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	<b>Logistics guideline          BR-packaging manual</b>	Author BR/PUR-LOG	Date 2006

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## 1. Aim

The logistics guideline packaging manual is intended to inform about the use of packaging. It is aiming at pointing out to the persons/ authorities in charge how to package the goods in the most secure and best way.

At the same time it is:

- A support for purchasers in order to demonstrate to suppliers (e.g. in emerging markets) the use of correct packaging for supplies to BR,
- A teaching aid for BR dispatch departments in order to train associates.


## 2. Scope

This packaging manual is a recommendation for the Bosch Rexroth AG and its different subsidiaries. If there are specific laws to observe in a country, this packaging manual must be sensibly used. Holding companies are recommended to adopt this manual.

However, the application of this logistics guideline is not mandatory. As far as it was possible, further support/ addresses are indicated in the following. BR/PUR-LOG especially points out that the contents of the said guideline do not exempt the persons/ authorities in charge from liability for damage, e.g. for defective packaging or insufficient corrosion protection. The person/ authority in charge is also not exempt from the duty of information about the applicable regulations for packaging and means of packaging.

## 3. Term definitions

Term definitions are to be found in part 2 of the ZN 02101 “Labelling regulations for packaging”.

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## 4. Regulations, guidelines, standards and legislations

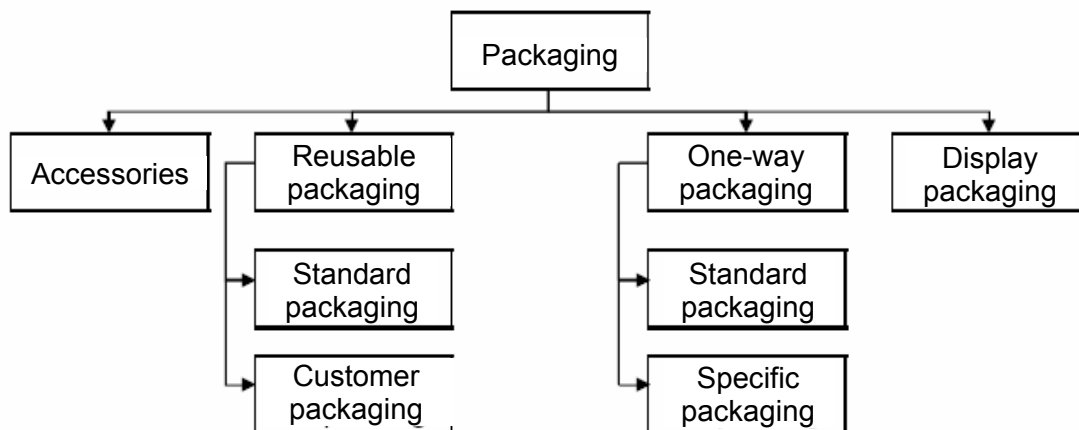
Regulations, guidelines, standards and legislations about packaging can be found in the "Logistics manual for suppliers of the Bosch Group".

The applicable import regulations for packaging/ packaging materials are contained in the "International Standard for Phytosanitary Measures No 15" (ISPM).

(<http://www.fao.org/Legal/treaties/004s-e.htm>)

For applicable information on wood packaging see <http://www.hpe.de>

## 5. Packaging at Bosch Rexroth




### 5.1 General information on functions and usages of packaging

#### Functions of packaging

The most important functions of packaging are the protective function, storing function, and the loading and transporting function.

The protective function ensures that the products are protected from mechanical and environmental influences and from loss of content.

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The storing function of packaging guarantees that the packaging is designed in such a way that the product can be simply, neatly and securely stored.

The loading and transporting function of a packaging ensures that the packaging can usually be easily, efficiently and securely moved.

### **Usages of packaging**

The design and construction of the means of packaging and the inner attachment of the packaged goods must be carried out taking into consideration the (static and dynamic) load during transport, handling, and storing as well as the economic efficiency. The goods must usually be dispatched packaged according to its nature.


### **Packaging of sea cargo**

The shipping units are suitable for sea cargo, i.e. they are space-saving considering an favourable size/ weight ratio. The most suitable packaging must be chosen each time. The intactness of the goods considering the risks of transport must be guaranteed with regards to outer mechanical and climatic influences as well as corrosion during transport by sea and the following transport until arrival at the destination, by rail, by truck, by inland waterways, by combined transport, during several transfers and longer storages outside.

The design of the packaging must be such that it is suitable for loading by crane as well as loading by floor trucks. Sizes and weight must be tailored sensibly to loading space and load-carrying capacity of the means of transport and the lifting gears.

### **Packaging of air-cargo**

Unless differently stated in an agreement, for transport of air cargo low-weight and space-saving packaging must be used that still ensures the intactness of the goods regarding outer mechanical and climatic influences as well as corrosion even during post-transport and post-storage.

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## Lists of cargo units

In international logistics, a cargo unit is the smallest unit of a consignment of goods. A list of cargo units lists the cargo units on the delivery note.

Usually, the service providers and recipients receive a list of cargo units in addition to the regulations for proper packaging processing. This form of lists of cargo units is mandatory for the processing of a commission.


## 5.2 Accessories

The accessories are divided into five groups according to their nature and application.

Group	Example	Note
Plastic	PE bags and pouches	Reusable (no plastic pouches)
Adhesive	Labels	Residue-free removal
Filling material	Padpac	No styrofoam or filling material made of foodstuff(e.g. maize chips), no packaging foam
Strapping material	Steel/ plastic strap	
Anti-tarnish paper	VCI-paper	Notes under point 8

## 5.3 Reusable packaging

Reusable packaging can be used several times and is usually used on a lend-return basis or is lent against payment of a deposit.

