

Supplier Logistics Manual

Logistics Requirements of Bosch Group

Release 3.0



BOSCH
Invented for life

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Preamble

Competition in national and international markets has become significantly tougher in recent years. The increased individuality of our customers places high requirements on our business, and as a result also on the logistics functions, in terms of quality and flexibility.

The conventional role of handling commodity and merchandise flows has nowadays turned into a comprehensive, customer-oriented management function.

The quality of logistics is becoming more and more decisive to the competitiveness of our business, and is an increasingly important factor in our strategic success.

However, since the Bosch Group (in the following referred to as BOSCH for short) can only attain that high quality level in conjunction with its suppliers, it needs reliable and competent business partners who work toward the same customer-oriented goals.

This Supplier Logistics Manual is intended to enhance supply relationships between suppliers and BOSCH Group and to minimise costs resulting from non-conformance.

The standards set out form the generally binding framework for all business units of BOSCH. They can be supplemented by location-specific standards, in order to respond to the specific supply relationships of particular plants or regions.

This document is structured as follows:

Text refers to general and standard regulations and processes.

Tables refer to region-specific standards from the point of view of the receiving Bosch plant.

Supplements may be required due to regional requirements or bilateral agreements between a BOSCH plant and its suppliers. The local partner at the receiving BOSCH plant is able to provide you with corresponding information.

Liability of SUPPLIER is governed by the agreed delivery contract.

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1. Information Logistics

Communication between SUPPLIER and BOSCH is the basis of a successful cooperation. The preconditions for this are:

Prompt, proactive notification of changes in all matters relating to supplier relations (agreements, processes etc.) by both parties.

Compliance with and monitoring of agreements.

1.1 Communication between SUPPLIER and BOSCH

1.1.1 Contacts

Suppliers must designate a key contact personnel responsible for handling logistics support (name of contact, nominated deputy and superior, with e-mail address, phone and fax numbers).

The key contact person must have the necessary expertise.

Communication language:

- language of corresponding customer BOSCH plant, OR
- English (as standard for international communication)

1.1.2 Availability

The key contact person designated by SUPPLIER (or his or her proxy) must be reachable on working days between 7 a.m. and 5 p.m. (SUPPLIER'S local time).

Outside of this time period (and during plant shutdown periods), appropriately qualified staff must be on call to handle "emergencies".

1.2 Information Interchange

Electronic data interchange (EDI) as method of information interchange is fundamental to all supplier relations with BOSCH. SUPPLIER should use EDI to receive and transmit information (such as delivery call-offs/ scheduled releases) from and to BOSCH. Suppliers who do not have an existing EDI link to BOSCH must establish an EDI system based on a jointly agreed schedule and procedure with the receiving BOSCH plant.

Technical requirements and message formats are set out in detail in the specific EDI contracts. This manual also relates to those contract elements. Further information can be obtained from the EDI brochure, available from your BOSCH key contact personnel.

A distinction can be made between categories of EDI: classical EDI / WebEDI.

1.2.1 Classical EDI

For the interchange of ordering data BOSCH uses the following industry standards:

REGION	STANDARD
A. Europe	VDA, ODETTE, EDIFACT
B. North America	AIAG, EDIFACT
C. South America	RND, EDIFACT
D. South Africa	VDA, ODETTE, EDIFACT
E. Australia	EDIFACT, ANSI
F. Asia	EDI format to be defined with the receiving BOSCH plant – except for
- Korea	EDIFACT as preferred standard
- Japan	ZEXEL legacy system for local supply (imported parts: fax)

1.2.2 WebEDI

WebEDI is an internet-based information system for suppliers to communicate with BOSCH, used for example in cases of low call-off volumes or where suppliers do not have the necessary infrastructure. It is an alternative to classical EDI. BOSCH standard WebEDI application is provided by internet marketplace [SupplyOn AG](http://www.supplyon.com) (Internet: <http://www.supplyon.com>) – except for RBLA plants (South America) that use BeSIS.

1.2.3 Procurement Control Concepts

The following procurement control concepts are generally in use:

- Classical delivery call procedure with releases (Release Process)
- Vendor Managed Inventory (VMI) or delivery control management (DCM)
- Kanban

Within the framework of the implementation of the Bosch Production system (BPS) BOSCH strives to form a lean supply chain from the customer to the supplier.

