

Function

Logistics Brose Group

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Procurement Logistics – Logistics requirements for suppliers

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List of abbreviations

AIAG	-	A utomotive I ndustry A ction G roup
BroTAP	-	B rose T ransport A vis P ortal
BTM	-	B rose T ransport M anagement
CCRA	-	C anadian C ustoms R evue A gency
DAP	-	D elivered a t P lace
DFÜ	-	D ata communication (OFTP)
DIN	-	D eutsches I nstitut für N ormung (German Institute for Standardisation)
EDI	-	E lectronic D ata I nterchange
EDL	-	E xternal service provider
E.g.	-	For example
ESD	-	E lectrostatic D ischarge
EU-VO	-	E uropean Union Regulation
FCA	-	F ree C arrier
GLT	-	L arge load carrier
GST	-	G oods and S ervices T ax
HR	-	H igh rack
IBC	-	I ntermediate B ulk C ontainer
ID	-	I dentification
ISO	-	I nternational O rganization for S tandardization
ISPM	-	I nternational S tandard for P hytosanitary M easures
JIS	-	J ust in S equene
JIT	-	J ust in T ime
KLT	-	S mall load carrier
LT-Management	-	L oad carrier management
NAFTA	-	N orth A merican F ree T rade A greement
pcs.	-	P ieces
THC	-	T erminal H andling C harge
VDA	-	V erband der A utomobilindustrie (Automobile industry association)
WD	-	W orking day
ZIP	-	Z IP code

1 INTRODUCTION

The deliveries to Brose are supposed to be according to the requirements of this manual, individual agreements with the relevant production site and the Brose general terms and conditions. The purpose of this manual is to provide Brose suppliers with a better understanding of the logistical requirements and their responsibilities.

2 GENERAL CONDITIONS

2.1 Delivery concept

Deliveries to Brose take place after ordering by Brose based on the agreed logistics details. These are described below and fixed 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 will ensure that further variants developed by Brose can be introduced without any problems.

The delivery concept comprises the following:

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

2.2 Explanation of the delivery conditions

The delivery conditions are agreed upon between the receiving Brose plant and the supplier for all parts.

2.2.1 Incoterms

Since 01.01.2012, Brose has generally been using the Incoterms revision status 2010 in procurement. **After the Incoterm update on 01.01.2020 the new binding revision status for all transports will be ICC 2020.**

Brose generally applies the Incoterms presented below. Deviating Incoterms (DDP "delivered duty paid" only after approval by Central Logistics, Taxes and Finance) are only applicable after approval by the responsible Brose logistics planner if particular cost savings can be achieved. In principle, Brose insures all transports organized by Brose by itself and dispenses with additional transport insurances.

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 "Named place". Generally, this is the location where the costs transfer to the buyer according to the selected Incoterm(s).

2.2.3 Annex to Incoterms (Consignment warehouse)

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

Additional Condition Consignment warehouse

In the case of an additional condition "Consignment warehouse", Brose maintains a consignment warehouse, to which the following agreements apply in addition to the respective, specified Incoterms:

- 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. Comprehensive information can be found in **chapter 7.2.**

2.2.4 Delivery Address

For communication with the supplier, Brose uses a 5-character alphanumeric code for the corresponding delivery address to define the unloading point. The code and the corresponding translation for the respective address are shown in the table under **appendix 9.II**. Brose expects from the supplier to attach the corresponding code to the shipping labels as described in the definition for container labeling under **chapter 5.3**.

2.2.5 Supplier's Dispatch Address

Supplier dispatch addresses if differing from the order address need to be defined in the delivery concept. In the event of a changing dispatch address of the supplier (e.g. through relocation) the supplier has to announce the change six weeks prior to the transition.

2.2.6 Packaging Responsibility

The packaging regulations are agreed upon with the receiving Brose plant and the supplier for all parts alike. The handover interface for empties corresponds to the point of transfer of risk according to the delivery conditions (**chap. 2.2.1**). The only exception is the use of the Brose-Supply-Net, in this case the supplier's area of responsibility for reusable load carriers shall end at the point of transfer to the Brose-Supply-Net.

Ownership of the containers is recorded through credits and debits in the container accounts. The standard containers used in the supply chain between supplier and Brose are described 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 has to 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 time-span has been agreed upon, the supplier sends the container status to the Brose container schedulers on a monthly basis.
- In case the supplier requires additional containers due to increased short-term call-offs, it must be coordinated with the Brose schedulers.
- KLT are generally only provided in complete load 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 ask the respective purchasing department.
- With regard to empties, Brose generally only provides and accept clean, operational empties and only accepts clean operational pool containers for deliveries (**chap. 3.6.3**). 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	E.g. 3
Basic requirement, supplier	1.5 x delivery frequency [wd]; for lifecycles ≤ 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 a 1:1 exchange of the empties	0
Σ		21.2

Table 3 - Sample calculations for container requirements

	Sample calculations:		
	E.g. 1	E.g. 2	E.g. 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./ load unit (LU)	200 pcs./ load unit (LU)	200 pcs./ load 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 load units:	$2.085 \text{ LU/ wd} \times 25.1 \text{ wd} =$ 52 LU	$2.085 \text{ LU/ wd} \times 10 \text{ wd} =$ 21 LU	$2.085 \text{ LU/ wd} \times 20.6 \text{ wd} =$ 43 LU

The delivery cycle calculated here in working days should take into account 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.

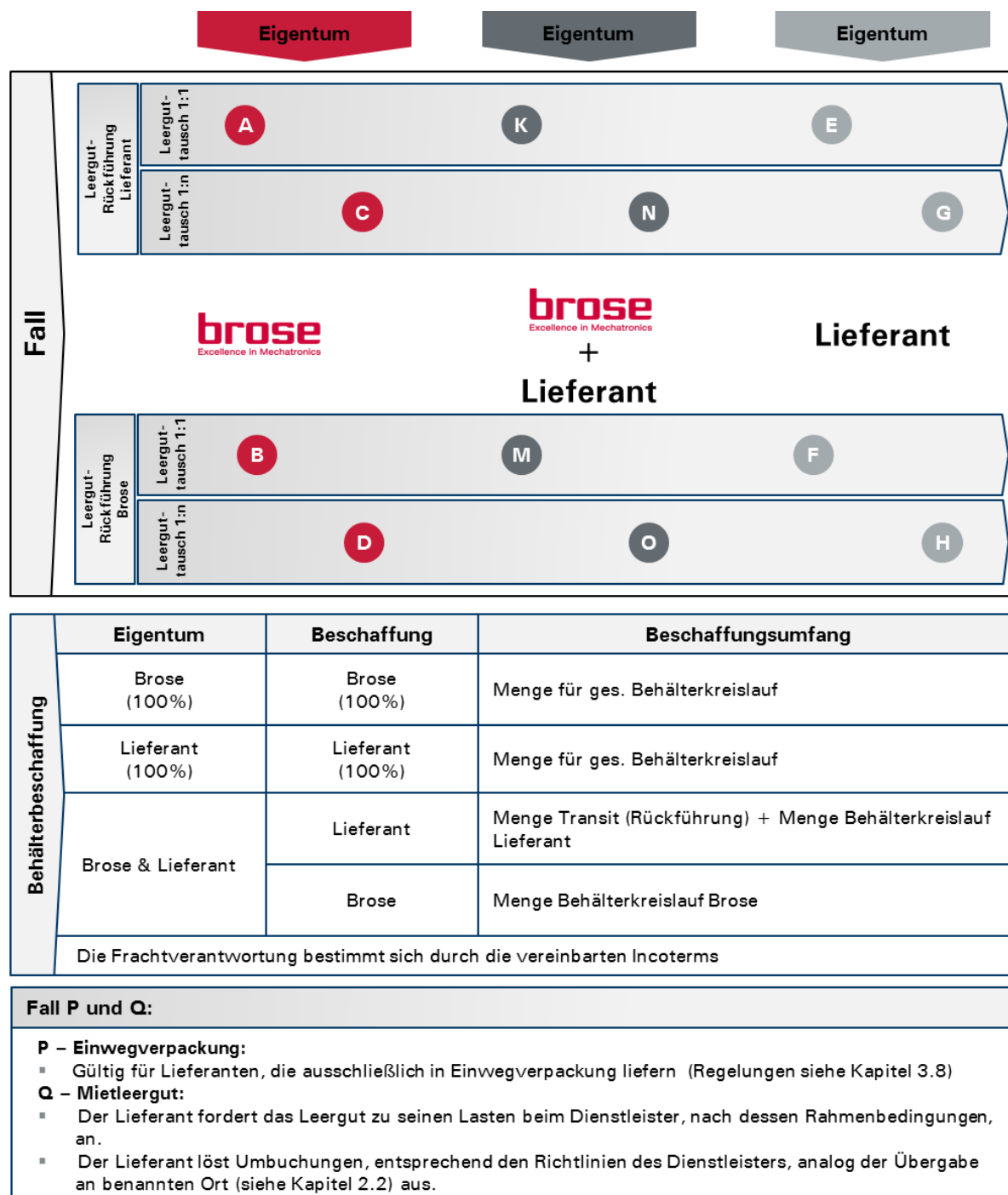


Illustration 1 - Case examples of packaging responsibility

2.2.7 Transport Procedure

The quantities declared must be packaged appropriately in accordance with Brose's requirements and instructions for transport (cp. **chap. 3**), 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. 0**) immediately.

2.2.7.1 European Transport Registration

If delivery terms **FCA supplier** are agreed upon, the supplier has to 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. **Document type**
 - Fulls
 - Empties
2. **Sender**
3. **Receiver**
 - Plant
 - Unloading spots
 - etc.
4. **General Information**
 - Identification number
 - Delivery note number
 - etc.
5. **Pick-up / Delivery time window**
6. **Cargo information**
 - Amount
 - Weight
 - 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 be ensured at all times.

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

Contact BTM Team

Brose Transport Management

Mail: 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	Mega
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	Meerane
main contact person				Max Mustermann			Max Mustermann		
phone number				+49 123 45678			+49 123 45678		
email				max.mustermann@123.com			max.mustermann@123.com		
Opening Hours				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	Rožnov pod Radhoštěm
main contact person				Max Mustermann			xx		
phone number				+49 123 45678			+420 556 84 4870		
email				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: brosenachrobinson.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

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 has to be divided between the following components:

- Transport costs to Brose/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 has to pay, may be declared (according to agreed delivery conditions)

2.3.1 Differentiation from the 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 of the logistics costs components

Table 4 - Overview of logistics costs

Logistics costs/ 100 pcs	Costs component	Formula
Logistics costs/ 100 pcs	Transport costs to Brose or external service provider /100 pcs.	Costs for transporting goods: From dispatch address to destination, according to delivery conditions (cp. chap. 2.2) This includes: • Pre-run, main run and post-run costs • Toll and fuel costs • Provision costs for containers, and • All transfer costs within the interfaces, such as Crossdock, THC, stowage
	Packaging cost /100 pcs.	• Costs for one-way packaging material (package and packaging aids). • Costs for returnable packaging or returnable load carriers (for the part of the load carrier circulation that the supplier is responsible for or has to purchase.) Possible options are current costs, depreciation value, rental costs, transfer costs (incl. administration costs for LT management). Usually 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 they are process related and there is proof they have been paid by the supplier.

Logistics costs/100 pcs	Costs component	Formula
	Additional external logistics service /100 pcs.	All required external logistics service costs paid by the supplier. These costs include: • 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. • Crossdock costs
	Customs duty /100 pcs.	All customs (export and import duty) , according to customs conditions of the country of export and of import, All costs and fees connected with customs handling (e.g. handling costs for the customs agent).
	Taxes, fees /100 pcs.	All taxes , according to tax legislation of the country of export and of import, which are non-refundable. 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 as a result of tax registration by the supplier through a supplier warehouse (transfer of ownership upon collection by Brose).
	B price /100 pcs.	• Transport costs • Packaging cost • Additional external logistics service • Customs and 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 the Supplier Workplace (web-based supplier portal) is required.

For the electronic data interchange, Brose prefers the use of VDA (Automobile industry association) standard messages, alternatively in EDIFACT 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 under the following link: <https://www.brose.com/de-en/edi/>. For technical EDI questions the central EDI coordination (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 or 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. [chap. 9.II](#)).

If another Incoterm than "DAP receiving plant" is agreed, the supplier shall provide the goods in an appropriate time, taking into account 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.

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 respective Brose specifications shall apply. **Detailed technical specification as well as the latest specifications of the ASN structure and content can be found on the Brose Homepage <https://www.brose.com/de-en/edi/>.** The Brose homepage also offers an ASN validation service to ensure the conformity with the Brose standards.

The ASN must contain the following data:

- Delivery note number
- Order or delivery schedule number (usually: 55xxxxxxx)
- Brose material number and the delivery quantity for the load unit.
- Batch number per material number
- Brose packaging material number (container code) with particular number of the packaging units and the filling quantity
- Shipments that are registered via the Brose BroTAP notification portal must carry the FWO (**For**warding **Order**) number in the Means of transport ID field of the ASN.
- Each HU (handling unit) must be associated with a clear identification number assigned by the supplier. This is also referred to as unique package number on the label. The package number links the ASN with the labels of load units (LU)/large load carrier (GLT) and packaging units (PU)/small load carrier (KLT).

Additional logistics requirements:

- ASN data/structure and delivery documents
 - The ASN needs to reflect the packaging structure of the load units. The packaging structure of the load unit transmitted in the ASN (GLT package number and referring KLT package numbers) needs to match exactly with the delivered packaging structure of the load unit (package numbers on labels). Especially in case of the delivery of several load units per material number the correct allocation has to be observed.
 - The data transmitted in the ASN must match with the data on the delivery documents (cp. **chap. 5.2**) and on the attached labels (cp. **chap. 5.3**).
- 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.
- Batch number:
 - Each load unit may contain only one material batch.
 - Different batches of one material have to be declared separately on the delivery note.
 - Different batches of one material have to be notified separately.

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 (cp. chap. 8)** have to be used. A detailed description of load 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 have to 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:

Table 5 - 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 taking into account 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/hand-books-templates/>).

3.2 General Requirements

The following requirements have to 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 load 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 chapter **8.4 Concepts of cardboard packaging** and information regarding packaging marking **chapter 8.5 Concept of Packaging-Marking.**
- Transportability of shipping units with floor conveyers and on Brose conveyer 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, according to the Directive (EU) 2000/53 (ELV - End of Life Vehicle Directive), the corresponding 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. For further questions regarding REACH requirements, please write to the following e-mail address: IMDS@Brose.com.**

3.4 Modular design, stackability and securing load carriers

3.4.1 Modular design

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

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

Illustration 3 - Modular structure of load units

3.4.2 Stackability

Palletized load 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 is 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 have to be labeled as "empty containers".

