

Bosch Rexroth AG

Bosch Rexroth Appendix to Supplier Logistics Guideline of Bosch Group

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Preliminary Note

All regulations of the Bosch Group Supplier Logistics Guideline are valid for Bosch Rexroth. Additions and/or exceptions are specified as follows.

The part-specific agreements within the scope of Bosch Rexroth part-specific Supplier Agreement (TLV, chapter 3) have priority over general regulations at all times.

All existing contracts like Routing Orders, EDI contracts, etc. are used additionally.

1 Supplement to 1.2.3. – Planning methods in procurement

The following planning methods in Bosch Rexroth procurement are:

- Classic delivery schedule (LAB)
- Vendor Managed Inventory (VMI) resp. Delivery Control Monitor (DCM)
- Kanban
- Single orders

The regulations for LAB, VMI, DCM and Kanban given in Bosch Supplier Logistics Guideline remain unchanged. Additional regulations are:

Single orders

Single orders are issued with parameters agreed upon in the TLV (part specific supplier agreement). Paragraph 1.3.1. of Bosch Supplier Logistics Guideline is equally applicable for single orders.

Order confirmations are individually agreed upon in the TLV. Order confirmations contain at least the same information that has been given in the purchase order.

2 Supplement to 2.1 – Packaging

2.1 Purpose

The following issues for the sub process packaging logistics are guidelines which provide information about correct usage and about existing guidelines and regulations relating to packaging at Bosch Rexroth.

These issues should help you to achieve a faultless material flow between internal and external suppliers and Bosch Rexroth and prevent unnecessary repackaging.

2.2 Scope

The following issues are mandatory for Bosch Rexroth AG and its regional subsidiaries and for suppliers of Bosch Rexroth.

Where it is necessary to consider country-specific legislation, these issues should be interpreted accordingly. Affiliated companies are advised to follow these issues. Any special regulations in exceptional cases must be agreed with the responsible logistics department at the Bosch Rexroth plant concerned.

Information on additional support/addresses has been provided in this version, where possible. Bosch Rexroth draws your attention in particular to the fact that the contents of these guidelines do not release the operating person/department from liability for damages, such as damage resulting from faulty packaging or insufficient protection against corrosion, for instance. Neither is the operating person/department released from the obligation to supply information about the respective valid regulations for packaging and packaging material.

2.3 Regulations, guidelines, standards and statutes

Regulations, guidelines, standards and statutes which are relevant are listed in the “Supplier Logistics Guideline of the Bosch Group”.

For international trade involving solid wood packaging materials, the applicable version of the phyto-hygienic regulations issued by the IPPC (International Plant Protection Convention), a suborganization of the FAO (Food and Agriculture Organization of the UN), must be adhered to.

Information relating to IPPC regulations and country-specific regulations is available for download at the following link:

<https://www.ippc.int/>

2.4 General information on the use of packaging

The packaging materials and the means used to secure the packaged goods internally must be constructed and designed according to the load during transport, handling and storage (static and also dynamic), taking economic efficiency into consideration. The goods must generally be dispatched in packaging that is appropriate for the nature of the goods.

2.4.1 Securing for transport

Strapping should only be used when edge protection profiles or a cover are used. A pallet covering box with strapping may also be used.

2.4.2 Seaworthy packaging

The dispatch units should be designed suitable for sea freight, i.e. a space-saving design taking a favourable dimension/weight ratio into account. The most appropriate packaging should be chosen in each case. The packaging must be designed so as to guarantee that the packaged goods remain intact before, during and after transportation, taking into account any risks that may arise. The goods must be protected in particular from external mechanical and climatic stress, as well as corrosion where multiple modes of transport are used, including during transfers between transport modes and extended periods of storage in the open air without the use of a separate protection system.

The packaging should be designed so that it is suitable for crane loading and also loading with forklift and industrial trucks. Dimensions and weights should be adjusted according to the loading dimensions and lifting capacity of the transport means and hoisting devices.

This point applies in addition to VDA no. 4525.

2.4.3 Air freight packaging

When transporting goods by air, providing there is no agreement to the contrary, lightweight and space-saving packaging that is designed to ensure goods remain intact before, during and after transportation must be used. The selected packaging must provide protection in particular against external, mechanical and climatic stress, as well as against corrosion where multiple modes of transport are used, including during transfers between modes of transport and extended periods of storage in the open air without the use of a separate protection system.