If the general conditions allow, primarily procurement processes based on pull principles will be used (only deliver what the previous manufacturing level has consumed) , for example Kanban, DCM, and VMI.

The control concept applied for the respective contracted product is decided by BOSCH.

The procurement control concepts KANBAN, DCM and VMI, are supported by a web based Inventory Collaboration Tool provided by the company SupplyOn.

Release Process

Release Orders are transmitted on a rolling basis. They are updated regularly and generally contain data with a horizon of at least 6 months. The last release order is binding and replaces earlier releases.

VMI Process (Vendor Managed Inventory)

For Vendor Managed Inventory (VMI) the supplier will receive access to gross demand and the inventory levels from Bosch for the supplied parts. SUPPLIER is responsible to manage the shipments to ensure inventory level within the agreed MIN-/ MAX-stock levels (generally consignment stock). These levels are agreed upon between BOSCH and SUPPLIER.

DCM Process (Delivery Control Monitor)

Similar to the VMI process (Min / max. stocks) but inventory control according to actual consumption. When the order point the system produces a suggested amount for delivery (e.g. fill up to max). Dependent on the agreement with the plant this suggested amount for delivery must be delivered in full or can be modified by supplier related to the agreed Min / max. limits. This control concept is often used as a interim solution before the introduction of KANBAN (concept used for products with constant consumption; in many cases several shipments per day).

KANBAN Process

Trigger is the consumption of KANBANS (containers) from supply source near to production (supermarkets). This steering concept is used mainly for A and B parts with constant consumption and is the preferred form of supply within Bosch.

If the KANBAN process is used, additional forecast information will be transmitted as well (forecast valid for production and material release). The KANBAN order is the binding trigger for the shipment.

1.2.4 EDI Transactions

Suppliers with an EDI connection to BOSCH use delivery call-off/ releases (in case of VMI gross demands), and advanced shipping notifications (ASN) as the minimum EDI transactions.

The use of stock movement transactions (in particular for consignment arrangements) and self-billing invoice procedures should be agreed specific to location.

On specific request of BOSCH, SUPPLIER must use forwarding advice (transport advice), while using WebEDI.

For VMI and eKANBAN EDI based interfaces are available as well and can be installed plant specific.

1.2.5 Consistency of Automated Processing

Ordering and stock information communicated to SUPPLIER by classical EDI should be imported into SUPPLIER's IT-system without need of further data entry or additional editing.

The goal is fully automated integration into SUPPLIER's production planning system (PPS). This includes, for example, breakdown into parts lists, automatic generation and forwarding of purchase orders to subcontractors, and integration into capacity planning and production control processes.

The consistency of the system must be ensured throughout the planning, production and shipping process.

Communication between the systems must be regularly monitored to assure correct and complete transfer of data.

1.2.6 ASN / Label Printing / Shipping Documents

SUPPLIER shall transmit an ASN via EDI/ WebEDI system or VMI order monitor at the same time that the shipping documents are generated.

Shipping documents/ labels are generated in SUPPLIER'S own shipping system according to the following standards.

REGION	STANDARD
A. Europe	VDA
B. North America	AIAG
C. South America	RND (ASN) and VDA (labels)
D. South Africa	VDA
E. Australia	EDIFACT, ANSI QSP0703-906 (Internal procedure)
F. Asia	Standards to be defined with according BOSCH customer plant – except for
- Japan	BOSCH External: ZEXEL legacy system for local supply (Import :VDA)

If SUPPLIER uses SupplyOn WebEDI, it may generate the shipping documents with this tool.

The information used for labelling purposes should be taken from the EDI release/ demand information sent.

1.3 Order Processing

SUPPLIER receives yearly volumes as non-binding forecast. Based on this, SUPPLIER has to make sure

- that production capacity corresponds to this volume and
- that sub-suppliers are able to deliver material accordingly.

1.3.1 Execution

The delivery dates quoted in the call-offs/ scheduled releases (Release processing) are the required dates of receipt by correspondent BOSCH plant. Any non-conformance to that standard must be agreed separately. SUPPLIER checks if the received delivery call-off/ release is complete, correct and plausible (e.g. that SUPPLIER name, part number, quantity and delivery dates are correct). If any discrepancies are noted, SUPPLIER must inform the responsible BOSCH contact immediately.