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### 5.3.1 Standard packaging

#### European exchange pallet



(euro pallet)

European exchange pallets must be used in the internationally recognized sizes of 1200 x 800 mm (euro pallet as per DIN 15146-part 2) and 1200 x 1000 mm (industrial pallet as per DIN 15141-part 4). Only in these cases is a optimum module formation (as per DIN 55 520) and full utilization of the pallet guaranteed.

#### Mesh boxpallets




The also exchangeable mesh boxpallets (as per DIN 15155) have the basic size of 1200 x 800 mm and thus enable an optimum stackability.





The flat and mesh box-pallets should meet the quality requirements of the „European Pallet Association (EPAL)“.

#### Small load carriers (KLT, Kleinladungsträger)

The KLT system is a uniform and modular system that can be mechanically and manually operated. It is standardized to the basic size of 1200 x 800 (Euro) and 1200 x 1000 (ISO) and is an exchangeable system that is universally used.

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**KLT - types used at Bosch Rexroth:**

Characteristic	VDA-C-KLT*	VDA-R-KLT	VDA-RL-KLT	VDA-F-KLT
Picture				
KLT-design	double-walled	one-walled	one-walled	one-walled
Rigid/ foldable	rigid	rigid	rigid	foldable
Filling weight	up to 50 kg	up to 20 kg	up to 20 kg	up to 20 kg
Bottom	compatible bottom	compatible bottom	smooth bottom	compatible bottom

\* preferred type by Bosch Rexroth: VDA-C-KLT

**Stackability**




C-KLT 6428 module 600x400



Column ability to be stacked RL-KLT with four-way flat pallet made of wood, locking plate

The security during transport is only guaranteed if the container system is secured form within, i.e. the KLT are offset stacked. Otherwise, it is recommended to strap the KLT column.

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## 5.3.2 Customer packaging

Should the customers of Bosch Rexroth have special requirements for the usage of packaging materials, these must be observed and carried out. In addition, the packaging materials (e.g. the Volvo pallet) that are put at disposal by the customer must be used.

## 5.4 One way packaging

One way packaging is generally only used for one single transport and are not filled again.

### 5.4.1 Standard packaging (transport packaging made of corrugated cardboard)


For transport packaging made of corrugated cardboard, standard sizes marked with an "S" are specified with certain qualities.

There is a modular system of which the basic sizes are such that the packaging can be stacked in a sea container.

Mat. No.	Inner measures in mm	Outer measures in mm	Quality	model:	Additional creasing for height in mm
S70	1100x730x940	1130x760x1000	2.96 BAA	Fefco 0201	750, 850
S60	1100x730x590	1130x760x650	2.96 BAA	Fefco 0201	550, 350
S50	745x550x468	760x565x500	2.91 BC	Fefco 0201	250, 350
S55	745x267x218	760x282x250	2.91 BC	Fefco 0201	-
S40	535x350x436	550x365x468	2.91 BC	Fefco 0201	350
S30	350x260x202	365x275x234	2.70 BC	Fefco 0201	150
S20	260x167x202	275x182x234	2.70 BC	Fefco 0201	-
S15	172x127x212	182x137x234	1.40 C	Automatic bottom Fefco 0711	-
S10	172x127x95	182x137x117	1.40 C	Automatic bottom Fefco 0711	-

In addition, only in a few cases there is special packaging, which is generally tailored to certain products. These are marked with an "X".



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## 5.4.2 Specific packaging

The wood thickness of boxes, crates and carriages must be adjusted to the weight, the sensitivity, the position of the gravity centre, and the value of the goods as well as to the expected effects of transport, handling and storage.

For import and export consignments, one way pallets should be used.

### 1. Bundling

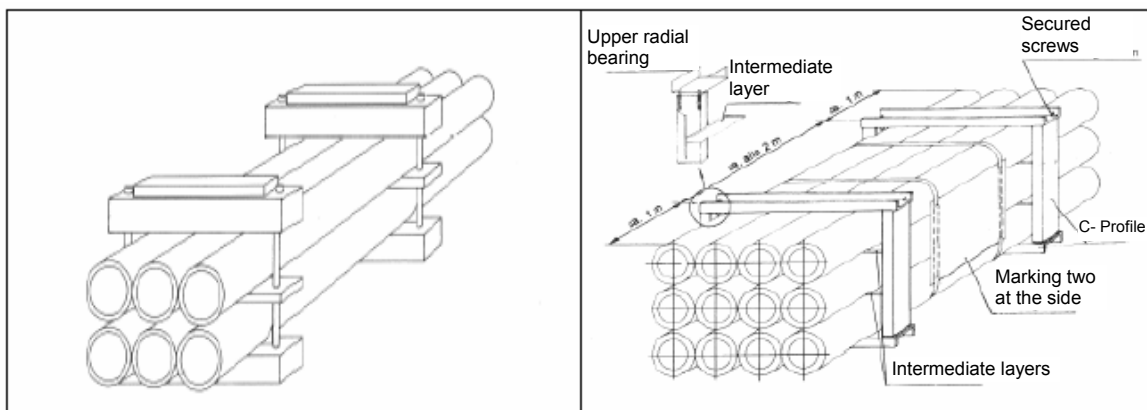
#### Type of equipment

Equipment that is not subject to damage by corrosion or mechanical effects, e.g. pipes, pipelines, structural steel, steel constructions.

#### Construction

The bundling must be done:

- with scantling clasps and locking screws;
- With intermediate layers (threaded onto locking screw poles) made of boards trimmed in parallel depending on the weight of the goods.
- The bottom pipe layer must be wedged outside.
- In between the salient screw heads, a batten must be nailed.
- The screws must be secured.
- If there is the danger of individual parts sliding out, the relevant securing measures are to be taken (flat iron or sheets).
- In individual cases, bundling with steel straps or wires must be agreed upon with the customer depending on the requirements.