2.4.4 Auxiliary packaging materials

Auxiliary packaging materials are divided into six groups according to type and use.

Group	Example	Note*
Plastic	Polythene bags and pouches	Reusable (no plastic bags)
Adhesive	Labels	Removable without residue
Filler material	Padpac	No polystyrene or filler material made from foodstuffs (e.g. corn chips), no packaging foam, no bubble wrap
Strapping material	Plastic tape	Steel strapping is prohibited
Corrosion protection	VCI paper/film	See notes under item 12
Wood	Squared timber	Secure if necessary

* Note: Plant-specific exceptions may be agreed with the supplying plant on a case-by-case basis.

2.4.5 Reusable packaging

Reusable packaging is packaging that can be used more than once. It is usually used in returnable and return transportation and is supplied against a deposit.

Any reusable packaging provided remains the property of Bosch Rexroth and is provided on loan only (exception: Euro pallets). We recommend that reusable packaging is stored separately.

2.4.5.1 Standard packaging

Pool pallets



(Euro pallet)

Pool pallets with the internationally recognized dimensions of 1200 x 800 mm (Euro pallet according to DIN 15146 Part 2) and 1200 x 1000 mm (industrial pallet according to DIN 15141 Part 4) must be used. Only by using these pallets is the optimum formation of modules (according to DIN 55 520) and utilization of the pallet guaranteed.

Mesh box pallets






The mesh box pallets, which can also be pooled (according to DIN 15155), have the basic measurements 1200 x 800 mm and therefore allow for optimum stackability.

Flat and mesh box pallets must meet the quality requirements of the European Pallet Association (EPAL) and must be replaced by the dispatch department or managed on account.
<http://www.epal-pallets.de/uk/produkte/paletten.php>

2.4.5.2 Small load carriers (KLT)

The KLT system is a standard, mechanically and manually manageable system that is adjusted on a modular basis to the (base) areas 1200 x 800 mm (Euro) and 1200 x 1000 mm (ISO). This system can be implemented universally and has pooling capability.

Types of KLT used at Bosch Rexroth:

Characteristic	VDA-C-KLT*	VDA-R-KLT	VDA-RL-KLT
Image			
KLT construction	Double-walled	Single-walled	Single-walled
Rigid/foldable	Rigid	Rigid	Rigid
Filling weight	Up to 50 kg	Up to 20 kg	Up to 20 kg
Base	Composite base	Composite base	Flat base

* Used by default at Bosch Rexroth: VDA-C-KLT

Stackability



VDA-C-KLT 6428 module 600x400
(KLT stacked crosswise)



VDA-KLT column stacking with flat
wooden/plastic pallet and secured with cover

Transport safety is only guaranteed if the container system is secure itself, i.e. the KLTs are stacked crosswise. The KLTs must be additionally secured with stretch film or strapping using plastic tape.

2.4.5.3 Plant-specific packaging

In addition to the standard reusable packaging, plant-specific reusable packaging is used at Bosch Rexroth. The areas of application for this packaging are determined by the packaging regulations.

2.4.5.4 Custom packaging

If Bosch Rexroth customers have special packaging requirements, the relevant specialist department must be involved in agreeing these requirements.

2.4.6 Disposable packaging

Disposable packaging is only intended for a single transport. Bosch or Bosch Rexroth will not provide disposable packaging to a supplier, nor reimburse any costs incurred in relation to the use of disposable packaging.

Standard packaging (corrugated cardboard transport packaging)

For transport packaging made from corrugated cardboard, standard sizes (labeled "S") have been defined.

There is a modular system. The basic measurements in this system are such that the packages can be stacked in a sea container.

Mat. no.	Internal dimensions in mm	External dimensions in mm	Quality	Design	Additional creasing for height in mm
S90	1100x730x940	1130x760x1000	2.96 BAA	Fefco 0201	750, 850
S80	1100x730x590	1130x760x650	2.96 BAA	Fefco 0201	550, 350
S70	745x550x468	760x565x500	2.91 BC	Fefco 0201	250, 350
S60	745x267x218	760x282x250	2.91 BC	Fefco 0201	-
S50	535x350x436	550x365x468	2.91 BC	Fefco 0201	350
S40	350x260x202	365x275x234	2.70 BC	Fefco 0201	150
S30	260x167x202	275x182x234	2.70 BC	Fefco 0201	-
S20	172x127x212	182x137x234	1.40 C	Automatic base Fefco 0711	-
S10	172x127x95	182x137x117	1.40 C	Automatic base Fefco 0711	-

The height of the total loading unit must be no greater than 1 m. The goods must be packaged such that they can be transported safely.

