3.6.6 Special load carriers

The use of special load carriers must be agreed with the respective Brose logistics planner. In addition to that, the process of packaging development applies for the planning and design of a special load container (see [chapter 3.5](#))

In principle, the supplier's share of the costs for procurement, maintenance and repair shall be regulated on a project-basis. The planning and design costs shall be borne essentially by the supplier. The supplier and Brose shall specify the number of special load carriers required for circulation together. The empties account shall be managed by the supplier and shall be supported by the Brose container management.

### 3.6.7 Hazardous goods packaging

In principle, the packaging of hazardous goods and Intermediate Bulk Containers (IBC) must be agreed with Brose in writing due to their complexity. This packaging must also comply with the currently applicable national and international provisions. All relevant test reports and certificates must be provided to Brose.

### 3.6.8 Canadian Goods and Service Taxes GST requirements for reusable packaging circulation

All Canadian suppliers receiving empty returnable containers from U.S. facilities are required to participate in the flow through GST recovery method. The following process applies:

- Brose shall pay the fees incurred by sending empties to Canada and shall send a debit note, along with copies of the B3 form and the pro-forma or commercial invoice, to the Canadian supplier.
- The Canadian supplier shall include the debit note in its GST claim with CCRA using the flow through method.

## 3.7 Disposable packaging

In principle, the listed standard disposable containers in "**Brose Packaging Specification**" shall be used. If this is not possible, the required disposable packaging is generally procured and made available by the supplier and is at his expense. Disposable packaging must be stackable. Prior agreement and written release from Brose are required. The supplier shall be liable for any damage to and the use of this special packaging

### 3.7.1 Requirements for disposable packaging

The technical requirements are defined in "**Brose Packaging Specification**".

### 3.7.2 Avoiding packaging waste

Packaging is always to be planned bearing in mind economic and environmental aspects. The waste-economic targets of the environmental legislation include the following priorities:



**Table 8 - Regulations for packaging waste**

<b>Reduction</b>	<ul style="list-style-type: none"> <li>• Use of the economically and ecologically most suitable packaging and packaging tools.</li> <li>• Limitation on the necessary weight and volume (Saving of resources and reduction of the amount of transport)</li> </ul>
<b>Material use</b>	<ul style="list-style-type: none"> <li>• Use of environmentally friendly, reusable materials for all types of packaging; use as close to the place of collection as possible to avoid return via the delivery chain and the associated transport volume.</li> <li>• The costs of recycling are to be borne by the supplier. The labeling of those materials is described in the "Brose Packaging Specification".</li> </ul>

### 3.7.3 Handling markings

The correct and complete marking of disposable packaging must comply with DIN 55402 and ISO R 780 (Marking of distribution packages). This helps prevent:

- Incorrect handling, accidents, losses and damage,
- Delays or rejections during customs clearance
- Liability waiver for the party, which transported, transferred or stored the goods, and as a result of whose handling damage occurred.

The requirement to label packaging with handling labels is defined in "Brose Packaging Specification".

## 3.8 Collective loading units

Due to customs- and system-technical reasons material numbers have to be delivered unmixed. A mixing of batches of material subject to documentation or with batch requirements (D-parts, material with traceability) in a loading unit is not permitted, either. Each loading unit may contain only one material number and one material batch.

If complete loading units cannot be formed due to the small call-off quantities, load carriers with different ID numbers can be combined to form a collective loading unit only after written approval by Brose. These must be packed such that the same ID numbers are grouped together (ideally in layers) on the pallet. The requirements in [chapter 3.4](#) must be fulfilled. A mixed pallet must be labelled clearly as such on the outside (short and long side of the container) (e.g. A4 page or Master label printed with "Mixed pallet"). Every packaging unit must be uniquely identifiable by an attached single label. Additionally, for every material number on the mixed pallet an extra master label needs to be created and attached to the pallet. The requirements from [chapter 5.4 Container Labeling](#) need to be complied with. For the notification of mixed pallets, the EDI Packaging Structure Examples on <https://www.brose.com/edi/> must be observed.

## 3.9 ESD packaging, electronics production

For electronic components or parts, which are installed in ESD-protected (Electronic Discharge-protected) areas, ESD packaging must be used. The requirement is fulfilled either by Brose and/or by the supplier. ESD packaging must be designed such that they comply with the respective applicable VDA recommendation 4504 or the Brose standard: BN 588863. The Brose ESD standard containers are listed in [Brose Packaging Specification](#).

## 3.10 Overseas packaging

### 3.10.1 General requirements and guidelines for overseas packaging

Loading units for shipping overseas generally have to be designed such that they are suitable for transport in overseas containers. The basis for the design is the currently applicable VDA recommendation 4525, "Standardized disposable packaging for sea container applications" and [Brose Packaging Specification](#). This contains a list and detailed description of the Brose Standard overseas container.

Reusable packaging for overseas shipments has to be specified with the responsible Brose logistics planner and the Logistics of the destination plant.

In general, packaging components must be verified by the supplier in respect of the loads in overseas transport. Before being included in the logistics process, there must be consultation with and written consent from Brose for the packaging units.

In the case of non-compliance, Brose reserves the right to charge the respective supplier for additional costs incurred and to include packaging defects in the supplier evaluation.

### 3.10.2 Inner Packaging

The inner packaging and packaging tools, especially corrosion protection and drying material must be specified by the supplier. It has to ensure the quality-appropriate delivery, with sea transport (container on deck) as well as a pre and post-run of two weeks each (outdoor storage and truck transport) as a basis. Detailed information on durations (sea transport) can be obtained from the receiving Brose plant.

### 3.10.3 Other requirements for overseas packaging

In addition to the aspects described above, the following requirements must be considered:

- Use of four-way accessible loading units, the use of INKA, press board, plastic, cardboard or EURO pallets is not permitted
- Use of **stackable** loading units (not opened layers, no pyramid stacking), the marking of loading units with the note "not stackable" without approval by Brose is not permitted
- Protection of goods against wet, damp, salt water and corrosion
- Resistible packaging against transport and climate conditions
- When using wooden packaging, the labeling according to IPPC Standard, ISPM 15 (cp **chap. 8.3.3**) must be affixed
- For deliveries from the USA to Europe, the subject "Plant protection application" must be considered, as described in VDA recommendation no. 4525. <http://www.vda.de/de/downloads/678/>
- The rust protection in overseas packaging is to be defined and specified in such way that the packaged parts or goods are protected for a total of 6 months. The desiccant, VCI or intercept method can be used for this purpose. If the rust protection cannot be ensured by means of packaging, the parts must be wetted with additional preservation. Both the packaging rust protection and the additional preservation must be specified and coordinated with the responsible Brose logistics planning department.

### 3.11 Packaging of steel coils and steel bands

The packaging, preservation and shipping of steel coils and steel bands must take place generally in accordance with the VDI guidelines: 2373, 2698, 2699.

Unless there are specific details supplied with the order, the strip is to be dispatched in the following coil sizes:

**Table 9 - Dimensions of steel bands**

Internal Diameter	508 mm
External Diameter	max. 1,500_100 mm
Maximum coil weight	4,000 kg

The coils are to be dispatched flat on transport boards or on squared timber supports:

**Table 10 - Dimensions of shipping coils**

Transport boards, dimensions:	max. 1,500 x 1,500 mm
Squared timber, classification II, cross-section:	100 x 100 mm, minimum length: 1,150 mm
Pallet height:	max. 750 <sup>+100</sup> mm
Under clearance (DIN 15145)	min. 100 mm
Entry width (DIN 15145)	min. 600 mm
Strapping with steel band:	axial: min. 3 times, radial 2-3 times

Other loading devices are only to be used after consultation with the responsible Brose logistics planning.

Each unit must show the following information:

- Dimensions, weight, and Brose material number
- Quality identification in accordance with DVV or the respective DIN
- Galvanizing number
- Order number and name or symbol of the supplying plant
- Sample deliveries (test volumes) must be clearly identified as such. The orderers name must be stated.
- Materials that require documentation have to be identified with a clearly visible „D“. Special regulations see Brose-Norm 569142-xxx/1002



## 4 CUSTOMS AND EXPORT REQUIREMENTS

### 4.1 General information

The supplier is responsible for the correct - for Brose free of charge - creation of customers and export papers according to current legal requirements and for the correct customs planning for the import and export of goods. Brose reserves the right to charge the supplier for all costs resulting from incorrectly created papers that are relevant for customs handling.

#### 4.1.1 Inner-EU deliveries

Brose requires the delivery of preferred goods, insofar as the supplier is based on a country or delivers the goods from a country, which has concluded a corresponding preferred agreement with the EU. In this case, the supplier shall create a long-term supplier declaration for Brose according to EU Directive 1207/2001. If comparable trade agreements are available between the countries of origin and destination, we require the implementation of this agreement content in order to minimize the import cost for Brose. The supplier shall also submit the corresponding declaration to Brose in this case.

#### 4.1.2 Accompanying papers for international import deliveries

Depending on the means of transportation and country of delivery, the corresponding accompanying papers must be enclosed with the shipment. These may be:

- Verification of preference (EUR.1, EUR-MED, A.TR, UZ Form A, declaration of origin on invoice, or similar declarations to show a specific preferred origin)
- Certificate of origin (from the respective national chamber of trade and industry)
- Dispatch note T1 or T2 if applicable, or equivalent (transfer paper)
- Commercial invoice in triplicate
- Consignment notes (CMR/ CIM)
- Carnet-ATA
- Delivery notes
- IPPC-Standard ISPM 15 – Label on wooden load carrier
- Compliance with special requirements of the destination country (e.g. Brazil – cp. **chap. 7.3.4**)
- Export registration (standard document, registration EX1) – or analogous
- Non-Wood declaration regarding used packaging (separate document or alternatively, printed on the delivery note)
- Other required import documents because of international trade barriers (e.g. China – CCC-approval, Russia GHOST-R certificate or EU-CE certifications); any required safety datasheets

#### 4.1.3 Accompanying papers when shipping/exporting capital goods

By capital goods, Brose means plant, machinery as well as its parts and tools, which are needed for the direct or indirect production of series material. When delivering capital goods to a German Brose location but with **direct** invoicing to a foreign Brose location, the supplier shall provide the following documents with the delivery:

- Single supplier declaration according to Directive EC 1207/2001 (cp. **chap. 4.1.1**) with precise description of goods and additional details of the eight-digit goods tariff number (combined nomenclature)
- If applicable, written confirmation of the proportion of US goods in the goods/plant
- Written confirmation of an existing authorization requirement according to EU export control provisions (EU dual use directive with annex I), the German law on foreign trade and payments (AWG) and the German foreign trade regulations (AWV), stating the export list number. If there is no authorization requirement, we expect corresponding written information in the accompanying documents that the capital goods can be shipped / exported without requiring authorization
- All current customs documents must state the serial numbers of the capital goods in order to guarantee identity
- The supplier shall enclose all documents relevant for the destination country, which serve the smooth import of the goods

#### 4.1.4 Packing and shipping **production** and capital goods- HPE guideline

All **production** and capital goods must generally be packed correctly and appropriately before transport. It is hereby referred to the packaging guidelines of HPE (German Federal Association for wooden packaging material, pallets and export packaging <http://www.hpe-standard.com/>). It is recommended to consult an appropriate specialist company.

#### 4.1.5 Deviations

Addresses of the shipping location, recipient of the payment, or biller that differ from the address of the recipient of the order must immediately be reported to the ordering party.

#### 4.1.6 Invoicing/Commercial invoice

Unless stated otherwise in the order, the invoice must be submitted in triplicate. The printed invoice can be omitted if billing by EDI (Invoice VDA 4906 and Credit note VDA 4908). Free deliveries must also be shown on the invoice. The invoice must have a tabular form.

For customs handling, the invoices must contain the following information:

- Brose supplier number
- Brose EORI number (formerly customs number)
- Brose sales tax ID number and supplier's sale tax ID number
- Brose order or delivery schedule number (usually: 55xxxxxxxx)
- Brose material ID number and exact product description
- Note to payee for free deliveries
- Delivery note number, dispatch date
- Quantity, unit of measurement
- Value of goods (single and total price) – free deliveries and services must be designated with the remark "free of charge - value only for customs purposes"
- Price unit, currency unit
- Packaging price (for delivery condition ex. packaging)
- INCOTERM of the underlying transaction according to ICC 2010
- Separate note of the freight costs from the EU outer border to the inner-EU destination
- Number of packages
- weight (gross weight, net weight), **integer values only**
- Dispatch address / Unload bay
- For returned deliveries, the Brose delivery note / invoice number of the original shipment

For delivery of duty-free goods, the costs not in the price

- such as commission, licensing costs, packaging costs, Brose resources, and
- the value of repair work according to material and wage costs must be stated separately.

**Even for free deliveries (sample shipments, resources, etc.) the proper value must be stated (value corresponds to the series material or usual commercial price), whereby the remark "Free, value stated only for customs purposes" must be included. Incorrect information may lead to a reduction in duty in the destination country!**

Note: Overseas deliveries to the USA (sea freight) – Security requirements of the U.S. Customs and Border Protection, Federal Register 73FR71730

Analogous to the new security requirements of the U.S. Customs and Border Protection (Federal Register 73FR71730), overseas deliveries to the USA (sea freight) or for deliveries to Mexico via USA sea ports, must state the US-HTS number (US goods tariff number) on the pro-forma invoice or commercial invoice. The supplier will be provided the applicable US-HTS number with the general contract and the delivery call-off. The supplier is responsible for ensuring that the US-HTS number is correctly stated on the commercial invoice or pro-forma invoice for each material number.

## 4.2 Proof of origin

The supplier shall submit a written declaration regarding the origin of the delivered objects. This shall include both the preferred and non-preferred origin of the goods delivered to the Brose Group.

#### 4.2.1 Non-preferred origin

The non-preferred origin is uniformly defined for all member states of the EU in the customs code (ZK) and the ZK-DVO (Article 23 and 24). The non-preferred origin of goods is determined according to the country of its complete production or according to the country of the last significant and economically justified processing or finishing.

#### 4.2.2 Preferred origin

In principle, we require delivery of preferred goods.

#### 4.2.3 Verification of preferred origin for inner-EU deliveries

- For inner-EU deliveries, we expect to receive an original copy of a long-term supplier declaration (LLE) according to EU Directive 1207/2001. Single verifications enclosed with the goods shipment cannot be accepted. At the start of each calendar year, the Brose organization requires an LLE pre-worded by Brose for its entire series business. This must be used and returned to the requester within one month. Late submission of the LLE results in a negative supplier evaluation.
- Additionally, for goods of non-EU origin, which have already been cleared in the Community for free sale, the comment "already cleared for inner-Community free sale" and the origin country must be stated on the delivery documents.

#### 4.2.4 Verification of preferred origin for non-EU deliveries

For deliveries from third-party countries (non-EU members) or customs transit from EU suppliers, the preferred origin must be confirmed by a corresponding proof of preference. Proof of preference includes EUR.1, EUR-MED, A.TR, UZ Form A, declaration of origin on the invoice.

The supplier is liable for all disadvantages resulting from an incorrect or late submission of the supplier declaration or the corresponding proof of preference. When necessary, the supplier shall verify its details regarding the origin of the goods using an information sheet confirmed by customs (INF3 or similar).

#### 4.2.5 North American Free Trade Agreement NAFTA

All North American suppliers shipping within the NAFTA countries are to be required to provide NAFTA certificates to the customs' broker designated by Brose as well as other third-party designees working on behalf of Brose.

These certificates must be provided annually. Brose must be notified of changes in the status of materials or goods, which were previously certified as qualifying for NAFTA.

Please state the respective NAFTA status in your quote. All documents used to support the status must be kept for five years. Suppliers based in the EU confirm the preferred origin for NAFTA with a long-term supplier declaration (LLE) according to EU Directive 1207/2001. This also applies in cases where only a non-EU location of the Brose Group is supplied. In these cases, the LLE must be provided to the logistics department of the Brose Group at the Coburg location. Alternatively, a certificate of origin must be enclosed with every delivery.

### 4.3 Export-control-regulation of the European community (dual-use) and US-re-export-regulations

The EU export control regulations for goods, which can be used both for civil and military purposes (dual-use goods), must be observed. It is irrelevant here as to whether the company exclusively produces products for civil purposes. For all EU member states, a standardized goods list with authorization requirements has been specified. The supplier shall highlight any export authorization requirement for its goods as unrequested. In certain cases, we expect a precise description of the goods, the name of the export list position and, if applicable, the ECCN number of the American export list.

All goods (wares, software and technology) imported from the USA are subject to the American export conditions, as are all goods produced on the basis of American technology, under some circumstances foreign goods (e.g. German goods), which contain more than a specific proportion of American components, under some circumstances goods produced by American, imported, licensable machinery or plants. Various US goods may not be exported into certain countries without prior authorization from the US authorities. If you purchase goods from the USA, a corresponding reference to the US re-export conditions must be included in the delivery documents. In these cases, please advise us so that we are able to comply with the relevant US requirements for export.

### 4.4 Security in the supply chain

With Directive (EC) No. 648 /2005 (to change the customs code), the European Union introduced a series of measures in April 2005 to increase the security standard in international goods transactions. Faster and more targeted checks should guarantee the security of the internal market and the international supply chain. The creation of a so-called "authorized market participant" is one of the changes necessary because of the increased security requirements in international trade. As AEO-F holder, Brose is required to guarantee complete security of international supply chains, in order to prevent access, in particular, to wares and goods by unauthorized persons and to prevent the resulting misuses and risks.

We assume that our suppliers are either certified themselves as AEO-F (or equivalent e.g. C-TPAT or PIP) or at least as AEO-S (or equivalent e.g. C-TPAT or PIP) or are taking and have documented corresponding security measures that guarantee the security of the supply chain. Upon request, our suppliers are required to provide us with corresponding verification of the security of the supply chain to submit a security declaration. In particular, we refer here to the national and supranational requirements for the screening of business partners and personnel by the applicable "terror lists".

**Note: Entry Summary Declarations - ENS from 01.11.2011 - Imports from non-EU countries into the European Union Directive (EC) 648/2005 (13.04.2005), Directive (EC) 1875/2006 (18.12.2006), Directive (EC) 312/2009 (16.04.2009).**

From 01.01.2011 an Entry Summary Declaration (ENS) must be sent electronically to the European customs for each shipment from a non-EU country, which reaches the EU via the sea, air or land, which must contain various shipment data. This affects all shipments from non-EU countries (except Switzerland and Norway), which either:

- are imported into the EU
- arrive in EU by sea/air for onward transport to a non-EU country via road or rail
- is reloaded at a port (airport) of the EU for onward transport to a non-EU country
- arrives by ship or plane at a port (airport) in the EU and is transported onwards to a non-EU country using the same means of transport.

Prior registration must be submitted before the shipment reaches the external EU border. The following deadlines are derived:

- Deep Sea Container sea transport – at least 24 hours before loading
- Short Sea Container sea transport – at least 2 hours before arrival in the first EU port
- Break Bulk sea transport – at least 4 hours before arrival in the first EU port
- Long-haul flights (min. 4 hours) – at least 4 hours before arrival in the first EU port
- Short-haul flights (less than 4 hours) – by take-off at the latest

In principle, the ENS must already be submitted in the export country (non-EU country). As a supplier, you shall provide the transporter (shipping lines, airlines or carriers) with the following data for each shipment to the EU from 01.01.2011:

- Sender (name and address)
- Recipient (name and address)
- Any Notify/ 3rd party (name and address)
- Clear description of the goods
- HS-Code/ customs tariff number (6-digits)
- Package (type and quantity)
- Highlighting
- Container number (FCL)
- Gross weight
- UN-Dangerous Goods Code with net weight per UN number

Non-compliance with the registration deadlines may lead to the following:

- No loading in the port of departure (sea freight)
- Time-intensive and costly inspection by the customs authorities at the EU border or place of unloading
- Non-compliance with agreed delivery deadlines
- Storage costs and delivery bottlenecks

For outgoing airfreight shipments within the EU, Brose expects the respective supplier or service provider to fulfill the EU legal status of "known sender" or "regulated contractor" in full. If Brose is disadvantaged as a result of non-compliance with these requirements, Brose reserves the right to pass on these costs.

Please note that non-compliance with these requirements will affect your supplier evaluation.

## 5 DELIVERY DOCUMENTS AND CONTAINER LABELING

### 5.1 Delivery documents

For inner-European transports to a Brose consolidation point (Crossdock or for oversea shipment via OCC oversea consolidation center) as well as for direct transports to a Brose receiving plant, the documents/remarks listed in [chapter 4.1.2](#) must be created and enclosed/attached. Delivery documents need to be generated separately for each plant or unloading place or dock.

All documents must be attached to the goods by default. I.e. goods and documents form a unit and are transported together. A mere handing over of the documents to the truck driver is not accepted. **The supplier is responsible for the loss of documents during transport due to insufficient attachment and the resulting additional efforts.**

Example: red dispatch folder with delivery note, commercial invoice, pack list and export declaration attached to a loading unit.



Illustration 10 - Example red dispatch folder

### 5.2 Forwarding order (CMR)

Upon delivery to a Brose consolidation point or a Brose receiving plant, the receiver confirms the proper condition and completeness of the consignment by signing the CMR or forwarding order. In addition, the forwarder must obtain an official company stamp on the transport documents as proof of proper delivery. The supplier must ensure that the delivery documents are properly completed. He shall bear the costs for obtaining the information not on the delivery documents.