**Bundling**

**Bundling with U-iron**

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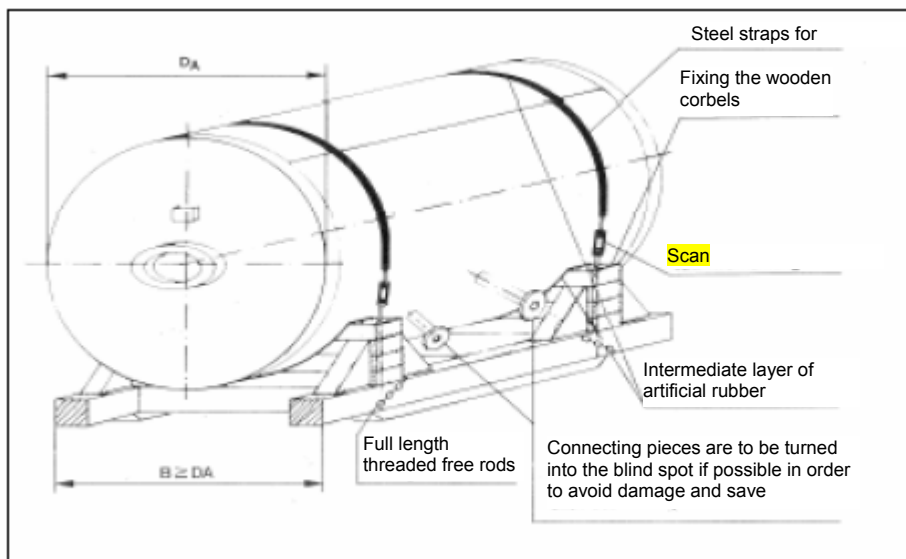
## 2. Carriages, scantling constructions, boardings

### Type of equipment

Bulky equipment and container, heavy cargo units which are not endangered by mechanical or corrosive influences.

### Construction

- The construction can either be made of wood or metal.
- The packing units have to be fixed on the carriage with steel straps that are lined with elastics, non-skid and screwed onto the carriage with locking screws.
- Flange openings must be closed with sealing and blank flanges or closed with a cover if necessary.
- Constructions of carriages must not exceed the length and width of the measures of the goods ( $B = DA$ ).
- Containers and equipment with their own standing devices must be fitted with a strong wooden base as anti-skid measure.




Carriages, scantling constructions, boardings

## 3. Crates

### Type of equipment

Equipment, devices and containers sensitive to corrosion that cannot be packed on carriages, ladders, parts of stages and platforms, pre-fabricated pipelines as well as moulded parts with small measures.

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## Construction

### Bottom

- Longitudinal bottom runners, especially for shipments to the states of the CIS and for container shipments, or lateral runners
- Maximum distance between longitudinal runners 90 cm (runner-centre to runner-centre)
- Bottom planks cross-nailed

### Side walls:

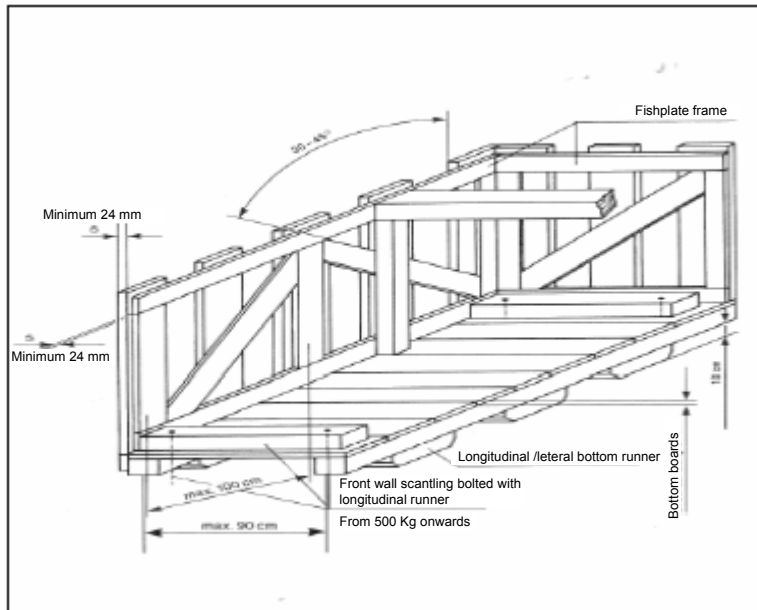
- Boarding of the side walls vertical, horizontal only if sensible; battens must be inside
- Distance between the boards not larger than the average board width

### Cover:


- Longitudinal boards above the front and side parts recede by 5 mm; lateral battens, compression wood of cover runs lateral and is supported at the bottom-side
- Board width 10 – 18 cm

The equipment must be securely fixed at the bottom with full-length bolts possibly through the longitudinal runners or be wedged in such a way that they cannot come out of the packaging. If parts are sensitive to rainwater and/ or soiling, the cover must be made of plastic sheet.

If there is the danger of individual parts coming out of the packing unit, it must be fully boarded at the front side. The labelling must be fixed on the plywood or chipboard of the cargo units at the specified places. The layout of the runners and bottom runners is to be taken from the sketch.