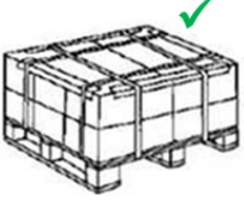
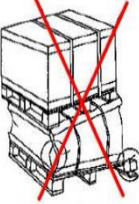
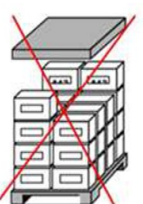
Permitted			
Not permitted		 	

Illustration 4 - Regulations for load 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 5 - 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. Load units must be strapped with plastic tension belts. Metal tension belts are not permitted. Shrink-wraps and stretch films are permitted 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 6 - 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) has to be used to prevent damage (i.e. by fork lifter) on the cover plate at the bottom. The complete container has to be tied up with the last euro-pallet at the bottom.



Illustration 7 - 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 have to 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 load 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 have to be borne by the originator. If the supplier needs more containers due to raised delivery call-offs, he has to contact the disposition 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 in the course of the initial sampling as proof of suitability of the load carrier.

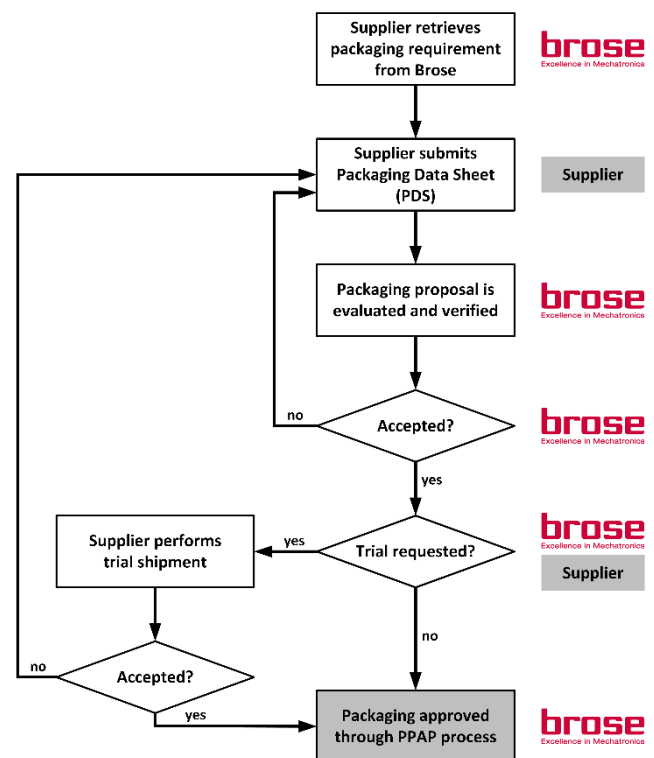


Illustration 8 - Process of packaging development

The following principles must also be taken into account:

- 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 containers

3.6.1 Use of poolable Brose standard containers

The parts delivery to Brose plants is based on the use of poolable containers. Poolable means that all containers are separated across the stock level, independently of the respective supplier, in order to prevent elaborate separation by owner.

Pool containers may only be used for delivery of series parts to Brose plants. They may not be used for internal material flows, temporary storage or for supplying subcontractors for other purposes.

3.6.2 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 movements with the empties administration at the Brose Coburg plant.

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.

3.6.3 Damage to containers, dirt and scrap

Table 6 - Regulations for condition and handling of containers

Damage to containers	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.
Dirt on containers	Clean means without labels, scrap, parts and free of dust, oil and grease as well as parts where the cleanliness requirements are specified in the drawing. For defined circulations with special containers with a different cleanliness standard, this must be agreed separately with Brose. 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. If the cleanliness of the load carriers does not meet the agreement, this should be reported to the source providing the service. Quality reports (in particular 8D reports) do not have to be provided as an answer.
Scrapping containers	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.

3.6.4 Exchange criteria for EURO pallets and pallet cages

The delivery condition of EURO pallets and pallet cages is based on the exchange guidelines for EPAL (see www.epal-pallets.org). Containers, which do not meet this standard, must be complained about. 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

3.6.5 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.

3.6.6 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.

3.6.7 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 (cp. **chap. 0**). Prior agreement and written release from Brose is 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 7 - Regulations for packaging waste

Reduction	Use of the economically and ecologically most suitable packaging and packaging tools. Limitation on the necessary weight and volume (Saving of resources and reduction of the amount of transport)
Material use	Use of environmentally-friendly, reusable materials for all types of packaging; use as close to the place of collection as possible in order to avoid return via the delivery chain and the associated transport volume. The costs of recycling are to be borne by the supplier. The labeling of those materials is described in the "Brose Packaging Specification".

3.7.3 Handling labels

The correct and complete labeling of disposable packaging must comply with DIN 55402 and ISO R 780 (Labeling 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 load units

Material numbers have to be delivered unmixed. A mixing of batches in a load unit is not permitted, either. Each load unit may contain only one material number and one material batch.

If complete load units cannot be formed due to the small call-off quantities, load carriers with different ID numbers can be combined to form a collective load unit **after explicit 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 Masterlabel 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 5.3 Identification 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 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

Load 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 have 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 load units,
- The use of INKA, press board, plastic, cardboard or EURO pallets is not permitted,
- Use of **stackable** load units (not opened layers, no pyramid stacking), **the marking of load 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. 8.3.4**) 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/>

3.10.4 Labeling of overseas packaging

The handling labels are shown in "**Brose Packaging Specification**". Load units corresponding to **chap. 5** have to be labeled with the VDA label or a compatible format:

- Each small load carrier must be labeled at the prescribed mark. If this is missing, the position of the label must be agreed with Brose.
- Two master labels must be stuck to each load unit / pallet (front and side) so that the container can also be identified and allocated when stacked. Labeling on front and side is an exception to **chap. 0**.
- The Brose location (receiving plant **NOT unloading point location**) must be stated on the label.
- Each label must have a serial number according to DIN 55 402 (single item and total number):
e.g.: "No. 1 of 5", "2/62, "Pal. #5 of 10").

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.

3.11.1 Delivery of coils

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

Table 8 - 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 9 - 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
Underclearance (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.

3.11.2 Labeling packaging units

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 order's 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

We require 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. See also the information in chap. 4.2.

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, we mean plant, machinery, parts and tools of same, 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 Export Act (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 capital goods

All capital goods must generally be packed correctly and appropriately before transport.

To this end, we refer to the packaging guidelines of HPE (Bundesverband Holzpackmittel Paletten Exportverpackung (HPE) e.V.) <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

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 number (purchase order/delivery schedule no.)
- Brose ID number and exact description of the goods
- 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 2020**
- Separate note of the freight costs from the EU outer border to the inner-EU destination
- Number of packages, weight (gross weight, net weight)
- 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" 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 01.11.2011 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 from this:

- 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* 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

*Transporters are shipping lines, airlines or carriers.

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 Forwarding order (CMR)

Our container management uses the forwarding order as a basis for the regular co-ordination of accounts and as a controlling instrument for the quantitative and qualitative control of containers on the arrival of (the) goods.

For this purpose, we require complete, correct and clear information, which has to be entered in the forwarding order as follows:

Table 10 - 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. chapt. 8.7 , ID of the respective overview)
Number	Number of containers

The correct condition and completeness of the consignment is confirmed by the signature of the driver or the haulage company.

The supplier must ensure that the delivery documents are correctly completed. It shall bear the costs for obtaining the information not in the delivery documents.

5.2 Delivery note

As a transport document and goods-accompanying slip the latest 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 EDI goods accompanying slip.

The following information is required:

- **Delivery note number**
- Identification of country, postcode, place of dispatch and the supplier's number
- **Brose order number (purchase order no./deliver schedule no.)**
- **Brose ID number and exact description of the goods**
- **Weight (gross-, netweight)**
- For each material identification number exact information must be provided with respect to:
 - Quantity of the material-ID Number
 - All packaging components of the load unit and their respective quantity
 - Brose container code/packaging ID of the respective container, packaging and load units ~~(except for disposable packaging)~~.
 - The container code is basis for the container management system and therefore must be indicated in the delivery documents with each delivery. Delivery notes without material-ID/Brose container codes cannot be registered and causes false registration on the container accounts, which in turn leads to difficulties for the incoming goods and container management. As a result, no payment will be made!
- For materials requiring documentation (D-parts, material with traceability):
 - The unique batch number per delivery of the material ID number.
 - Upon delivery of different batch numbers for one material number, a separate delivery position must be generated, packed and adviced per batch number.
 - **Additional markings, such as the safety item marking  on the delivery note may be requested by the receiving plant.**

Additionally, for deliveries registered via the Brose BroTAP notification portal, the **Forwarding Order** (FWO) number from the BroTAP (cp. **chap. 2.2.7**) must also be recorded on the delivery note.

The data on the delivery documents needs to match with the data transmitted in the ASN (cp. **chap. 2.4.3) and on the attached labels (cp. **chap. 5.3**).**

5.3 Container labeling

5.3.1 Label layout and content

A distinction is made between two Label types: GLT-Label (= Master-Label/goods label) and KLT Label (= Single-Label). 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 or from the business unit logistics. This applies for example to:

- the Global Transport Label (GTL) according to VDA 4994 (alternatively AIAG B-16), only in combination with the DUNS-number, but not JAPLA or ODETTE
- the PDF417 label with two-dimensional barcode (cp. [chap. 9.III](#))

The label layouts and content required by Brose for the VDA 4902 label are explained below. No individual agreement can be made between the supplier and Brose plant regarding the label content. The following standard specifications must be fulfilled.

GLT label according to VDA 4902:

(1) Receiver Brose Schließsysteme GmbH & Co. KG DE 42369 Wuppertal		(2) Unloading point/storage location WU100	
(3) Delivery note no. (N) 368169 		(4) Supplier address OMEGA TECHNOLOGY PLASTIC DE 49356 Diepholz	
		(5) Net weight 25,00	(6) Gross weight 56,00
		(7) Quantity of packaging 1/1	
(8) Part number customer (P) 987581-102 			
(9) Quantity (Q) 12800 		(10) Description Sub Rod SL-R	
		(11.2) Customer no. of packaging (B) 304413-000 	
(12) Supplier ID (V) 9837 		(13) Date D16.11.09	(14) Revision Status 103
(15) Package no. (M) 146541001 		(16) Batch No. (H) 5201531011 	
(17) OMEGA TECHNOLOGY PLASTIC GmbH & Co.			

Illustration 9 - GLT label according to VDA 4902

"Safety Item"
Special labeling symbol
for parts that require
documentation

(8) Part number customer (P) 657412-101 	Made in Germany 
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Illustration 10 - Special labeling symbols "Country of Origin" and "Safety Item"

KLT label according to VDA 4902:

(1) Receiver Brose Schließsysteme GmbH&Co. KG DE 42369 Wuppertal		(2) Unloading point/storage location WU100	(3) Delivery note no. 368169
(8) Part no. (P) 987581-102 			
(9) Quantity (Q) 800 		(10) Description Sub Rod SL-R	
(11.2) Customer no. of packaging (B) 3044EA-000 		(12) Supplier ID (V) 9837 	
(13) Date D16.11.09		(14) Revision Status 103	
(15) Package no. (S) 146541002 		(16) Batch No. (H) 5201531011 	
(17) OMEGA TECHNOLOGY PLASTIC GmbH & Co.			

Illustration 11 - KLT label according to VDA 4902

"Safety Item"
Special labeling symbol for parts
that require documentation

(8) Part number customer (P) 657412-101 	
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Illustration 12 - Special Labeling symbol "Safety Item"

Overview of data elements:

Table 11 - 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: Production site Location (Country code, ZIP-code, city)	-	Brose Schließsysteme GmbH & Co. KG DE 42369 Wuppertal	M ¹⁾	M
(2)	Unloading point/storage location	Usage key for the unloading point or transfer point to Brose (cp. call-off or chap. 9.II)	-	WU100	M	K ²⁾
(3)	Delivery Note No.	Number allocated to the delivery note by the supplier	N	368169	M	K
(4)	Supplier Address	Supplier name and address short (Country code, ZIP-code, city)	-	OMEGA TECHNOLOGY PLASTIC DE 49356 Diepholz	M	-
(5)	Net weight	Weight of the package without load unit [kg]	-	25.00	M	-
(6)	Gross weight	Weight of the package with load unit [kg]	-	56.00	M	-
(7)	Number of packages	No. of the respective package / number of packages for this delivery	-	1/1, 1/4 etc.	M	-
(8)	Part number customer	10-digit Brose ID number If required for overseas shipments, the country of origin can be inserted here. (cp. chap. 7.3.2) For parts that require documentation, the special labeling symbol for safety item  must be entered in the far right in field 8 or alternatively in field (16) batch number.	P	987581-102 Made in Germany 	M	M
(9)	Quantity	Filling quantity of ID number in the package (for GLT-master label the filling quantity of the load unit; for the KLT label, the one of the packaging unit).	Q	12800 ST	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: ³⁾ GLT: ID of the sub-pallet, KLT: container ID	B	Pallet: e.g. 304413-000 KLT: e.g. 3044EA-000	M	M

No.	Field description	Contents	Barcode ID (prefix)	Example	GLT	KLT
(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: -	K	K
(15)	Package number	Unique ID (per year), which the supplier allocates to a package. GLT-master-label: load unit with KLT, barcode ID = M, load unit without KLT, barcode ID = S. KLT-Label: Barcode ID = S	see left: M / S	Master: M146541001 Single: S146541002	M	M
(16)	Batch No (max. 10 characters)	Number, which the manufacturer allocates to a batch or production lot. If there is no batched part or batch management by the manufacturer, 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 GmbH & Co.	M	M

¹⁾ M = Mandatory field

²⁾ K = Optional field

³⁾ Brose Packaging ID:

- For universal load carriers, cp. **chap. 8.7 "Brose Packaging Specification"**.
- For Brose Standard packaging (returnable and one-way), cp. **chap. 8.7 "Brose Packaging Specification"**
- 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 load unit (packaging numbers on labels). Cp. **chap. 2.4.3 Advanced Shipping notification (ASN)****

5.3.2 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 on format and paper quality must be complied with:

Table 12 - Regional label sizes and quality

	Europe/Asia	NAFTA	Paper quality
GTL (Master) Label	A5 (210mm x 148mm),	Half-Letter (215.9mm x 139,7mm)	Insert label: min. 120 g/m ² Adhesive label: min. 80 g/m ² white with black print, smooth, moisture resistant
	A6 (148mm x 105mm),	6in x 4in (152,40mm x 101,60mm)	
KLT (Single) Label	210mm x 74mm	210mm x 74mm	

5.3.3 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. 13).
- For deliveries in and to the NAFTA region, adhesive labels are permitted (cp. Illus 14).
- 1 Single-label per package (KLT/cardboard). For VDA-KLTs, the label must be pushed into the slip pocket provided for this purpose.
- 2 Master-labels per load unit (GLT), one each on the bottom right on both front sides (short sides). (Exceptions for overseas packaging: cp. chapter 3.10.4 Labeling of overseas packaging)
- 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.
- Elements used to secure the load 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. Old goods tags and fastening elements (e.g. clips, wires) must be removed.