2.4.7 Internal packaging

Internal packaging must be used to provide a product with sufficient protection against damage.

The internal packaging can be reusable (e.g. intermediate layers for KLT, plastic thermoformed blisters) or disposable packaging (e.g. solid board inserts, bags, corrosion protection paper).

The internal packaging used is generally also defined in the packing instructions.

2.4.8 Labeling packaging

Regulations regarding the labelling of individual containers are set out in the "Bosch Group Logistics Supplier Manual."

Mixed deliveries require the inclusion of a loading list for each recipient, showing the following details:

- Recipient
- Material number
- Name
- Supply volume
- Packing units
- Weight

2.5 Container Management

2.5.1 Processing empties

With the objective of ensuring a high degree of supply reliability while at the same time maintaining a low level of container stock across the entire supply chain, Bosch Rexroth has set up a standard container management system. Reusable packaging is to be used solely for shipments to Bosch

Rexroth. The supplier is responsible for sourcing any reusable packaging required for internal processes at the supplier's premises.

Three forms are to distinguish:

2.5.1.1 Pooling packaging

In the pooling system, Bosch Rexroth uses the network of a service provider to supply vendors with empties. Generally, the supplier or the plant always receives cleaned empties from the nearest cleaning depot.

The pooling goods are provided exclusively by Bosch Rexroth. Suppliers do not introduce their own containers to the pool. This is also excluded by the system. The system does not allow suppliers to build up any negative stock.

Pooling containers:

Pooling containers may only be designated as such by Bosch Rexroth.

Details of the current pooling containers in use can be obtained from Bosch Rexroth on request.

2.5.1.2 Plant-specific packaging

The plant-specific packaging can be managed using the current service provider. Suppliers are supplied with plant-specific packaging from the depot close to the plant or in the manner agreed upon in the case in question.

2.5.1.3 Supplier-specific packaging

A supplier may use its own packaging only after obtaining approval from Bosch Rexroth. The supplier bears the costs of return transport.

2.5.2 Designing reusable packaging

With regard to the design of the individual containers, the maximum gross weight of VDA-KLT of 15 kg must not be exceeded unless a different agreement has been defined in the packing instructions issued by Bosch Rexroth.

Only full layers are allowed on the pallet. The uppermost layer at least must be covered with a VDA-KLT cover or consist of closed packages. For low unit volumes, individual KLTs can be dispatched. In this case, the KLT must be closed with a VDA-KLT cover and strapped with plastic tape.

VDA-KLTs must be packed according to type.

Mixed deliveries require the inclusion of a loading list.

Bosch Rexroth provides the supplier with reusable packaging for a defined inventory (generally three days).

Reusable packaging required for the supplier's internal production processes must be procured by the supplier (see also "Bosch Group Logistics Supplier Manual").

The regulations of the European Pallet Association (website: www.epal-pallets.org) apply to Euro pallets and Euro mesh box pallets.

2.5.3 Cleaning reusable packaging

On behalf of Bosch Rexroth, the container management service provider provides cleaned reusable packaging only. The resulting costs must be agreed bilaterally with the supplier.

Reusable packaging must not be glued or used for any purpose other than that for which it is intended. Easily soluble glue dots for securing labels are allowed provided that they are removed before the packaging is cleaned by Bosch Rexroth.

2.5.4 Transporting empties

Orders received by 12 pm are provided for dispatch on the following day. Empties are delivered according to the agreement with the freight carrier. The costs of delivering empties are borne by Bosch Rexroth if no agreement to the contrary has been made.

2.5.5 Supply

If the supplier fails to request the packaging in time, it must bear any resulting additional costs (e.g. freight costs, repackaging costs).

Both plant-specific reusable packaging and pooling containers must be requested in the online system in good time (taking transport time into account).