The forwarding order serves the Brose container management as a basis for the regular coordination of accounts and as a controlling instrument for the quantitative and qualitative control of containers on the arrival of goods.

For this purpose, Brose requires the following information to be entered in the forwarding order:

Table 11 - Required information on shipping orders


Designation	Contents
Sender	Supplier's name and address
Loading point	Dispatch point, possibly different from company headquarters, with international country codes and ZIP code
Supplier number	Current supplier name according to delivery schedule
Shipment, load, reference number	Serial reference number allocated to the consignment by the supplier.
Packaging	Type of packaging, container code and / or indication of disposable packaging (container codes cp. <a href="#">chapt. 8.7</a> , packaging ID of the respective overview)
Number	Number of containers

## 5.3 Delivery note

As a transport document and goods-accompanying slip the current version of the VDA recommendation (VDA 4939) or a compatible delivery note by ODETTE or AIAG must be used. Upon request from the receiving Brose plant, the delivery note can also be replaced by the VDA 4912 goods accompanying slip.

The data on the delivery documents needs to match exactly with the data transmitted in the ASN (cp. [chap. 2.4.3](#)) and the data on the attached KLT and GLT label (cp. [chap. 5.4](#)).

The delivery note must contain the following data:

- Delivery note number
- Country Code, postal code, place of dispatch and the supplier number
- Brose order or delivery schedule number (usually 55xxxxxxx)
- Brose material ID number and exact product description
- Weight (gross weight, net weight), **only integer values**
- Deliveries that are registered via the BroTAP must include the **Forw**arding **Order** (FWO) numbers from the BroTAP (cp. [chap. 2.2.7](#)) on the delivery note.
- Exact details must be given for each ID number with respect to:
  - Quantity of the respective ID Number
  - The packaging components belonging to the loading unit/package unit as well as their respective Brose packaging ID (container code), number of pieces and filling quantity
  - The container code is the basic information for the container management system and therefore must be indicated in the shipping documents for all deliveries. Delivery notes without Brose packaging ID/container codes cannot capture containers at goods receiving Brose or Crossdock. This results in incorrect container account stocks, difficulties in goods receiving and container management. Therefore, no payment can be made!
- For material subject to documentation or with batch requirements (D-parts, material with traceability):
  - The batch number of the material ID number
  - Each loading unit may only contain one batch of one material. If different batch numbers are delivered for one material number, a separate delivery position must be generated, packed and notified (ASN) for each batch number.
  - Any additional markings, such as the safety item marking  on the delivery note, can be agreed and requested on a plant-specific basis.

## 5.4 Container labeling

### 5.4.1 Label layout and content

A distinction is made between two Label types:

- GLT-Label: **Master-Label, for large load carriers without subunit (e.g. Gitterboxes) and loading units/containers with subunits or small load carriers (KLT, cardboard)**
- KLT Label: **Single-Label, for small load carriers (KLT, cardboard) as subunit of a loading unit**

In general, the standard according to VDA 4902 (the latest version is binding, cp. VDA website) with barcode "Code 39" shall be used. Alternatively, compatible solutions from ODETTE (Vers. 1 Rev. 4) or AIAG (AIAG B-10) can be used.



Exceptions are only permitted after written approval and validation by the Brose Logistics planner from central logistics and from the business division logistics. This applies for example to the PDF417 label with two-dimensional barcode (cp. [III](#))

**Brose is gradually striving for a global transition to the Global Transport Label (GTL) according to VDA 4994 (alternatively ODETTE Vers. 3 Rev. 1 or AIAG B-16). Since the use of the GTL label in Brose plants and supply chain processes must be checked individually, suppliers who would like to priorly use the GTL label globally require written approval and validation by the Brose logistics planner Central Logistics.**

**The use of the GTL label is only valid with the DUNS number (company ID assigned by the agency Dun & Bradstreet), but not with the company ID of JAPLA or ODETTE.**

The label layouts and content required by Brose for the VDA 4902 label are explained below. The following standard specifications must be fulfilled for the whole Brose group.



**GLT label according to VDA 4902:**

(1) Receiver <b>Brose Schließsysteme GmbH &amp; Co. KG</b> <b>DE 42369 Wuppertal</b>		(2) Unloading point/storage location <b>WU100</b>	
(3) Delivery note no. (N) <b>368169</b> 		(4) Supplier address <b>OMEGA TECHNOLOGY PLASTIC DE 49356 Diepholz</b>	
		(5) Net weight <b>25,00</b>	(6) Gross weight <b>56,00</b>
		(7) Quantity of packaging <b>1/4</b>	
(8) Part number customer (P) <b>987581-102</b> 			
(9) Quantity (Q) <b>12800</b> 		(10) Description <b>Sub Rod SL-R</b>	
		(11.2) Customer no. of packaging (B) <b>304413-000</b> 	
(12) Supplier ID (V) <b>9837</b> 		(13) Date <b>D16.11.19</b>	(14) Revision Status <b>103</b>
(15) Package no. (M/S) <b>146541001</b> 		(16) Batch No. (H) <b>5201531011</b> 	
(17) OMEGA TECHNOLOGY PLASTIC GmbH & Co.			

**Illustration 11 - GLT label according to VDA 4902**

"Safety Item"

Special labeling symbol for parts that require documentation

(8) Part number customer (P) <b>657412-101</b> 	Made in Germany 
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**Illustration 12 - Special labeling symbols "Country of Origin" and "Safety Item"**

**KLT label according to VDA 4902:**

(1) Receiver <b>Brose Schließsysteme GmbH &amp; Co. KG</b> <b>DE 42369 Wuppertal</b>		(2) Unloading point/storage location <b>WU100</b>	(3) Delivery note no. <b>368169</b> 
(8) Part no. (P) <b>987581-102</b> 			
(9) Quantity (Q) <b>800</b> 		(10) Description <b>Sub Rod SL-R</b>	
		(11.2) Customer no. of packaging (B) <b>3044EA-000</b> 	
(12) Supplier ID (V) <b>9837</b> 		(13) Date <b>D16.11.19</b>	(14) Revision Status <b>103</b>
(15) Package no. (S) <b>146541002</b> 		(16) Batch No. (H) <b>5201531011</b> 	
(17) OMEGA TECHNOLOGY PLASTIC GmbH & Co.			




**Illustration 13 - KLT label according to VDA 4902**

(8) Part number customer (P) <b>657412-101</b> 	
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**Illustration 14 - Special Labeling symbol "Safety Item"**

## Overview of data elements:

**Table 12 - Overview of data elements on GLT/KLT labels**

No.	Field description	Contents	Barcode ID (prefix)	Example	GLT	KLT
(1)	Receiver, short	Address Brose receiving plant short: Name Brose receiving plant Location (Country code, ZIP-code, city) <b>NOT unloading point location</b>	-	Brose Schließsysteme GmbH & Co. KG DE 42369 Wuppertal	M <sup>1)</sup>	M
(2)	Unloading point/storage location	Usage key for the unloading point or transfer point to Brose (cp. call-off or <b>chap. 9.II</b> )	-	WU100	M	O <sup>2)</sup>
(3)	Delivery Note No.	Number allocated to the delivery note by the supplier	N	368169	M	O <sup>3)</sup>
(4)	Supplier Address	Supplier name and address short: Supplier name Location (Country code, ZIP-code, city)	-	OMEGA TECHNOLOGY PLASTIC DE 49356 Diepholz	M	-
(5)	Net weight	Weight of the package without loading unit [kg]	-	25,00	M	-
(6)	Gross weight	Weight of the package with loading unit [kg]	-	56,00	M	-
(7)	Number of packages	No. of the respective package (single item) / number of packages for this delivery (total number)	-	1/4, 1/1 etc.	M	-
(8)	Part number customer	10-digit Brose ID number  If required for oversea shipments, the country of origin can be inserted here. (cp. <b>chap. 7.3.2</b> )  For parts that are subject to documentation, the special labeling symbol for safety item  must be entered in the far right in field (8) or in field (16) batch number.	P	987581-102  Made in Germany  	M	M
(9)	Quantity	Filling quantity of ID number in the package GLT-master label: filling quantity loading unit KLT-single label: Filling quantity of the packaging unit	Q	12800 pcs.	M	M
(10)	Description	Description of the goods	-	Sub Rod SL-R	M	M
(11.2)	Customer's material number for packaging	Packaging ID number assigned by the customer to the packaging: <sup>4)</sup> GLT: ID of the sub-pallet, KLT: container ID	B	Pallet: e.g. 304413-000 KLT: e.g. 3044EA-000	M	M
(12)	Supplier no.	ID number allocated by Brose to the supplier	V	9837	M	M
(13)	Date	Production date/date of shipment: If at the time of label printing, the shipping date is known, print delivery date (D), otherwise production date (P)	-	D16.11.19 Alternatively: P14.1.19	M	M
(14)	Change status, design	Drawing status of what is being delivered: last 3 numbers of the drawing ID, (can deviate from material no.), alternatively, the field is "empty"	-	103 Alternatively: -	O	O
(15)	Package number (max. 9 characters)	Unique ID (per year), which the supplier allocates to a package. <b>GLT-master-label:</b> loading unit with individually marked KLT: barcode ID = M loading unit without KLT: barcode ID = S. <b>KLT-Label:</b> Barcode ID = S	see left: M / S	Master M: 146541001 Single S: 146541002	M	M
(16)	Batch No (max. 10 characters)	Number, which the manufacturer allocates to a batch or production lot. If material is not subject to documentation, then field "empty" (if applicable, Safety Item symbol  if necessary and not yet in field 8)	H	5201531011 Alternatively: -	M	M
(17)	Supplier's name	Supplier's name	-	OMEGA TECHNOLOGY PLASTIC	O	O



<sup>1)</sup> M = Mandatory field

<sup>2)</sup> O = Optional field

<sup>3)</sup> Optional field, provided that electronic ASN notification of the delivery, as well as unique package number (cp. field no. (15))

<sup>4)</sup> Brose Packaging ID:

- For universal load carriers, cp. **chap. 8.7 Catalogue of standard packaging items**
- For Brose Standard packaging (returnable and one-way), cp. **chap. 8.7**
- For special containers: issued by the Logistics Brose Group. If packaging material number is not known, please reach out to your Brose Logistics Planner.

The data on the GLT- and KLT-labels must match the data transmitted in the ASN. The packaging structure transmitted in the ASN (GLT packaging number and referring KLT packaging numbers) needs to match exactly with the delivered packaging structure of the loading unit (packaging numbers on labels). Cp. **chap. 2.4.3 Advanced Shipping notification (ASN)**

#### 5.4.2 Label sizes and quality

The size and quality of the labels may vary depending on the size of the packaging and the region in which it is used. To ensure perfect machine and manual legibility, the recommendations of the VDA (4902, 4994) and AIAG (B-10, B-16) on format and paper quality must be complied with:

**Table 13 - Regional label sizes and quality**

	Europe/Asia	NAFTA	Paper quality
GLT (Master) Label	A5 (210mm x 148mm)	Half-Letter (215,9mm x 139,7mm)	Insert label: min. 120 g/m <sup>2</sup> Adhesive label: min. 80 g/m <sup>2</sup>
	A6 (148mm x 105mm)	6in x 4in (152,4mm x 101,6mm)	Combined label: 130-170 g/m <sup>2</sup>
KLT (Single) Label	210mm x 74mm	8.27in x 2.91in (210mm x 74 mm) 6in x 4in (152.4mm x 101.6mm)	Paper: white with black print, machine smooth, moisture resistant Adhesive: permanent adhesive, moisture resistant, easy to remove
	<u>For flat KLTs/boxes:</u> 210mm x 42mm	<u>For flat KLTs/boxes:</u> 210mm x 42 mm (8.27in x 1.65in)	

#### 5.4.3 Barcode Specification

The size and quality of the barcode may vary depending on the kind of Barcode specification which is used. To ensure perfect machine legibility by all Brose scanners, the recommendations of the VDA (4902, 4994) and AIAG (B-10, B-16) on Barcode specifications which are summarized in the following shall be complied with:

**Table 14 - Barcode specification**

Barcode Parameter	VDA 4992 / AIAG B-10	VDA 4994 / AIAG B-16
Coding	Linear Barcode 39 (ISO/IEC 16388)	Linear Barcode 128 (ISO/IEC 15417)
Measurements (min. height of barcode)	GLT Label: 13mm (0.51in) KLT Label: 6mm (0.24in)	GLT Label: 17mm (0.67in) KLT Label: 15mm (0.59in)
Smallest bar (module width, X value)	Brose prefers 0.43mm  Tolerance between 0.33mm ± 0.11mm (0.013in) and 0.43mm ± 0.15mm (0.017in)	Tolerance between 0.51mm (0.020in) and 0.64mm (0.025in)
Ratio small to wide bars	3.0:1 Tolerance between 2.8:1 and 3.2:1	Tolerance between 2.2:1 and 3.0:1
Quiet zone	Left and right min. 6.4mm (0.25in) Additional 3mm at lower end of KLT label	
Bar code quality requirements	Minimum requirement ISO 15416 / 15415 (for 2D) Minimum print quality grade 3 (or B)	

#### 5.4.4 Label attachment

For the label attachment, the following must be observed:

- For deliveries in and to Europe and Asia, adhesive labels on GLTs and KLTs are generally forbidden. Only the use of adhesive dots to attach the labels is permitted as long as they do not cover the barcodes. (cp. Illus. 15).  
For deliveries in and to the NAFTA region, adhesive labels are permitted (cp. Illus. 16).
- 1 Single-label per package (KLT/cardboard). For KLTs and small load carriers, the label must be pushed into the slip pocket provided for this purpose **or attached to the predefined marking**.
- 2 Master-labels per loading unit (GLT), one each on the bottom right on both front sides (short sides), **for oversea deliveries 2 Master-labels per loading unit, one each on the short and the long side so that loading units can be identified even when stacked**
- Labels may not extend beyond the outer contour of the packaging and may not cover each other.
- When attaching the labels, it must be ensured that any old (and thus invalid) labels and adhesive residues are removed, pasted over or made unrecognizable. Old fastening elements (e.g. clips, wires) must be removed **as well**.
- Elements used to secure the loading units (e.g. strapping) should not impede the readability of the labels.
- The tag must be perfectly legible by machine and manually at the destination. The label and its content must be clear and resistant for various transport and environmental conditions. Faded and blurry labels are not permitted. For perfect legibility, the label attachment must not create any waves in the paper.

Deviating agreements regarding the label positioning can be made between the supplier and the plant logistics after written approval.

Additional tags may only contain information for the recipient/transporter (e.g. change information, hazardous goods label, safety information). These must be attached in a way that they do not extend over the outer contour of the packaging.



Permitted	Not permitted
	

Illustration 15 - Regulations for placement of labels on VDA KLT

For NAFTA-sized containers the labels have to be placed within the according space (Kennedy-Label).

Permitted	Not permitted
	

Illustration 16 - Regulations for placement of labels on NAFTA KLT

## 5.5 Traceability of supplier parts

For further information about the handling of parts subject to documentation or with specific requirements for verification see [Brose Homepage > Purchasing > Download center > Handbooks / Templates > Brose Quality Management Regulations](#).

The additional requirement Traceability of Supplier Parts (Packaging Labels with 2D-Barcode) applies to all supplier parts of the business division Drives, for which a particular traceability and archiving by the supplier (material batches, process data, etc.) is required.

## 6 SECURITY OF SUPPLY

### 6.1 Logistics for JIS plants

With the production-synchronous assembly and delivery of products to the end customer within a prescribed time window, there are no noteworthy finished goods stocks in JIS (Just in Sequence) plants.

The availability of OK parts is correspondingly important.

The supplier is responsible for ensuring that its supply security is guaranteed with its deliveries to the respective Brose location at all times - even in emergencies.

Therefore, the supplier is required to document the entire process chain and to define and implement measures - see checklist JIT-QVP, this is provided as required with the documents for advanced quality planning.

The following regulations regarding supply security serve to secure the material flow process chain - availability of OK parts - and are part of the suppliers offer.

### 6.2 Production capacity

The production capacity must be designed such (in a way) that short-term capacity fluctuations can be compensated.

Delivery must be ensured for variety-rich parts even if slow sellers experience an extreme and rapid increase in numbers.

### 6.3 Emergency strategy

The supplier must have an integrated strategy that ensures the supply of O.K. parts at all times. **A risk assessment should identify which processes to be documented in the contingency procedures.** Such contingencies may be:

- A delivered batch cannot only partially be used or
- There are problems with subcontractors
- Employees leave
- Transport fails
- **Equipment fails**
- **Packaging fails**
- **EDI fails**

In this case, the supplier must disclose what problems have occurred and how long it takes to overcome them.

The supplier must explain the emergency strategies and have Brose approve them (single agreements regarding supply security).

Problems that are found by the consumer have to be checked. The cause for the problem must be eliminated and the responsibility for these defects clarified between the supplier and Brose by mutual consent.

## Overview of conduct in an emergency:

**Table 15 - Overview of correct behavior in emergencies**

Causer	Problem	Solution	Responsible for problem solution	Responsible for costs
Supplier	The goods are not available for dispatch to the agreed upon schedule (fault of supplier)	Forwarder informed → Collection delayed → Timely delivery facilitated by the forwarder	Supplier	Supplier
		Queries to Brose scheduler → Late delivery is possible		
		Special transport → Timely delivery secured		
	The goods are not delivered at Brose according to the agreed schedule	Brose informed → Joint clarification of measures together with forwarder → Timely delivery facilitated by forwarder	Supplier	Supplier
		Queries to Brose scheduler → Late delivery is possible		
		Replacement delivery coupled with special transport → Timely delivery is guaranteed		
	Goods are in the wrong packaging, as the defined container is not available in adequate quantities (fault of supplier)	Pack in pre-defined alternate containers (part of the sourcing project)	Supplier	Supplier
		Special transport of empties → Timely provision or delivery of bought-in parts in designated containers is guaranteed		
Brose	The goods are not available for dispatch to the agreed upon schedule due to short-term orders or changes to order by Brose	Production plan is changed by the supplier → Goods are available for collection according to schedule or delivered to Brose	Supplier	Brose
		Special transport → Timely delivery secured	Brose	Brose
	Goods are in the wrong packaging, as the defined container is not available in adequate quantities (fault of Brose, no or delayed delivery of containers)	Definition of alternative containers and repackaging at Brose	Brose	Brose
		Special transport of empties to supplier		
Relating to all problems		The supplier must ensure that there is a sufficient quantity of bought-in parts according to the issued production and material approvals and these are available to Brose as a reserve for short-term production movements.	Supplier	
		The causer of the problem must immediately (within one hour) inform and must agree with all partners by phone and/or fax about the type of problem, possible causes, impacts and the required steps for solving the problem and must guarantee the implementation of the solution. The responsibility for problem solving essentially lies with the causer. All participants shall support the problem solving. The resulting costs shall be borne by the causer. For circular runs and one-way routes, it must be ensured in principle that all subsequent suppliers and/or customers are immediately informed of any problems.	Supplier, Brose, logistics service provider	
		100 % availability must be ensured by the supplier between the hours of 7.30 a.m. and 5.00 p.m. <b>local time of the respective supplier. In all cases (including public holidays or during shutdowns) an emergency contact with the necessary expertise must guarantee the availability for Brose.</b>	Supplier	
		All specialist departments can be reached via the gates of the plant.	Supplier	

## 6.4 Emergency lead time and a possible security-stock

The supplier requires a defined lead-time in order to be able to react to problems in the supply chain. This is the time between notification by the supplier and delivery of the OK goods to Brose.

This has to be represented to Brose by the supplier and documented with the associated processes and times (emergency plan) and ensured through suitable measures (Brose supply security).

Both Brose and the supplier are to check the necessity of a security-warehouse near to the Brose site together.

The parts stored in the security-stock are to be accessible at any time.

## 6.5 Safety-stock

Each supplier must inform Brose about the safety-stock level of the finished goods for delivery.

## 6.6 Change management

The supplier is to ensure that an index change is realized in time with the required quantity and that the following delivery is done with the new index only. The supplier has to notify planned changes to Brose without any delay and present the relevant releases immediately.

For further information about reporting changes, see Brose Homepage > Purchasing > Download center > Manuals > Brose Quality Management Regulations.

## 6.7 Legal consequences for violations of Brose logistics regulations

If a supplier culpably violates the regulations in the Manual Procurement Logistics, Brose reserves the right to charge the supplier **a lump sum for any additional process costs incurred**. The supplier is free to prove that the expenses claimed are excessive. Brose is entitled to offset the debits using the self-billing/credit note procedure.

Performance units (LEs) serve as the basis for calculating the charges. **These are defined for the respective Brose plants based on the internal hourly rates**. These charges cover the costs incurred by Brose (personnel, space, production equipment, general expenses) which are necessary to correct the corresponding errors before they lead to further malfunctions. Brose expressly reserves the right to claim compensation for damages beyond these charges. This includes, in particular, special transport necessary because of a violation listed below.