Permitted	Not permitted
	

Illustration 13 - 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 14 - Regulations for placement of labels on NAFTA KLT

5.4 Container accompanying documents

Delivery documents need to be generated separately for each plant or unloading place or dock.

The container management requires precise ID number-based packaging data. Brose gets this data from the delivery documents.

At goods receiving or upon delivery to a Crossdock, the containers are recorded with the number and container code; at the same time a comparison between the physical delivery and the documents takes place. This allows the monitoring of container movements

5.5 Traceability of bought-in parts - Definition of goods labels

This additional requirement applies to all purchased parts, for which a particular traceability and archiving by the supplier (material batches, process data, etc.) is required.

The following text is recorded on the parts label: "Additional Requirements according to BOM"

Detailed explanations of the additional requirement can be found in chap. 9.III.

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 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 your 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 is to ensure the availability of O.K. parts even during emergencies.

Such emergencies may be

- A delivered batch cannot be used, or only partially
- There are problems with subcontractors
- Employees leave
- Transport 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 13 - 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., local time, of the receiving Brose location.	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 has to 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 is 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 > Quality assurance agreements, bought-in parts

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 the amounts listed below.

Performance units (LEs) serve as the basis for calculating the load. These are divided into the country groups (LGR) of the respective Brose plants as follows:

Table 14 - Level of charges for violations per country group

LGR	Country	Load
1 ¹⁾	Germany, Spain, Belgium, Sweden, USA, Canada, England, France, Japan	50 € per LE
2	Mexico, Czech Republic, Slovakia, Portugal, Brazil, Hungary, South Africa, Korea	35 € per LE
3	China, India	20 € per LE

¹⁾ All countries not listed here are assigned to country group LGR 1.

These charges cover the cost to Brose (staff, space, production equipment, general costs) of correcting the corresponding defects before they lead to further trouble. 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.

Work of 1.75 LEs per complaint is calculated for the time resulting from a complaint, in addition to the LEs for the violations listed below. The following work and services are included:

- 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

Moreover, the respective listed amounts are charged for the following violations, insofar as they are committed culpably.

Table 15 - Charged LEs per violation

Charge amount	Violation
1 LE per article number	Short or over-delivery Division of the delivery quantity into several deliveries Incorrect or damaged packaging Insufficient labeling (no label corresponding to requirements 5.2, incorrect amount or weight, several labels) Insufficient delivery documents (cp. chapter 4) Delivery outside the agreed time window Late delivery of the transportation to the supplier Incorrect notification of goods delivery according to procurement manual
1 LE per hour	Sorting or repacking parts: a) At Brose by Brose b) At Brose by the supplier (in addition to the external supplier costs) c) For external service providers
2 LE per shipment	Incorrect / Missing EDI Missing or incomplete customs declaration Omitted load securing

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 inform our Brose plant in Coburg via EDI.

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 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 LE (item 1) + 1 LE (item 2) + 2 LE (item 3) = 4.75 LE
 4.75 LE x 50 € (plant Coburg = LGR 1) = 237.50 €

The supplier shall be entitled to prove that the claimed amounts are excessive. Brose reserves the right to offset the costs using the self-billing procedure.

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 so named Crossdock from Brose. The supplier ships clearly plant-specifically labeled goods with all delivery documents (consignment note, delivery note, customs forms where required) and delivery note EDI and reports the load per recipient on the day before delivery in Crossdock, stating the number of load 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 are exchanged by arrangement or 1:1 by the respective Crossdock operator locally, e.g. upon delivery to the location Sta. Margarida via the Crossdock D + S Ebersdorf, the empties are exchanged by D + S for Brose Spain 1:1.

7.2 Consignment warehouse

7.2.1 Basic concept

Allocation stocks and scheduling to suppliers with a cooperative system. Features of the consignment warehouse concept at Brose are described in [chapter 2.2.3](#).

7.2.2 Process sequence

The Crossdock operator inspects the goods for obvious damage and the number of load units against the papers. The supplier ships clearly plant-specifically labeled goods with all delivery documents (consignment note, delivery note, customs forms where required) and delivery note EDI and reports the load per recipient on the day before delivery in Crossdock, stating the number of load units with the respective weight. The delivery advice has 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 rear ramp unloading. 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 are exchanged 1:1 by the respective Crossdock operator locally, e.g. upon delivery to the location Sta. Margarida via the Crossdock D + S Ebersdorf, the empties are exchanged by D + S for Brose Spain 1:1.

The operator checks the delivered goods in accordance with the enclosed documents and looks for obvious damages.

The 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

Normally 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, normally a charge / batch tracing is possible.

Repacking: If the delivery container does not match up to the container required by Brose on the shop floor, the goods will be decanted.

Approval and Acceptance: 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

This chapter describes the process of "overseas shipments" of supplier supplies to a Brose overseas location via a Brose Overseas Consolidation Centre (OCC) in addition to the existing remarks. The separate description of overseas shipping is intended to describe this process unambiguously and summarized in order to simplify the project/planning work.

7.3.1 Delivery terms and Standard Procedure

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; the supplier has to ensure the seaworthy packaging (stability, protection against humidity, water and salt) and on-time delivery to the Brose stowing location.

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

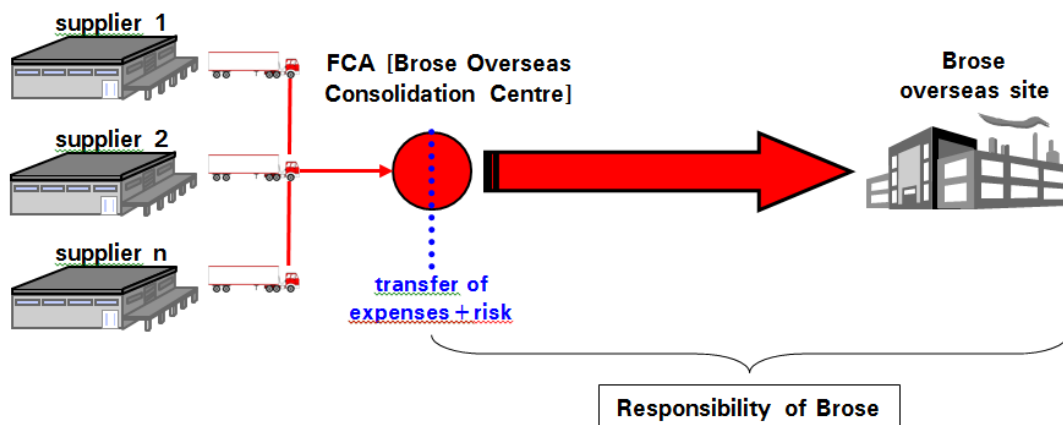


Illustration 15 - Flow chart "overseas shipment"

Delivery notification

Overseas shipments, which are delivered via a Brose stowing location, must be reported **per e-mail or shipping notification** to the stowing location by the supplier no later than the time of shipping in order to facilitate container load planning. These shipments are additionally described in **chap. 2.2.7**.

For shipments ex Europe:

The following minimum content must be sent with the shipping notification (e-mail) to the Brose storage location export@rauh.biz :

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

In order to avoid unnecessary truck downtimes, a time window for delivery at the stowing point shall be booked for shipments ex Europe.

Chronological process sequence

The load 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.

The respective applicable chronology (cut-offs, incl. arrival dates at storage location) has to be agreed by the supplier with the receiving Brose plant.

For better understanding, the following diagram shows an example of the most important steps in overseas shipping:

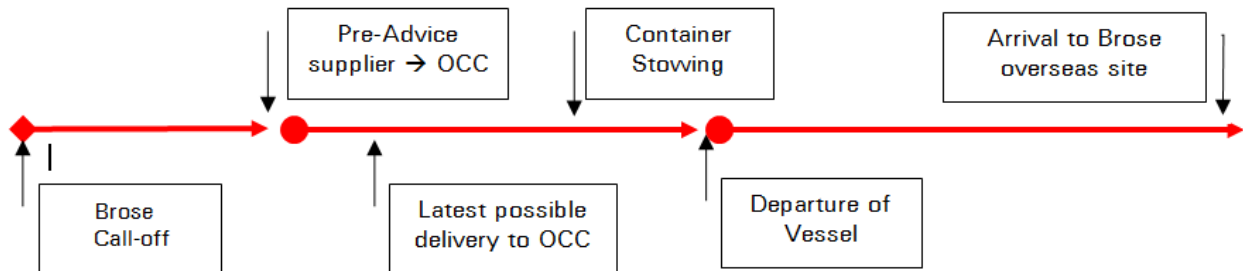


Illustration 16 - Essential steps of overseas shipping

Please note: - The dates sent in the Brose call-offs represent arrival dates at the storage location (OCC)!

- In the context of the conversion to a new overseas process, it may be required in the future to send the shipping notification directly to the Brose plant and not to the OCC.

7.3.2 Packaging

A) Permitted packaging in overseas transport

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.

Table 16 - Packaging requirements for overseas transport

Chapters	Description
8	Specification, design of overseas packaging and container-optimized dimensions
3.2	General Requirements
3.10	Requirements for pallets
3.10.4 and 0	Requirements regarding container labeling

The shipments to China:

The outer packaging must clearly show the good's country of origin (cp. Illust. 17). 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”.

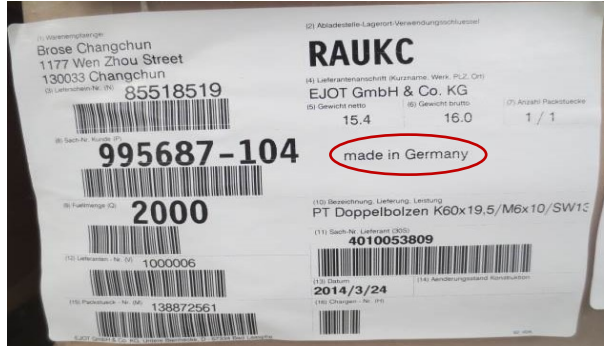
Solution 1): Packaging	Solution 2): Printed label
	

Illustration 17 - Solutions for labeling the country of origin

B) Forms of packaging not permitted in overseas transport

Forms of packaging not permitted are regulated in **chapter 3** and **8**.

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

7.3.3 Documentation

When sending to a Brose storage location (OCC) within the framework of an overseas delivery, the documents/remarks listed in chapter 4.1.2 must be created and enclosed/attached.

Important:

All documents must be attached to the goods by default. I.e. goods and documents form a unit and are transported together. Example: red dispatch folder (see illustration 18) with delivery note, commercial invoice, pack list and export declaration attached to a pallet. A mere handing over of the documents to the truck driver is not accepted.



Illustration 18 - Example red dispatch folder

In special cases (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.

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

Please note:

If your documentation is not complete, a sea container can be stopped at any time by the authorities in the country of 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.

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/Mrs. // Telephone/Fax Manufacturer (Company name): Address: Zip Code - City - Country Contact: Mr/Mrs. // Telephone/Fax Payment Terms Freight Condition: Incoterm:	Invoice No:  Date: Sold to / Consignee (Company Name) Address: Zip Code - City - Country Contact: Mr/Mrs. // Telephone/Fax
--	--

Qty/Unit	Discription of goods with part number	Unit Price (USD)	TotalAmount (USD)
57.600	COMMUTATOR - # A23942-110	0,23	13.248,00
1.920	WINDOW REGULATOR - # 972429-201	4,97	9.542,40
50.000	END STOP - # 964500-100	0,50	25.000,00
TOTAL			47.790,40

Total Net Weight kg:  Total Gross Weight kg: Total of Volumes: Total of CBM: Country of Supply: Country of Shipment: Country of Origin:	Way of Shipment : Port or Airport of Origin: Port or Airport of Destination:
---	---

BROSE DO BRASIL LTDA.

SIGN FROM MANUFACTURY (IN BLUE)

Must have the stamp. 

Illustration 19 - Required information on Brazil invoices

PACKING LIST

*** Use the logo from your factory **** ←

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

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

Payment Terms
Freight Condition:
Incoterm:

Packing List No: ←
Invoice No: ←
Date: ←

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

Notes:

Crates	Description of goods with part number	Qty pieces	Net Weight Kgs	Gross Weight Kgs	Dimensions Cm
1/3	COMMUTATOR - # A23942-110	57.600	691,00	720,00	60 X 50 X 40 CM
2/3	WINDOW REGULATOR - # 972429-201	1.920	16.976,00	19.064,00	60 X 50 X 40 CM
3/3	END STOP - # 964500-100	50.000	21,00	22,00	60 X 50 X 40 CM
3		109.520	17.688,00	19.806,00	

↑ ↑ ↑ ↑


BROSE DO BRASIL LTDA.
 SIGN FROM MANUFACTORY (IN BLUE)
 Must have the stamp. ←

Illustration 20 - Required information on Brazil packing list

8 BROSE PACKAGING SPECIFICATION

8.1 Introduction

The following guidelines and provisions from Brose form the basis for the delivery of parts (production material and goods) to the Brose locations and are considered supplemental contractual agreements to the general purchasing terms and conditions.

The Brose Packaging Specification is part of the procurement manual, which can be downloaded from the Brose homepage. It is incumbent upon the supplier to have a current version of the procurement manual.

The Brose Packaging Specification informs the supplier of the Brose packaging provisions so that it can develop an optimum packaging system based on these provisions. This should guarantee a smooth material flow between the suppliers and Brose, taking into account all qualitative, ecological and economic aspects.

Furthermore, it is incumbent upon the supplier to ensure, both internally and externally, that all delivered parts are preserved, protected and packaged correctly and adequately so that they reach their destination at Brose securely.

The supplier shall comply with the provisions of the packaging manual and shall consider any national and international provisions.