**Crates**

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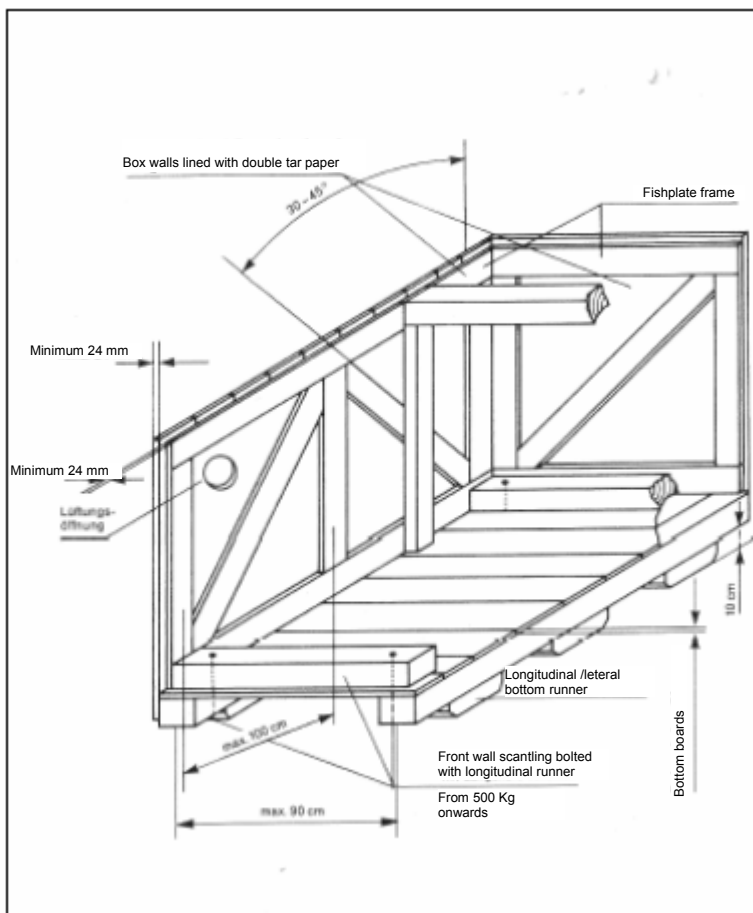
#### 4. Box with lining

##### Type of equipment


Equipment that is sensible to mechanical damage, subject to the risk of theft or loss, pipes, pipe bends, flanges, fittings, tools, installation material

##### Construction

Same construction as crates but fully boarded; side walls must be lined with waterproof bituminized paper with fabric insert or construction foils (UV-resistant) in between the fishplate frame and the boarding. The cover construction must be watertight and prevent the possible formation of a water pocket. From 500 kg onwards, longitudinal runners must be bolted with the front scantlings. For the ventilation of the box, the bituminized paper must be left out at same places in the angle which is created by a diagonal board and the fishplate frame.



**Box with lining**

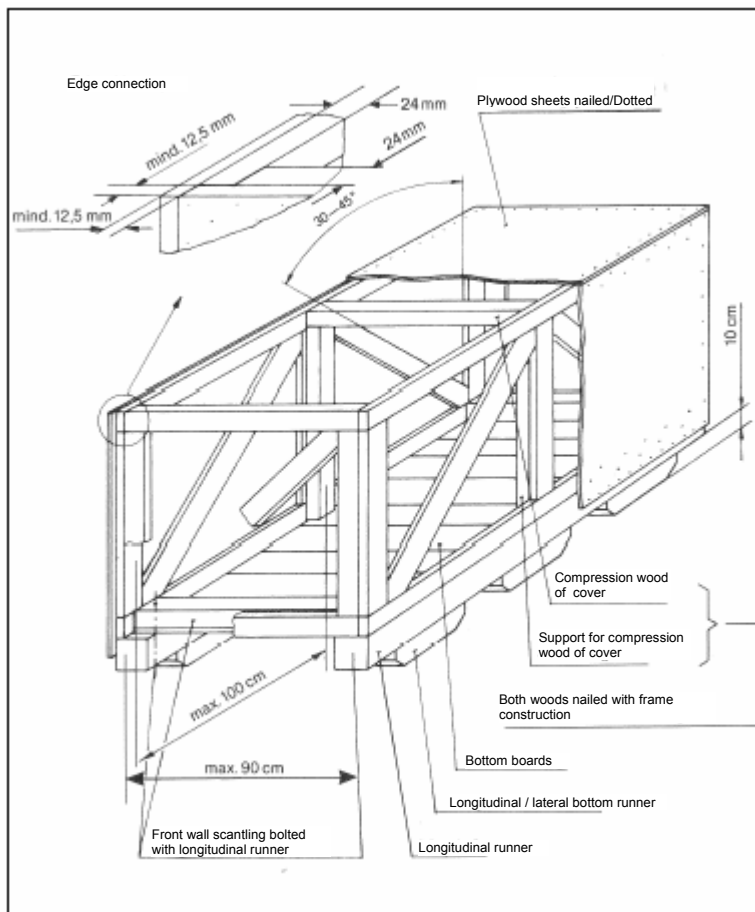
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## 5. Boxes with alternative surface materials


### Plywood box

Boxes made of 5-layer waterproof glued plywood with a minimum thickness of 12.5 mm. The frame construction must have a minimum thickness of 24 mm and must be designed according to the weight and the specific characteristics of the goods to be packaged. The lateral boards must be bolted with the longitudinal runners, the compression wood of covers however, laterally. For the construction of the side and cover parts, the diagonal boards are only to be provided if needed. If the cover consists of several sheets, the stacks must be sealed with permanently elastic cement or a watertight board must be mounted.

The construction needs the approval of the customer.



**Plywood box**

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## 6. Corrugated cardboard box for the shipment in containers of land and air cargo

### Type of equipment

Automotive aggregates, spare parts, electrical and electronic parts, homogenous materials

### Construction

The corrugated cardboard box must be of tested water-resistant corrugated cardboard as per DIN 55 468 and a one-way flat wooden pallet. 2- and 3-fold corrugated cardboards of at least the quality class 2.92 – 2.96 are to be used. The corrugated cardboard box must be folded and protected from corrosion according to the requirements of the customer.

The construction needs the approval of the customer.