For the resulting administrative effort of complaint processing, 1.75 LEs per complaint will be charged in addition to the LE's for the violations listed below. The following work and services are included in the administrative expenses:

- Complaint to the supplier manager (Purchasing) in the plant
- Troubleshooting
- Creation of a complaint in the IT system, block parts and, if applicable, order return / rework.
- Letter of complaint, with pictures, to supplier
- Monitoring, internal check of permanent corrective actions by the supplier, close complaint, create, send and book charge
- Archive complaint

Analogous to the violations listed in the Brose Supplier Management Manual (see Brose Homepage > Purchasing > Download Center > Handbooks / Templates > Supplier Management), the LEs listed in each case will be charged if they are culpably committed:

**Table 16 - Charged LEs per violation**

Charge Amount	Violation
<b>1 LE per material number</b>	<ul style="list-style-type: none"> <li>• Under- / Oversupply, missing parts</li> <li>• Transport fault (caused by supplier)</li> <li>• Delivery / pick-up outside defined timeslot</li> <li>• Late / incorrect advice of transport requirement</li> </ul>
<b>1 LE per process</b>	<ul style="list-style-type: none"> <li>• Partner at supplier almost not available, intensive work to get information</li> <li>• Non-reliable information, translation efforts</li> <li>• Insufficient flexibility regarding requirements or change requests from Brose</li> <li>• Poor / wrong container account-management</li> </ul>
<b>1 LE per delivery (delivery note / invoice)</b>	<ul style="list-style-type: none"> <li>• Wrong (according instruction), dirty or damaged packaging, use of environmentally compatible packaging is not guaranteed</li> <li>• Missing or wrong labels / mixed materials (label not according to Brose requirements, wrong / insufficient label content), missing label of dangerous materials</li> <li>• Customer Item-Number is missing on debit-note</li> <li>• Missing / wrong content</li> <li>• Missing / wrong Avis</li> </ul>
<b>2 LE per delivery</b>	<ul style="list-style-type: none"> <li>• Missing / wrong delivery documents (delivery note / invoice)</li> <li>• Missing / incorrect ASN</li> <li>• Insufficient tie down (operational safety, road safety)</li> </ul>

Below is an example of the calculation for a charge:

A supplier delivers an article number in a disposable packaging instead of the agreed reusable packaging and despite the contractual agreement does not advise the shipment via ASN to the Brose plant in Coburg.

Calculated as follows:

1. Work of 1.75 LE is charged for the organizational work of troubleshooting, creating a complaint, monitoring, creating a charge, archiving the complaint.
2. Work arises from the use of non-agreed packaging for storage and removal, commissioning and additional work for disposal of the disposable packaging. This is calculated at 1 LE.
3. An omitted EDI ASN means that the Brose planning system does not take into account the material requirement plan and the delivery has to be recorded manually in the system when the goods are received. 2 LEs are charged for this.

This gives the total:  $1.75 \text{ LE (item 1)} + 1 \text{ LE (item 2)} + 2 \text{ LE (item 3)} = 4.75 \text{ LE}$

## 7 LOGISTICS SERVICES AND OVERSEAS SHIPMENTS

The respective operators are selected by Brose and fixed prices are negotiated for the services offered. Services purchased by Brose are paid for by Brose.

The regulations of this manual also apply to deliveries by service providers.

### 7.1 Crossdock

- The suppliers use the crossdock named by Brose.
- The supplier ships clearly plant-specifically labeled goods with all delivery documents (consignment note, delivery note, customs documents where required) and ASN.
- Additionally to the registration via BroTAP for European transports (cp. **chap. 2.2.7.1**) the supplier reports the load per recipient on the day before delivery in Crossdock, stating the number of loading units with the respective weight.
- The delivery is to be made within a defined timeslot before the relevant transport. The timeslot for the delivery has to be agreed upon between supplier and operator.
- The delivering trucks must be suitable for ramp unloading via the rear.
- The Crossdock operator checks the delivered goods in accordance with the accompanying documents and looks for obvious damages.
- The Crossdock operator loads the transport units and creates all transport documents for each outgoing load to a Brose plant. The goods are loaded as they are delivered. The Crossdock operator **does not** change the packaging structure.
- Reusable packaging is exchanged by arrangement or 1:1 by the respective Crossdock operator locally, e.g. upon delivery to the location Brose Hallstadt via the consignment warehouse D + S Ebersdorf, the empties are exchanged by D + S for Brose Hallstadt 1:1.

### 7.2 Consignment warehouse

#### 7.2.1 Delivery conditions

In case of the annex to Incoterm "Consignment warehouse" (**chapter 2.2.3**), Brose maintains a consignment warehouse where the allocation of stocks and scheduling to suppliers takes place within a cooperative system. In addition to the respective Incoterm, the following agreements apply:

- The transport of the supplier's goods to the consignment warehouse shall take place at the cost and risk according to the agreed Incoterm(s).
- If Brose is responsible for the transport from the supplier to the consignment warehouse, Brose shall guarantee a maximum transport time until arrival at the consignment warehouse.
- The supplier shall be responsible for the customer's stock within defined fluctuations and minimum and maximum stock levels. If min/max-stock levels are not defined, the delivery must be made at least 24 hours before the needed date according to the requirement preview.
- Brose shall bear the costs and risk for storage and handling in the warehouse, as long as the stocks remain below the defined maximum level. Storage costs and risks, which exceed the defined maximum stock level, shall be borne by the supplier.
- The supplier delivers the goods in the agreed packaging. If the supplier culpably does not deliver in the agreed packaging, he bears the costs and the risk of necessary repackaging.
- The goods are commercially recorded as receivables by Brose upon leaving the consignment warehouse.
- The operator of the consignment warehouse shall provide the supplier with a daily report of the movements.
- Withdrawals are booked via a daily summary delivery note, which is the basis of the credit note to the supplier.
- For deliveries via consignment warehouses, particular tax regulations must be observed.

#### 7.2.2 Process sequence

- The supplier ships clearly plant-specifically labeled goods with all delivery documents (consignment note, delivery note, customs documents where required) and ASN and notifies the load per receiving Brose-plant on the day before delivery at the consignment warehouse, stating the number of loading units with the respective weight.



- The delivery must take place within a defined timeslot. The timeslot for the delivery has to be agreed upon between supplier and operator.
- The delivering trucks must be suitable for rear ramp unloading.
- The warehouse operator inspects the goods for obvious damage and the number of loading units against the papers.
- Reusable packaging is exchanged 1:1 by the respective warehouse operator, e.g. upon delivery to the location Brose Hallstadt via the consignment warehouse D + S Ebersdorf, the empties are exchanged by D + S for Brose Hallstadt 1:1.
- The warehouse operator removes the goods required by the Brose plants per Kanban and creates all transport documents for each outgoing load to the Brose plant.
- The supplier receives a movement report every day from the operator as the basis for the credit notes from Brose

### 7.2.3 Offered services

In general, the following basic services are offered:

- Storage:** The warehouse operator receives and stores the delivered goods in the delivery packaging. Mixed pallets are split into single-product pallets before storage. The warehouse management system meets the requirements of FIFO (First-In, First-Out). Generally, batch tracing is possible.
- Repacking:** If the delivery container does not match with the container required by Brose on the shop floor, the goods will be decanted.
- Order picking:** The ordering Brose locations are typically included in a Kanban system with the warehouse and are supplied by the warehouse operated in defined cycles according to consumption.

## 7.3 Overseas shipments / Consolidation Centre

### 7.3.1 Delivery conditions

The standard delivery conditions for the overseas delivery process via a Brose Overseas Consolidation Centre (OCC) is "FCA [stowing location/consolidation center Brose]". The transfer of costs / risk is the named Brose stowing location.

General "Overseas delivery" flow chart via Brose storage location:

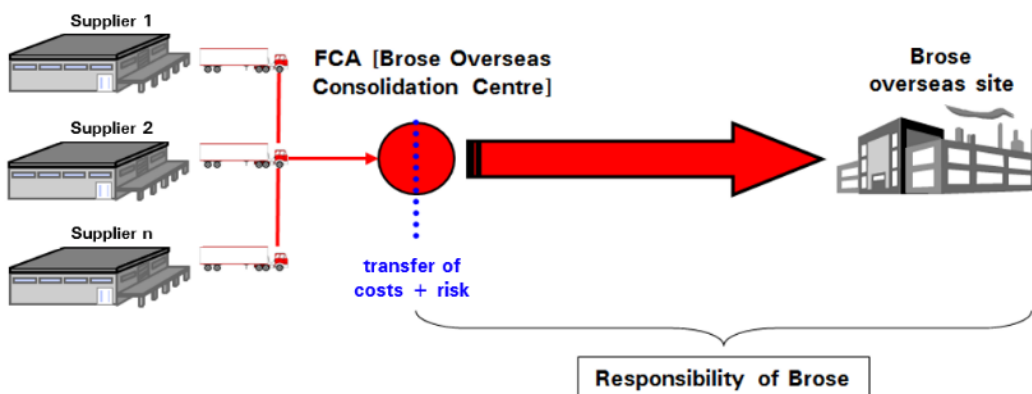


Illustration 17 - Flow chart "overseas shipment"

### 7.3.2 Process sequence

The following diagram shows an example of the most important steps and requirements in overseas shipping:

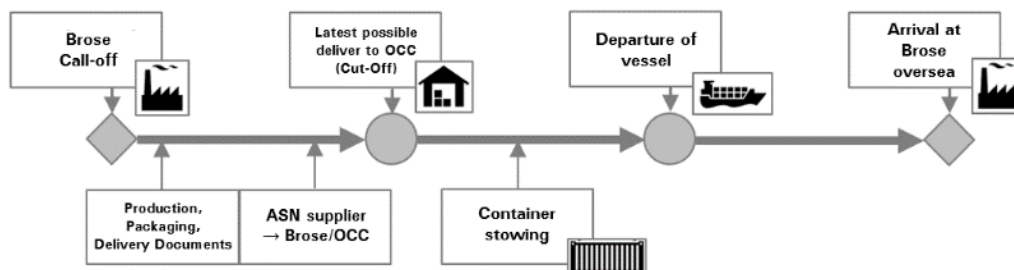


Illustration 18 - Essential steps of overseas shipping

- The dates sent in the Brose call-offs represent arrival dates at the storage location (OCC)
- The supplier has to ensure the seaworthy packaging (stability, protection against humidity, water and salt) as well as the attachment of the required delivery documents and container labeling as stated in **chap. 5**
  - Please note:  
If your documentation is not complete, a sea container can be stopped at any time by the authorities in the country or export or recipient. Equally, airfreight shipments ex Brose OCC, which touch US territory, can be stopped and seized by the US authorities if documentation has been omitted. Any additional costs resulting from missing / incorrect documents shall be borne by the Supplier.
- As part of the changeover to a new overseas process, a notification of overseas deliveries via ASN directly to the receiving Brose plant will be required in the future. A delivery notification by e-mail can be omitted in this case.
- The supplier has to ensure on-time delivery to the Brose stowing location. Acknowledgement of correct delivery must be made as described in **chapt. 5.2**. To avoid unnecessary truck downtimes, a time window for delivery at the stowing point shall be booked for shipments ex Europe.
- The respective time schedule (cut-offs, incl. arrival dates at stowing location) has to be coordinated by the supplier with the responsible receiving Brose plant.
- The loading units are loaded according to the FIFO principle and depending on the destination are subject to a defined time limit (cut-offs) for the individual process steps.

#### Delivery notification

Overseas shipments, which are delivered via a Brose stowing location, must be reported per e-mail or shipping notification (ASN) to the stowing location by the supplier no later than the time of shipping in order to facilitate container load planning.

For shipments ex Europe:

The following minimum content must be sent with the shipping notification to the Brose storage location RAUH [export@rauh.biz](mailto:export@rauh.biz)

- Brose Supplier number / supplier name
- Number and description of the loading units
- Dimensions and weight of loading units [in mm/kg]
- Total weight of consignment [in kg]
- Delivery note numbers
- Receiver / target group Brose Group
- Stackability
- Arrival date / time in the Brose OCC

In exceptional situation, for exports from Europe, the export documents can be sent as .pdf documents by e-mail to the European storage location. Email address: [export@rauh.biz](mailto:export@rauh.biz).

The following information is mandatory in the subject line: **Supplier name - Brose plant - Date - Delivery note number**.

### 7.3.3 Packaging

The packaging requirements relevant for overseas transport are shown in the chapters listed in the following table.

The packaging must be determined by the sender. It must safeguard quality-assured delivery, whereby sea transport (container on deck) and a pre-run and post-run of two weeks each (storage outside and transport by truck) must be assumed.


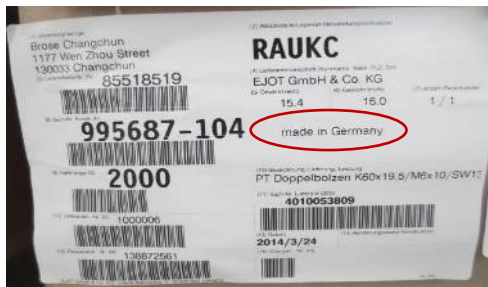
Please note: In the case of non-compliance with these regulations, Brose reserves the right to charge the respective supplier for additional costs incurred and have packaging defects affect the supplier evaluation.

**Table 17 - Packaging requirements for overseas transport**

Chapters	Description
8	Specification, design of overseas packaging and container-optimized dimensions
3	General Requirements
8.3	Requirements for pallets
5.4	Requirements regarding container labeling

The shipments to China:

The outer packaging must clearly show the good's country of origin (cp. Illust.). This must be ensured by a marking on the packaging or by using a special sticker or label – e.g.: “Made in Germany”, “Product of Spain”, “Manufactured in Czech Republic”.

Solution 1): Packaging	Solution 2): Printed on label
	

**Illustration 19 - Solutions for labeling the country of origin**

### 7.3.4 Additional documentation requirements for Brazil

According to Brazilian import legislation, a **packing list** is also required in addition to the documents listed above, which lists the exact content of a goods shipment.

Documents are generally only accepted in the **original (no copies)** and must not contain any handwritten notes!

Moreover, commercial invoices and packing lists must show the company logo, must be signed in **blue ink** (documents with black ink may be copies) and must be **stamped**.

The required information for the invoice and packing list is specified in the following illustrations:

**COMMERCIAL INVOICE**

\*\*\* Use the logo from your factory \*\*\*

Exporter / Shipper (Company name)  
Address:  
Zip Code - City - Country  
Contact: Mr/Ms. // Telephone/Fax

Manufacturer (Company name):  
Address:  
Zip Code - City - Country  
Contact: Mr/Ms. // Telephone/Fax

Payment Terms  
Freight Condition:  
Incoterms:

Invoice No:  
Date:

Sold to / Consignee (Company Name)  
Address:  
Zip Code - City - Country  
Contact: Mr/Ms. // Telephone/Fax

Qty/Unit	Description of goods with part number	Unit Price (USD)	Total Amount (USD)
57 600	COMALFATOR - # A23942-110	0.23	13 248.00
1 800	WINDOW REGULATOR - # 917429-201	4.97	9 042.40
50 000	END STOP - # 964500-100	0.50	25 000.00
	TOTAL		47 790.40

**Way of Shipment :**  
Port or Airport of Origin:  
Port or Airport of Destination:

**Country of Supply:**  
**Country of Shipment:**  
**Country of Origin:**

**BROSE DO BRASIL LTDA.**

**SIGN FROM MANUFACTURE (IN BLUE)**

**Must have the stamp.**

## 8 BROSE PACKAGING SPECIFICATION

### 8.1 Introduction

Brose's packaging specification serves to develop an optimal packaging system based on the following specifications. This should ensure a smooth flow of materials between suppliers and Brose, considering all qualitative, ecological and economic aspects.

In addition, it is the supplier's responsibility to ensure, both internally and externally, that all delivered parts are correctly and appropriately preserved, protected and packed so that they reach their destination at Brose safely. The supplier is obliged to comply with the provisions of this manual and to take into account all national and international regulations.

### 8.2 Packaging Concepts

#### GLT-concepts:

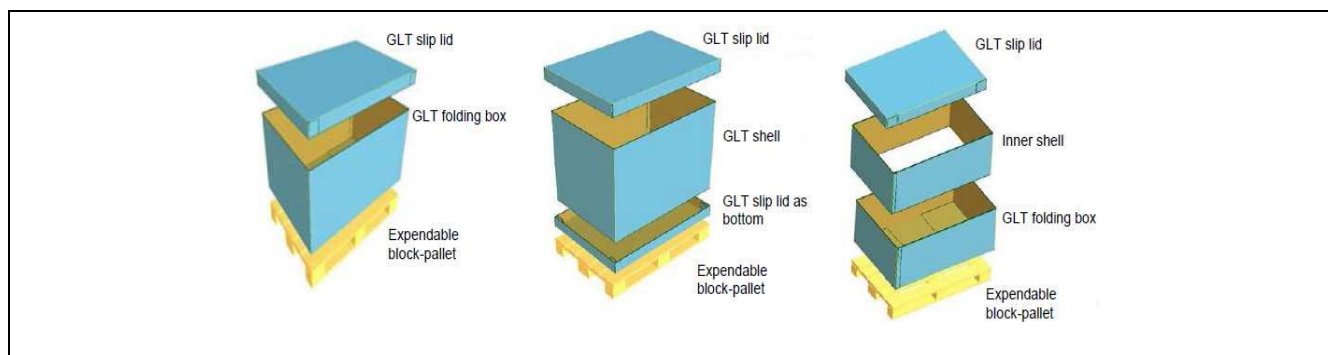


Illustration 22 - GLT packaging concepts

#### KLT-concepts:

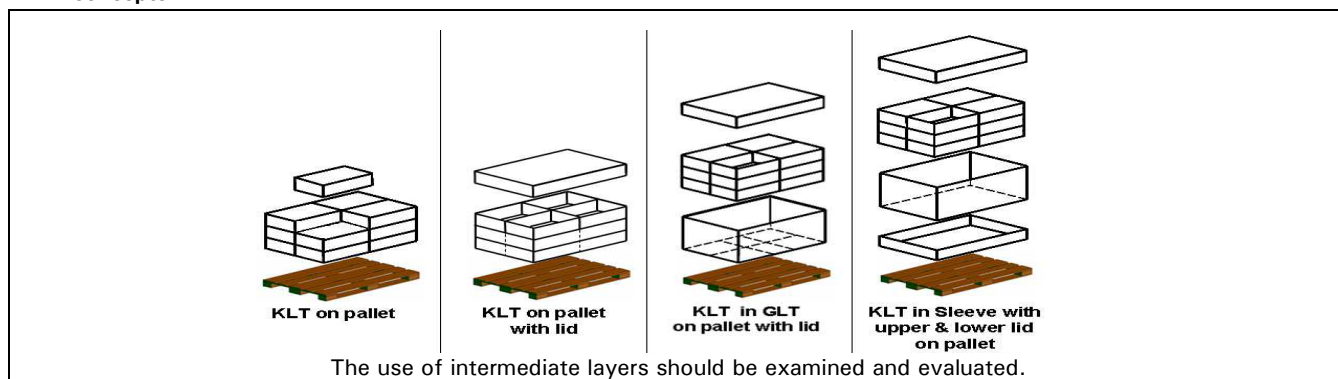


Illustration 23 - KLT packaging concepts

The GLT-systems and bundles of KLT (including the lid) should in best case have the size of the pallet.  
The lid overlap must not exceed the max. of 1.5 cm (right and left side together).

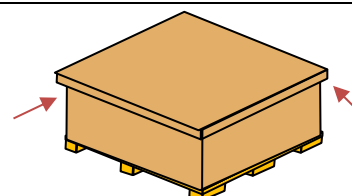


Illustration 24 - Maximum size of GLT/KLT

## 8.3 Concepts of pallets

This guideline sets out standards for the construction, implementation and handling of reusable and expendable pallets.

Pallets must be strong enough to carry the load of approx. 1,000 kg (in bottomless rack storage). Following price-aspects, pallets should not be overdesigned, either. The following requirements must be considered:

- all pallets must have a **four-way entry design**
- **wood-pallets** must have both top and bottom deck-boards and the correct **IPPC mark**
- **Infestation** of post beetles, termites and other wood-destroying insects are not permitted in any pallet parts
- **Pressed-wood pallets** are not acceptable for any shipment to Brose

For a secure dynamic and static load, appropriate wood material and fastening elements must be used. Fastening elements (helically threaded nails, also called screw nails) for joining the pallet components ensure a secure and stable construction. Boards and blocks must be joined without splintering the wood materials.

Dry pallets are stronger; therefore, the moisture-content of pallets should not go beyond 18 %.

(A)PDS (**P**allet **D**esign **S**oftware) can be used to analyze the weight the pallet is capable of holding.