8.2 Concept and design layout of packaging

GLT-concepts:

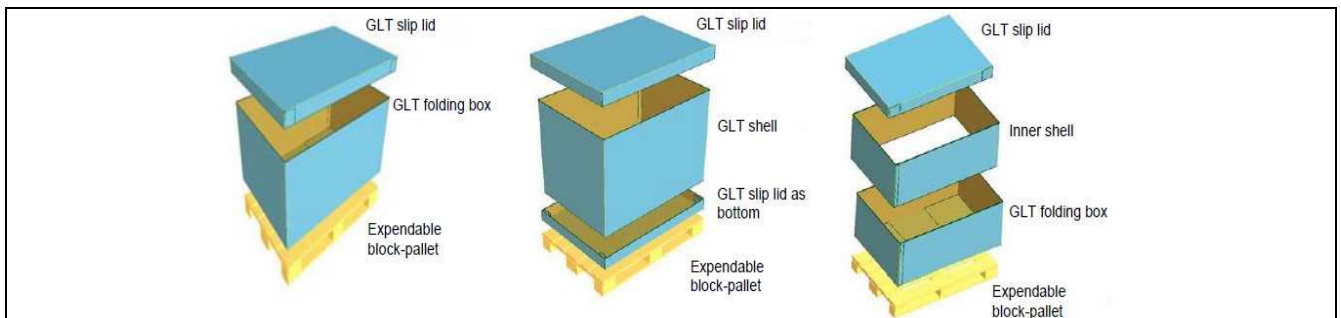


Illustration 21 - GLT packaging concepts

KLT-concepts:

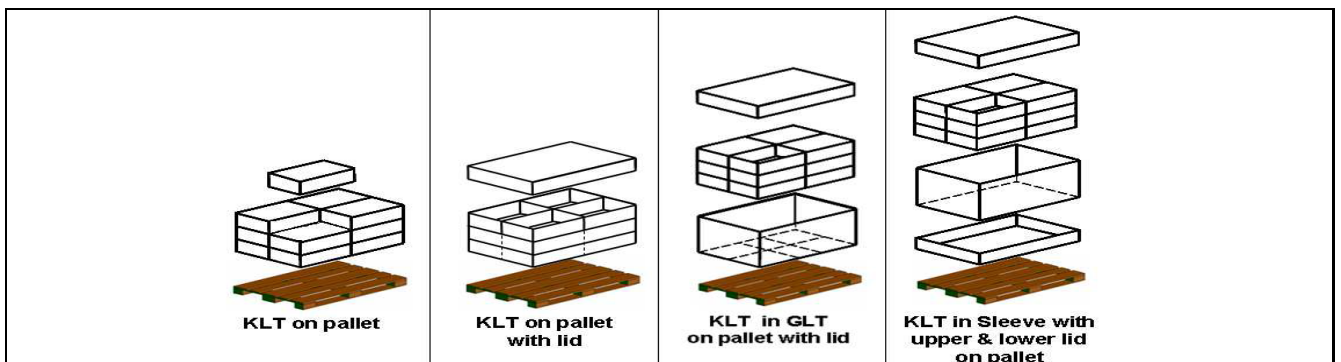


Illustration 22 - KLT packaging concepts

The use of intermediate layers should be examined and evaluated.

The GLT-systems and bunch of KLT (including the lid) should best have the size of the pallet. Max. dimension of overlapping of lid amounts 1.5cm (right and left side together).

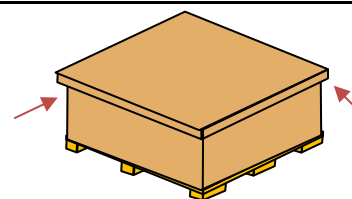


Illustration 23 - Maximum size of GLT/KLT

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), but following price-aspects, pallets should not be overdesigned. 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

8.3.1 Pallets for truck transport

Table 17 - Specifications for pallets for truck transport

Europe	For further information check DIN EN 13698. In addition, the construction items are described in: http://www.epal-pallets.org
NAFTA	For details, concepts and technical specification refer to the website of "National Wooden Pallet & Container Association": http://palletcentral.com/ . 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: • 48 x 45 Inch (1219 x 1143 mm): 1,000 kg • 32 x 30 Inch (813 x 762 mm): 600 kg
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 geared to the Anglo-American measuring system. Load units with **Euro-pallet** dimensions are unsuitable for transportation in containers with an inside width of 2,350 mm. In order to place two load units next to each other, the **standard length** of the pallets must be reduced to **1,140 mm**.

To get an optimum use of the length available in the container, the following **pallet-widths** have to be considered: **980 mm** (ISO-industrial-pallet), **820 mm** (for GD) or **790 mm** (Euro-Pallet).

The requirements of overseas-pallets are shown in **Chap. 3.10**.

The supplier of export overseas-pallets has to consider the following lumber regulations.

Table 18 - Lumber regulations

Area	Standard	Link
Europe	DIN 4074-1 DIN 4074-5	
NAFTA		http://palletcentral.com
Asia	DIN 4074-1 & 5	http://palletcentral.com

8.3.3 Components and load capacity of pallets

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.

(A)PDS (Pallet Design Software) can be used to analyse the weight the pallet is capable of holding.

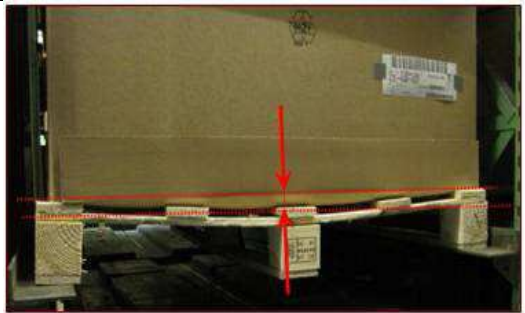
Pallets must have the load capacity for the following logistics principles: • Block storage • Rack storage • Transportation on forklift vehicle, trucks and overseas-containers As displayed in the picture, significant bowing under load is not acceptable due to potential safety issues. The required static load capacity must be strictly adhered to rack-storage because here the load for the pallet is higher.	
--	--

Illustration 24 - Bending of pallets

Components and drawings of overseas pallets:

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: ± 5 mm and across of ± 2 mm can occur.

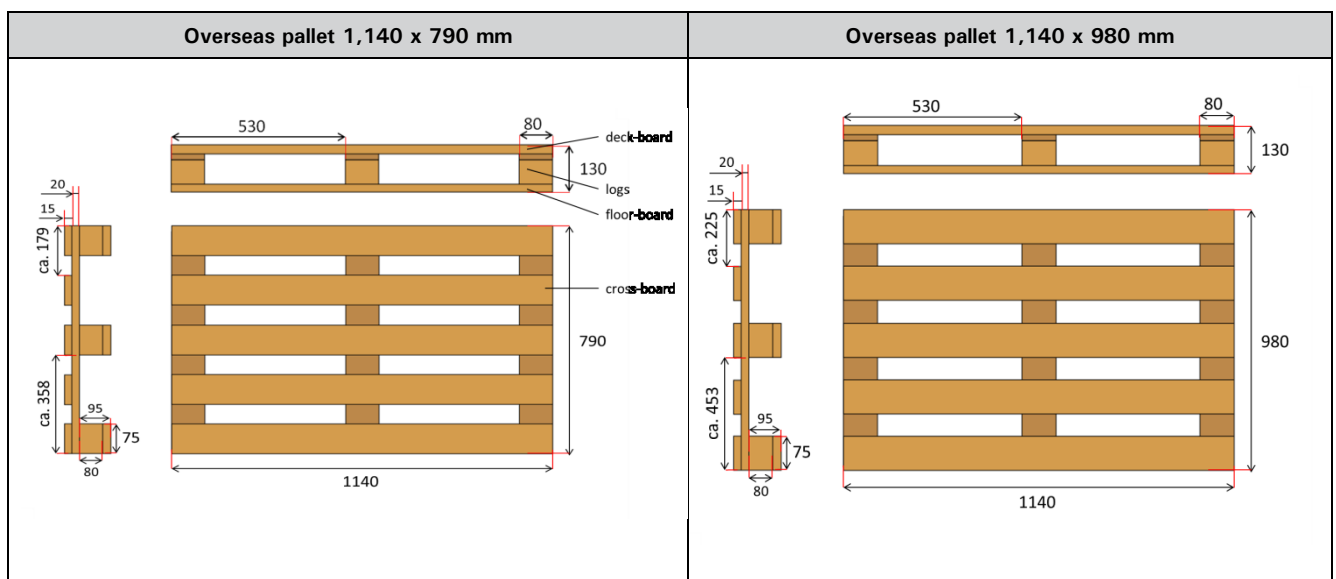


Illustration 25 - Drawing of overseas pallets

8.3.4 Pre-treatment requirements for wood

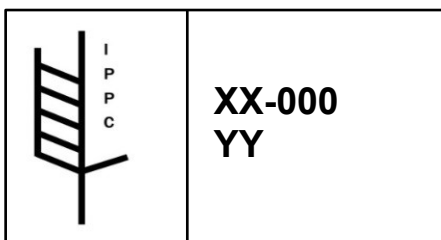
Dry pallets are stronger; therefore the moisture-content of pallets should not go beyond 18 %.

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 has to guarantee the validity of the IPPC marking through correct storage etc. and is responsible for further consequential damages if not.**

Standard format of proper IPPC mark

The internationally applicable IPPC label requires the following information:



• 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"

Illustration 26 - International IPPC markings

- Given examples illustrate different layouts of the required 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 3 illustrates

The German applicable IPPC code requires the following information:

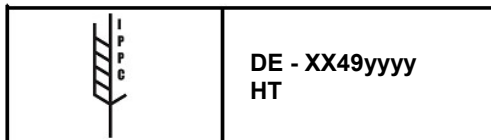
Example 1:



• Symbol with the letters IPPC

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

Example 2:



Example 3:

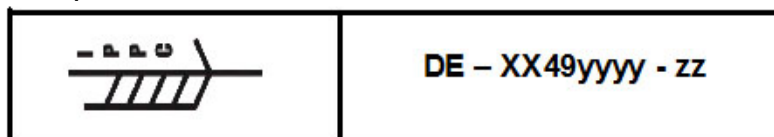


Illustration 27 - German IPPC markings

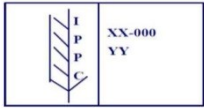
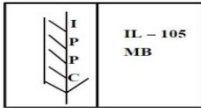
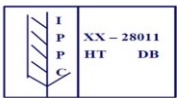
Samples of improper, unacceptable IPPC marks:			
# Incomplete IPPC mark	# Color is not accepted: only black		
			
# Mark should not be drawn by hand	# Stamps in the form of a paper sticker		
			

Illustration 28 - Examples of incorrect IPPC markings

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.

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.

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.

VDA 4530 "Expendables Small-Load-Carriers (EW KLT)-Systems"

Download: <http://www.vda.de>

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 29 - 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.

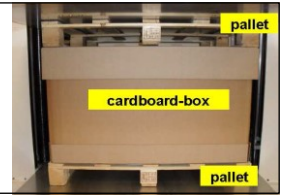
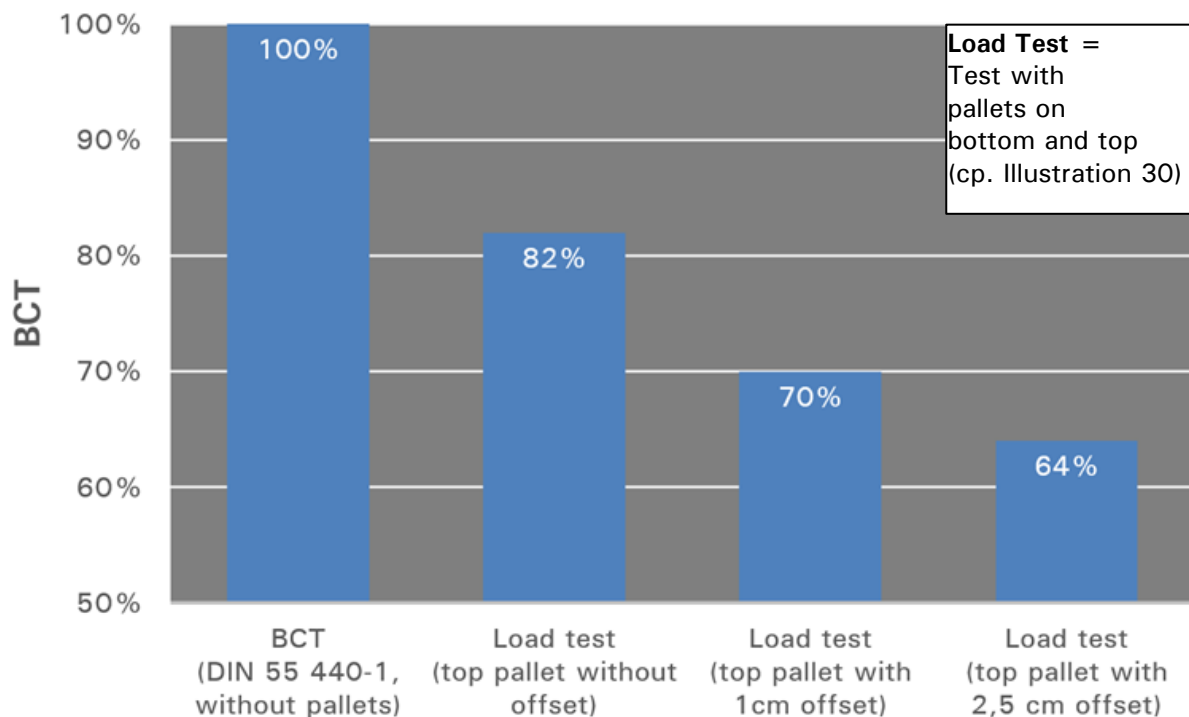


Illustration 30 - Use of pallets for BCT

Based on load tests of the EXO 2.0 GLT 980 low (P04902-000), the effect of the use of pallets and the climatic pretreatment (sea climate) on the BCT value is shown as an example.

Pallets

The load-bearing test with wood pallets adversely affects the BCT value by approximately 15 % to 25 % compared to testing without pallets. With a slight lateral offset of only 1 cm from the top pallet, the stacking resistance is reduced by a further 5 % to 15 %, with a displacement of 2.5 cm by 10 % to 20 %.



Climatic pretreatment 23° C/50 % rH vs. 20° C/90 % rH

In the load tests with a climatic pretreatment below 20° C/90 % rH (sea climate) instead of 23° C/50 % rH, a reduction of the average static maximum force of 57 % was measured.

Illustration 31 - Change BCT with lateral offset of the upper pallet

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 19 - 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

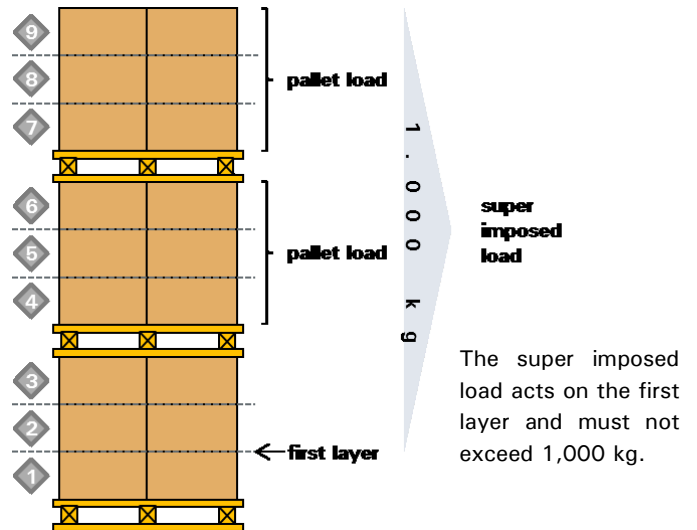


Illustration 32 - Maximum super imposed load on first layer

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 Universe, 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 20 - Overview of recycling symbols

	Recycling symbols	Description
8.5.1.1		Universal recycling symbol
8.5.1.2		"Rezy" cardboard recycling symbol <i>Recycling concept for waste disposal in Germany. Must be placed on cardboard packaging items.</i> http://www.resy.de/
8.5.1.3		Plastic Identification Code <i>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.</i> <i>Reference:</i> http://plastics.americanchemistry.com/ https://en.wikipedia.org/wiki/Resin_identification_code

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.