## 7. Combination box made of corrugated cardboard

Box made of a wooden frame construction according to the construction of crates using 3-fold corrugated heavy cardboard. It should be water-resistant and glued as per DIN 55 468 and correspond at least to the quality classes 2.95 - 2.96.

The construction needs the approval of the customer.

## 8. Box with polyfoil insulation layer

### Type of equipment

Sensitive mechanical equipment, simple electrical equipment, insulating material, fireproof material, packaging period up to 12 months


### Construction

The conservation is done by shrink-wrapping in polyfoil using drying agents and, if necessary, corrosion prevention agents. The design of the boxes must allow good ventilation. Otherwise the box must be design like a box with lining. The box must be additionally labelled with "Packing unit contains drying agent".

## 9. Box with insulation layer of aluminium multi-layer foil

### Type of equipment

Electrical equipment such as switch cabinets, electric motors, sensitive mechanical equipment: packaging period more than 12 months

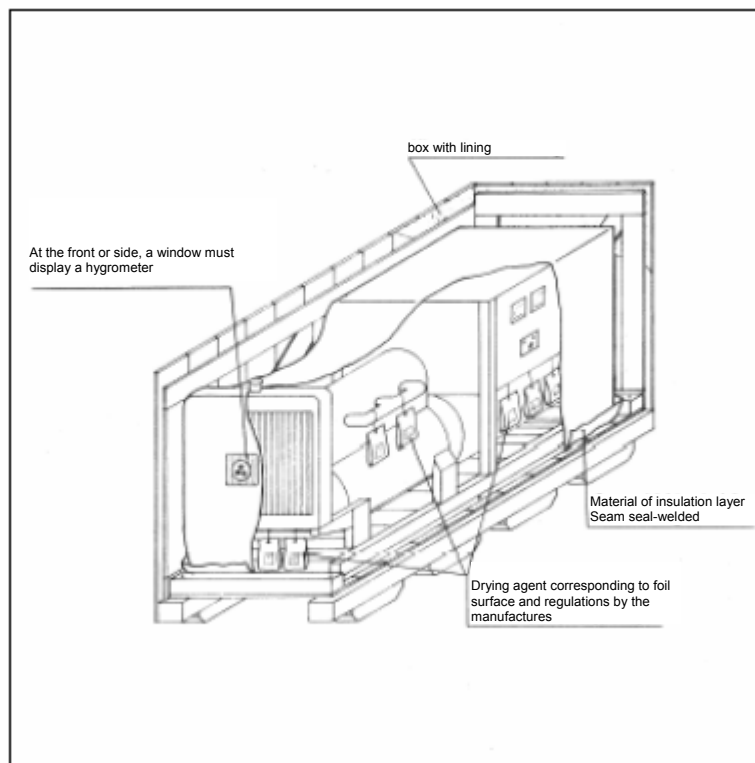
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## Construction

The construction is the same as for boxes with lining.

The conservation is done by shrink-wrapping in multi-layer aluminium foil using drying agents. The indicators built into the insulation layer on request must be legible from the outside. The openings must be closed with tiltable ventilation shutter.

The box must be additionally labelled with “Packing unit contains drying agent”.



**Box with insulation layer of polyfoil/ aluminium multi-layer foil**

## 10. Double box


### Type of equipment

Goods that are especially sensitive to impact, shock or vibration, e.g. special electrical or electrostatical equipment, computer, switch cabinets, laboratory instruments

### Construction

The construction of the box is the same as for a box with lining; in addition, it contains floating packaging and padding according to weight and sensitivity. The conservation is done by shrink-wrapping in aluminium multi-layer foil using drying agents.



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The construction must be agreed upon by the customer.

The inner box is to be made of plywood or an equivalent material. The material thickness is 8-12 mm, depending on the weight of the product to be packaged. The inner clasps and the frame battens must be dimensioned in such a way that full stability of the inner box is ensured and deformation is not possible.

## 11. Cable reels

### Type of equipment

Cable reels, larger than 1m<sup>3</sup>

### Construction

Generally, only new or as good as new cable reels (KTG standard) are to be used. Boarding of the cable reel using 20 mm boards with additional 2-fold steel strapping, nailed and previously carefully conserved cable ends.

## 12. Built-in packaging

It is characteristic of built-in packaging that various packaging materials are attached without bearing load in order to mechanically protect the actual product.

### Type of equipment

Modules and system components whose nature ensures static stability.

### Construction

The built-in packaging must be designed in such a way that it can be securely transported when the packaged product is hoisted. The packaging must be designed with devices (extension sleeves) for transport by floor trucks and with attaching devices that allow for attaching lifting tackles (shackles, ropes, side arms).

## 13. Transport bottoms

### Type of equipment

All materials that are shipped in containers until they reach their final destination

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## Construction

### Bottom

- Longitudinal runners, on the inside at the head front-wall scantlings that are bolted with the runners
- Maximum distance between longitudinal runners 90 cm (runner-centre to runner-centre)
- Bottom is fully boarded
- Lifting eye nut fixed in longitudinal direction and/ or steel-rope strops to pull the bottom out of the container
- The conservation is done by shrink-wrapping in aluminium multi-layer foil using drying agents

## 5.5 Display packaging

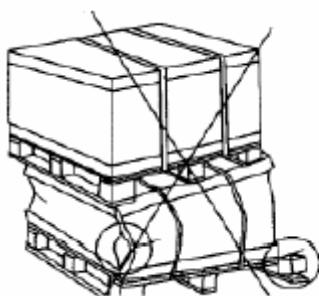
Display packaging see part 3 of the packaging manual. (ZN 02102)

## 6. Unit loads of reusable and one-way packaging

A unit load is a load that is put together in such a way that the items or packages can be handled, transported, stacked and stored as a unit.

If the unit load comprises of smaller containers (special or universal containers, KTL or one-way packaging), these must comply with the standard measures of the pallet.