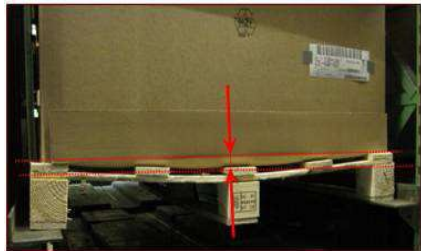
<p>The pallets must have sufficient stability and load capacity for all subsequent logistics processes:</p> <ul style="list-style-type: none"> <li>• Block storage</li> <li>• Rack storage</li> <li>• Internal transports with e.g. forklifts</li> <li>• External transports on trucks or on ships in overseas containers</li> </ul> <p>A significant deflection under load (see picture) is not acceptable for safety and operational reasons.</p>	
---	---

Illustration 25 - Bending of pallets

### 8.3.1 Land freight-pallets

Table 18 - Specifications for pallets for truck transport / land freight

Europe	For further information check DIN EN 13698. In addition, the construction items are described in: <a href="http://www.epal-pallets.org">http://www.epal-pallets.org</a>
NAFTA	For details, concepts and technical specification refer to the website of "National Wooden Pallet & Container Association": <a href="http://palletcentral.com/">http://palletcentral.com/</a> . In general, the concept and design of stringer pallets are preferred. Block pallets can be used, as long as they can proof a dynamic loading capacity of: <ul style="list-style-type: none"> <li>• 48 x 45 Inch (1219 x 1143 mm): 1,000 kg</li> <li>• 32 x 30 Inch (813 x 762 mm): 600 kg</li> </ul>
Asia	The pallet standards for inner-Asian transport are similar to European standards. Only the quality of lumber and fastening elements is not regulated for inner-Asian transport. The quality-verification has to be documented and provided to Brose Central Logistics. In addition, some Brose plants use the services of pool-providers for wooden pallets. For further questions, contact the responsible logistics manager or planner.

### 8.3.2 Overseas-pallets

In worldwide overseas traffic, the **container dimensions** are based on the Anglo-American measuring system. Loading units with **Euro pallet** dimensions are unsuitable for transportation in containers with an inside width of 2,350mm.

- In order to being able to place two loading units next to each other in a container, the **standard length** of the pallets must be reduced to **1,140 mm**.
- In order to make optimum use of the length available in the container, the following **pallet widths** must be considered: **980 mm** (ISO industrial pallet), **820 mm** (for GD) or **790 mm** (Euro pallet).

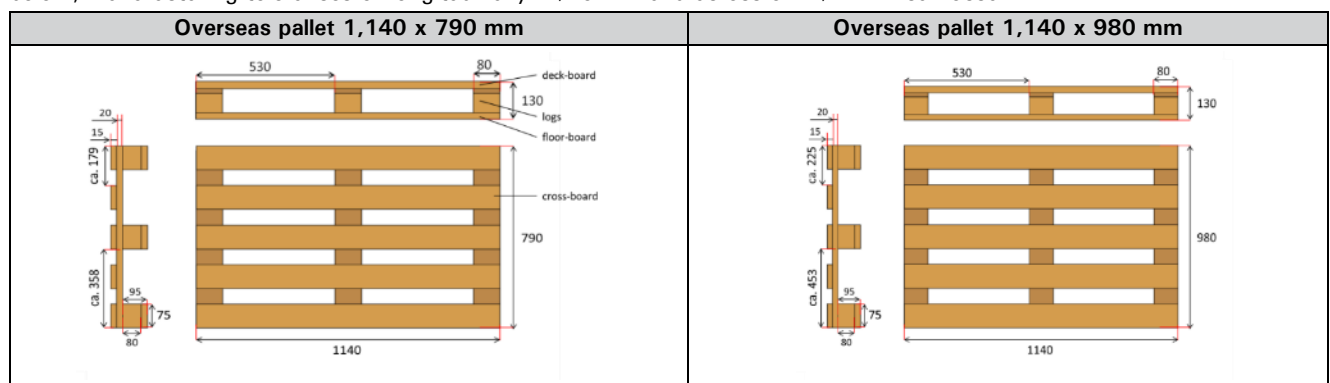
The Brose specific requirements for overseas-packaging are shown in **chap. 3.10**.

Suppliers of export overseas-pallets have to consider the following lumber regulations.

**Table 19 - Lumber regulations**

Area	Standard	Link
Europe	DIN 4074-1 & DIN 4074-5	
NAFTA		<a href="http://palletcentral.com">http://palletcentral.com</a>
Asia	DIN 4074-1 & DIN 4074-5	<a href="http://palletcentral.com">http://palletcentral.com</a>

Generally, all boards and blocks made of natural wood should be manufactured out of one piece. At the overseas pallets shown below, manufacturing tolerances of longitudinally  $\pm 5$  mm and across of  $\pm 2$ mm can occur.



**Illustration 26 - Drawing of overseas pallets**

### 8.3.3 IPPC-requirements for pre-treatment of wood

#### Phytosanitation standard

Pallets or pallet parts must be sterilized prior to export to countries participating in the International Plant Protection Convention (IPPC). The regulations stipulate that the interior of hard woods and soft woods used in pallets and packaging material must be heated to 56°C or 133°F for a minimum of 30 minutes. Each pallet or pallet part must be marked to verify that it has been heat-treated. Treatment and marking of wood-pallets must conform to the **International Standards for Phytosanitary Measures** Publication No. 15 (ISPM 15) regulations of wood packaging material in international trade. ISPM 15 has been adopted worldwide as import requirements for wood pallets. The supplier must guarantee the validity of the IPPC marking through correct storage etc. and is responsible for further consequential damages if not.

#### Special requirement for India:

India requires wood packaging materials to be treated and marked per ISPM 15. In addition, the shipment must be accompanied by a phytosanitary certificate published by each producer.



## Standard format of proper IPPC mark

The internationally applicable IPPC label requires the following information:

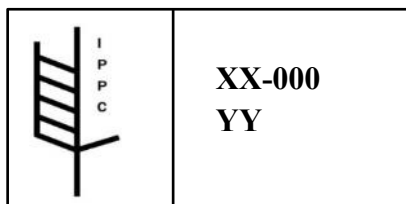


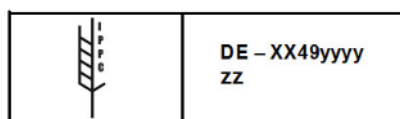
Illustration 27 - International IPPC markings

- **Symbol with the letters IPPC**
- **XX:** ISO country code
- **000:** Company registration number
- **YY:** IPPC abbreviation for treatment code
  - # HT for "Heat Treatment"
  - # MB for "Methyl Bromide"
  - # DH for "dielectric heating"

- Given examples illustrate different layouts of the required code-components; however, no variations in the symbol are accepted.
- Other permitted variations include marks with rounded corners
- If a mark is applied by stenciling, small gaps in the boarder may be possible
- The components may also be arranged in one line as example 2 illustrates

The German applicable IPPC code requires the following information:

### Example 1:



### Example 2:

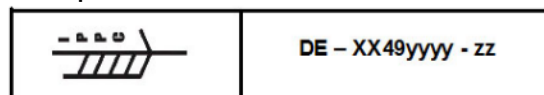
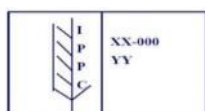


Illustration 28 - German IPPC markings

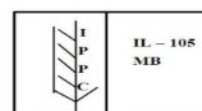
- **Symbol with the letters IPPC**
- **DE:** ISO country code for Germany
- **XX:** Code for the region/federal state
- **49yyyy:** Company registration number of wood manufacturer
- **zz:** IPPC abbreviation for treatment code
  - # HT for "Heat Treatment"
  - # MB for "Methyl Bromide"
  - # DH for "dielectric heating"

## Samples of improper, unacceptable IPPC marks:

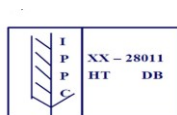
### # Incomplete IPPC mark



### # Color is not accepted: only black



### # Mark should not be drawn by hand



### # Stamps in the form of a paper sticker



Illustration 29 - Examples of incorrect IPPC markings



## 8.4 Concepts of cardboard packaging

This guideline sets out standards for the construction, verification and implementation of cardboard. It is a guide on how to find the right cardboard packaging item for the respective logistics process. The design of cardboard packaging items is based on the recommendations of the "international code for packaging items", called FEFCO. For further details, please refer to: [www.fefco.org](http://www.fefco.org).

### 8.4.1 Additional configuration

#### Cardboard in trucks:

The national specifications and guidance must be followed for the installation of packaging items respecting national truck transport. Consider the pallet system, which is used as standard in your country or region and adapt the appropriate cardboard-sizes to it. Ensure that the overall height of a dispatch-unit, including the pallet does not exceed 1,000 mm.

#### Cardboard as alternative for VDA-plastic boxes:

In cases, when VDA standard totes are not available or cardboard boxes have to be provided within the same configuration and dimensions, refer to VDA recommendation 4530 "Expendables Small-Load-Carriers (EW KLT)-Systems".

### 8.4.2 Applied load for cardboard packaging

During transport, packaging items are imposed by the loads, which will be stacked upon. It must be proven that stability and compressive resistance are sufficient to ensure transport requirements. Before cardboard packaging items (GLT or KLT) are installed in the logistics process, an official verification of stability, **the BCT** must be provided to Brose. The **Box Compression Test (BCT)** indicates the stability of the packaging-item and the BCT- value quantifies the force that the cardboard box can absorb and pass on. If a BCT cannot be provided, the supplier has to proof the stability in a different way. In this case, an approval from Brose is needed.



Illustration 30 - Cardboard packaging in the BCT

#### Use of pallets for BCT:

The cardboard-item should be placed on those pallets, which will be used for transportation. Ensure that the same pallet will be placed on the GLT cardboard-box or the bunch of layers of the KLT-versions. The test conditions are based on real transport conditions and will apply the same situations that appear in reality during transport. Based on the test results the packaging can be rated regarding the suitability for transport.

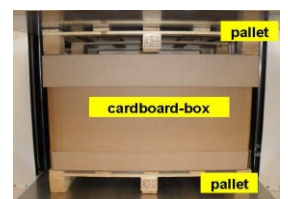


Illustration 31 - Use of pallets for BCT

#### Safety factors:

The structural strength of corrugated cardboard is influenced by humidity, temperature and material aging as well as handling and storage conditions. Safety factors are used as a multiplier in the calculation to make up for what the elements of the distribution environment take away. The following safety-factors are binding.

Table 20 - Overview of safety factors

Safety factor	Transport	Note
2	static	Regulations of BGR 234
3	dynamic	Impacts during transport
4	overseas	Additional transport and humidity impacts

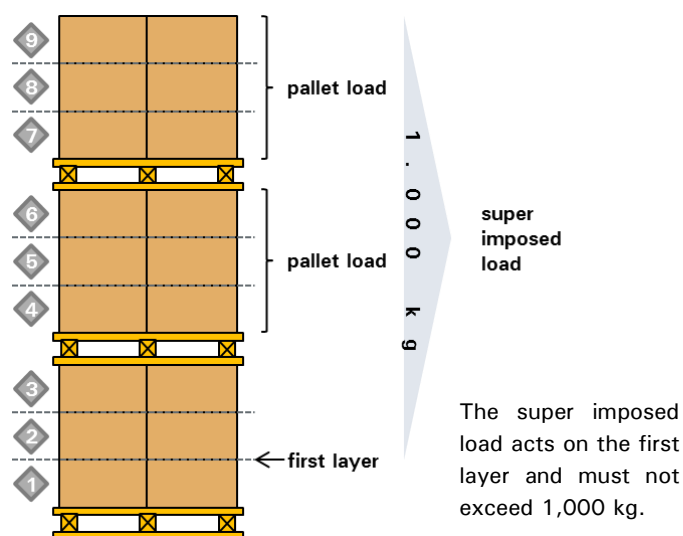


Illustration 32 - Maximum super imposed load on first layer

## 8.5 Concept of Packaging-Marking

All packaging-items must be properly identified by unique stencilling and markings. This identification must be performed with clear symbols that are comprehensible for all nations. In detail, we will achieve:

- Consideration of governmental and recycling requirements
- Provide an overview of the required symbols
- Consideration of stackability

All markings and symbols must be applied in a way that they can be clearly and easily identified from a distance of app. 4.0 m. The preferred font is Univers, black.

### 8.5.1 Recycling symbols

Each cardboard and plastic packaging item that will be brought into business must be marked with the appropriate recycling symbol.

Table 21 - Overview of recycling symbols

	Recycling symbols	Description
8.5.1.1		<b>Universal recycling symbol</b>
8.5.1.2		<b>"Resy" cardboard recycling symbol</b> Recycling concept for waste disposal in Germany. Must be placed on cardboard packaging items. <a href="http://www.resy.de/">http://www.resy.de/</a>
8.5.1.3		<b>Plastic Identification Code</b> The appropriate plastic identification code (depending on the various kinds of plastic) must be placed on plastic packaging items and can be found in the links below. The picture left is an example. Reference: <a href="http://plastics.americanchemistry.com/">http://plastics.americanchemistry.com/</a>

## 8.5.2 Marking of handling characteristics

### General descriptions

The handling instructions: "Handling marks" due to DIN EN ISO 780 help to ensure that greater care is taken with cargo handling and storage. It helps to prevent incorrect handling, misuse and accidents.

The marking must be able to tell,

- whether the package is sensitive to heat or moisture
- whether it is at risk of breaking
- where the top and bottom are and where the centre of gravity is located
- where loading tackle may be slung.

**Table 22 - Overview of handling markings**






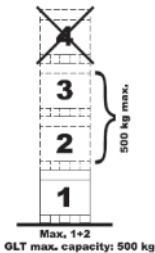
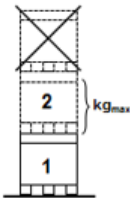
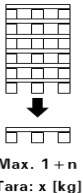
	ISO symbols	Description
8.5.2.1		<b>Fragile, Handle with care</b> (optional use) ISO 7000, No. 0621
8.5.2.2		<b>This way up</b> (Mandatory for overseas packaging and GLT) ISO 7000, No. 0623
8.5.2.3		<b>Keep dry</b> (Mandatory for paper packaging) ISO 7000, No. 0626
8.5.2.4		<b>Electrostatic sensitive device</b> (Mandatory for ESD-sensitive parts) Contact should be avoided at low levels of relative humidity, especially if insulating footwear is being worn or the ground /floor is nonconductive.

Table 23 - Overview of Brose handling markings

8.5.2.5		<p><b>Brose-logo</b></p> <p>Must be printed on each single packaging item in property of Brose exactly as displayed. Default color: Pantone 200C.</p> <p>White color should be used on dark surfaces like blue VDA KLT and color black on light surfaces like paper / corrugated board packaging. Further exceptions to not use Pantone 200C on the respective packaging have to be approved by Brose.</p> <p>The competence line could be left out on packaging items like VDA KLT, if the letters are too small and could not be seen clearly.</p>
8.5.2.6		<p><b>Stacking instruction</b></p> <p>According to this picture, a total of 3 stacking layers of GLT is permitted. Each number illustrates one layer. The stacking load of both layers 2 and 3 must not exceed 500kg in total. The max. load capacity of one GLT amounts 500kg. Due to the requirements, a fourth stacking layer is not permitted.</p> <p>In general, the information "max. 1 + 2" indicates that 2 layers are permitted on top of the first layer.</p>  <p>The image of these stacking instructions indicates that 2 more layers are permitted on top of the first one, as well. This marking can be used if the size of the packaging does not allow the first marking or if this marking is already printed on the packaging (cliché is existing).</p>
8.5.2.7		<p><b>Stacking instruction collapsed</b></p> <p>"n" gives information about the maximum number of permitted collapsed containers that may be stacked as one unit.</p> <p>Optional: <b>Tara</b> indicates the weight of the packaging-item.</p>
8.5.2.8	<p><b>Made in Germany</b></p>	<p><b>Country of origin</b></p> <p>Packaging must be marked with the appropriate country of origin (where the packed goods have been manufactured).</p>

If there are legitimate reasons to not print the stacking instructions or the country of origin on the packaging, a label with the respective symbol can be put on alternatively after approval of Brose.

### 8.5.3 Placing of packaging markings

For a safe and secure transport of products, packaging items must be marked with a properly placed stacking instruction. Although different stacking instructions may be used, Brose recommends the stacking symbol which should preferably be printed on the packaging item. The stacking instruction must be placed at least on two separate sides of the packaging item. However, for KLTs a marking is not necessary as the max. gross weight is limited to 15 kg.

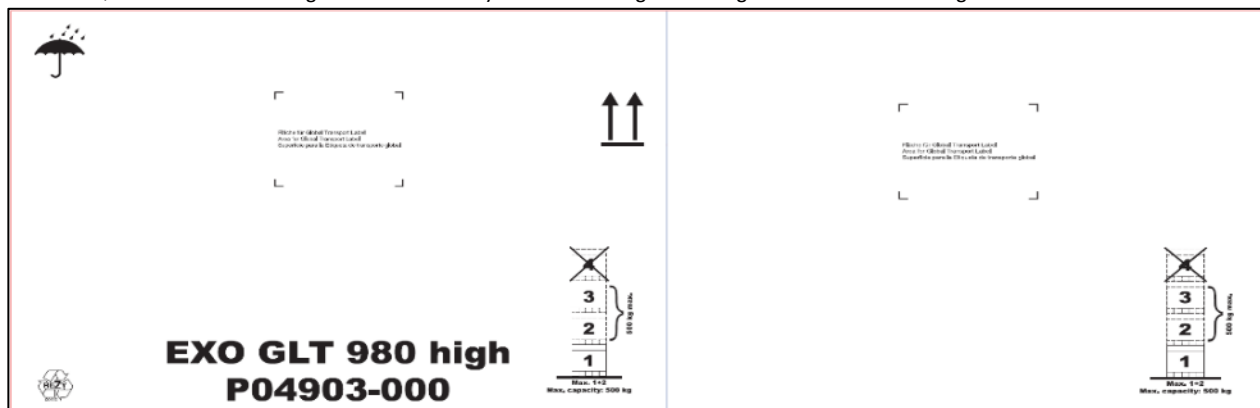


Illustration 33 - Placing of markings on GLT

### 8.5.4 Country of origin

Due to customs regulations, products leaving or entering the European Union must be properly marked with the appropriate country of origin (see table 21). Additional labels may be used but printing the information directly in a central position like shown below on the packaging item is highly recommended.

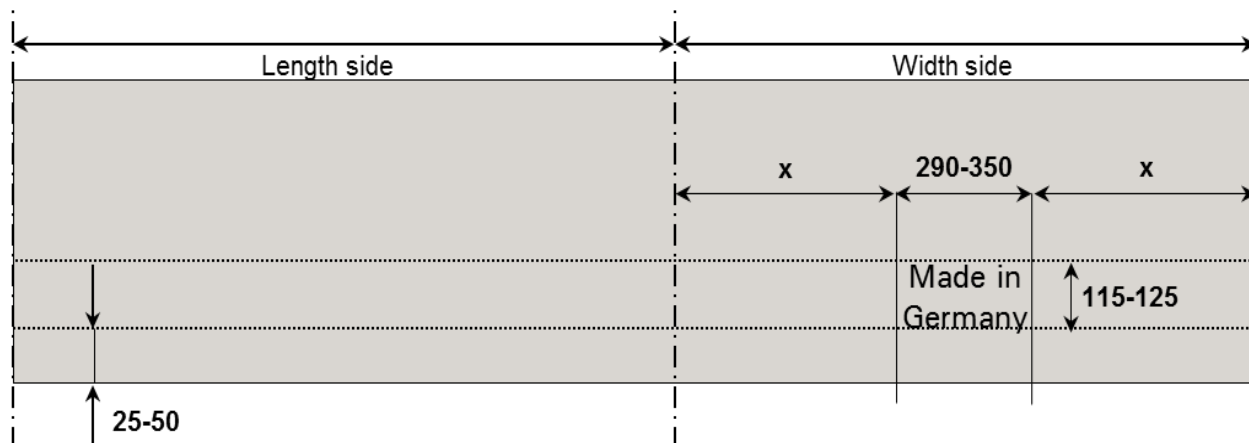


Illustration 34 - Placing of country of origin markings on cardboard GLT

### 8.5.5 Cardboard

All writings and markings declaring the packaging type and the Brose-material numbers as well as the main label and the country of origin marking must be printed in a central position on the designated sides below.

The remaining symbols must be placed at a distance between 20-25 mm away from the edges.

#### KLT



Illustration 35 - Placing of markings on KLT

The Resy-marking can also be placed on the sides.

#### Frame

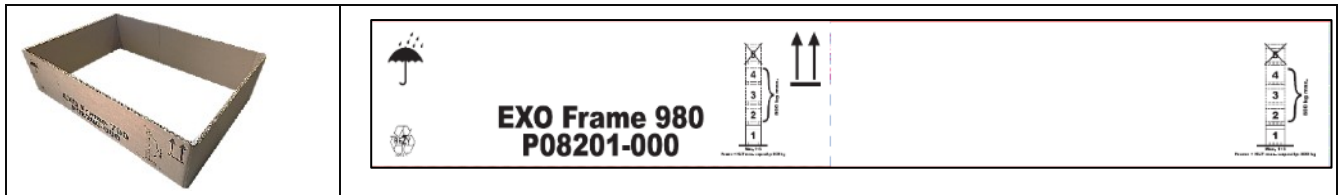


Illustration 36 - Placing of markings on frames

#### GLT

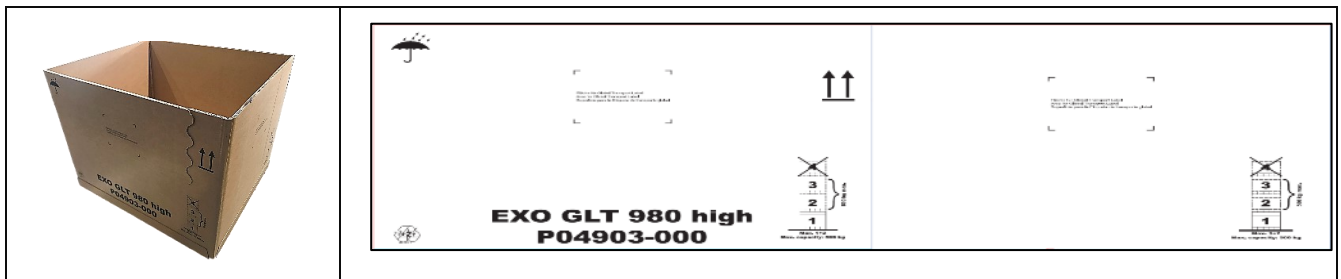


Illustration 37 - Placing of markings on GLT

#### Lid

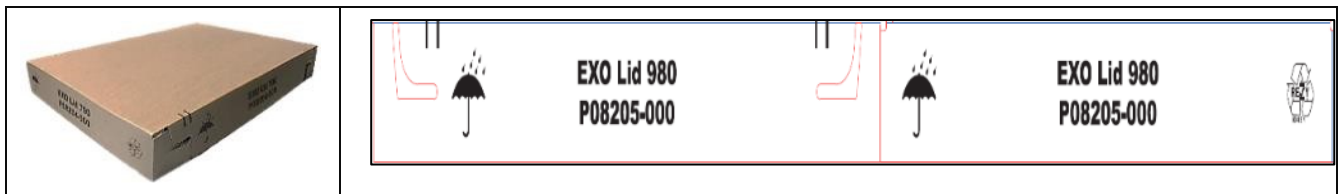


Illustration 38 - Placing of markings on lids

Banding marks must be printed in a way that the loading is maximally secured.