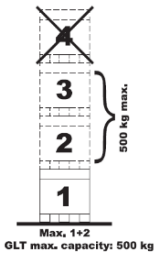
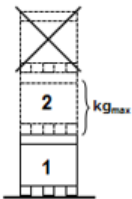
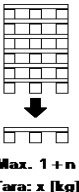
The marking must be able to tell,

- 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 21 - Overview of handling markings

	ISO symbols	Description
8.5.2.1		Fragile, Handle with care (optional use) ISO 7000, No. 0621
8.5.2.2		This way up (Mandatory for overseas packaging and GLT) ISO 7000, No. 0623
8.5.2.3		Keep dry (Mandatory for paper packaging) ISO 7000, No. 0626
8.5.2.4		Electrostatic sensitive device (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 22 - Overview of Brose handling markings

8.5.2.5		Brose-logo and competence line <i>Must be printed on each single packaging item in property of Brose exactly as displayed. Default color: Pantone 200C.</i> <i>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.</i> <i>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.</i>
8.5.2.6		Stacking instruction <i>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.</i> <i>In general, the information "max. 1 + 2" indicates that 2 layers are permitted on top of the first layer.</i>  Max. 1 + 2 <i>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).</i>
8.5.2.7		Stacking instruction collapsed <i>"n" gives information about the maximum number of permitted collapsed containers that may be stacked as one unit.</i> <i>Optional: Tara indicates the weight of the packaging-item.</i>
8.5.2.8	Made in Germany	Country of origin <i>Packaging must be marked with the appropriate country of origin (where the packed goods have been manufactured).</i>

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 (cp. Table 23).

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 (see Table 22 - 5.2.9) 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.

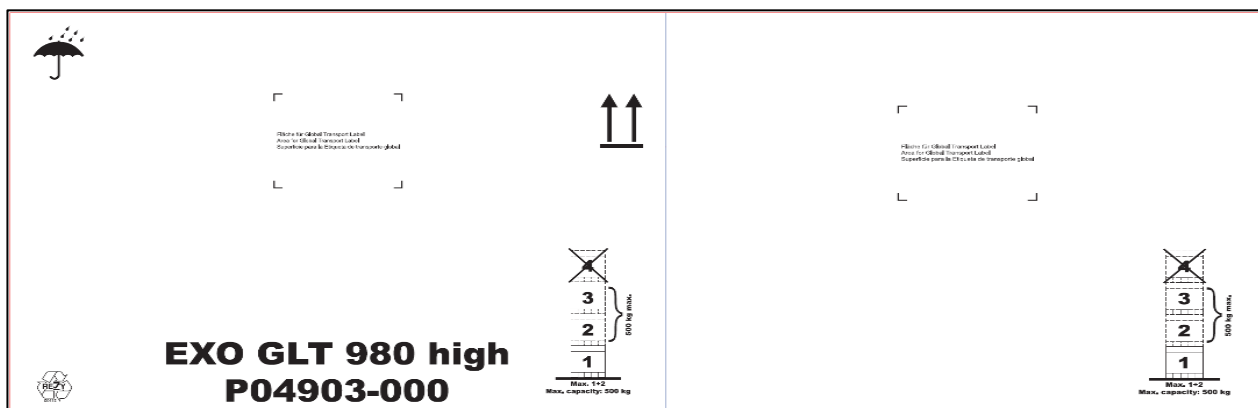


Illustration 33 - Placing of markings on GLT

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 22 - 5.3.1). Labels may be used but printing the information directly in a central position like shown below on the packaging item is highly recommended.

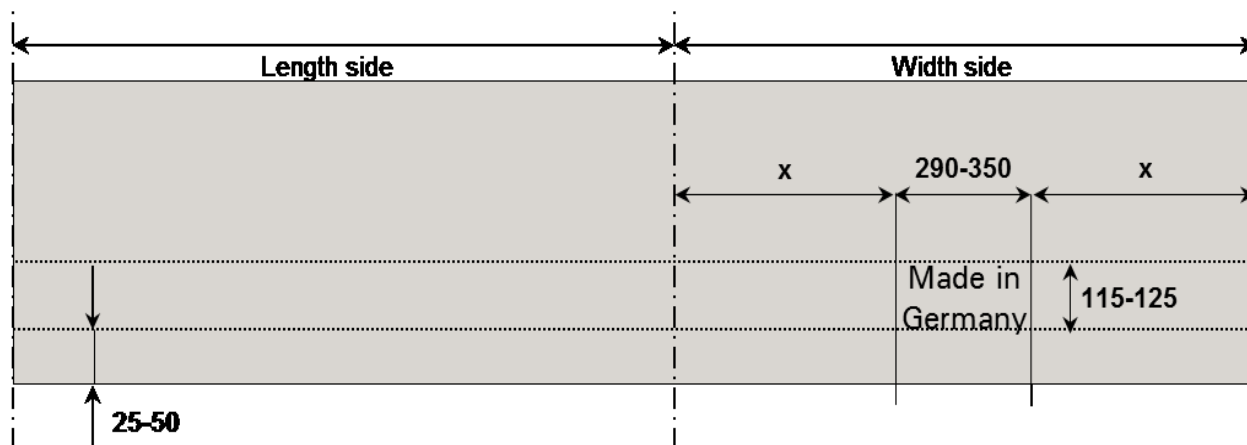


Illustration 34 - Placing of country of origin markings on cardboard GLT

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 Rezy-marking can also be placed on the sides.

Frame

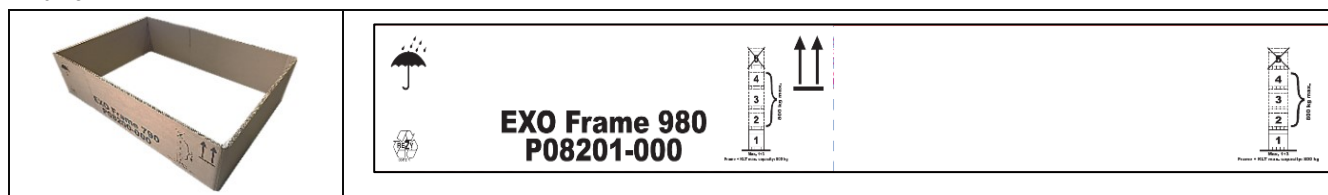


Illustration 36 - Placing of markings on frames

GLT



Illustration 37 - Placing of markings on GLT

Labeling on front and side is an exception to chapter 0

Lid

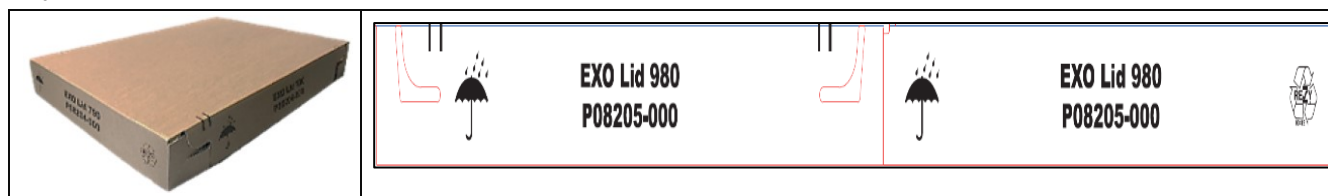


Illustration 38 - Placing of markings on lids

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

8.5.6 Plastic

Reusable packaging requires the Brose logo (see Table 22 - 5.2.8) with the material number right below and regular as well as collapsed stacking instructions. Furthermore, the right plastic recycling symbol (see Table 19, [chap. 8.5.1](#)) must be placed. The illustration below represents the placing guideline.

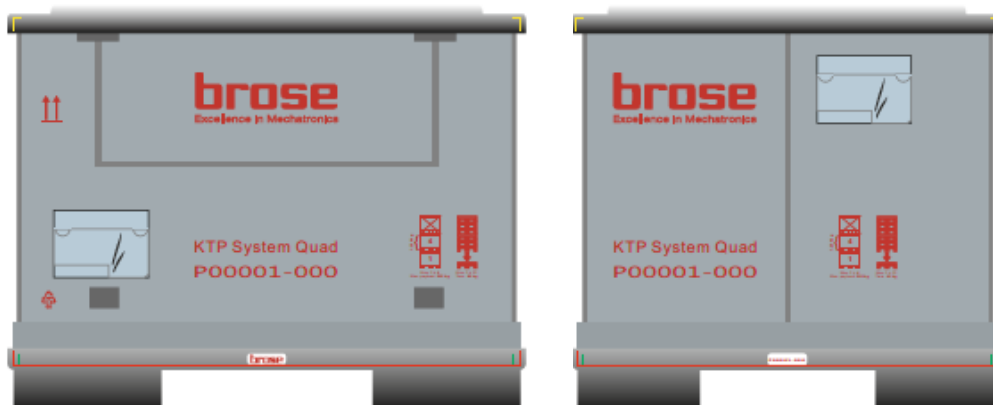
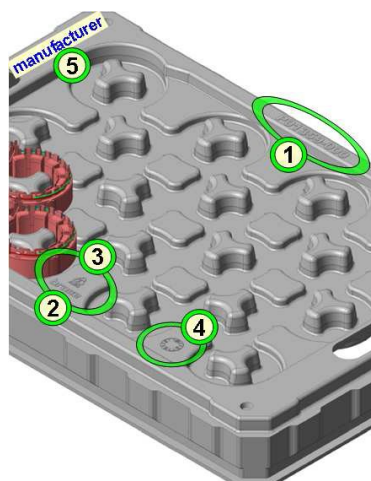


Illustration 39 - Placing of markings on reusable plastic packaging

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 23 - Overview of packaging materials

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

8.7 Catalogue of standard packaging items

8.7.1 Standard GLT

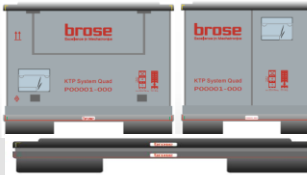
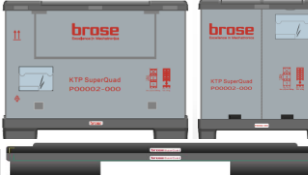
Steel GLT, reusable

Table 24 - 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	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		

Plastic GLT, reusable

Table 25 - 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	Europe (for all containers)		
Outside dimensions L/W/H [mm] Height folded [mm]	1,230 x 1,020 x 990 235	1,230 x 830 x 980 220	1,200 x 1,000 x 990 205
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		

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	Asia, China		NAFTA	
Material	PP Plastics		PE Plastics	
Outside dimensions L/W/H [mm] Height folded [mm]	1,200 x 1,000 x 1,000 215	1,200 x 1,000 x 780 215	1,219 x 1.143 x 864 333	813 x 762 x 635 333
Inside dimensions L/W/H [mm] L/W/H [inch]	1,143 x 943 x 825 -	1,143 x 943 x 605	1,123 x 1,054 x 706 44.2 x 41.5 x 27.8	813 x 762 x 635 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 /in transit	1,500 /1,000		794 /794	907 /907
Remark	General usage for projects with long distance delivery		4845 AIAG-standard 2 labelholder, 2 placecards, forkstrap system	
	One side open	No side open	Two access doors (1-48/1-45)	One access door (1-32)

Wooden GLT, expendable

Table 26 - Wooden GLT, expendable

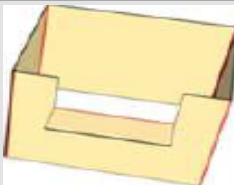
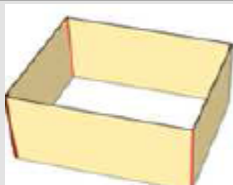
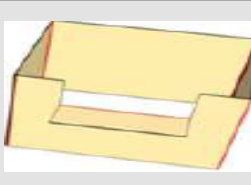
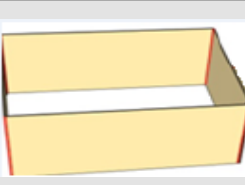
Container	Wooden overseas-box, high	Wooden overseas-box, low
Material no.	304459-000	304458-000
Picture		
Material	Lumber and presswood	
Outside dimensions L/W/H [mm]	1,120 x 966 x 1,030	1,120 x 946 x 600
Inside dimensions L/W/H [mm]	1,040 x 860 x 830	1,040 x 860 x 400
Tare weight [kg]	66.00	46.00
Container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

Cardboard GLT
Table 27 - 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	Europe for oversea			Europe for overland
Material	Cardboard, 3.92 CAA			Cardboard, 2.92 AC
Outside dimensions L/W/H [mm]	1,123 x 953 x 865	1123 x 953 x 579	1,123 x 771 x 865	1,200 x 800 x 833
Inside dimensions 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]	Only combined with KLT up to 500 kg, not released for bulk material (larger load only after release by Brose logistics planning)			450
Stacking in stock/transit	1 + 2			1 + 2 / 1 + 1
Container stacking load [kg]	500			
Remark	-			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	Europe for oversea		Global for oversea and overland	
Material	Cardboard, 3.92 CAA		Cardboard, 3.92 CAA	
Outside dimensions L/W/H [mm]	1,123 x 771 x 579	1123 x 953 x 590	1,123 x 953 x 282	1.123 x 771 x 282
Inside dimensions 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]	Combined with KLT up to 800 kg, bulk material released up to 500 kg (after ok shipping trial)		500 kg	
Stacking in transit	1 + 2		1 + 3	
Container stacking load [kg]	500		800	

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	Asia and NAFTA			
Material	Cardboard, 3.92 CAA			
Outside dimensions 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 dimensions 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]	Combined with KLT up to 800 kg, bulk material released up to 500 kg (after ok shipping trial)			
Stacking in transit	1 + 2			
Container stacking load [kg]	500			

Container	Sleeve 870	Sleeve 580	Enforcement ring 870	Enforcement ring 580
Material no. /VS-Code	P04306-000	P04308-000	P04307-000	P04309-000
Picture				
Usage	Asia for overland			
Material	Cardboard, ECT 8575 N		Cardboard, ECT 8575 N	
Outside dimensions L/W/H [mm]	1,166 x 980 x 870	1,166 x 980 x 580	1.136 x 952 x 870	1.136 x 952 x 580
Inside dimensions L/W/H [mm]	1,142 x 958 x 870	1,142 x 958 x 580	1.112 x 938 x 870	1.112 x 938 x 580
Tare weight [kg]	4.61	3.07	4,49	2,99
Container capacity [kg]	500 (together with enforcement rings)		Only used as a system with sleeve 870 for enforcement ring 870 and sleeve 580 for enforcement ring 580 or with KLT. Capacity and payload see sleeves	
Stacking of Hus In stock /transit	1 + 2 /1 + 1 (with enforcement rings or KLT)	1 + 3 /1 + 1 (with enforcement rings or KLT)		
Container stacking load [kg]	500 (together with enforcement rings)			