Ability of unit loads to be stacked

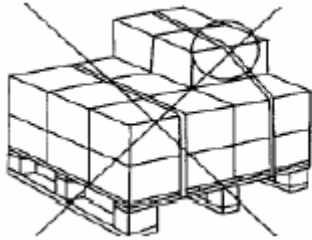


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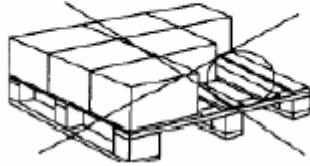


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**Wrong**



**Correct**

### Formation of unit loads

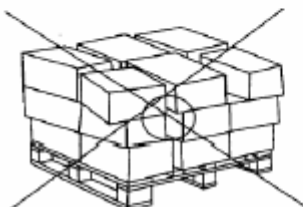
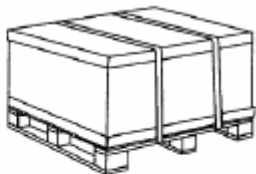
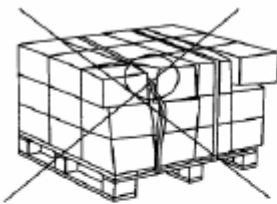
The basic size of the unit loads (1200 x 800 mm or 1200 x 1000 mm) must not be exceeded by the goods and unit loads. The height of the entire unit load must not exceed 1000 mm.

The unit load must be transportable by floor trucks and automated vehicle systems. Thus, the space in between the pallet feet must not be taken up by the securing devices of the unit load. Unit loads must be secured in such a way that the transport packaging cannot get out of place during transport. This can be ensured by using:

- Shrink hoods
- Plastic elastic straps
- Shrink foils

Straps cutting into the cardboard packaging are not permissible. This can be avoided by using edge protectors.


If something is taken out of the unit load, it must be ensured that the rest is stable.



**Wrong**



**Correct**

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## 7. Information on environment and quality

### 7.1 Hazardous cargo

Hazardous cargo is material that poses a risk for humans, animals, or the public safety and order when transported on public means of transport (road, rail, waterways, air traffic).

#### Guidelines for hazardous cargo

Means of transport	Regulation
Road traffic	ADR/ GGVS
Rail traffic	RID
Ocean shipping	IMDG-Code
Air traffic	ICA-TI or IATA-DGR-manual

Basically, hazardous goods must not be packaged as sub package. The regulations on hazardous cargo must be strictly observed.

The materials to be delivered can only be filled into tested inner packaging (casks, buckets, other containers). For all regulations, specific packaging requirements, filling materials and bans on joint transportation must be observed.


In order to identify a substance, solution or an item with hazardous characteristics as per the regulations on the transportation of hazardous cargo or to determine the conditions for a transportation (e.g. shipping ban, exemptions, means of shipping), they must be classified.

They are classified by the substance characteristics which are, for example, stated in the manufacturer's security data sheets.

#### Classification

Substances are classified according to the following system:

- UN number
- Hazard class
- Packaging group
- Classification code

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### UN number

Substances, solutions or mixtures are assigned with a four-digit number worldwide that is allocated by the UNO.


### Hazard class

All hazardous goods are classified into hazard classes according to their characteristics. The classes indicate the main possible hazards (e.g. inflammable, toxic or radioactive)

### List of the hazard classes

Class	Designation	Examples
1	Explosive substances and items with explosives	not relevant*
2	Gases	Spray cans, acetylene, oxygen, nitrogen
3	Inflammable liquid substances	Paint, solvents, fuel, alcohol
4.1	Inflammable liquid substances	Oil and solvent-containing waste, paint filter
4.2	Self-igniting substances	Coal dust, soiled machine cleaning cloths
4.3	Substances that develop inflammable gases when in contact with water	Calcium-carbide
5.1	Substances causing inflammation	Hydrogen peroxide
5.2	Organic peroxides	Curing agents, adhesives
6.1	Toxic substances	Cyanide, isocyanate
6.2	Infectious substances	not relevant
7	Radioactive substances	Ionization detectors
8	Caustic substances	Acids, bases, accumulators
9	Various hazardous substances and items	Asbestos, PCB-capacitors, special oils

\*generally not available at Bosch Rexroth

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### Packaging group

Besides the classification in hazard classes, the largest part of the hazardous goods is also classified in so-called packaging groups I, II, and III.



**Packaging group I (X)**  
For substances with great hazard (very hazardous substances)

**Packaging group II (Y)**  
For substances with medium hazard (hazardous substances)

**Packaging group III (Z)**  
For substances with medium hazard (less hazardous substances)

(X, Y, Z letters of efficiency of the packaging)

### Classification code


In order to specifically define the hazard arising from a substance, each substance receives an additional classification letter besides the already described classification.

## 7.2 Special requirements for wooden packaging materials

In the international trade with packaging material made of solid wood, the hygienic regulations of the IPPC (International Plant Protection Convention), a sub-organization of the FAO (Food and Agriculture Organization of the UN) must be observed. These regulations stipulate treatment with recognized processes which comprise of heat treatment of at least 30 minutes with a core temperature of 56°C and disinfection with methyl bromide. The packaging must be marked clearly with a corresponding label with an identification code which consists of the ISO country code, the regional code and a four-digit identification number.

The phytosanitary services or offices inform for which countries, from what time and to what extent the IPPC-standard applies.