### 8.5.6 Plastic

Reusable packaging requires the Brose logo with the material number right below and regular as well as collapsed stacking instructions. Furthermore, the right plastic recycling symbol must be placed. The illustration below represents the placing guideline.

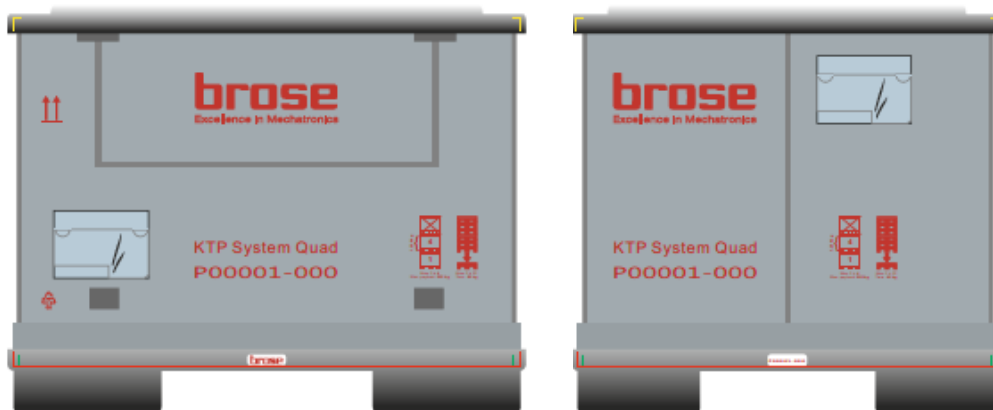
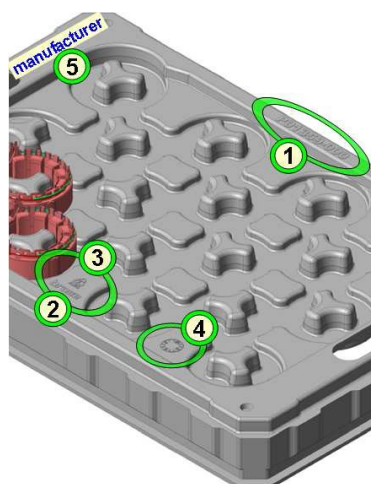


Illustration 39 - Placing of markings on reusable plastic packaging

#### Trays

For plastic KLT trays owned by Brose the following applies:



3 Plastics identification code for recycling

4 Date-stamp / insert (Datumsuhr) for traceability

5 Manufacturer

In addition, when KLT are **reusable** the following markings must be placed:

1 Brose-Material-number

2 **BROSE**-Logo or embossing: "property of BROSE"

Illustration 40 - Placing of markings on (reusable) plastic trays

Plastic KLT trays owned by third parties can use this as a guideline.

## 8.6 Materials for packaging items

All packaging materials must meet the aspects of logistics, quality assurance, environmental compatibility and economic efficiency. They must be made out of ecologically friendly materials, which are accepted worldwide for recycling. The cleanness of the products must not be interfered by packaging materials.

The following list will provide you an overview about the allowed packaging materials:

**Table 24 - Overview of packaging materials**

Material	Released	Forbidden
<b>Composite materials</b>		Composite materials must always be avoided. A direct permission from Brose must be given for the use.
<b>Plastics, disposable</b>	PE, PP, PS, PET (labeling due to DIN 6120-1)	PUR, PVC EPS and PC only after release
<b>Plastics, reusable</b>	PE, PP, PS, ABS (labeling due to DIN 6120-1)	PUR, PVC
<b>Shrink- &amp; stretch-foils</b>	Accepted after agreement with Brose, material must consist out of PE	Adhesive tapes and labels made from other material
<b>Film-bags and sacks</b>	PE (labeling due to DIN 6120-1)	Adhesive tapes and labels made from other material
<b>Tightening straps</b>	PET, PP	Polyamide & polyester plastics straps and straps made out of steel
<b>Paper and cardboard</b>	Labeled with recycling symbol, in Germany with RESY-sign	Coated with wax, paraffin, bitumen or oil Impregnated paper and cardboard
<b>Wood</b>	IPPC-Standard ISPM 15, <b>HPE Guideline</b>	Impregnated, varnished or coated wood
<b>Styrofoam, EPS</b>	Only for the use of individual customized packaging items	Styrofoam chips
<b>Filling packaging material</b>	Corrugated cardboard, paper	Use of packaging chips of any kind






## 8.7 Catalogue of standard packaging items

### 8.7.1 Standard GLT



#### Steel GLT, reusable

Table 25 - Steel GLT, reusable

Container	EURO pallet cage, DIN 15155	China-Steelbox, high, non-collapsible	China-Steelbox, low, non-collapsible
Material no. / VS-Code	304409-000 / 09	304849-000 / -	P00347-000 / -
Picture			
Usage in	Europe	Asia, China	Asia, China
Outside dimensions L/W/H [mm]	1,240 x 835 x 970	1,200 x 1,000 x 1,000	1,200 x 1,000 x 780
Inside dimensions L/W/H [mm]	1,210 x 810 x 789	1,150 x 950 x 820	1,150 x 950 x 600
Return factor	1:1	1:1	1:1
Tare weight [kg]	85	105	108
Container capacity [kg]	1,000 (for all containers)		
Max. stacking in stock / transit	1 + 4 / 1 + 2	1 + 3 / 1 + 1	1 + 4 / 1 + 2
Container payload [kg] in stock / transit	4,000		
Remark	Should be replaced by foldable systems, if possible		



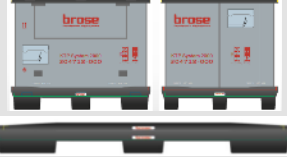
#### Wooden GLT, expendable

Table 26 - Wooden GLT, expendable





Container	Wooden overseas-box, high	Wooden overseas-box, low
Material no.	304459-000	304458-000
Picture		
Material	Lumber and presswood	
Outside dimensions L/W/H [mm]	1,120 x 966 x 1,030	1,120 x 946 x 600
Inside dimensions L/W/H [mm]	1,040 x 860 x 830	1,040 x 860 x 400
Tare weight [kg]	66.00	46.00
Container stacking load [kg]	1,100	
Stacking in stock/ transit	1 + 3 / 1 + 1	1 + 3 / 1 + 2

**Plastic GLT, reusable**

**Table 27 - Plastic GLT, reusable**


Container	KTP-Quad	KTP-Super-Quad	KTP-System 2000
Material nr. / VS-Code	P00001-000 / MD	P00002-000 / MC	304718-000 / MC
Picture			
Usage in	Europe (for all containers)		
Outside dimensions L/W/H [mm]	1,230 x 1,020 x 990	1,230 x 830 x 980	1,200 x 1,000 x 990
Height folded [mm]	235	220	205
Inside dimensions L/W/H [mm]	1,175 x 965 x 795	1,195 x 795 x 785	1,140 x 940 x 805
Return factor	1:4.19	1:4.45	1:4.82
Tare weight [kg]	49.00	47.00	40.00
Container capacity [kg]	500	650	250
Max. stacking in stock / transit	1 + 4 / 1 + 2	1 + 4 / 1 + 2	1 + 5 / 1 + 2
Container payload [kg] in stock / transit	1,250 both	1,650 both	1,250 both
Remark	Should be used as substitutes for non-foldable systems, if possible		





**Table 28 - Plastic GLT, reusable**





Container	China-F GLT, high	China-F LT, low	KD 845-34 Bulk Bin	KD 230-25 Bulk Bin
Material nr. / VS-Code	P00399-000 / -	P00398-000 / -	304529-000 / FM	304528-000 / SC
Picture				
Usage in	Asia, China		NAFTA	
Material	PP Plastics		PE Plastics	
Outside dimension L/W/H [mm]	1,200 x 1,000 x 1,000	1,200 x 1,000 x 780	1,219 x 1,143 x 864	813 x 762 x 635
Height folded [mm]	215	215	333	333
Inside dimensions L/W/H [mm]	1,143 x 943 x 825	1,143 x 943 x 605	1,123 x 1,054 x 706	813 x 762 x 635
Height folded [mm]	-	-	44.2 x 41.5 x 27.8	32.0 x 30.0 x 25.0
Return ratio	1:5	1:4	1:2.6	1:2.3
Tare weight [kg]	36.80	33.00	59.00	31.00
Container capacity [kg]	500 (for all containers)			
Stacking in stock / transit	1 + 2 / 1 + 1	1 + 3 / 1 + 2	1 + 5 / 1 + 2	
Container stacking load [kg] In stock / transit	1,500 / 1,000		794 / 794	907 / 907
Remark	General usage for projects with long distance delivery		4845 AIAG-standard 2 label holder, 2 place cards	
	One side open	No side open	Two access doors (1-48/1-45)	One access door (1-32)



# Cardboard GLT & Frames

Table 29 - Cardboard GLT & Frames, expendable

Container	EXO 3.0 GLT 980, high	EXO 3.0 GLT 980, low	EXO 3.0 GLT 790, high	MK 08, high
Material no.	P04903-000	P04902-000	P04901-000	P04006-000
Picture				
Usage in	Europe for oversea			Europe for overland
Material	Cardboard, 3.92 CAA			Cardboard, 2.92 AC
Outside dimension L/W/H [mm]	1,123 x 953 x 865	1,123 x 953 x 579	1,123 x 771 x 865	1,200 x 800 x 833
Inside dimension L/W/H [mm]	1,098 x 928 x 855	1,098 x 928 x 569	1,098 x 746 x 855	1,180 x 780 x 828
Tare weight [kg]	5.492	3.881	4.971	9.00
Container capacity [kg] Released for bulk	not released for bulk material			-
Container capacity [kg] Released as system	up to 500 kg (larger load only after release by Brose logistics planning) only as a system with EXO 3.0 KLT, interlayers and lid			450
Stacking in stock/transit	1 + 2			1 + 2 / 1 + 1
Container stacking load [kg]	500			
Remark	Chap. 3.4.2 applies. If it is not possible to fill complete GLT due to the call-off quantities, the EXO 3.0 frames 980 (P08201-000) or 790 (P08200-000) must be used. Cp. chap. 8.7.5 - Table 41			Sys. pallet: P04157-000 System lid: P07031-000 System weight: 20 kg System height: 970 mm

Container	EXO 3.0 GLT 790, low	VH GLT	EXO 3.0 Frame 980	EXO 3.0 Frame 790
Material nr.	P04900-000	304339-000	P08201-000	P08200-000
Picture				
Usage in	Europe for oversea		Global for oversea and overland	
Material	Cardboard, 3.92 CAA		Cardboard, 3.92 CAA	
Outside dimension L/W/H [mm]	1,123 x 771 x 579	1,123 x 953 x 590	1,123 x 953 x 282	1,123 x 771 x 282
Inside dimensio L/W/H [mm]	1,098 x 746 x 569	1,098 x 928 x 580	1,098 x 928 x 282	1,098 x 746 x 282
Tare weight [kg]	3.495	3.881	1.589	1.45
Container capacity [kg] Released for bulk	up to 500 kg bulk material released (after ok shipping trial)		not released for bulk material	
Container capacity [kg] Released as system	up to 800 kg only as a system with EXO 3.0 KLT, interlayers and lid		up to 500kg only as a system with EXO 3.0 KLT, interlayers and lid	
Stacking in transit	1 + 2		1 + 3	
Container stacking load [kg]	500		800	
Remark	Chap. 3.4.2 applies. If it is not possible to fill complete GLT due to the call-off quantities, the EXO 3.0 frames 980 (P08201-000) or 790 (P08200-000) must be used. Cp. chap. 8.7.5 - Table 41			

Container	EXO Frame 980*855	EXO Frame 980*570	EXO Frame 790*855	EXO Frame 790*570
Material no.	P04909-000	P04908-000	P04907-000	P04906-000
Picture				
Usage in	Asia and NAFTA for oversea			
Material	Cardboard, 3.92 CAA			
Outside dimension L/W/H [mm]	1,123 x 953 x 855	1,123 x 953 x 570	1,123 x 771 x 855	1,123 x 771 x 570
Inside dimension L/W/H [mm]	1,098 x 928 x 855	1,098 x 928 x 570	1,098 x 746 x 855	1,098 x 746 x 570
Tare weight [kg]	6.0	4.0	5.5	3.5
Container capacity [kg] Released for bulk	up to 500 kg bulk material released (after ok shipping trial)			
Container capacity [kg] Released as system	up to 800 kg only as a system with EXO 3.0 KLT, interlayers and lid			
Stacking in transit	1 + 2			
Container stacking load [kg]	500			
Remark	Chap. 3.4.2 applies. If it is not possible to fill complete GLT due to the call-off quantities, the EXO 3.0 frames 980 (P08201-000) or 790 (P08200-000) must be used. Cp. chap. 8.7.5 - Table 41			


Container	RC 1.0 High Surrounding	RC 1.0 Half-high Surrounding
Material no. / VS-Code	P04306-000	P04308-000
Picture		
Usage in	China domestic	
Material	Cardboard, ECT 19000 N	
Outside dimension L/W/H [mm]	1,164 x 978 x 870	1,164 x 978 x 580
Inside dimension L/W/H [mm]	1,142 x 958 x 870	1,142 x 958 x 580
Tare weight [kg]	7.00	4.70
Container capacity [kg]	500	
Stacking in stock / transit	1 + 2 / 1 + 1	1 + 3 / 1 + 1
Container stacking load [kg]	500	

## 8.7.2 Standard KLT

### Plastic KLT


#### VDA-RL KLT

Table 30 - VDA-RL KLT, reusable

Container	VDA-RL KLT 3147	VDA-RL KLT 4147	VDA-RL KLT 6147	VDA-RL KLT 6280
Material no. / VS-Code	3044DZ-000	3044EA-000 / EA	3044EC-000 / EC	3044ED-000 / ED
	General use in Europe			
	<b>Capacity for all containers</b> 15 kg (in regulation to Brose-Standard for KLT) <b>Material for all containers</b> plastic, blue			
Outside dimensions L/W/H [mm]	297 x 198 x 147.5	396 x 297 x 147.5	594 x 396 x 147.5	600 x 400 x 280
Inside dimensions L/W/usable H [mm]	243 x 162 x 129.5	346 x 260 x 129.5	544 x 359 x 129.5	544 x 359 x 262
Tare weight [kg]	0.57	1.08	1.87	2.67
Boxes per HU (Euro Pallet, H:1.00m)	96	48	24	12
Layers / boxes per layer	6 / 16	6 / 8	6 / 4	3 / 4
Boxes per HU (ISO Pallet, H:1.00m)	120	60	30	15
Layers / boxes per layer	6 / 20	6 / 10	6 / 5	3 / 5
Stacking of HUs in stock / transit	1 + 3 / 1 + 2			
Container stacking load [kg]	400	600	600	600


#### VDA-R KLT, ESD protection

Table 31 - Plastic KLT, VDA-R KLT, ESD protection, reusable

Container	VDA-R KLT 3115	VDA-R KLT 4115	VDA-R KLT 6115	VDA-R KLT 6129
Material no.	304610-000	304611-000	304612-000	304613-000
	General use in Europe and Asia Only used for electronic parts			
	<b>Capacity for all containers</b> 15 kg (in regulation to Brose-Standard for KLT) <b>Material for all containers</b> ESD, plastics, black <b>Surface resistance for all containers</b> 10 <sup>4</sup> - 10 <sup>10</sup> Ohm			
Outside dimensions L/W/H [mm]	297 x 198 x 147.5	396 x 297 x 147.5	594 x 396 x 147.5	594 x 396 x 280
Inside dimensions L/W/usable H [mm]	243 x 162 x 129.5	346 x 260 x 109.5	544 x 359 x 109.5	544 x 364 x 242
Tare weight [kg]	0.63	1.40	2.32	3.30
Boxes per HU (Euro Pallet, H:1.00m)	96	48	24	12
Layers / boxes per layer	6 / 16	6 / 8	6 / 4	3 / 4
Boxes per HU (ISO Pallet, H:1.00m)	120	60	30	15
Layers / boxes per layer	6 / 20	6 / 10	6 / 5	3 / 5
Stacking of HUs in stock / transit	1 + 3 / 1 + 2			
Container stacking load [kg]	400	600	600	600


## Asia KLT

Table 32 - Plastic KLT Asia, reusable

Container	AI KLT 3147	AI KLT 4147	AI KLT 6147	AI KLT 6180
Material no.	P01224-000	P01225-000	P01226-000	P01227-000
	General use in Asia			
	Capacity for all containers 15 kg (in regulation to Brose-Standard for KLT) Material for all containers plastic, blue			
Outside dimensions L/W/H [mm]	300 x 200 x 148	400 x 300 x 148	600 x 400 x 148	600 x 400 x 280
Inside dimensions L/W/H [mm]	285 x 150 x 123	350 x 250 x 123	550 x 350 x 123	550 x 350 x 255
Tare weight [kg]	0.57	0.90	1.87	2.67
Boxes per HU (Euro Pallet, H:1.00m)	96	48	24	12
Layers / boxes per layer	6 / 16	6 / 8	6 / 4	3 / 4
Boxes per HU (ISO Pallet, H:1.00m)	120	60	30	15
Layers / boxes per layer	6 / 20	6 / 10	6 / 5	3 / 5
Stacking of HUs in stock / transit	1 + 2 / 1 + 1	1 + 3 / 1 + 2	1 + 3 / 1 + 2	1 + 3 / 1 + 2
Container stacking load [kg]	400	600	600	600


## NAFTA KLT (AIAG)

Table 33 - Plastic KLT NAFTA (AIAG), reusable

Container	AIAG 1207-5	AIAG 1215-7	AIAG-2415-7
Material no. / VS-Code	304520-000 / S2	304521-000 / FN	304522-000 / FO
	General use in NAFTA		
	Material for all containers plastics, dark-blue 9002317		
Outside dimensions L/W/H [mm] L/W/H [inch]	304.8 x 177.8 x 127 12.0 x 7.0 x 5.0	381 x 305 x 191 12.0 x 15.0 x 7.5	609.6 x 381 x 187.9 24.0 x 15.0 x 7.4
Inside dimensions L/W/H [mm] L/W/H [inch]	285 x 150 x 123 11.2 x 5.9 x 4.84	239 x 330 x 173 9.4 x 13.0 x 6.8	544 x 330 x 173 21.4 x 13.0 x 6.8
Tare weight [kg]	0.50	1.00	1.60
Container capacity [kg]	20.00	20.00	13.40
Boxes per HU (H: 41 in.) Layers / boxes per layer	168 7 / 24	60 5 / 12	30 5 / 6
Stacking of HUs in stock / transit	1 + 2 / 1 + 1		
Container stacking load [kg]	-	-	-





## Brazil KLT

Table 34 - Plastic KLT Brazil, reusable

Container	KLT BRO-CVDA-M-KU-BLA	Caixa Plástica CN-6415
Material no.	304420-000	P01113-000
	General use in Brazil	
	Capacity for all containers	15 kg (in regulation to Brose-Standard for KLT)
	Material for all containers	plastic, blue
Outside dimensions L/W/H [mm]	297 x 197 x 114	600 x 400 x 150
Inside dimensions L/W/H [mm]	263 x 163 x 93	565 x 365 x 139
Tare weight [kg]	0.93	1.9
Boxes per HU (Euro Pallet, H:1.00m)	80	24
Layers / boxes per layer	10 / 8	6 / 4
Boxes per HU (ISO Pallet, H:1.00m)	-	-
Layers / boxes per layer	-	-
Stacking of HUs in stock / transit	1 + 2 / 1 + 1	1 + 3 / 1 + 2
Container stacking load [kg]	400	600

## Cardboard KLT - EXO 3.0 KLT, Global





Table 35 - Cardboard, EXO 3.0 KLT Global, expendable

Container	EXO KLT 3147	EXO KLT 4147	EXO KLT 6147	EXO KLT 6280
Material no. / VS-Code	P06100-000 / PN	P06101-000 / PM	P06102-000 / PL	P06103-000 / PK
Picture				
Capacity for all containers	15 kg (in regulation to Brose-Standard for KLT)			
Material for all containers	Cardboard, 1.40 B			
Usage in	Global			
Outside dimension L/W/H [mm]	273 x 181 x 138.5	364 x 273 x 138.5	546 x 364 x 138.5	546 x 364 x 280
Inside dimension L/W/H [mm]	237 x 169 x 136	328 x 261 x 136	510 x 352 x 136	510 x 352 x 278
Tare weight [kg]	0.183	0.277	0.411	0.759
Container stacking load [kg]	No single stacking. Only as system with EXO 3.0 GLT / Frame, interlayers and lid.			
Remark	EXO KLT made of corrugated board are damaged by moisture. Moist parts (oil, water ...) must therefore be packaged in a bag.			