The supplier must only order the packaging that is relevant for it (according to the packaging regulations). The quantity required is defined by Bosch Rexroth based on the due delivery volume. If the individually specified maximum stock level is reached, no further orders can be made (prevented by the system). The maximum stock level can only be increased in agreement with Bosch Rexroth.

In the event of shortages of the specified packaging materials, the supplier must ensure that appropriate alternative packaging is available. The form of any alternative packaging used must be documented in writing and submitted to the responsible logistics department at Bosch Rexroth for approval prior to the first delivery with the alternative packaging taking place. Alternative packaging must be the same size as the original packaging and must be able to accommodate the same number of parts (unless the weight of the parts to be delivered exceeds the maximum load capacity of the alternative packaging). The supplier must issue an invoice within three months after the delivery date for any costs arising from the use of alternative packaging, where the reason for such use is attributable to Bosch Rexroth.

2.5.6 Stock management

An online management system is provided for managing the stock of reusable packaging. All orders and every receipt or dispatch of a container must be booked in this system. The supplier books in the incoming goods after receiving the container, within 24 hours of goods receipt at the latest. Outgoing containers are booked out at the time the dispatch department is notified.

With appropriate authorization, each party involved in the cycle can view the current stock online. In the case of stock differences, the parties involved must initiate a reconciliation process.

Suppliers are liable for any costs resulting from stock differences attributable to the supplier.

At the end of the year (December 31), a stock take of all reusable packaging in the property of Bosch Rexroth must be performed.

2.5.7 Labeling reusable packaging

A shipment in reusable packaging must always have a blank credit note showing the DC order number attached, provided no other plant-specific agreement exists. This blank credit note is created automatically when the goods dispatch is booked in the management system.

2.5.8 Quality complaints

If the supplier finds any quality defects in a container delivery or has any complaints relating to the logistics of the delivery (e.g. contaminated or defective containers, incorrect containers, under/overdelivery), these issues must be reported immediately to the container manager at the appropriate lead plant (see also "Bosch Group Logistics Supplier Manual").

2.6 General packaging requirements

Measures must be taken to ensure that the parts are protected against contamination and damage:

- The packaging must be designed such that parts are protected against mechanical damage and corrosion. The corrosion protection specifications set out in the order specification must be strictly adhered to
- Cartons must be sealed with adhesive tape — not with metal clips
- The shipping packaging must ensure that the containers or cartons are adequately secured during transport or handling
- The packaging must allow forklift or industrial trucks to unload the containers or cartons from the transport vehicles without any problems

2.7 Packaging regulations

To ensure a faultless material flow without any unnecessary repackaging, Bosch Rexroth generally defines packaging regulations for each product on a plant-specific basis.

The packaging regulations are agreed for each plant with the supplier using the Part-Specific Logistics Agreement (TLV) or via other agreements with the supplier.

The supplier also receives a "Packaging Regulations Standard Form" (Appendix 1) for each parts group at least. This form describes in detail how the parts must be packaged.

Compliance with the packaging regulations is checked at Bosch Rexroth when the goods are received.

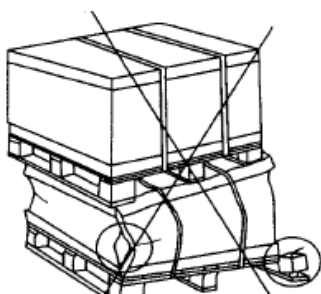
Any deviation from the agreed packaging regulations will have an impact on the logistics supplier evaluation. If the packaging regulations are not complied with, Bosch Rexroth reserves the right to invoice for the resulting additional expenses. For more information, please refer to the "Bosch Group Logistics Supplier Manual."

2.8 Loading units of reusable and disposable packaging

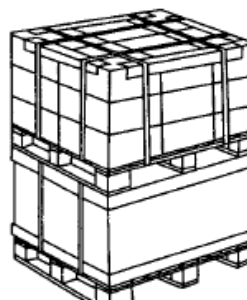
A loading unit refers to a load that is composed of objects or packages of additional resources so that these items can be handled, transported, stacked and stored as a unit. Loading units must be designed such that they can be lifted by forklift trucks.

If a loading unit is composed of smaller containers (special containers, universal containers, KLTs or disposable packaging), these containers must be aligned with the standard pallet dimensions.