For applicable information on wood packaging see <http://www.hpe.de>

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### 7.3 Regulations on the use of materials

Type	Recommendation - alternative	Materials to be avoided
Cardboards	Free of materials harmful to paper production	with water-insoluble coating or adhesives
Composites	not recommended	
Wood	Untreated solid wood or plywood	Chipboards, coated or varnished wood, wood wool
Plastics	PE, PP, PUR	PVC, PC, styrofoam chips
Anti-tarnish paper	VCI paper, which is proven to be reusable together with paper/cardboard	Incompatibly impregnated or soaked paper (e.g. bituminized, oiled and waxed paper)

#### Banned materials

The cumulative concentration of lead, cadmium, mercury, and chromium (VI) in packaging materials must not exceed the maximum permissible value of 100 ppm as defined in the EU directive on packaging (94/62/EG).

[Bosch Rexroth, ZN 07950-01]

In addition, ZN 07950-12 is applicable for VCI-packaging (volatile corrosion inhibitors).


A detailed list of declarable and banned substances is to be found in the Bosch Rexroth ZN 07950- 12.

## 8. Corrosion prevention

Corrosion is the attack on and destruction of metallic materials by chemical or electrochemical reactions with active substances of the environment. Corrosive matters are those substances surrounding the part, affecting the material and causing corrosion.

#### Conservation

Conservation must provide a temporarily restricted protection against detrimental influences and thus preserve the state at the time the conservation was carried out.

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Only anti-corrosion agents that are approved by the department process engineering, environmental protection and industrial safety can be used.

Type, nature and time of the inner and outer conservation of parts, devices and equipment made of iron materials depend on

- the subsequent treatment,
- the subsequent application purpose,
- the sensitivity of technical surfaces to corrosion and other detrimental influences (dust, soiling etc)
- the storage conditions and duration,
- the technical terms of delivery of the customer.

### **Anti-corrosion measures for individual parts**

Anti-corrosion measures for individual parts are already carried out in the manufacturing stage (e.g. by using corrosion-inhibiting coolant - and lubricant additives during the processing). If this temporarily restricted protection (due to long through-put times of the parts) does not provide sufficient conservation, this will be achieved by using VCI paper, dewatering fluid or anti-corrosion oil. The VCI paper (Volatile Corrosion Inhibitor) is an inhibitor which inhibits or prevents chemical reactions.

Usually, the corrosion protection is carried out with a primer coat on all outer surfaces of the device excluding lands (AB 01- 03.05). Parts that are immediately assembled after manufacturing without any interim storage do not need to be conserved.

Parts that are especially sensitive to corrosion or are subject to long storage periods (e.g. stock parts) must be additionally protected with an anticorrosive paper with VCI active substance or by shrink-wrapping and evaluation or shrink-fitting in water-vapour tight plastic foils. Parts that have a reduced protection after a certain storage period according to experience are treated with a subsequent conservation as a means of prevention.


### **Abraded surfaces**

Abraded surfaces (lands) of devices receive caps of special cardboard or plastic with VCI active substance for protection.

### **Safety measures for aggregates**

Aggregates are order-specific, complete equipment and are thus subject to inner and outer conservation after completion and final testing in accordance with order specifications and the customer regulations.



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Machines, switch-gear assemblies, electrical devices and all goods exposed to corrosion must be shrink-wrapped in a largely water-vapour tight insulation layer adding drying agents for a conservation period of at least 12 months. Materials for the insulation layer are polyethylene foil and aluminium multi-layer foil. The foils must be carefully and tightly sealed in order to create watertight or nearly water-vapour tight insulation layers. The air within the insulation foil must be sucked off until the insulation layer clings on to the product that needs to be protected. After testing the tightness, the insulation layer must be draped around the packing unit so that the remaining air can circulate within the insulation layer. The insulation layers must be protected against pressure and abrasion from the inside and outside with suitable non-hygroscopic cushioning material.

### **Drying agent**

The aim of using a drying agent is to create a closed system in which the relative air humidity is reduced to less than 40% for the entire period of transport, handling and storage since in this range no condensation takes place anymore.

The drying agent binds the water and reduces the relative air humidity to a targeted value.


The necessary number of drying agent units is calculated as per DIN 55474. The drying agents can be purchased with 1/6, 1/3, 1/2, 1, 2, 4, 8, 16 or 32 units.

The drying agents must be placed in the upper part of the climate package so that they get sufficient air. Direct contact of the drying agents with the products must always be avoided as the moist drying agent would only create corrosion. In addition, it is sensible to use several smaller sachets of drying agent instead of few larger ones as the surface of the available drying agents expands in order to absorb the water.

## **9. Labelling regulations**

### **Bar-coded label**

The shipping pallets are labelled with one address sticker with bar code. The place of the sticker must be clearly visible, right- and angular adjusted. The distance should be 100 mm (+/- 50 mm) to the top of the pallet and to the lateral edge.

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**Central standard**

The central standard “labelling regulations packaging” (ZN 02101), are described specifications for Bosch Rexroth (see part 2 of the packaging manual).

**10. Labelling and marking**


**Labelling of individual parts**

All individual parts, even loose parts within a cargo unit must be separately labelled. This labelling must be mentioned in the list of cargo units/ delivery note. The contractor will be notified of our individual labelling along with our order or our guidelines for the shipping procedure respectively.