### Cardboard KLT – RC 1.0 KLT, Asia




Table 36 - Cardboard, RC KLT Asia, expendable

Container	RC KLT 3147	RC KLT 4147	RC KLT 6147	RC KLT 6280
Material no. / VS-Code	P05401-000	P05414-000	P05415-000	P05416-000
Picture				
Capacity for all containers	15 kg (in regulation to Brose-Standard for KLT)			
Material for all containers	Cardboard, 1.40 B			
Usage in	China domestic			
Outside dimensions L/W/H [mm]	273 x 181 x 144	380 x 285 x 144	570 x 380 x 144	570 x 380 x 288
Inside dimensions L/W/H [mm]	237 x 158 x 141	347 x 262 x 141	537 x 357 x 141	537 x 357 x 285
Tare weight [kg]	0.20	0.32	0.47	0.86
Container stacking load [kg]	No single stacking. Only as system with RC 1.0 GLT / Frame and lid.			
Remark	RC KLT made of corrugated board are damaged by moisture. Moist parts (oil, water ...) must therefore be packaged in a bag.			

### 8.7.3 Pallets

#### Plastic pallets, reusable

Table 37 - Plastic pallets, reusable




Pallet	AIAG SP 4845-5	Pallet 1200x800	ESD pallet 1200x800
Material no. / VS-Code	304527-000 / S3	304828-000 / ME	P00326-000
picture			
Usage in	Use in NAFTA	Europe	
Material	plastics, black	HDPE, re-granulate	HDPE, re-granulate
Outside dimensions L/W/H [mm]	1,219 x 1,143 x 127	1,200 x 800 x 150	1,200 x 800 x 150
L/W/H [inch]	48 x 45 x 5	-	-
Tare weight [kg]	22.7	14.5	14.5
Pallet payload in high rack [kg]	1,814 (static)	800	800
Remark	- 2*Brose-logo-hotstamp (die AE826-7) on 48" sides - 2*Seat belt retractor on 45" sides	For internal production-purposes, especially in clean rooms	For use in areas that require ESD protection



# Wooden pallets

Table 38 - Wooden pallets, reusable & expendable




Pallet	ISO-Flat-Pallet	EURO-Flat-Pallet	AI-EXO-PAL 1,000
Material no. / VS-Code	3044N2-000 / N2	304413-000 / 13	143958-000 / -
Picture			
Usability	reusable		expendable
Usage in	Use in European-/Asian-/Brazil transportation	Use in European transportation	Only in Asia; not for overseas
Material	wood		
Outside dimensions L/W/H [mm]	1,200 x 1,000 x 145	1,200 x 800 x 145	1,200 x 1,000 x 130
Tare weight [kg]	30.00	25.00	19.00
Pallet payload in high rack [kg]	1,500		1,000
Components status	7 x deckboard; ...	5 x deckboard / 3 x floorboard / 3 x crossboard / 9 x logs	
Components dimensions			
Deck-/Floorboard, L/W/H [mm]	1200 x 145/100 x 22	1,200 x 145/100 x 22	1,200 x 100 x 12
Crossboard, L/W/H [mm]	1,000 x 145 x 22	800 x 145 x 22	1,000 x 100 x 15
Logs, L/W/H [mm]	145 x 145/100 x 78	145 x 145/100 x 78	100 x 100 x 80
Remark	ISO-Flat-Pallet, DIN EN 13 698.2	EURO-Flat-Pallet, DIN EN 13698.1	-

Pallet	EXO-PAL 1.110	EXO-PAL, ALO	EXO-PAL 1.108
Material no.	304122-000	P04000-000	P04002-000
Picture			
Usability / usage in	Expendable / global oversea		
Material	Wood, ISPM-15 (standard for IPPC-measures)		
Outside dimensions L/W/H [mm]	1,140 x 980 x 130	1,140 x 820 x 140	1,140 x 790 x 130
Tare weight [kg]	9.00	16.00	8.00
Pallet payload in high rack [kg]	900	800	800
Components status	5 x deckboard / 3 x floorboard / 3 x crossboard / 9 x logs		
Components dimensions			
Deck-/Floorboard, L/W/H [mm]	1,140 x 75 x 15	1,140 x 100 x 16-18	1,140 x 75 x 15
Crossboard, L/W/H [mm]	980 x 80 x 20	820 x 100 x 16-18	790 x 80 x 20
Logs, L/W/H [mm]	80 x 80 x 80	100 x 100 x 80	80 x 80 x 80
Remark	According to aspects of VDA 4525	Use for ALO/DLO-planning	According to aspects of VDA 4525

## 8.7.4 Lids and interlayers

### Plastic lids, reusable




Table 39 - Plastic lids, reusable

Lid	VDA lid Cover A1208	KLT lid Cover 1210	Cover A1208	Cover 1210
Material no. / VS-Code	3044H0-000 / H0	304609-000 / MF	P04323-000 / -	P04322-000 / -
Picture				
Usage in	Europe and Asia		Asia	
Material	Plastics, blue (RAL 5005 / 5012)		Plastics, black	
Outside dimensions: L/W/H [mm]	1,207 x 806 x 94	1,200 x 1,000 x 84	1,205 x 808 x 94	1,229 x 1,030 x 84
Tare weight [kg]	6.10	8.20	6.10	7.20
Remark	- VDA 4500 lid (A1208-1) - With drain holes in base - new version from VDA: A1208-1			With safety corners

Lid	Top Cap 4845	KLT-Cover 32	KLT-Cover 43	KLT-Cover 64
Material no. / VS-Code	304526-000 / S4	P05431-000 / -	P05432-000 / -	P05433-000 / -
Picture				
Usage in	NAFTA		Asia	
Material	Plastics, black and blue		Plastics, PP, blue RAL 5005	
Outside dimensions L/W/H [mm] L/W/H [inch]	1,219 x 1,143 x 66 48 x 45 x 2.6	297 x 198 x 27 -	396 x 297 x 27 -	594 x 396 x 27 -
Tare weight [kg]	9.07	0.30	0.40	0.70
Remark	- 45 x 48 B CISS top cap with 2 belts, 4845 AIAG - 2 x Brose logo hot stamp (die AE826-7) on 48 in. sides - 2 seat belt buckles on 45 in. sides		Cover for KLT 400 x 300	Cover for KLT 600 x 400

# VDA-RL-KLT lids

Table 40 - VDA RL-KLT lids

KLT Lid	KLT lid D65	KLT lid D45	KLT lid D35
Material no. / VS-Code	P03169-000	P03170-000	P03279-000
Picture			
Usage	Europe		
Material	PP plastics, blue		
Outside dimensions: L/W/H [mm]	562.5 x 365 x 16	365 x 267 x 13.5	267.8 x 169 x 17
Tare weight [kg]	0.67	0.27	0.09
Remark	for KLT 6280 (3044ED-000) & 6147 (3044EC-000)	for KLT 4147 (3044EA-000)	for KLT3147 (3044DZ-000)

# Cardboard Lids and Interlayers, expendable

Table 41 - Cardboard lids, expendable







Lid	EXO 3.0 Lid 980	EXO 3.0 Lid 790	VH Lid	RC 1.0 Lid
Material no. / VS-Code	P08205-000	P08204-000	304340-000	P04310-000
Picture				
Usage in	Global		Europe	China domestic
Material	Cardboard, 2.70 BC			
Outside dimensions L/W/H [mm]	1,140 x 970 x 142	1,140 x 788 x 142	1,140 x 970 x 142	1,200 x 1,000 x 100
Inside dimensions L/W/H [mm]	1,128 x 958 x 136	1,128 x 776 x 136	1,128 x 958 x 136	1,180 x 990 x 100
Tare weight [kg]	1.402	1.197	1.402	1.43

Table 42 - Cardboard inlayer, expendable

EXO Inlayer	EXO 3.0 Interlayer 980	EXO 3.0 Interlayer 790
Material no. / VS-Code	P08203-000	P08202-000
Picture		
Usage in	Global	
Material	Cardboard, 2.70 BC	
Outside dimensions L/W/H [mm]	1,083 x 1,085 x 6	901 x 1,085 x 6
Tare weight [kg]	0.922	0.767
Remark	Use in addition to EXO 3.0 KLT + GLT / Frame Interlayers must be on top of every KLT-layer except top layer, folding edges faced downwards	

## 8.7.5 EXO - Expendable overseas systems, Cardboard

### EXO 3.0 System, Europe

For the expendable overseas packaging system EXO 3.0, several variants exist. The possibilities of compilations between EXO GLT / Frame and EXO KLT sizes are presented in the tables below: **Brose recommends using the variant EXO 3.0 GLT 980 high to minimize the handling effort and costs.**

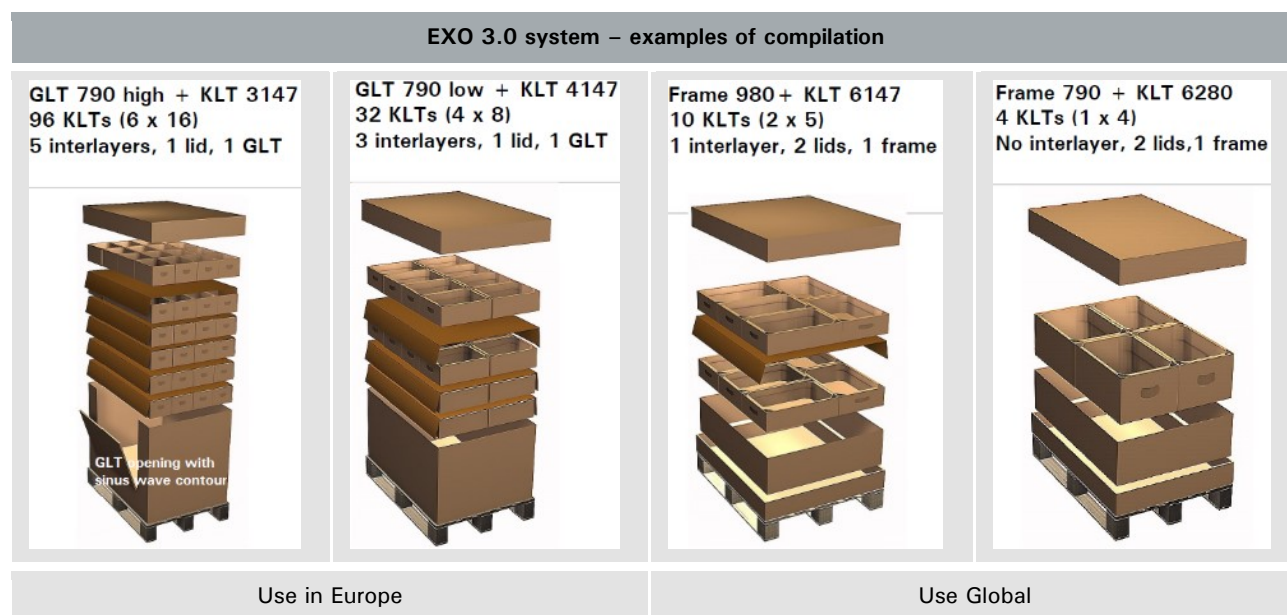


Illustration 41 - Examples of EXO 3.0 packaging systems Europe

Table 43 - Amount of EXO 3.0 KLT per system Global

Container		EXO 3.0- system with EXO KLT 3147	EXO 3.0- system with EXO KLT 4147	EXO 3.0- system with EXO KLT 6147	EXO 3.0- system with EXO KLT 6280
Europe	ASIA & NAFTA				
<b>Pallet 304122-000 (1.140 x 980 mm)</b> <b>Boxes per HU / layers / boxes per layer</b> EXO GLT 980 high (P04903-000)      EXO Frame 980*855 (P04909-000) EXO GLT 980 low (P04902-000)      EXO Frame 980*570 (P04908-000) EXO Frame 980 (P08201-000)      EXO Frame 980 (P08201-000)		120 (6 x 20)	60 (6 x 10)	30 (6 x 5)	15 (3 x 5)
		80 (4 x 20)	40 (4 x 10)	20 (4 x 5)	10 (2 x 5)
		40 (2 x 20)	20 (2 x 10)	10 (2 x 5)	5 (1 x 5)
This system is to be used with the EXO Lid 980 (P08205-000) and the EXO Inlayer 980 (P08203-000)					
<b>Pallet P04002-000 (1,140x790mm)</b> <b>Boxes per HU / layers / boxes per layer</b> EXO GLT 790 high (P04901-000)      EXO Frame 790*855 (P04907-000) EXO GLT 790 low (P04900-000)      EXO Frame 790*570 (P04906-000) EXO Frame 790 (P08200-000)      EXO Frame 790 (P08200-000)		96 (6 x 16)	48 (6 x 8)	24 (6 x 4)	12 (3 x 4)
		64 (4 x 16)	32 (4 x 8)	16 (4 x 4)	8 (2 x 4)
		32 (2 x 16)	16 (2 x 8)	8 (2 x 4)	4 (1 x 4)
This system is to be used with the EXO Lid 790 (P08204-000) and the EXO Inlayer 790 (P08202-000)					
<b>Stacking of HUs</b> In transit / in stock		1 + 2	1 + 2	1 + 2	1 + 2

## Folding Instruction for EXO 3.0 KLTs

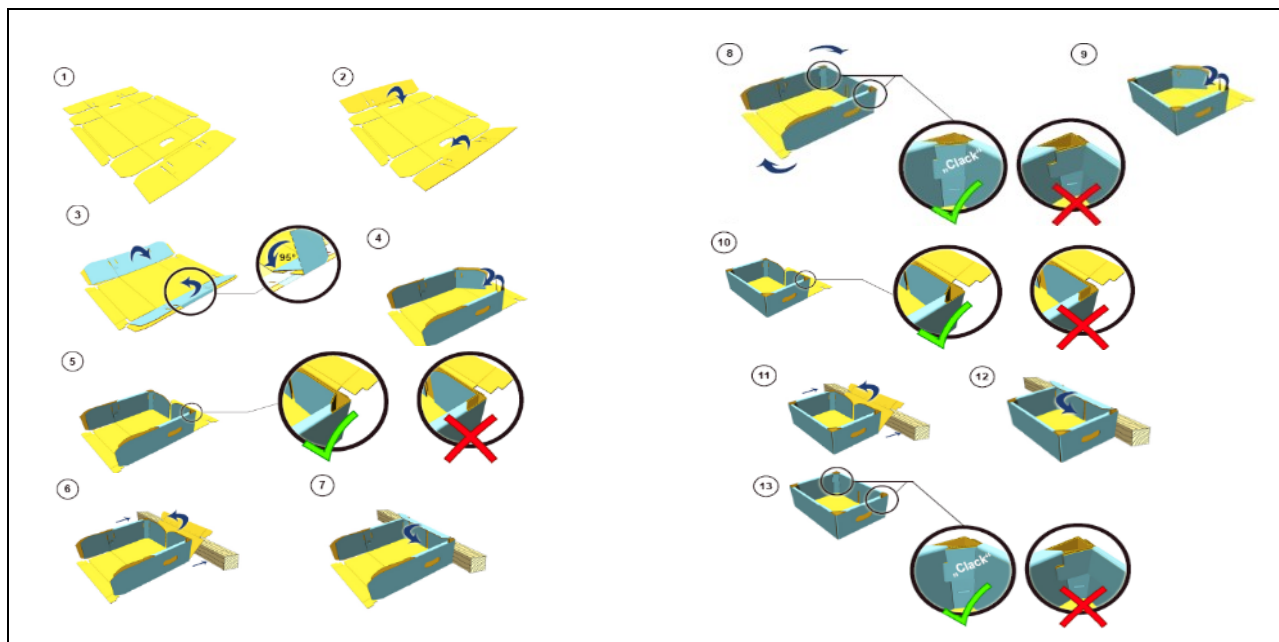


Illustration 42 - Folding instruction EXO KLTs

## Requirements for the EXO KLT Handling






Step 1	Step 2	Step 3	Step 4	Step 5
Cut the packing strap of the carton, open the lid, check if the carton is intact and undamaged and find the tape at the bottom of the box for unpacking.	Peel off the tape along the bottom of the box to separate the bottom of the box from the side panel. Only lift the GLT box at the top edge with both hands so that the KLTs are exposed.	After removing the outside GLT, pay attention to the stacking direction and the position of the handle used to hold the KLT. To avoid collapsing, the KLTs must stand straight.	When carrying the KLT, make sure that the KLT is lifted evenly with both hands at the two handles provided. Lifting the KLTs without using the handles provided or even pulling the KLTs is prohibited. Otherwise there is a risk of damage to the KLT, which could cause it to fall apart.	When restacking the KLTs, make sure that they are stacked in a row in the same direction, so that the handles are visible, for example. This prevents the KLT from being damaged by crushing and therefore remains stable.
				

Illustration 43 - Requirements EXO KLT Handling

Set up and use of new EXO 3.0 Interlayer



**Illustration 44 - Set up and use EXO interlayer**

- 1) Place the interlayer vertically in the GLT at the closure side
- 2) Place the KLT as close as possible to the interlayer in the GLT
- 3) Lift the interlayer with the folding line above the KLT, close it and insert the folding edge



## 8.7.6 Purchasing and delivery references for packaging items (Europe)

**Table 44 - Purchase and delivery references for packaging Europe**

Packaging-module	Material-number	Supplier	Reference	Contact	Location	Delivery Dimension [mm]	Minimum delivery unit	Items/ delivery unit
Steel GLT								
Euro pallet cage, DIN 15155	304409-000	various suppliers regarding the current market price, please refer to Brose Purchasing Logistics in Bamberg						
Plastic GLT, reusable								
KTP-Super-Quad	P00002-000	KTP Kunststoff	Ms. Küster	+ 48 6834 9210-16	DE 66359 Bous (Saar)	1,230 x 830 x 980	4x pallet	52
KTP-System 2000	304718-000	Palettentechnik				1,200 x 1,000 x 990		56
KTP-Quad	P00001-000	GmbH				1,230 x 1,020 x 990		48
Cardboard GLT, expendable								
GLT 980, high	P04903-000	Tricor Packaging & Logistics AG	Mr. Gardeler	+ 49 8247 9622184	DE 86825 Bad Wörishofen	2100 x 850 x 1500	1x pallet	30
GLT 980, low	P04902-000					2100 x 1200 x1 500		30
GLT 790, high	P04901-000					1900 x 850 x 1500		30
GLT 790, low	P04900-000					1900 x 1150 x 1500		30
Frame 980	P08201-000					2100 x 850 x 1500		90
Frame 790	P08200-000					1900 x 850 x 1500		140
MK 08, high	P04006-000					1,924 x 1,353 x 1.000	2x pallet	40
VDA-RL-KLT, reusable								
VDA-RL-KLT 3147	3044DZ-000	ISOCO Plastics Technology GmbH	Mr. Schweitzer	+ 49 36701 67 0	DE 07318 Saalfeld	1,200 x 800 x 1,000	1x pallet	96
VDA-RL-KLT 4147	3044EA-000							48
VDA-RL-KLT 6147	3044EC-000							24
VDA-RL-KLT 6280	3044ED-000							12
VDA-R-KLT, ESD protection								
VDA-R-KLT 3115	304610-000	Schoeller Allibert GmbH	Ms. Leuschner	+ 49 30 36471-142	DE 10117 Berlin	1,200 x 800 x 1,000	1x pallet	96
VDA-R-KLT 4115	304611-000							48
VDA-R-KLT 6115	304612-000							24
VDA-R-KLT 6129	304613-000							12
EXO KLT, expendable								
EXO-KLT 3147	P06100-000	Schumacher Packaging GmbH	Ms. Jahn	+ 49 9562 383-154	DE 96237 Ebersdorf	846 x 1,200 x1 ,000	1x pallet	600
EXO-KLT 4147	P06101-000					937 x 1,326 x 1,000		600
EXO-KLT 6147	P06102-000					800 x 1,200 x 1,000		300
EXO-KLT 6280	P06103-000					1,200 x 1,685 x 1,000		300
Pallets								
Pallet, plastics 1208	P00166-000	Georg Utz GmbH	Mr. Roelofs	+ 49 5923 805 441	DE 48465 Schüttorf	1,200 x 800 x 1,000	1x pallet	tbd
EXO-PAL 1,110	304122-000	Sägewerk	Mr. Schreiner	+ 49 9561 60678	DE 96450 Coburg	1,140 x 980 x 1,000		
EXO-PAL 1,108	P04002-000	Obermühle oHG			1,140 x 790 x 1,000			
EXO-PAL ALO	P04000-000	Liebensteiner GmbH	Mr. Schön	+ 49 9631 605-200	DE 95703 Plößberg	1,140 x 820 x 1,000		
Lids								
VDA lid / A1208	3044H0-000	ISOCO Plastics Technology GmbH	Mr. Schweitzer	+ 49 36701 67 0	DE 07318 Saalfeld	1,200 x 800 x 2,000	1x pallet	35
VDA lid / 1210	304609-000					1,200 x 1,000 x 2,000		
Lid 980	P08205-000	Tricor Packaging & Logistics AG	Mr. Gardeler	+ 49 8247 9622184	DE 86825 Bad Wörishofen	1,247 x 1,600 x 1,000		140
Lid 790	P08204-000					1,200 x 800 x 1,000		
Interlayers								
Interlayer 980	P08203-000	Schumacher Packaging GmbH	Ms. Jahn	+ 49 9562 383-154	DE 96237 Ebersdorf	1200 x 1085 x 1000	1x pallet	130
Interlayer 790	P08202-000					1200 x 901 x 1000		130

## 9 APPENDIX

### I. Addresses and contacts of the Brose locations

The addresses of the Brose locations can be found under <https://www.brose.com/de-en/company/locations/>.