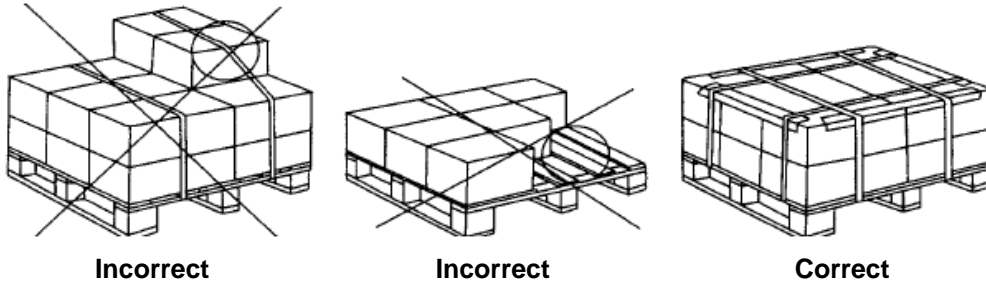
2.8.1 Stackability of loading units



Incorrect



Correct



2.8.2 Creating loading units

Packaged goods and loading units must not exceed the basic measurements of the loading units (1200 x 800 mm and 1200 x 1000 mm). The height of the whole loading unit must not exceed 1000 mm. Other plant-specific regulations may apply.

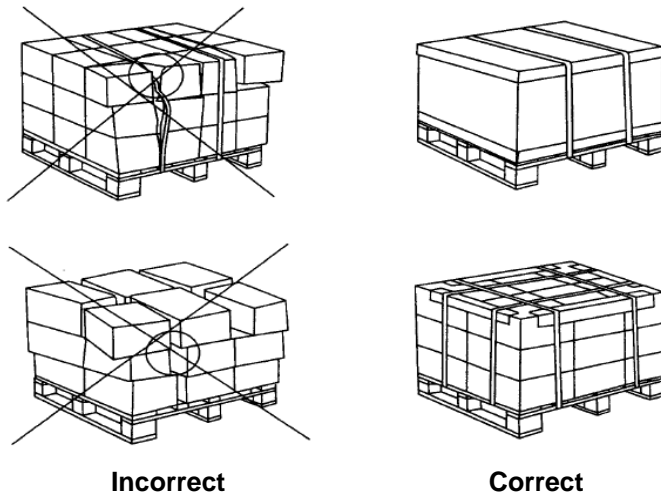
It must be ensured that units can be handled using forklift and industrial trucks and automated materials handling technology. The free space between the pallet feet must therefore not be compromised by any measures used to secure the loading unit.

Loading units must be secured such that the transport packaging cannot slip during transport. This can be achieved by using:

- Shrink hoods
- Plastic tensioning belts
- Stretch films

Straps must not cut into cardboard packaging; this must be avoided by using edge protection profiles.

When partial quantities of a loading unit are removed, the stability of the remaining quantity must be ensured.



2.9 Regulation of the use of materials

Type	Recommendation — alternative	Prohibited materials
Cardboard boxes	Free from materials that are harmful to paper production	With water-insoluble coatings or adhesives
Composite materials	Not recommended	
Wood	Untreated solid wood and plywood	Chipboards, coated or painted wood, wood shavings
Plastics	PE, PP, PUR	PVC, PC, polystyrene chips
Corrosion protection paper	VCI paper, which has been proven to be recyclable with paper/cardboard	Non-contractually impregnated or saturated paper (e.g. bitumen, oil and waxed paper, paper containing nitrite)

Prohibited materials

In packaging materials, the cumulative concentration of lead, cadmium, quicksilver and chrome (VI) must not exceed the limit of 100 ppm defined in the EU packaging guideline (94/62/EC) (Bosch Rexroth ZA 8680 — Prohibition and Declaration of Materials).

A detailed list of declarable and prohibited materials is provided in Bosch Rexroth ZA 8680 — Prohibition and Declaration of Materials.

2.10 Corrosion protection

Corrosion is the process in which metallic materials are attacked and destroyed as a result of chemical or electrochemical reactions with substances in the environment. Corrosive agents are materials that surround the component, act on the material and cause corrosion.

2.10.1 Preservation

Preservation should provide temporary and time-limited protection against harmful influences and therefore ensure that the materials remain in the same state as when the preservation method is carried out.

Only corrosion protection agents permitted by the process engineering, environmental protection and work safety departments may be used.