8.7.2 Standard KLT

Plastic KLT

VDA-RL KLT

Table 28 - 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			
	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 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) Layers / boxes per layer	96 6 / 16	48 6 / 8	24 6 / 4	12 3 / 4
Boxes per HU (ISO Pallet, H:1.00m) Layers / boxes per layer	120 6 / 20	60 6 / 10	30 6 / 5	15 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 29 - 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			
	Capacity for all containers 15 kg (in regulation to Brose-Standard for KLT) Material for all containers ESD, plastics, black Surface resistance for all containers $10^4 - 10^{10}$ 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) Layers / boxes per layer	96 6 / 16	48 6 / 8	24 6 / 4	12 3 / 4
Boxes per HU (ISO Pallet, H:1.00m) Layers / boxes per layer	120 6 / 20	60 6 / 10	30 6 / 5	15 3 / 5
Stacking of HUs In stock / transit	1 + 3 / 1 + 2			
Container stacking load [kg]	400	600	600	600

Asia KLT

Table 30 - 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) Layers / boxes per layer	96 6 / 16	48 6 / 8	24 6 / 4	12 3 / 4
Boxes per HU (ISO Pallet, H:1.00m) Layers / boxes per layer	120 6 / 20	60 6 / 10	30 6 / 5	15 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 31 - 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]	305 x 187 x 130 12.0 x 7.4 x 5.0	381 x 305 x 191 12.0 x 15.0 x 7.5	610 x 381 x 191 24.0 x 15.0 x 7.5
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 32 - 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) Layers / boxes per layer	80 10/8	24 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

VDA-RL-KLT lids

Table 33 - VDA RL-KLT lids

KLT Lid	KLT lid D65 (for KLT 6280 & 6147)	KLT lid D45 (for KLT 4147)	KLT lid D35 (for KLT3147)
Material no. / VS-Code	P03169-000	P03170-000	P03279-000
Picture			
Usage	Europe		
Material	PP plastics, blue		
Outside dimensions: L/W/H [mm]	562,5x365x16	365x267x13,5	267,8x169x17
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 KLT

EXO 3.0 KLT, Global

Table 34 - Cardboard, EXO 3.0 KLT Global, expendable

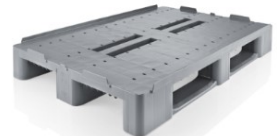
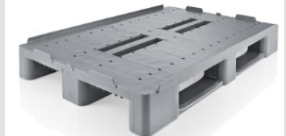
Container	EXO KLT 3147	EXO KLT 4147	EXO KLT 6147	EXO KLT 6280
Material no. /VS-Code	P06100-000 /PN	P06101-000 /PM	P06102-000 /PL	P06103-000 /PK
Pictures:				
Capacity for all containers	15 kg (in regulation to Brose-Standard for KLT)			
Material for all containers	Cardboard, 1.40 B			
Usage	Global			
Outside dimensions 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 dimensions L/W/H [mm]	237 x 169 x 136	328 x 261 x 136	510 x 352 x 136x	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 GLT, interlayers and lid.			

EXO 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 35 - 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	Use in NAFTA	Europe	
Material	plastics, black	HDPE, re-granulate	HDPE, re-granulate
Outside dimensions L/W/H [mm] L/W/H [inch]	1,140x 1,217 x 127 44,9 x 48 x 5.0	1,200 x 800 x 150 -	1,200 x 800 x 150 -
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-pur- poses, especially in clean rooms	For use in areas that require ESD protection

Wooden pallets

Table 36 - 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	Use in European-/Asian-/Brazil transportation	Use in European transportation	Only in Asia; not for over-seas
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] Crossboard, L/W/H [mm] Logs, L/W/H [mm]	1200 x 145/100 x 22 1,000 x 145 x 22 145 x 145/100 x 78	1,200 x 145/100 x 22 800 x 145 x 22 145 x 145/100 x 78	1,200 x 100 x 12 1,000 x 100 x 15 100 x 100 x 80
Remark	ISO-Flat-Pallet, DIN EN 13 698.2	EURO-Flat-Pallet, DIN EN 13698.1	

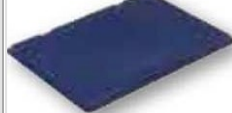
Pallet	EXO-PAL 1.110	EXO-PAL, ALO	EXO-PAL 1.108
Material no.	304122-000	P04000-000	P04002-000
Picture			
Usability	expendable		
Material	Wood, ISPM-15 (standard for IPPC-measures)		
Outside dimensions L/W/H [mm]	1,140 x 980 x 130	1,140 x 820 x 140	1,140 x 790 x 130
Tare weight [kg]	9.00	16.00	8.00
Pallet 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] Crossboard, L/W/H [mm] Logs, L/W/H [mm]	1,140 x 75 x 15 980 x 80 x 20 80 x 80 x 80	1,140 x 100 x 16-18 820 x 100 x 16-18 100 x 100 x 80	1,140 x 75 x 15 790 x 80 x 20 80 x 80 x 80
Remarks	According to aspects of VDA 4525	Use for DLO-planning	According to aspects of VDA 4525

8.7.4 Lids

Plastic lids, reusable

Table 37 - 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	Europe and Asia		Asia	
Material	Plastics, blue (RAL 5005 / 5012)		PP plastics, blue	PP 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	- ISO lid - With safety corners		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	NAFTA		Asia	
Material	Plastics, black and blue		Plastics, PP, blue RAL 5005	
Outside dimensions L/W/H [mm] L/W/H [inch]	1,156 x 1,240 x 25.4 45 x 48,8 x 1	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 300 x 200	Cover for KLT 400 x 300	Cover for KLT 600 x 400

Cardboard Lids and Inlayers, expendable

Table 38 - Cardboard lids, expendable

Lid	EXO 3.0 Lid 980	EXO 3.0 Lid 790	VH Lid
Material no. /VS-Code	P08205-000	P08204-000	304340-000
Picture			
Usage	Global		Europe
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
Inside dimensions L/W/H [mm]	1,128 x 958 x 136	1,128 x 776 x 136	1,128 x 958 x 136
Tare weight [kg]	1.402	1.197	1.402

Table 39 - Cardboard Inlayer, expendable

EXO Inlayer	EXO 3.0 Inlayer 980	EXO 3.0 Inlayer 790
Material no. / VS-Code	P08203-000	P08202-000
Picture		
Usage	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	

8.7.5 Expendable overseas (EXO) systems, Cardboard

EXO 3.0 System, Europe

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

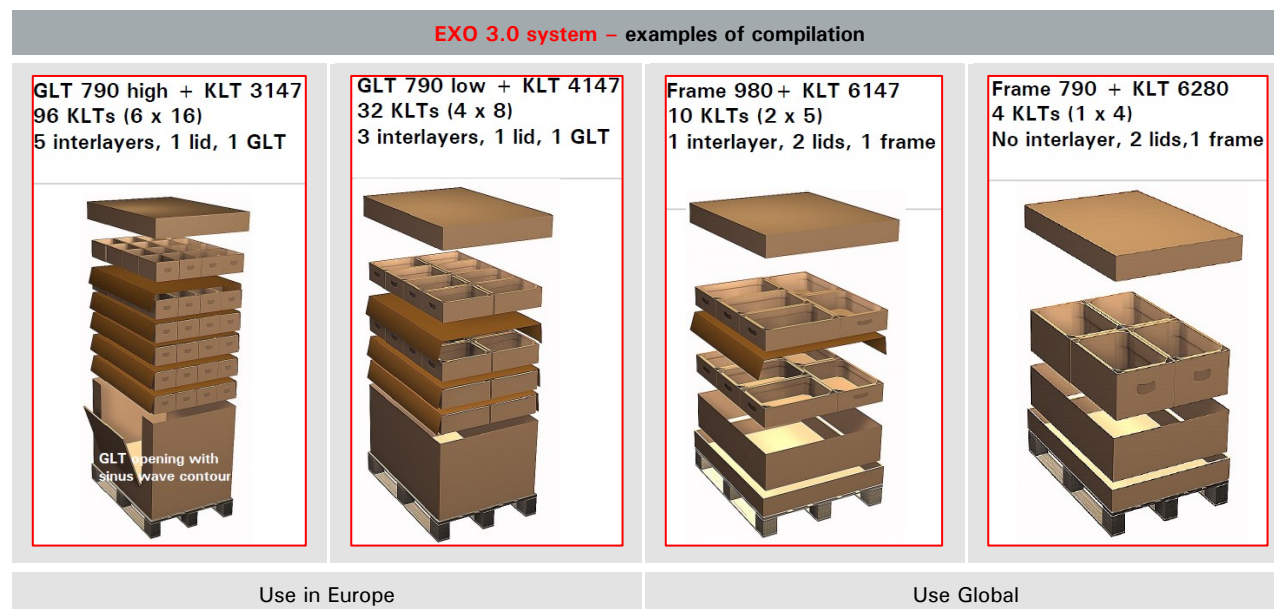


Illustration 41 - Examples of EXO 3.0 packaging systems Europe

Table 40 - 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				
Pallet 304122-000 (1.140 x 980 mm) Boxes per HU / layers / boxes per layer					
EXO GLT 980 high (P04903-000)	EXO Frame 980*855 (P04909-000)	120 (6 x 20)	60 (6 x 10)	30 (6 x 5)	15 (3 x 5)
EXO GLT 980 low (P04902-000)	EXO Frame 980*570 (P04908-000)	80 (4 x 20)	40 (4 x 10)	20 (4 x 5)	10 (2 x 5)
EXO Frame 980 (P08201-000)	EXO Frame 980 (P08201-000)	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)					
Pallet P04002-000 (1,140x790mm) Boxes per HU / layers / boxes per layer					
EXO GLT 790 high (P04901-000)	EXO Frame 790*855 (P04907-000)	96 (6 x 16)	48 (6 x 8)	24 (6 x 4)	12 (3 x 4)
EXO GLT 790 low (P04900-000)	EXO Frame 790*570 (P04906-000)	64 (4 x 16)	32 (4 x 8)	16 (4 x 4)	8 (2 x 4)
EXO Frame 790 (P08200-000)	EXO Frame 790 (P08200-000)	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)					
Stacking of HUs In transit /in stock		1 + 2	1 + 2	1 + 2	1 + 2

8.7.6 Purchasing and delivery references for packaging items (Europe)

Table 41 - Purchase and delivery references for packaging Europe

Packaging-module	Material-number	Supplier	Reference	Contact	Location	Delivery Dimension [mm]	Mini-mum de-livery 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 Palettentechnik GmbH	Ms. Küster	+ 48 6834 9210-16	DE 66359 Bous (Saar)	1,230 x 830 x 980	4x pallet	52
KTP-System 2000	304718-000					1,200 x 1,000 x 990		56
KTP-Quad	P00001-000					1,230 x 1,020 x 990		48
Cardboard GLT, expendable								
GLT 980, high	P04903-000	Tricor Packaging & Logistics AG	Mr. Dempfle	+ 49 8247 962 2208	DE 87745 Eppishausen	1,344 x 2,050 x 1,000	1x pallet	30
GLT 980, low	P04902-000					1,200 x 2,500 x 1,000		30
GLT 790, high	P04901-000					1,250 x 1,860 x 1,000		30
GLT 790, low	P04900-000					1,200 x 1,860 x 1,000		30
Frame 980	P08201-000					2,400 x 855 x 1,000		90
Frame 790	P08200-000					2,400 x 855 x 1,000		140
MK 08, high	P04006-000					1,924 x 1,353 x 1,000		2x pallet
VDA-RL-KLT, reusable								
VDA-RL-KLT 3147	3044DZ-000	tbd	Mr. Heintze (Brose Purchasing Logistics)	+ 49 951 7474 3202	DE 96052 Bamberg	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	tbd	Mr. Heintze (Brose Purchasing Logistics)	+ 49 951 7474 3202	DE 96052 Bamberg	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 x 1,000	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 Obermühle oHG	Mr. Schreiner	+ 49 9561 60678	DE 96450 Coburg	1,140 x 980 x 1,000		
EXO-PAL 1,108	P04002-000	Liebensteiner GmbH	Mr. Schön	+ 49 9631 605-200	DE 95703 Plößberg	1,140 x 790 x 1,000		
EXO-PAL ALO	P04000-000					1,140 x 820 x 1,000		
Lids								
VDA lid / A1208	3044H0-000	tbd	Mr. Heintze (Brose Purchasing Logistics)	+ 49 951 7474 3202	DE 96052 Bamberg	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. Dempfle	+ 49 8247 962 2208	DE 87745 Eppishausen	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 <http://www.brose.com/de/Unternehmen/Standorte/>.
If a contact partner from the respective plant is not known, please contact the e-mail address stated.

II. Delivery addresses for the Brose Group

For communication with the supplier, Brose uses a 5-character alphanumeric code for the corresponding delivery address. The code and the corresponding translation for the respective address are shown in the following table.
Please note that we expect the supplier to attach the corresponding code to the tag as described in the definition for goods tags (cp. **chap. 5.3**).