If you do not know a contact person from the respective plant, please contact the e-mail address listed there.

### II. Delivery addresses for the Brose Group

In communication with the supplier, Brose uses the unloading point as a five-digit alphanumeric code for the corresponding delivery address. The code and translation for the respective address can be found in the table below.

**Table 45 - Overview Coding Unloading Points Brose Plants**

Brose plant	Plant Code	Unloading Point	Name	Name 2	Country	ZIP	City	Street	No.
Beijing	10A3	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Beijing	10A3	PEK01	Brose Beijing	Automotive Systems Co., Ltd.	CN	100076	Beijing	Ding Ye Road	23
Beijing	10A3	SHACD	Anji-CEVA Automotive Logistics Co., Ltd.		CN	201805	Shanghai	CaoAn Road	4408
Beijing	10A3	PEK02	Changchun Zonebond International Logistics Co. Ltd.		CN	130031	Changchun	Donghuancheng Road	5000
Beijing	10A3	ZN110	Kerry EAS logistics Limited	Crossdock Kerry	CN	215008	Shanghai, Jiading District	Jiaxing Road	1686
Beijing	10A3	CDSUZ	Kerry EAS Logistics Limited	Shanghai Branch	CN	215008	Suzhou	JinZhu Street	588
Belgrade	10C1	BGD01	Brose d.o.o. Beograd-Vračar		RS	26000	Pančevo		
Belvidere	10B4	BEL01	Brose Belvidere, Inc.	Goods receipt	US	61008	Belvidere	Logistics Drive	725
Belvidere	10B4	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Berlin	1082	BER01	Brose Fahrzeugteile Berlin	Logistikzentrum Spedition Craiss	DE	10553	Berlin	Neues Ufer	29
Berlin	10A7	BER02	Brose Antriebstechnik Berlin	Logistikzentrum Spedition Craiss	DE	10553	Berlin	Neues Ufer	29
Berlin	10A7	BER03	Brose Antriebstechnik GmbH & Co.	Kommanditgesellschaft, Berlin	DE	10553	Berlin	Sickingenstr.	29 - 38
Berlin	10A7	BER04	Offergeld Logistik GmbH & Co. oHG	EDL OFFERGELD LOGIST	DE	14641	Wustermark	Bremer Ring	5
Berlin	1082	BER04	Offergeld Logistik GmbH & Co. oHG	EDL OFFERGELD LOGIST	DE	14641	Wustermark	Bremer Ring	5
Betim	1131	BET01	Brose do Brasil Ltda.		BR	32530-490	Betim	Av. Contorno da Fiat	1300
Bratislava	1036	BA100	Brose Bratislava, spol.s.r.o.	Wareneingang	SK	90055	Lozorno s.c. 1006	Priemyselný park Lozorno	
Bratislava	1036	BABXX	D + S logistic GmbH	Crossdock Bratislava	DE	96271	Grub am Forst	Gruber Strasse	11
Bremen	1092	BRE01	Brose Fahrzeugteile GmbH&Co.KG Bremen	Wareneingang Brose Bremen	DE	28309	Bremen	Friedrich-List-Str.	13
Bremen	1092	DUSBR	D + S logistic GmbH	Crossdock Bremen	DE	96271	Grub am Forst	Gruber Strasse	11
Brits	1035	BR100	RG Brose	Automotive Components (Pty.) Ltd.	ZA	0250	Brits N.W.	6 Spruit Avenue , P.O. Box 899	
Brits	1035	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Changchun	1058	CC100	Brose Changchun	Automotive Systems Co., Ltd.	CN	130033	Changchun	Wen Zhou Street	1177
Changchun	1058	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Changchun	1058	SHACD	Anji-CEVA Automotive Logistics Co., Ltd.	Cross Dock Shanghai	CN	201805	Shanghai	CaoAn Road	4408
Changchun	1058	CC101	Schener Hong Kong Warehouse		HK	6013-20W	Kwai Chung	Unit 6013-20W, 6/F	
Changchun	1058	CC102	Reginal Synergy (M) SDN. Bld.		MY	42000	Northport Port Klang	KCT B3 Shed	
Chongqing	10A2	CH100	Brose Chongqing	Wareneingang Brose Chongqing	CN	401331	Chongqing	Xingwang Road	63
Chongqing	10A2	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Chongqing	10A2	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Chongqing	10A2	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Chongqing	10A2	SHACD	Anji-CEVA Automotive Logistics Co., Ltd.	Crossdock Anji	CN	201805	Shanghai	CaoAn Road	4408
Chongqing	10A2	ZN110	Kerry EAS logistics Limited	Crossdock Kerry	CN	215008	Shanghai, Jiading District	Jiaxing Road	1686
Chongqing	10A2	ZN120	Jiangsu HuiZhou Logistics Co., LTD	Crossdock HuiZhou	CN	215335	Suzhou	Kunshan San Xiang Road	433
Chongqing	10A2	OCCMA	KN OCC Manzanillo TIMSA	Oversea Consolidation Center Manzanillo	MX	28250	Manzanillo, Colima C.P.	Av. Teniente Azueta	29 EDIF
Coburg	1012	CO210	Brose Fahrzeugteile SE & Co.	Kommanditgesellschaft, Coburg	DE	96450	Coburg	Bamberger Straße	44
Coburg	1012	DUS01	D + S Logistic GmbH	Konsi-Lager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Coburg	1012	DUS02	D + S Logistic GmbH	Außenlager Brose Eigentum	DE	96237	Ebersdorf	Birkleite	5



Brose plant	Plant Code	Unloading Point	Name	Name 2	Country	ZIP	City	Street	No.
Coburg	1012	DUSEB	D + S Logistic GmbH	Stahl- und Werkzeuglager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Coburg	1012	DUSZO	D + S logistic GmbH	Zollager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Coburg	1012	KO100	Brose CZ spol. s r.o.	Wareneingang Koprivnice	CZ	742 21	Koprivnice	Prumyslový park	302
Coburg	1012	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Coburg	1012	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Coburg	1012	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Coburg	1012	WU100	Brose Schließsysteme Wuppertal	Wareneingang Werk 1	DE	42369	Wuppertal	Otto-Hahn-Straße	34
Coburg	1012	COTVS	Brose Fahrzeugteile SE & Co.	Kommanditgesellschaft, Coburg	DE	96450	Coburg	Dieselstraße	6
Coburg	1012	COTON	Brose Fahrzeugteile SE & Co.	Kommanditgesellschaft, Coburg	PT	3465-158	Santiago de Besteiros/ Tondela	Rua Max Brose	No. 38
Coburg	1012	KO125	Brose Fahrzeugteile SE & Co.	Kommanditgesellschaft, Coburg	DE	96450	Coburg	Max-Brose-Straße	6
Coburg	1012		Lieferantenliste DE Rohstoffmanagement	Rohstoffpool	DE				
Coburg	1012	DUS03	D + S Logistic GmbH	Außenlager Coburg Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Coburg	1015	BFS01	BFS Flugservice GmbH	Hangar Brose	DE	96450	Coburg	Zur Brandensteinsebene	
Coburg	1012	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Coventry	1024	CDNOJ	Schenker sp.o.o.	Crossdock Novy Jicin	CZ	741 01	Novy Jicin	Suvorovova	108
Coventry	1024	CV100	Brose Ltd.	Goods receipt	GB	CV7 9NW	Coventry	Colliery Lane, Ex-hall	
Coventry	1024	CV200	Brose Ltd.	Goods Receipt	GB	CV6 5NH	Coventry	Courtaulds Way, Foleshill	
Coventry	1024	CV208	Brose Ltd.	Goods receipt Plant 2 Ersatz	GB	CV6 5NH	Coventry	Courtaulds Way, Foleshill	
Coventry	1024	CVB01	D + S logistic GmbH	Crossdock Coventry	DE	96271	Grub am Forst	Gruber Strasse	11
Coventry	1024	CVB02	D + S logistic GmbH	Crossdock Coventry	DE	96271	Grub am Forst	Gruber Strasse	11
Coventry	1024	CVB03	D + S logistic für Coventry, Crossdock Gresham Road	Crossdock Coventry Gresham Road	DE	96237	Ebersdorf	Birkleite	4
Coventry	1024	CVG01	Gefco UK Ltd.	CROSSDOCK COVENTRY	GB	CV6 4BX	Coventry	Central Boulevard Prologis Park	unit 13m
Coventry	1024	CDHIL	Rhenus Freight Logistics GmbH + Co. KG	Crossdock Brose	DE	40721	Hilden	Im Hülsenfeld	25
Curitiba	1031	CRXXX	Brose do Brasil Ltda.	Campo Largo da Roseira Entrada	BR	83183-000	SÃO JOSÉ DOS PINHAIS	Avenida Sul	151
Curitiba	1031	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Curitiba	1031	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Curitiba	1031	OCCVE	GOLMEX PUERTO Manzana	Oversea Consolidation Center Veracruz	MX	91700	Manzana	SN Interior del recinto portuario	
Curitiba	1031	CREXP	Brose do Brasil Ltda.	Centro Curitiba Entrada Export	BR	83183-000	SÃO JOSÉ DOS PINHAIS	Avenida Sul, 151	
Curitiba	1031	JAR01	Brose do Brasil Ltda.	Rodovia Dom Pedro I, SP65, KM90	BR	13240-000	Jarinu (SP)	Bairro do Pinhal - Estrada Mun. Alberto Tofanin	
Detroit	1026	DE100	Brose North America, Inc.		US	48326	Auburn Hills	3933 Automation Avenue	
Detroit	1026	DE200	Brose North America, Inc.		US	48326	Auburn Hills	1650 Harmon Rd.	
Diadema	1331	DIA01	Brose do Brasil Ltda.	Bairro Casa Grande	BR	09961-390	DIADEMA-SP	AV CASA GRANDE	850
East London	1135	BR200	RG Brose	Automotive Components (Pty.) Ltd	ZA	5201	East London	Ikhalala Road	
East London	1135	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Gent	1037	GT100	Brose Gent BVBA	Wareneingang	BE	9042	Gent	Skaldenstraat	121
Gent	1037	GTB01	D + S logistic GmbH	Crossdock Gent	DE	96271	Grub am Forst	Gruber Strasse	11
Gent	1037	DUSBE	D + S Logistic GmbH	Konsi-Lager (Belgium)	DE	96271	Grub am Forst	Gruber Strasse	11
Gent	1037	DUSZE	D + S Zeickhorn		DE	96271	Grub am Forst	Gruber Strasse	11
Gifhorn	1068	DUSGI	D + S logistic GmbH	Crossdock Gifhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Gifhorn	1068	WO100	Brose Fahrzeugteile Gifhorn	Wareneingang Brose Gifhorn	DE	38518	Gifhorn	Rockwellstraße	11
Gifhorn	1068	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Goiana	1431	GOI01	Brose do Brasil Ltda.	Entrada Goiana	BR	55900-000	Nova Goiana	Rod BR 101-Norte KM	13/15
Goiana	1431	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Goiana	1431	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Goiana	1431	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Gothenburg	1054	GOE01	Brose Sweden AB	Wareneingang Brose Gothenburg	SE	423 37	Torslanda	Flygfältsgatan	4
Gothenburg	1054	G0EG1	D + S logistic GmbH	Crossdock Gothenburg	DE	96271	Grub am Forst	Gruber Strasse	11
Gothenburg	1054	DUSSE	D + S logistic GmbH	Konsi-Warehouse (Gothenburg)	DE	96271	Grub am Forst	Gruber Strasse	11
Gothenburg	1054	DUSZE	D + S Zeickhorn		DE	96271	Grub am Forst	Gruber Strasse	11
Guangzhou	10B1	GUA10	Brose Guangdong	Goods receipt	CN	510530	Guang Zhou City	Kai Chuang Avenue	1503

Brose plant	Plant Code	Unloading Point	Name	Name 2	Country	ZIP	City	Street	No.
Guangzhou	10B1	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Guangzhou	10B1	OCCDT	Kuehne + Nagel, Inc.	Oversea Consolidation Center Detroit	US	48174	Romulus	11501 Metro Airport Center Drive, Suite 100	
Hallstadt	1017	DUS01	D + S Logistic GmbH	Konsi-Lager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Hallstadt	1017	DUS02	D + S Logistic GmbH	Außenlager Brose Eigentum	DE	96237	Ebersdorf	Birkleite	5
Hallstadt	1017	DUS04	D + S Logistic GmbH	Außenlager Hallstadt Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Hallstadt	1017	HA104	Brose Fahrzeugteile SE & Co.	Kommanditgesellschaft, Bamberg	DE	96103	Hallstadt	Max-Brose-Straße	2
Hallstadt	1017	HA106	Brose Fahrzeugteile SE & Co.	Kommanditgesellschaft, Bamberg	DE	96103	Hallstadt	Max-Brose-Straße	2
Hallstadt	1017	HA108	Brose Fahrzeugteile SE & Co.	Kommanditgesellschaft, Bamberg	DE	96103	Hallstadt	Max-Brose-Straße	2
Hallstadt	1017	HAB04	D + S logistic GmbH	Crossdock Birkleite HAL MO/VKU	DE	96237	Ebersdorf	Birkleite	4
Hallstadt	1017	HAB06	D + S logistic GmbH	Crossdock Birkleite HAL (VFE)	DE	96237	Ebersdorf	Birkleite	4
Hallstadt	1017	HAG04	D + S logistic GmbH	Crossdock Zeickhorn HAL MO/VKU	DE	96271	Grub am Forst	Gruber Strasse	11
Hallstadt	1017	HAG06	D + S logistic GmbH	Crossdock Zeickhorn HAL (VFE)	DE	96271	Grub am Forst	Gruber Strasse	11
Hallstadt	1017	OCCCHK	Schenker International (H.K.) Ltd	Oversea Consolidation Center Hong Kong	HK		Tsing Yi	Tsing Yi Hong Wan Road	38
Hallstadt	1017	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Hallstadt	1017	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Jarinu	1531	JAR01	Brose do Brasil Ltda.	Rodovia Dom Pedro I, SP65, KM90	BR	13240-000	Jarinu (SP)	Bairro do Pinhal - Estrada Mun. Alberto Tofanin	
Jefferson	1070	JEF01	Brose Jefferson	Wareneingang Brose Jefferson	US	48091	Warren	25295 Guenther Drive	
Jefferson	1070	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Jefferson	1070	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Kecskemet	1099	KEC01	Brose Hungary Automotive Kft.	Wareneingang Brose Hungary	HU	6000	Kecskemét	Daimler ut.	1
Kecskemet	1099	KECXX	D + S logistic GmbH	Crossdock Kecskemét	DE	96271	Grub am Forst	Gruber Strasse	11
Kecskemet	1099	DUSZE	D + S Zeickhorn		DE	96271	Grub am Forst	Gruber Strasse	11
Korea	1155	DAE10	Brose Korea Ltd.	Goods receipt	KR	21990	Incheon	75, Cheomdan-daero 60beon-gil	
Korea	1155	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Korea	1155		Lieferantenliste CZ Rohstoffmanagement	Rohstoffpool	KR				
La Suze	1075	LSU01	Brose Automotive La Suze	Wareneingang Brose La Suze	FR	72210	La Suze-sur-Sarthe	Le-Pré-Sec	
London	1046	RAUL1	Rauh Spedition & Logistik GmbH	LON PRE PRODUCTION	DE	96269	Großheirath	Hans Rauh Straße	1
London	1046	RAUL2	Rauh Spedition & Logistik GmbH	LON FINAL ASSEMBLY	DE	96269	Großheirath	Hans Rauh Straße	1
London	1046	LO100	Brose Canada Inc.	Plant 1	CA	N6N 1P7	London	Max Brose Drive	1500
London	1046	LO200	Brose Canada Inc.	Plant 2	CA	N6N 1C9	London	Wilton Grove Road	1005
Meerane	1020	ELAG1	Brose Fahrzeugteile	ELAG-Lager Emden	DE	26723	Emden	Horchstrasse	2
Meerane	1020	MEBXX	D + S logistic GmbH	Crossdock Meerane	DE	96271	Grub am Forst	Gruber Strasse	11
Meerane	1020	MEXXX	BFT Meerane GmbH & Co.KG		DE	08393	Meerane	Seiferitzer Allee (WE)	
Meerane	1020	DUS01	D + S Logistic GmbH	Konsi-Lager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Meerane	1020	MEXX1	Rhenus SE & Co. KG	Ersatzleile Kartonage	DE	08393	Meerane	Dennheritzer Strasse	5
Meerane	1020	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Melfi	10A4	MEL01	Brose Melfi Automotive s.r.l.	Wareneingang Brose Melfi	IT	85025	San Nicola di Melfi	Zona Industriale	Zona D1
Melfi	10A4	DUSMF	D + S logistic GmbH	Crossdock Melfi	DE	96271	Grub am Forst	Gruber Strasse	11
Melfi	10A4	DUSZE	D + S Zeickhorn		DE	96271	Grub am Forst	Gruber Strasse	11
Melfi	10A4	MEL02	Brose Melfi Automotive s.r.l.	Wareneingang Brose Melfi	IT	85025	San Nicola di Melfi	Zona Industriale	Zona D1
New Boston	1276	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
New Boston	1276	NB001	Brose New Boston Inc.	Goods receipt	US	48167	New Boston	Bell Road	23400
New Boston	1276	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Ostrava	1029	OCCCHK	Schenker International (H.K.) Ltd	Oversea Consolidation Center Hong Kong	HK		Tsing Yi	Tsing Yi Hong Wan Road	38
Ostrava	1029	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Ostrava	1029	OCHKR	Schenker International (H.K.) Ltd	Oversea Consolidation Center Hong Kong ROZ	HK		Tsing Yi	Tsing Yi Hong Wan Road	38
Ostrava	1029	OCSHR	Huamao Warehouse	Oversea Consolidation Center Shanghai ROZ	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Ostrava	1029	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Ostrava	1029	OCGAR	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA ROZ	US	30337	College Park	4849 Massachusetts Boulevard	
Ostrava	1029	DUSNJ	D + S Logistic GmbH	Crossdock CZ Novy Jicin Aussenl.	DE	96237	Ebersdorf	Birkleite	4
Ostrava	1029	DUSRO	D + S Logistic GmbH	Crossdock Roznov	DE	96237	Ebersdorf	Birkleite	4
Ostrava	1029	KO100	Brose CZ spol. s r.o.	Wareneingang Koprivnice	CZ	742 21	Koprivnice	Prumyslový park	302