The type and composition of external and internal means of preservation applied to parts, devices and systems made of iron materials, and the time at which this preservation is applied, depend on:

- Subsequent further handling
- Subsequent intended use
- Sensitivity of technical surfaces to corrosion and other harmful influences (dust, contamination etc.)
- Storage conditions and the storage period

- Technical terms of delivery defined by the customer

2.10.2 Anti-corrosion measures for individual parts

Anti-corrosion measures for individual parts are implemented in the production phase (e.g. through the use of corrosion-inhibiting coolants and lubricant additives during processing). If this temporary, time-limited protection (based on longer throughput times of the parts) does not guarantee adequate preservation, then preservation is ensured using VCI materials, dewatering fluid or corrosion protection oils. The VCI packaging (Volatile Corrosion Inhibitor) is an inhibitor that can inhibit or prevent chemical reactions.

The corrosion protection is usually applied by painting a colour base on all external surfaces of the device, with the exception of contact surfaces (AB 01-03.05). Preservation methods are not applied to parts that are assembled immediately after production without an interim storage period.

Parts that are particularly sensitive to corrosion or those with a longer storage time (e.g. reserve parts) must also be protected with corrosion protection materials with a VCI agent, or by shrink packing and evaluation or shrink wrapping in water vapor-proof plastic films. For parts where the effectiveness of the protection decreases after a specific storage period, post-preservation is applied as a preventive measure.

The ZN-90001-001 packaging regulations for temporary corrosion protection apply.

2.11 Labeling and marking

The packages are marked either using a template with a saltwater-proof light-resistant contrasting color or with marking labels provided by the client. When marking using a template, the letter size is adjusted according to the size of the package. For unpackaged parts and slide constructions, the package or plywood board must be marked immediately. All packages must be marked on both of the long sides.

Marking guidelines are created for each order and are received by the contractor in good time.

2.11.1 Labeling rules

The central standard "Package Labeling Rules" (ZN 02101) describes the requirements for Bosch Rexroth.

2.11.2 Handling symbols

International symbols must be applied to goods that require special handling.



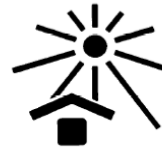
Keep dry



Fragile goods



This way up



Protect against heat



Electrostatically sensitive component



Center of gravity



Attach here



Permissible stack load



Manual hook prohibited



Do not damage barrier layer

Pictorial symbols according to DIN 55 402

2.11.3 Hazardous substance symbols

Refer to the international hazardous substance guidelines for the hazardous substance symbols.



T+
Sehr giftig



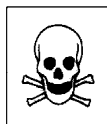
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Ätzend



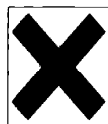
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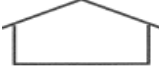
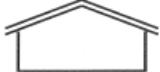
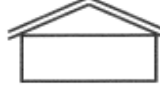
F
Leichtentzündlich



Asbesthaltige
Zubereitungen
und Erzeugnisse

2.11.4 Storage symbols

If no order-specific storage symbols have been specified, the following storage symbols can be used.

				
Open-air	Covered hall	Enclosed hall	Enclosed, heated hall, minimum temperature +8°C	Enclosed, heated, air-conditioned hall, minimum temperature +8°C, max. humidity 65%

2.12 Quality standards

At Bosch Rexroth, quality management systems are set up and certified pursuant to DIN EN ISO 9001:2000. This standard ensures that extensive measures are implemented that not only cover quality assurance but that clearly define the entire processes within DC.

Bosch Rexroth also integrates ISO/TS 16949. This technical specification consolidates all existing and published global quality standards and requirements in the automobile industry relating to quality management systems. It is based on ISO 9001:2000.

The QM system audit VDA 6.1 standard also applies at Bosch Rexroth.

2.13 Guarantee

The specifications described in this manual are minimum requirements for packaging and its use. The supplier guarantees to supply Bosch Rexroth AG with correct packaging designed in compliance with the minimum requirements set out in the manual, and guarantees the flawless quality of the packaging material. Prior written approval must be obtained from the receiving Bosch Rexroth plant for any necessary deviations from these requirements. The supplier is liable, regardless of fault, for all damages incurred by Bosch Rexroth resulting from the faulty design or manufacture of packaging and non-compliance with these minimum requirements.