Table 42 - Overview Coding Unloading Points Brose Plants

Brose Werk	Abladestelle	Name	Name 2	Land	PLZ	Ort	Straße	Haus Nr.
Brose Plant	Unload. point	Name	Name 2	country	Post Code	Place	Street	No.
Beijing	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Beijing	PEK01	Brose Beijing	Automotive Systems Co., Ltd.	CN	100076	Beijing	Ding Ye Road	23
Beijing	SHACD	Anji-CEVA Automotive Logistics Co., Ltd.		CN	201805	Shanghai Huangdu	Jiasongbeilu Road	5788
Beijing	PEK02	Changchun Zonebond International Logistics Co.,Ltd.		CN	130031	Changchun	Donghuancheng Road	5000
Beijing	ZN110	Kerry EAS logistics Limited	Crossdock Kerry	CN	215341	Kunshan	Yu Xi Road Middle	188
Belvidere	BELO1	Brose Belvidere, Inc.	Goods receipt	US	61008	Belvidere	Logistics Drive	725
Belvidere	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Berlin	BER01	Brose Fahrzeugteile Berlin	Logistikzentrum Spedition Craiss	DE	10553	Berlin	Neues Ufer	29
Berlin	BER02	Brose Antriebstechnik Berlin	Logistikzentrum Spedition Craiss	DE	10553	Berlin	Neues Ufer	29
Berlin	BER03	Brose Antriebstechnik GmbH & Co.	Kommanditgesellschaft, Berlin	DE	10553	Berlin	Sickingenstr.	29 - 38
Berlin	BER04	Offergeld Logistik GmbH & Co. oHG	EDL OFFERGELD LOGIST	DE	14641	Wustermark	Bremer Ring	5
Berlin	BER04	Offergeld Logistik GmbH & Co. oHG	EDL OFFERGELD LOGIST	DE	14641	Wustermark	Bremer Ring	5
Betim	BETO1	Brose do Brazil Ltda.		BR	32530-490	Betim	Av. Contorno da Fiat	1300
Bratislava	BA100	Brose Bratislava, spol.s.r.o.	Wareneingang	SK	90055	Lozorno s.c. 1006	Priemyselný park Lozorno	
Bratislava	BABXX	D + S logistic GmbH	Crossdock Bratislava	DE	96271	Grub am Forst	Gruber Strasse	11
Bremen	BRE01	Brose Fahrzeugteile GmbH&Co.KG Bremen	Wareneingang Brose Bremen	DE	28309	Bremen	Friedrich-List-Str.	13
Bremen	DUSBR	D + S logistic GmbH	Crossdock Bremen	DE	96271	Grub am Forst	Gruber Strasse	11
Brits	BR100	RG Brose	Automotive Components (Pty.) Ltd.	ZA	0250	Brits N.W.	6 Spruit Avenue , P.O. Box 899	
Brits	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Changchun	CC100	Brose Changchun	Automotive Systems Co., Ltd.	CN	130033	Changchun	Wen Zhou Street	1177
Changchun	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Changchun	SHACD	Anji-CEVA Automotive Logistics Co., Ltd.	Cross Dock Shanghai	CN	201805	Shanghai Huangdu	Jiasongbeilu Road	5788
Changchun	CC101	Schener Hong Kong Warehouse		HK	6013-20W	Kwai Chung	Unit 6013-20W, 6/F	
Changchun	CC102	Regional Synergy (M) SDN. Bld.		MY	42000	Northport Port Klang	KCT B3 Shed	
Chongqing	CH100	Brose Chongqing	Wareneingang Brose Chongqing	CN	401331	Chongqing	Zhenhua Road	
Chongqing	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Chongqing	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Chongqing	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Chongqing	SHACD	Anji-CEVA Automotive Logistics Co., Ltd.	Crossdock Anji	CN	201805	Shanghai Huangdu	Jiasongbeilu Road	5788
Chongqing	ZN110	Kerry EAS logistics Limited	Crossdock Kerry	CN	215341	Kunshan	Yu Xi Road Middle	188
Chongqing	ZN120	Jiangsu HuiZhou Logistics Co., LTD	Crossdock HuiZhou	CN	215335	Suzhou	Kunshan San Xiang Road	433
Chongqing	OCCMA	KN OCC Manzanillo TIMSA	Oversea Consolidation Center Manzanillo	MX	28250	Manzanillo, Colima C.P.	Av. Teniente Azueta	29 EDIF
Coburg	CO210	Brose Fahrzeugteile GmbH Werk 2	Werk 2 Geb10, EG, Wareneingang	DE	96450	Coburg	Bamberger Straße	44
Coburg	DUS01	D + S Logistic GmbH	Konsi-Lager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Coburg	DUS02	D + S Logistic GmbH	Außenlager Brose Eigentum	DE	96237	Ebersdorf	Birkleite	5
Coburg	DUSEB	D + S Logistic GmbH	Stahl- und Werkzeuglager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Coburg	DUSZO	D + S logistic GmbH	Zolllager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Coburg	KO100	Brose CZ spol. s r.o.	Wareneingang Koprivnice	CZ	742 21	Koprivnice	Prumyslový park	302

Brose Werk Brose Plant	Abladestelle Unload. point	Name Name	Name 2 Name 2	Land country	PLZ Post Code	Ort Place	Straße Street	Haus Nr. No.
Coburg	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Coburg	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Coburg	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Coburg	WU100	Brose Schließsysteme Wuppertal	Wareneingang Werk 1	DE	42369	Wuppertal	Otto-Hahn-Straße	34
Coburg	COTVS	Brose Fahrzeugteile GmbH & Co. KG	TVS1	DE	96450	Coburg	Dieselstraße	6
Coburg	COTON	Brose Fahrzeugteile GmbH & Co. KG, Coburg	Lager Tondela via Rhenus Hilden	PT	3465-158	Santiago de Besteiros/ Tondela	Rua Max Brose	No. 38
Coburg	CO125	Brose Fahrzeugteile Coburg	Wareneingang Geb.25 1. OG	DE	96450	Coburg	Max-Brose-Straße	6
Coburg	DUS03	D + S Logistic GmbH	Außenlager Coburg Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Coburg	BFS01	BFS Flugservice GmbH	Hangar Brose	DE	96450	Coburg	Zur Brandensteinebene	
Coburg	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Coventry	CDNOJ	Schenker sp.o.o.	Crossdock Novy Jicin	CZ	741 01	Novy Jicin	Suvorovova	108
Coventry	CV100	Brose Ltd.	Goods receipt	GB	CV7 9NW	Coventry	Colliery Lane, Exhall	
Coventry	CV200	Brose Ltd.	Goods Receipt	GB	CV6 5NH	Coventry	Courtaulds Way, Foleshill	
Coventry	CV208	Brose Ltd.	Goods receipt Plant 2 Ersatz	GB	CV6 5NH	Coventry	Courtaulds Way, Foleshill	
Coventry	CVB01	D + S logistic GmbH	Crossdock Coventry	DE	96271	Grub am Forst	Gruber Strasse	11
Coventry	CVB02	D + S logistic GmbH	Crossdock Coventry	DE	96271	Grub am Forst	Gruber Strasse	11
Coventry	CVB03	D + S logistic für Coventry, Crossdock Gresham Road	Crossdock Coventry Gresham Road	DE	96237	Ebersdorf	Birkleite	4
Coventry	CVG01	Gefco UK Ltd.	CROSSDOCK COVENTRY	GB	CV6 4BX	Coventry	Central Boulevard Prologis Park	unit 13m
Coventry	CDHIL	Rhenus Freight Logistics GmbH + Co. KG	Crossdock Brose	DE	40721	Hilden	Im Hülsenfeld	25
Curitiba	CRXXX	Brose do Brazil Ltda.	Campo Largo da Roseira Entrada	BR	83183-000	SÃO JOSÉ DOS PINHAIS	Avenida Sul	151
Curitiba	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Curitiba	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Curitiba	OCCVE	GOLMEX PUERTO Manzanera	Oversea Consolidation Center Veracruz	MX	91700	Manzana	SN Interior del recinto portuario	
Curitiba	CREXP	Brose do Brazil Ltda.	Centro Curitiba Entrada Export	BR	83183-000	SÃO JOSÉ DOS PINHAIS	Avenida Sul, 151	
Curitiba	JAR01	Brose do Brazil Ltda.	Rodovia Dom Pedro I, SP65, KM90	BR	13240-000	Jarinu (SP)	Bairro do Pinhal - Estrada Mun. Alberto Tofanin	
Detroit	DE100	Brose North America, Inc.		US	48326	Auburn Hills	3933 Automation Avenue	
Detroit	DE200	Brose North America, Inc.		US	48326	Auburn Hills	1650 Harmon Rd.	
Diadema	DIA01	Brose do Brazil Ltda.	Bairro Casa Grande	BR	09961-390	DIADEMA-SP	AV CASA GRANDE	850
East London	BR200	RG Brose	Automotive Components (Pty.) Ltd	ZA	5201	East London	Ikhala Road	
East London	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Gent	GT100	Brose Gent BVBA	Wareneingang	BE	9042	Gent	Skaldenstraat	121
Gent	GTB01	D + S logistic GmbH	Crossdock Gent	DE	96271	Grub am Forst	Gruber Strasse	11
Gent	DUSBE	D + S Logistic GmbH	Konsi-Lager (Belgium)	DE	96271	Grub am Forst	Gruber Strasse	11
Gent	DUSZE	D + S Zeickhorn		DE	96271	Grub am Forst	Gruber Strasse	11
Gifhorn	DUSGI	D + S logistic GmbH	Crossdock Gifhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Gifhorn	WO100	Brose Fahrzeugteile Gifhorn	Wareneingang Brose Gifhorn	DE	38518	Gifhorn	Rockwellstraße	11
Gifhorn	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Goiana	GOI01	Brose do Brazil Ltda.	Entrada Goiana	BR	55900-000	Nova Goiana	Rod BR 101-Norte KM	13/15
Goiana	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Goiana	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Goiana	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Göteborg	GOE01	Brose Sweden AB	Wareneingang Brose Göteborg	SE	423 37	Torslanda	Flygfältsgatan	4
Göteborg	GOEG1	D + S logistic GmbH	Crossdock Gothenburg	DE	96271	Grub am Forst	Gruber Strasse	11
Göteborg	DUSSE	D + S logistic GmbH	Konsi-Warehouse (Gothenburg)	DE	96271	Grub am Forst	Gruber Strasse	11
Göteborg	DUSZE	D + S Zeickhorn		DE	96271	Grub am Forst	Gruber Strasse	11
Guangzhou	GUA10	Brose Guangdong	Goods receipt	CN	510530	Guang Zhou City	Kai Chuang Avenue	1503
Guangzhou	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Guangzhou	OCCDT	Kuehne + Nagel, Inc.	Oversea Consolidation Center Detroit	US	48174	Romulus	11501 Metro Airport Center Drive, Suite 100	
Hallstadt	DUS01	D + S Logistic GmbH	Konsi-Lager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Hallstadt	DUS02	D + S Logistic GmbH	Außenlager Brose Eigentum	DE	96237	Ebersdorf	Birkleite	5
Hallstadt	DUS04	D + S Logistic GmbH	Außenlager Hallstadt Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Hallstadt	HA104	Brose Fahrzeugteile Hallstadt	Wareneingang MO/VKU	DE	96103	Hallstadt	Max-Brose-Straße	2
Hallstadt	HA106	Brose Fahrzeugteile Hallstadt	Wareneingang VFE	DE	96103	Hallstadt	Max-Brose-Straße	2

Brose Werk	Abladestelle	Name	Name 2	Land	PLZ	Ort	Straße	Haus Nr.
Brose Plant	Unload. point	Name	Name 2	country	Post Code	Place	Street	No.
Hallstadt	HA108	Brose Fahrzeugteile Hallstadt	Wareneingang Ersatz	DE	96103	Hallstadt	Max-Brose-Straße	2
Hallstadt	HAB04	D + S logistic GmbH	Crossdock Birkleite HAL MO/VKU	DE	96237	Ebersdorf	Birkleite	4
Hallstadt	HAB06	D + S logistic GmbH	Crossdock Birkleite HAL (VFE)	DE	96237	Ebersdorf	Birkleite	4
Hallstadt	HAG04	D + S logistic GmbH	Crossdock Zeichhorn HAL MO/VKU	DE	96271	Grub am Forst	Gruber Strasse	11
Hallstadt	HAG06	D + S logistic GmbH	Crossdock Zeichhorn HAL (VFE)	DE	96271	Grub am Forst	Gruber Strasse	11
Hallstadt	OCCHK	Schenker International (H.K.) Ltd	Oversea Consolidation Center Hong Kong	HK		Tsing Yi	Tsing Yi Hong Wan Road	38
Hallstadt	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Hallstadt	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeichhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Jarinu	JAR01	Brose do Brazil Ltda.	Rodovia Dom Pedro I, SP65, KM90	BR	13240-000	Jarinu (SP)	Bairro do Pinhal - Estrada Mun. Alberto Tofanin	
Jefferson	JEF01	Brose Jefferson	Wareneingang Brose Jefferson	US	48091	Warren	25295 Guenther Drive	
Jefferson	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Jefferson	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Kecskemet	KEC01	Brose Hungary Automotive Kft.	Wareneingang Brose Hungary	HU	6000	Kecskemet	Daimler ut.	1
Kecskemet	KECXX	D + S logistic GmbH	Crossdock Kecskemet	DE	96271	Grub am Forst	Gruber Strasse	11
Kecskemet	DUSZE	D + S Zeichhorn		DE	96271	Grub am Forst	Gruber Strasse	11
Korea	DAE10	Brose Korea Ltd.	Goods receipt	KR	21990	Incheon	75, Cheomdan-daero 60beon-gil	
Korea	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
La Suze	LSU01	Brose Automotive La Suze	Wareneingang Brose La Suze	FR	72210	La Suze-sur-Sarthe	Le-Pré-Sec	
London	RAUL1	Rauh Spedition & Logistik GmbH	LON PRE PRODUCTION	DE	96269	Großheirath	Hans Rauh Straße	1
London	RAUL2	Rauh Spedition & Logistik GmbH	LON FINAL ASSEMBLY	DE	96269	Großheirath	Hans Rauh Straße	1
London	LO100	Brose Canada Inc.	Plant 1	CA	N6N 1P7	London	Max Brose Drive	1500
London	LO200	Brose Canada Inc.	Plant 2	CA	N6N 1C9	London	Wilton Grove Road	1005
Meerane	ELAG1	Brose Fahrzeugteile	ELAG-Lager Emden	DE	26723	Emden	Horchstrasse	2
Meerane	MEBXX	D + S logistic GmbH	Crossdock Meerane	DE	96271	Grub am Forst	Gruber Strasse	11
Meerane	MEXXX	BFT Meerane GmbH & Co.KG		DE	08393	Meerane	Seiferitzer Allee (WE)	
Meerane	DUS01	D + S Logistic GmbH	Konsi-Lager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Meerane	MEXX1	Rhenus SE & Co. KG	Ersatzleile Kartonage	DE	08393	Meerane	Dennheritzer Strasse	5
Meerane	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeichhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Melfi	MELO1	Brose Melfi Automotive s.r.l.	Wareneingang Brose Melfi	IT	85025	San Nicola di Melfi	Zona Industriale	Zona D1
Melfi	DUSMF	D + S logistic GmbH	Crossdock Melfi	DE	96271	Grub am Forst	Gruber Strasse	11
Melfi	DUSZE	D + S Zeichhorn		DE	96271	Grub am Forst	Gruber Strasse	11
New Boston	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
New Boston	NB001	Brose New Boston Inc.	Goods receipt	US	48167	New Boston	Bell Road	23400
New Boston	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Ostrava	OCCHK	Schenker International (H.K.) Ltd	Oversea Consolidation Center Hong Kong	HK		Tsing Yi	Tsing Yi Hong Wan Road	38
Ostrava	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Ostrava	OCHKR	Schenker International (H.K.) Ltd	Oversea Consolidation Center Hong Kong ROZ	HK		Tsing Yi	Tsing Yi Hong Wan Road	38
Ostrava	OCSHR	Huamao Warehouse	Oversea Consolidation Center Shanghai ROZ	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Ostrava	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Ostrava	OCGAR	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA ROZ	US	30337	College Park	4849 Massachusetts Boulevard	
Ostrava	DUSNJ	D + S Logistic GmbH	Crossdock CZ Novy Jicin Aussenl.	DE	96237	Ebersdorf	Birkleite	4
Ostrava	DUSRO	D + S Logistic GmbH	Crossdock Roznov	DE	96237	Ebersdorf	Birkleite	4
Ostrava	KO100	Brose CZ spol. s r.o.	Wareneingang Koprivnice	CZ	742 21	Koprivnice	Prumyslový park	302
Ostrava	KO200	Brose CZ spol. s r.o.	Aussenlager Novy Jicin	CZ	741 01	Novy Jicin	Hrbítovní ulice	2203/82
Ostrava	KOBXX	D + S logistic GmbH	Crossdock Koprivnice	DE	96271	Grub am Forst	Gruber Strasse	11
Ostrava	RO100	Brose CZ spol. s r.o.	Wareneingang Roznov	CZ	75661	Roznov pod Radhostem	1. máje	2636
Ostrava	DUSCZ	D + S Logistic GmbH	Konsi-Lager (Czech Rep)	DE	96237	Ebersdorf	Birkleite	4
Ostrava	OCCVE	GOLMEX PUERTO Manzana	Oversea Consolidation Center Veracruz	MX	91700	Manzana	SN Interior del recinto portuario	
Ostrava	OCVER	GOLMEX PUERTO Manzana	Oversea Consolidation Center Veracruz ROZ	MX	91700	Manzana	SN Interior del recinto portuario	
Prievidza	PRI01	Brose Prievidza, spol. s r.o.	goods receiving	SK	971 01	Prievidza	Max Brose	20
Prievidza	DUSPR	D + S logistic GmbH	Crossdock Prievidza	DE	96271	Grub am Forst	Gruber Strasse	11
Prievidza	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Puebla	HINLA	Welldex's Warehouse		US	78045	Laredo	Humphry Road Sophia Industrial Park	13808
Puebla	PUXXX	BROSE PUEBLA SA DE CV	Entrada	MX	72730	Sanctorum, Puebla	Camino a San Lorenzo	1214