**Marking of the packing units**

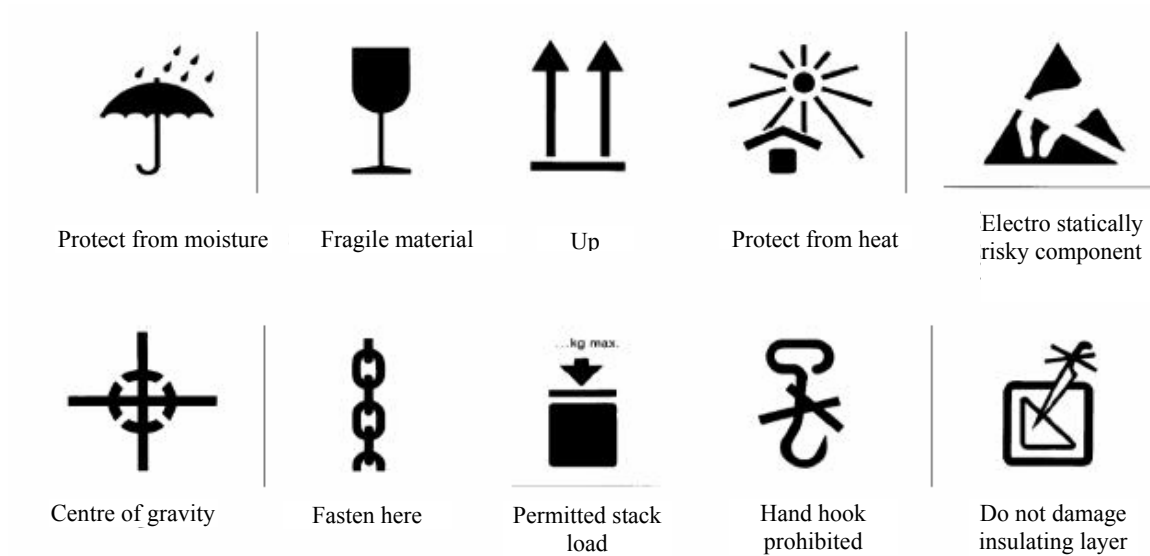
The packing units must either be marked with a sea watertight light-resistant contrasting colour with the help of a stencil or with marking labels that are provided by the customer. If the packing unit is marked with a stencil, the size of the lettering depends on the measures of the package. Unpackaged parts and carriages must be marked directly on the packing unit or on a plywood sheet. All packing units must be marked on both longitudinal sides.

Marking regulations are created with reference to the order and are provided to the contractor in time.

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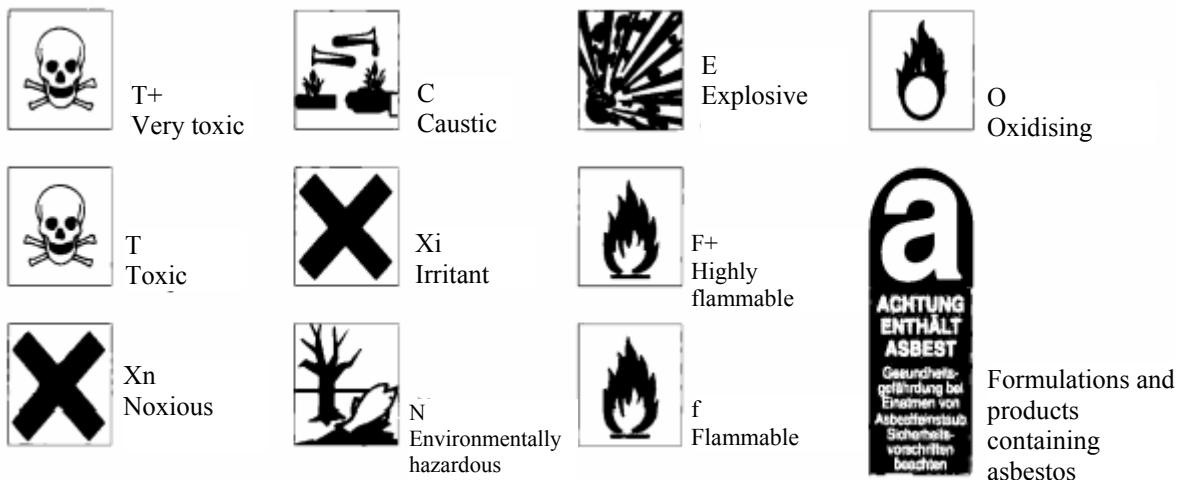
### Handling symbols


For the labelling of goods which must be handled in a particular way, international symbols as per DIN 55 402 must be attached.



### Symbols for hazardous cargo






The symbols for hazardous cargo are to be taken from the international code for hazardous cargo. The labelling is done according to the valid codes.



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### Storage symbols

The following storage labels can be used unless order-related storage symbols are specified.

				
Open-air ground	Covered warehouse	Closed warehouse	Closed, heated warehouse, minimum temperature +8° C	Closed, heated, air-conditioned warehouse, minimum temperature +8° C, maximum air humidity 65%

## 11. Return and disposal of the packaging

Basically, it is recommended to use re-usable packaging.

### Return

The customer reserves the right to inspect the packaging at a sub-supplier without any warning. In the case of an announced inspection, the packaging must not be sealed so that the inner packaging can be checked. The positive inspection does not release the contractor from his duty to package the products duly and properly.

### Disposal


One way packaging

The disposal of one-way packaging is part of the concluded supply agreement.

Reusable packaging:

It is recommended to use only absolutely functional re-usable packaging. If this is not the case, it must be exchanged. In addition, it is advisable to use only clean packaging.

The re-usable packaging must be administered in an inventory. The return of the empties is carried out via the pool for re-usable packaging.

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## 12. Quality standards

The establishment and certification of quality management systems at Bosch Rexroth is done as per DIN EN ISO 9001:2000. It ensures large-scale measures that clearly determine the entire procedures within BR that exceed the usual quality assurance.

Furthermore, Bosch Rexroth has incorporated the ISO/TS 16949, which contains all hitherto existing and published international quality standards and stipulations on a quality management system by the automotive sector. It is based on the ISO 9001:2000.

In addition, the quality management system audit VDA 6.1 is used at Bosch Rexroth.

## 13. Guarantee bond

The contractor guarantees Bosch Rexroth AG to package correctly complying with the minimum requirements described in the manual as well as flawless quality of the packaging material. For possible necessary deviations from these conditions, prior approval by Bosch Rexroth must be given. The contractor is liable to the customer for all damage arising from defective design of the packaging as well as from non-compliance with the minimum requirements.