Brose plant	Plant Code	Unloading Point	Name	Name 2	Country	ZIP	City	Street	No.
Ostrava	1029	KO200	Brose CZ spol. s r.o.	Aussenlager Novy Jicin	CZ	741 01	Novy Jicin	Hrbítovní ulice	2203/82
Ostrava	1029	KOBXX	D + S logistic GmbH	Crossdock Koprivnice	DE	96271	Grub am Forst	Gruber Strasse	11
Ostrava	1029	RO100	Brose CZ spol. s r.o.	Wareneingang Roznov	CZ	75661	Roznov pod Radhostem	1. máje	2636
Ostrava	1029	DUSCZ	D + S Logistic GmbH	Konsi-Lager (Czech Rep)	DE	96237	Ebersdorf	Birkleite	4
Ostrava	1029		BUSAN PORT - SOUTH KOREA		KR				
Ostrava	1029	OCCVE	GOLMEX PUERTO Manzana	Oversea Consolidation Center Veracruz	MX	91700	Manzana	SN Interior del recinto portuario	
Ostrava	1029	OCVER	GOLMEX PUERTO Manzana	Oversea Consolidation Center Veracruz ROZ	MX	91700	Manzana	SN Interior del recinto portuario	
Prievidza	10A9	PRI01	Brose Prievidza, spol. s r.o.	goods receiving	SK	971 01	Prievidza	Max Brose	20
Prievidza	10A9	DUSPR	D + S logistic GmbH	Crossdock Prievidza	DE	96271	Grub am Forst	Gruber Strasse	11
Prievidza	10A9	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Puebla	1033	HINLA	Welldex's Warehouse		US	78045	Laredo	Humphry Road Sophia Industrial Park	13808
Puebla	1033	PUXXX	BROSE PUEBLA SA DE CV	Entrada	MX	72730	Sanctorum, Puebla	Camino a San Lorenzo	1214
Puebla	1033	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Puebla	1033	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Pune	1064	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Pune	1064	IND02	BROSE INDIA	AUTOMOTIVE SYSTEMS PVT LTD	IN	411057	Hinjewadi, Pune	Panchshil Tech Park, Hinjewadi	
Pune	1064	IND01	BROSE INDIA	AUTOMOTIVE SYSTEMS PVT LTD	IN	411057	TAL- MULSHI, Hinjewadi, PUNE	Plot No.	5 & 7
Pune	1064	IND03	BROSE INDIA	AUTOMOTIVE SYSTEMS PVT LTD	IN	411057	TAL- MULSHI, Hinjewadi, PUNE	Plot No.	5 & 7
Querretaro Aeropuerto	10B2	QU300	Brose Querretaro, S.A. de C.V.	Galeras	MX	76295	Colon, Querretaro	Max Brose No.	1
Querretaro Aeropuerto	10B2	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Querretaro Benito Juarez	1025	QU100	Brose Mexico S.A. de C.V.	Entrada Benito Juarez	MX	76120	Querretaro QRO	Calle 2	No.7
Querretaro Benito Juarez	1025	QU108	Brose Mexico S.A. de C.V.	Entrada Benito Juarez ERSATZ	MX	76120	Querretaro QRO	Calle 2	No.7
Querretaro Benito Juarez	1025	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Querretaro El Marques	1125	QU200	Brose Mexico S.A. de C.V.	Entrada El Marques	MX	76246	Querétaro	Avenida de la Corte	No. 4
Querretaro El Marques	1125	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Querretaro El Marques	1125	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Querretaro El Marques	1125	OCCHK	Schenker International (H.K.) Ltd	Oversea Consolidation Center Hong Kong	HK		Tsing Yi	Tsing Yi Hong Wan Road	38
Rastatt	1050	RS100	Brose Fahrzeugteile Rastatt	Wareneingang	DE	76437	Rastatt	Mercedes-Benz-Straße	1
Rastatt	1050	RSB01	D + S logistic GmbH	Crossdock Rastatt	DE	96271	Grub am Forst	Gruber Strasse	11
Rastatt	1050	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Rayong (Thailand)	1093	OCCTH	Sintanachote Co., Ltd	Oversea Consolidation Center Thailand	TH	10260	Bangkok	Lazal road	876
Rayong (Thailand)	1093	RAY01	Brose Thailand Co., Ltd.	Brose Thailand	TH	21140	Rayong	300/28 Moo 1	
Rayong (Thailand)	1093	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Rayong (Thailand)	1093	OCSHT	Shanghai Yunfeng Logistics Co.LTD.	Oversea Consolidation Center Shanghai TH	CN	200137	Shanghai	Mindong Road	239
Rayong (Thailand)	1093	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Reynosa	1078	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Reynosa	1078	PHA01	M.A.S. Logistics LLC	Brose Reynosa	US	78577	Pharr, TX	International Blvd	9601
Reynosa	1078	REY01	Brose Reynosa, S.A. de C.V.	Wareneinganf Brose Reynosa	MX	88614	Reynosa, Tamps.	Carr. Riberena Km 10.5	
SBA	1034	OCCMA	KN OCC Manzanillo TIMSA	Oversea Consolidation Center Manzanillo	MX	28250	Manzanillo, Colima C.P.	Av. Teniente Azueta	29 EDIF
Shanghai	10A1	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	

Brose plant	Plant Code	Unloading Point	Name	Name 2	Country	ZIP	City	Street	No.
Shanghai	10A1	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Shanghai	10A1	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Shanghai	10A1	SHN01	Brose Shanghai	Automotive Systems Co.,Ltd.	CN	201814	Shanghai	Bai an Road	235
Shanghai	10A1	SHN02	Brose Shanghai	Automotive Systems Co.,Ltd.	CN	201814	Shanghai	Anchen Road	258
Shanghai (SHM)	1079	SHM01	Shanghai Brose Electric Motors	Co., Ltd.	CN	201801	Shanghai	1126, Jiaxin Road	
Shanghai (SHM)	1079	SHM02	Shanghai Brose Electric Motors	Fuhua Plant	CN	201801	Shanghai	Shenxia Road	358
Shanghai (SHM)	1079	SHM03	Shanghai Brose Electric Motors	Meijian Warehouse	CN	201801	Shanghai	Meijian Road	110
Shanghai (SHM)	1079	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Shanghai (SHM)	1079	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Shanghai (SHM)	1079	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Shanghai (SHM)	1079	SHM04	Shanghai Brose Electric Motors Co.,Ltd.	SHM external warehouse	CN	215400	Taichang, China	Guangzhou East Rd.	188
Shanghai (SHN)	1179	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Shanghai (SHN)	1179	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Shanghai (SHN)	1179	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Shanghai (SHN)	1179	SHN03	Shanghai Brose	Electric Motors Co.,Ltd.	CN	201814	Shanghai	Anchen Road	258
Shanghai JV (SBA)	1034	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Shanghai JV (SBA)	1034	SH100	Shanghai Brose Automotive		CN	201814	Shanghai Jading District	Yuan Mao Road	No.299
Shanghai Office	1059	SO100	Brose Asia	Regional Headquarters	CN	201814	Shanghai	Anchen Road, Jiating District	258
Shenyang	10B3	SY100	Brose Shenyang	Goods receipt	CN	110122	Shenyang	No.3 Building, Zhiyuan industry park, Piping Road, Dadong Zone	27-3
Shenyang	10B3	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Shenyang	10B3	SHACD	Anji-CEVA Automotive Logistics Co., Ltd.	Cross Dock Shanghai	CN	201805	Shanghai	CaoAn Road	4408
Shenyang	10B3	SHCD2	Zonebond International Group, Cross dock	Crossdock Shanghai	CN	201808	Shanghai, Jiating District	Laodong road	528
Sindelfingen	1057	SI100	Brose Fahrzeugteile Sindelfingen	Wareneingang Brose Sindelfingen	DE	71093	Weil im Schönbuch	Max Brose Strasse	1
Sindelfingen	1057	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeichhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Sindelfingen	1057	SIB01	D + S Logistic GmbH	Crossdock Sindelfingen	DE	96271	Grub am Forst	Gruber Strasse	11
Sindelfingen	1057	DUS01	D + S Logistic GmbH	Konsi-Lager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Sindelfingen	1057	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Spartanburg	1142	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Spartanburg	1142	SP100	Brose Spartanburg Inc.	Goods Receiving	US	29334	Duncan	Howell Road	1171
Sta. Margarida	1023	DUSEB	D + S Logistic GmbH	Stahl- und Werkzeuglager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Sta. Margarida	1023	EXESM	Brose S.A.	Supplier Warehouse	ES	08730	SANTA MARGARIDA I ELS MONJOS	C/ Valencia	4
Sta. Margarida	1023	SM100	Brose S.A.	Direct deliveries	ES	08730	Santa Margarida i Els Monjos	C/Illes Balears	2 - 6
Sta. Margarida	1023	SMBXX	D + S logistic GmbH	Crossdock Sta. Margarida	DE	96271	Grub am Forst	Gruber Strasse	11
Sta. Margarida	1023	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Sta. Margarida	1023	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Taichang	10A8	TA200	Brose Taichang Automotive Systems Co.,Ltd	Goods receipt	CN	21540	Taichang, China	Dongting Road	158
Taichang	10A8	TA100	Brose Taichang Automotive Systems Co., Lt	Goods receipt	CN	215400	Taichang, China	Guangzhou Road	No. 188
Taichang	10A8	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Taichang	10A8	CDSMY	Schenker Logistics (M) SDN. Bld.	Crossdock Schenker MY	MY	41200	Northport Port Klang	Loring Batu Nilam	No. 6-1 & 8-1
Taichang	10C7	TAC01	Brose Taichang Automotive	Drive Systems Co., Ltd	CN	215400	Taichang, China	Guangzhou East Rd.	188
Taichang	10A8	TAC01	Brose Taichang Automotive	Drive Systems Co., Ltd	CN	215400	Taichang, China	Guangzhou East Rd.	188

Brose plant	Plant Code	Unloading Point	Name	Name 2	Country	ZIP	City	Street	No.
Taichang	10C7	GE100	Brose Taichang Automotive Co. Ltd.	Geely zhangjiakou	CN	075000	Zhangjiakou	Zhongrui street	2
Taichang	10C7	AE100	Brose Taichang Automotive Co. Ltd.	Asia-Europe Automobile Taizhou	CN	318050	Taizhou, Zhejiang Province	Pengbei Avenue	588
Taichang	10C7	GE100	Brose Taichang Automotive Co. Ltd.	Geely yuyao	CN	315400	Yuyao City, Zhejiang Province	Binhai Avenue	18
Taichang	10C7	GE100	Brose Taichang Automotive Co. Ltd.	Geely chunxiao	CN	315800	Ningbo City	Chunxiao Avenue	188
Taichang	10C7	GE100	Brose Taichang Automotive Co. Ltd.	Geely hangzhouwan	CN	315336	Cixi City	Binhai 2nd Road	818
Taichang	10C7	GE100	Brose Taichang Automotive Co. Ltd.	Geely xi'an	CN	710016	Xi'an, Shan Xi	Jili Avenue	666
Taichang	10C7	TAC02	Brose Taichang Automotive	Drive Systems Co., Ltd	CN	215400	Taichang, China	Guangzhou East Rd.	188
Togliatti	1094	TOG01	Brose Togliatti	Wareneingang Brose Togliatti	RU	445141	Togliatti	Severnaya street	6A
Togliatti	1094	DUSTO	D + S Logistic GmbH	Crossdock Togliatti	DE	96237	Ebersdorf	Birkleite	4
Tondela	1045	TO100	Brose Sistemas de Fechaduras	para Automóveis, Unipessoal Lda.	PT	3465-158	Santiago de Besteiros/Tondela	Armazém	
Tondela	1045	CDHIL	Rhenus Freight Logistics GmbH + Co. KG	Crossdock Brose	DE	40721	Hilden	Im Hülsfeld	25
Tondela	1045	TONCD	D + S Logistik GmbH	Crossdock Tondela	DE	96271	Grub am Forst	Gruber Strasse	11
Tuscaloosa	1047	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großsheirath	Hans Rauh Straße	1
Tuscaloosa	1047	TU100	Brose Tuscaloosa Inc.	Wareneingang Brose Tuscaloosa	US	35490	Vance	Brose Drive	10100
Tuscaloosa	1047	TU200	Brose Tuscaloosa Inc.	Thyssen Krupp Industrie Solution	US	35022	Bessemer Alabama USA	Perimeter Way	4961
Tuscaloosa	1047	TU300	Brose Tuscaloosa Inc.	BWH	US	35490	Vance	Brose Drive	10095
Tuscaloosa	1047	SH100	SHAPE Corp.		US	49417	Grand Haven	Comstock Street	16344
Tuscaloosa	1047	BM100	NYX New Albany		US	47150	New Albany	Progress Blvd	999
Wuhan	1069	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großsheirath	Hans Rauh Straße	1
Wuhan	1069	WH100	Brose Wuhan Autom. Systems Co., Ltd		CN	430056	Hanyang district	Fengshu 2nd street, WEDZ	Build.20
Wuppertal	1044	HOWUP	AVT Abfüll- und Verpackungstechnik		DE	42369	Wuppertal	Otto-Hahn-Strasse	34
Wuppertal	1044	WU100	Brose Schließsysteme Wuppertal	Wareneingang Werk 1	DE	42369	Wuppertal	Otto-Hahn-Straße	34
Wuppertal	1044	WU200	Brose Schließsysteme GmbH & Co.KG	Wareneingang Werk 1 RHB	DE	42369	Wuppertal	Otto-Hahn-Straße	34
Wuppertal	1044	WU300	Brose Schließsysteme GmbH & Co.KG	Wareneingang Werk 1 B	DE	42369	Wuppertal	Otto-Hahn-Straße	34
Wuppertal	1044	WUB01	D + S logistic GmbH	Crossdock Wuppertal	DE	96271	Grub am Forst	Gruber Strasse	11
Wuppertal	1044	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Wuppertal	1044	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Würzburg	1072	WBG01	Brose Fahrzeugteile SE & Co.	Kommanditgesellschaft, Würzburg	DE	97076	Würzburg	Ohmstrasse	2a
Würzburg	1072	WBG02	D + S Logistik GmbH	Crossdock Würzburg	DE	96271	Grub am Forst	Gruber Strasse	11
Würzburg	1072	WBG03	Pabst Transporte GmbH & Co.KG		DE	97469	Gochsheim	Industriestraße	15
Würzburg	1072	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76

### III. Add. Requirement: Traceability of Supplier Parts (Packaging Labels with 2D-Barcode)

#### i. Scope of application

This additional requirement will apply to all supplier parts of the Drives business division, which require a specific traceability and compulsory archiving at the suppliers site (material lots, process data, etc.).

For these parts the following text has to be written on the Brose part drawing: **"Traceability acc. to additional requirement 6606082201"**. This additional requirement is also implemented in the BOM, listed in a position between 0900 and 0999.

#### ii. Identification on the packaging (by supplier)

The identification of each packing unit (pallet, lattice box, etc.) is to be marked in principle with the VDA label according to VDA 4902 version 4 (barcode according to Code 39/128), (See Brose Procurement Handbook Chapter "container marking"). In principle, the VDA label with PDF417 is valid for the traceability of purchased parts. The new VDA label 4994 with DMC is also permissible but may only be used after written agreed consultation and approval by Brose.

All packaging subunits (smallest packaging unit on a pallet e.g. plastic and cardboard boxes, cartridges, buckets, etc.) have to be identified, each with a label according GTL or VDA 4994. (cp. 5.4).

Label sample with PDF417 (2D-Barcode) according to the GTL (Global Transport Label)

<b>From</b> <b>Fa. Mustermann</b> <b>D 12345</b> <b>Musterhausen</b> <small>Kontakt</small> <small>Made in</small>		<b>To</b> <b>BROSE WUERZBURG</b> <b>BFT GMBH &amp; CO. KG</b> <b>OHMSTRASSE 2A</b> <small>Anlieferwerk / Abladerstelle</small> <b>22 / 01E75</b>		<small>Brutto-Gew. / Netto-Gew.</small> <b>156 / 136 KG</b> <small>Lieferscheindatum /</small> <b>2002-10-24</b> <small>Änderungsstand Konstruktion</small> <b>KAM3A0042</b> <small>Chargenr.</small> <b>12345678</b>	
<small>Lieferantennr.</small> <b>0128749/20</b> <small>Lieferscheinr.</small> <b>123456</b>		<small>Anlieferstelle / Verbraucherstelle</small> <b>01A3-4B004</b>		<small>Packmittelrnr.</small> <b>006428</b> <small>Füllmenge</small> <b>1234567 PCE</b>	
<small>Artikelnr.</small> <b>A12345-110</b>				<small>Vwendungsschlüssel</small> <b>S</b>	
<small>License Plate</small>  <b>1J UN 04-997-7473 123456789</b>				<small>SUPPLIER</small>	

Illustration 45 - Sample layout for GTL labels

If in any case the identification with the GTL or the VDA 4994 is not possible, the supplier may use a similar label with PDF417 or DMC but only with written confirmation by Brose Logistic planning and Plant Quality department).

If a packaging unit has no subunits, an additional label with a PDF417 according to the GTL has to be placed on the packaging unit or the PDF417 has to be integrated in the existing master label (see example next page), alternatively the GLT-Label VDA 4994 can be used.

The label has to be placed on the packaging so that it is readable while the parts are withdrawn from the packaging. This means for example no labels on the covers of the packaging or inside the boxes. The label has to be removable easily without any residuals. Furthermore, the readability of the 2D-Barcodes has to be ensured (code print quality, label material stiff and non-reflective, wrinkle-free, etc.).

Starting with the delivery of C samples (first serial off-tool parts, without requirement for interlinked production lines) all packaging units and subunits have to be identified with labels according to the serial format.

In the PPAP (production part approval process) documentation the identification has to be listed as an own position, evaluated and released by Brose (size, layout and readability). To check the readability of the labels please attach the label in serial format.



Example of master label VDA 4902 Version 4 with integrated PDF417:

(1) Empfänger <b>Brose Fahrzeugteil</b> <b>D 08393 Meerane</b>		(2) Abdruck, Lagerort/Verwendungsart <b>MEXXX 4000</b>	
(3) Lieferanten-Nr. (N)		(4) Lieferanten-Adresse (Werk, Pkt, Ort)	
1234 			
(5) Sach-Nr. Kunden (P)		(6) Gewicht Netto	(7) Gewicht Brutto
<b>A20926-110</b> 		13	123
		(7) Anzahl 1	
(8) Menge (Q)		(9) Bezeichnung	
123 		<b>Fan Single</b>	
(12) Lieferanten-Nr. (N)		(11) Sach-Nr. Lieferanten (N)	
44916 		003381 	
(13) Packstück-Nr. (N)		(12) Teile, -Lager	(14) Anmerkungsbereich
1234 		D121012 AC	
		(15) Chargen-Nr. (N)	
		1234 	

Warenverkehrslabel VDA 4902 Version 4

Illustration 46 - Sample layout for master labels

### iii. Specification 2D-Barcode

The 2D-Barcode is used for traceability at Brose. It is important that the barcode is based on ASCII (American Standard Code for Information Interchange) according to GTL specification. The following ASCII control characters have to be used:

	DEC	HEX	
[	91	5B	
)	41	29	
>	62	3E	
R <sub>s</sub>	30	1E	Data set separator
G <sub>s</sub>	29	1D	Group separator
E <sub>O<sub>T</sub></sub>	04	04	End of transmission

The data structure of the data string of the 2D-Barcode can be illustrated graphically as follows:

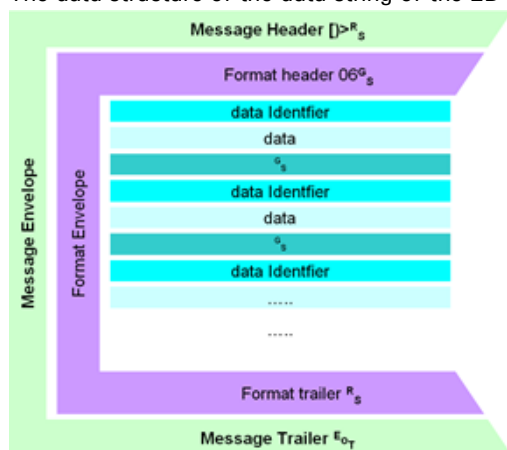


Illustration 47 - Structure of Barcodes

In the data string of the 2D-Barcodes different information can be included. The following 3 topics of information are mandatory and have to be included in the data string and have to be printed in plain text on the label in addition.

**Table 46 - Mandatory fields of barcodes**

Identifier	Description of	Length
P	Brose material number 10-digit (xxxxxx-xxx)	max. 18 characters
V	Supplier number, allocated by Brose	max. 10 characters
1T	Batch number issued by the supplier in order to define a specific lot, batch or partial amount	max. 17 characters

The respective batch sizes shall be communicated by the supplier and documented during the APQP (Advanced Product Quality Planning) process with the supplier.

The respective identifier has to be put in front of the information.

Additional identifiers according to GTL specification can be included as well:

**Table 47 - Other variables of barcodes**

Identifier	Description of	Length
31P	Order number / description	max. 35 characters
16K	Advice Note No	max. 12 characters
1P	Supplier's material number	max. 35 characters
Q	Quantity	max. 12 characters
9D	Delivery date in format YYYY-MM-DD or YYYY.MM.DD	
15D	Expiry date in the format YYYY-MM-DD or YYYY.MM.DD	
3S	Package identification	max. 17 characters
Z	Revision level	max. 2 characters
20P	track or sub	max. 12 characters
21P	tooling	max. 12 characters

For materials subject to an expiry date (e.g. adhesives, etc.) the content of field 15D must also be printed in clear text:  
**"Verfallsdatum/ Date of expiration: YYYY-MM-DD"**

The following example data string only contains the minimum requirements. All PDF417 barcodes must be structured analogously.

Examples:

[ ] > ▲ 06 ↔ PA12345-111 ↔ V8321425 ↔ 1TCHARG\_12345 [ ] ▲

ASCII control characters used in this example:

R<sub>s</sub> = ASCII Code 30 (data set separator)      ▲  
G<sub>s</sub> = ASCII Code 29 (group separator)      ↔  
E<sub>O<sub>T</sub></sub> = ASCII Code 04 (end of transmission)      [ ]

Printout PDF417:



**Illustration 48 - Printed barcode PDF417**



i. Print quality of the PDF417 barcode

The 2D-Barcode has to be printed in a quality that fulfills at least grade 3 (exceeds „good“ or ANSI Grade B) for all parameters in a readability test according to ISO/IEC 15426-2.

ii. Consideration of existing label layouts and data formats

Existing label layouts and data formats have to remain without changes because of compatibility reasons. Only after a written agreement by Brose (Logistic planning) a change is possible. A separate deviation request regarding label layout and data format is not needed for existing serial projects.

All other requirements (especially regarding print quality and readability of the label) have to be fulfilled. Otherwise it will be claimed.

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