Brose Werk Brose Plant	Abladestelle Unload. point	Name Name	Name 2 Name 2	Land country	PLZ Post Code	Ort Place	Straße Street	Haus Nr. No.
Puebla	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Puebla	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Pune	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Pune	IND02	BROSE INDIA	AUTOMOTIVE SYSTEMS PVT LTD	IN	411057	Pune	Panchshil Tech Park, Hinjewadi	
Pune	IND01	BROSE INDIA	AUTOMOTIVE SYSTEMS PVT LTD	IN	411057	TALUKA MULSHI, PUNE	SURVEY NO.254	
Pune	IND03	BROSE INDIA	AUTOMOTIVE SYSTEMS PVT LTD	IN	411057	TALUKA MULSHI, PUNE	Plot	5 & 7
Queretaro Aeroporto	QU300	Brose Queretaro, S.A. de C.V.	Galerias	MX	76295	Colon, Queretaro	Max Brose No.	1
Queretaro Aeroporto	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Queretaro Benito Juarez	QU100	Brose Mexico S.A. de C.V.	Entrada Benito Juarez	MX	76120	Queretaro QRO	Calle 2	No.7
Queretaro Benito Juarez	QU108	Brose Mexico S.A. de C.V.	Entrada Benito Juarez ERSATZ	MX	76120	Queretaro QRO	Calle 2	No.7
Queretaro Benito Juarez	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Queretaro El Marques	QU200	Brose Mexico S.A. de C.V.	Entrada El Marques	MX	76246	Querétaro	Avenida de la Corte	No. 4
Queretaro El Marques	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Queretaro El Marques	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Queretaro El Marques	OCCHK	Schenker International (H.K.) Ltd	Oversea Consolidation Center Hong Kong	HK		Tsing Yi	Tsing Yi Hong Wan Road	38
Rastatt	RS100	Brose Fahrzeugteile Rastatt	Wareneingang	DE	76437	Rastatt	Mercedes-Benz-Straße	1
Rastatt	RSB01	D + S logistic GmbH	Crossdock Rastatt	DE	96271	Grub am Forst	Gruber Strasse	11
Rastatt	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Rayong (Thailand)	OCCTH	Sintanachote Co., Ltd	Oversea Consolidation Center Thailand	TH	10260	Bangkok	Lazal road	876
Rayong (Thailand)	RAY01	Brose Thailand Co., Ltd.	Brose Thailand	TH	21140	Rayong	300/28 Moo 1	
Rayong (Thailand)	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Rayong (Thailand)	OCSHT	Shanghai Yunfeng Logistics Co.LTD.	Oversea Consolidation Center Shanghai TH	CN	200137	Shanghai	Mindong Road	239
Rayong (Thailand)	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Reynosa	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Reynosa	PHA01	M.A.S. Logistics LLC	Brose Reynosa	US	78577	Pharr, TX	International Blvd	9601
Reynosa	REY01	Brose Reynosa, S.A. de C.V.	Wareneingang Brose Reynosa	MX	88614	Reynosa, Tamps.	Carr. Riberena Km 10.5	
SBA	OCCMA	KN OCC Manzanillo TIMSA	Oversea Consolidation Center Manzanillo	MX	28250	Manzanillo, Colima C.P.	Av. Teniente Azueta	29 EDIF
Shanghai	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Shanghai	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Shanghai	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Shanghai	SHN01	Brose Shanghai	Automotive Systems Co.,Ltd.	CN	201814	Shanghai	Bai an Road	235
Shanghai	SHN02	Brose Shanghai	Automotive Systems Co.,Ltd.	CN	201814	Shanghai	Anchen Road	258
Shanghai (SHM)	SHM01	Shanghai Brose Electric Motors	Co., Ltd.	CN	201801	Shanghai	1126, Jiaxin Road	
Shanghai (SHM)	SHM02	Shanghai Brose Electric Motors	Fuhua Plant	CN	201801	Shanghai	Shenxia Road	358
Shanghai (SHM)	SHM03	Shanghai Brose Electric Motors	Meijian Warehouse	CN	201801	Shanghai	Meijian Road	110
Shanghai (SHM)	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Shanghai (SHM)	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Shanghai (SHM)	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Shanghai (SHN)	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Shanghai (SHN)	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Shanghai (SHN)	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Shanghai (SHN)	SHN03	Shanghai Brose	Electric Motors Co.,Ltd.	CN	201814	Shanghai	Anchen Road	258
Shanghai JV (SBA)	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Shanghai JV (SBA)	SH100	Shanghai Brose Automotive		CN	201814	Shanghai Jading District	Yuan Mao Raod	No.299
Shanghai Office	SO100	Brose Asia	Regional Headquarters	CN	201814	Shanghai	Anchen Road, Jiading District	258
Shenyang	SY100	Brose Shenyang	Goods receipt	CN	110122	Shenyang	No.3 Building, Zhiyuan industry park, Puping Road, Dadong Zone	27-3
Shenyang	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1

Brose Werk Brose Plant	Abladestelle Unload. point	Name Name	Name 2 Name 2	Land country	PLZ Post Code	Ort Place	Straße Street	Haus Nr. No.
Shenyang	SHACD	Anji-CEVA Automotive Logistics Co., Ltd.	Cross Dock Shanghai	CN	201805	Shanghai Huangdu	Jiasongbeilu Road	5788
Shenyang	SHCD2	Zonebond International Group, Cross dock	Crossdock Shanghai	CN	201808	Shanghai, Jiading District	Laodong road	528
Sindelfingen	SI100	Brose Fahrzeugteile Sindelfingen	Wareneingang Brose Sindelfingen	DE	71093	Weil im Schönbuch	Max Brose Strasse	1
Sindelfingen	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Sindelfingen	SIB01	D + S logistic GmbH	Crossdock Sindelfingen	DE	96271	Grub am Forst	Gruber Strasse	11
Sindelfingen	DUS01	D + S Logistic GmbH	Konsi-Lager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Sindelfingen	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Spartanburg	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Spartanburg	SP100	Brose Spartanburg Inc.	Goods Receiving	US	29334	Duncan	Howell Road	1171
Sta. Margarida	DUSEB	D + S Logistic GmbH	Stahl- und Werkzeuglager Ebersdorf	DE	96237	Ebersdorf	Birkleite	4
Sta. Margarida	EXESM	Brose S.A.	Supplier Warehouse	ES	08730	SANTA MARGARIDA I ELS MONJOS	C/ Valencia	4
Sta. Margarida	SM100	Brose S.A.	Direct deliveries	ES	08730	Santa Margarida i Els Monjos	C/Illes Balears	2 - 6
Sta. Margarida	SMBXX	D + S logistic GmbH	Crossdock Sta. Margarida	DE	96271	Grub am Forst	Gruber Strasse	11
Sta. Margarida	OCCON	OCEANLAND DISTRIBUTION SERVICES	Oversea Consolidation Center Canada	CA	L4V 1R3	MISSISSAUGA	3939 NASHUA DRIVE, UNIT A	
Sta. Margarida	OCCGA	Kuehne + Nagel, Inc.	Oversea Consolidation Center USA	US	30337	College Park	4849 Massachusetts Boulevard	
Taichang	TA200	Brose Taichang Automotive Systems Co., Ltd	Goods receipt	CN	21540	Taichang, China	Dongting Road	158
Taichang	TA100	Brose Taichang Automotive Systems Co., Lt	Goods receipt	CN	215400	Taichang, China	Guangzhou Road	No. 188
Taichang	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Taichang	CDSMY	Schenker Logistcs (M) SDN. Bld.	Crossdock Schenker MY	MY	41200	Northport Port Klang	Loring Batu Nilam	No. 6-1 & 8-1
Togliatti	TOG01	Brose Togliatti	Wareneingang Brose Togliatti	RU	445141	Togliatti	Severnaya street	6A
Togliatti	DUSTO	D + S Logistic GmbH	Crossdock Togliatti	DE	96237	Ebersdorf	Birkleite	4
Tondela	TO100	Brose Sistemas de Fechaduras	para Automóveis, Unipessoal Lda.	PT	3465-158	Santiago de Besteiros/Tondela	Armazém	
Tondela	CDHIL	Rhenus Freight Logistics GmbH + Co. KG	Crossdock Brose	DE	40721	Hilden	Im Hülsenfeld	25
Tondela	TONCD	D + S Logistik GmbH	Crossdock Tondela	DE	96271	Grub am Forst	Gruber Strasse	11
Tuscaloosa	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Tuscaloosa	TU100	Brose Tuscaloosa Inc.	Wareneingang Brose Tuscaloosa	US	35490	Vance	Brose Drive	10100
Tuscaloosa	TU200	Brose Tuscaloosa Inc.	Thyssen Krupp Industrie Solution	US	35022	Bessemer Alabama USA	Perimeter Way	4961
Tuscaloosa	TU300	Brose Tuscaloosa Inc.	BWH	US	35490	Vance	Brose Drive	10095
Tuscaloosa	SH100	SHAPE Corp.		US	49417	Grand Haven	Comstock Street	16344
Tuscaloosa	BM100	NYX New Albany		US	47150	New Albany	Progress Blvd	999
Wuhan	RAUKC	Rauh Spedition & Logistik GmbH	Oversea Consolidation Center Germany	DE	96269	Großheirath	Hans Rauh Straße	1
Wuhan	WH100	Brose Wuhan Autom. Systems Co., Ltd		CN	430056	Hanyang district	Fengshu 2nd street, WEDZ	Build.20
Wuppertal	HOWUP	AVT Abfüll- und Verpackungstechnik		DE	42369	Wuppertal	Otto-Hahn-Strasse	34
Wuppertal	WU100	Brose Schließsysteme Wuppertal	Wareneingang Werk 1	DE	42369	Wuppertal	Otto-Hahn-Straße	34
Wuppertal	WU200	Brose Schließsysteme GmbH & Co.KG	Wareneingang Werk 1 RHB	DE	42369	Wuppertal	Otto-Hahn-Straße	34
Wuppertal	WU300	Brose Schließsysteme GmbH & Co.KG	Wareneingang Werk 1 B	DE	42369	Wuppertal	Otto-Hahn-Straße	34
Wuppertal	WUB01	D + S logistic GmbH	Crossdock Wuppertal	DE	96271	Grub am Forst	Gruber Strasse	11
Wuppertal	DUSZE	D + S Logistic GmbH	Konsi-Lager Zeickhorn	DE	96271	Grub am Forst	Gruber Strasse	11
Wuppertal	OCCSH	Huamao Warehouse	Oversea Consolidation Center Shanghai	CN	201308	SHANGHAI, Pudong	Jienhang Road	76
Würzburg	WBG01	BFT GmbH & Co KG Würzburg	Wareneingang Brose Würzburg	DE	97076	Würzburg	Ohmstrasse	2a
Würzburg	WBG02	D + S Logistik GmbH	Crossdock Würzburg	DE	96271	Grub am Forst	Gruber Strasse	11
Würzburg	WBG03	Pabst Transporte GmbH & Co.KG		DE	97469	Gochsheim	Industriestraße	15
Würzburg	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, 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. **chap. 0 "Container labeling"**).

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

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

Illustration 42 - 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 Brose Fahrzeugteil D 08393 Meerane		(2) Abkürzung, Lagerort, Verwendungszweck MEXXX 4000	
(3) Lieferanten-Nr. (N) 1234 		(4) Lieferanten-Adresse (Werk, PZL, etc.)	
(5) Sach-Nr. Kunden (S) A20926-110 		(6) Gewicht Netto 13	
		(6) Gewicht Brutto 123	(7) Anzahl 1
(8) Menge (G) 123 		(9) Benennung Fan Single	
(12) Lieferanten-Nr. (V) 44916 		(11) Sach-Nr. Lieferanten (S) 003381 	
(15) Packstück-Nr. (S) 1234 		(13) Vers.-Datum D121012 AC	
		(14) Änderungsstand 1234 	
Weiterführende VDA 4902 Version 4			

Illustration 43 - 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 _S	30	1E	Data set separator
G _S	29	1D	Group separator
E _{OT}	04	04	End of transmission

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

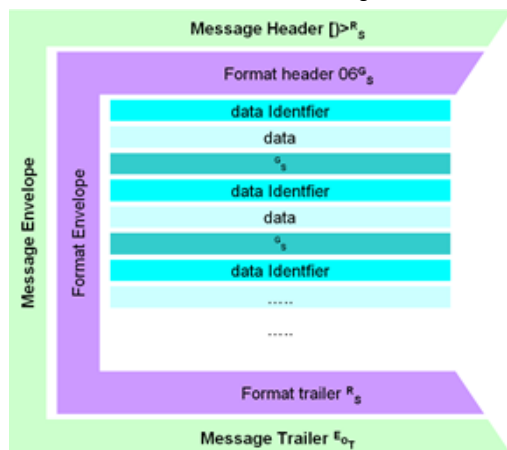


Illustration 44 - Structure of Barcodes

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 43 - 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 44 - 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_s = ASCII Code 30 (data set separator) ▲
G_s = ASCII Code 29 (group separator) ↔
E_{O_T} = ASCII Code 04 (end of transmission) □

Printout PDF417:



Illustration 45 - Printed barcode PDF417

iv. 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.

v. 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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