Delivery call-offs/ scheduled releases are binding for SUPPLIER unless notification to BOSCH within 2 working days after receipt of the release that the requirement cannot be fulfilled

Order confirmations are only required in case of a non-conformance to the specified delivery date or quantity. Any non-conformance to that standard is agreed separately.

In the case of process deviation the supplier must prove a functional escalation management

1.3.2 Order Tracking (Release Process)

SUPPLIER continuously tracks ongoing orders internally. SUPPLIER must be able to provide information of the progress of production at all times. Comprehensive, transparent tracking of orders placed with subcontractors must be ensured.

SUPPLIER will install an early warning system to detect supply problems. An effective crisis management system and emergency plans are required.

If disturbances occur which affect the compliance of BOSCH requirements SUPPLIER must initiate the necessary countermeasures. If it becomes clear that, despite the necessary measures initiated, the agreed deliveries cannot be met, SUPPLIER must notify their BOSCH contact immediately via e-mail/ fax and advise a new delivery date and/or quantity, as appropriate.

In this case, SUPPLIER must also be able to provide information on the following points:

1. The cause of the supply problem
2. Production output capabilities for the part(s) in backlog and production planning (number of shifts/hours per working day and working days per week)
3. Alternative production options investigated (production lines and/or production schedule; always according to quality requirements)
4. Availability of alternative parts (always according to quality requirements)

5. Check the possibility of partial delivery
6. Premium freight capabilities and timing
7. Escalation of the problem inside its company

If no mutually agreed solution can be found, involvement from the highest levels within SUPPLIER's organization will be required.

Liability of SUPPLIER due to late delivery is regulated by the relevant delivery contract.

1.3.3 Production and Material Release

SUPPLIER is obliged to deliver ordered products and required associated materials to the receiving BOSCH plant.

Production releases are legally binding purchase orders of finished goods. However, regarding delivery dates the last updated delivery call-off/ scheduled release is decisive.

Material releases are the basis for BOSCH's obligation to reimburse respective materials purchased by SUPPLIER, if any. Production and material releases relate to dates of receipt by BOSCH.

Periods for production and material releases are defined in general in the relevant supply contract. If the agreed releases are verifiably inadequate to maintain delivery capability, SUPPLIER can apply for an extension for material release or request additional forecast data from his BOSCH contact in individual cases. Requirements beyond those periods represent non-binding forecasts, based on which SUPPLIER plans its production capacity and sample production.

If BOSCH cancels delivery call-offs/ scheduled releases of finished goods within production release period without having placed corresponding future orders, BOSCH decides if receipt of the finished goods within a reasonable time is accepted or whether agreed upon price is paid.

If BOSCH cancels delivery call-offs/ scheduled releases of finished goods within material release period, BOSCH shall reimburse the cost which SUPPLIER incurred for such material, provided however that SUPPLIER demonstrates that the respective material could not be otherwise used within reasonable time. BOSCH reserves the right to request the shipment of the cancelled raw material.

1.3.4 Start-Up and Phase-Out Management

During start-up and phase-out BOSCH expects increased flexibility from its suppliers. This requires a capacity planning process in order to be able to supply even small volumes timely in the right quantities.

Capacity planning must be coordinated between BOSCH and SUPPLIER in time.

1.3.5 Order Processing Using the VMI Process

The processes and agreements described in sections 1.3.1 to 1.3.4 are to be applied analogously with VMI (DCM). Deviations are pointed out in the following.

With VMI, as a rule, gross demands (= production demands) are transmitted instead of delivery call-offs. SUPPLIER will control the delivery to assure VMI stock to be between the agreed min/ max limits (see also 1.2.3).

In VMI process material and production releases are based on gross demands. As valid periods for these releases, intervals defined in the delivery contract are applied correspondingly.

1.3.6 Order Processing Using the DCM or Kanban Process

With KANBAN the consumption of a KANBAN container triggers a release. The refilling of the empty KANBAN must be done in defined intervalls. Transmission of the electronic KANBAN will be done either with WebEDI or existing interfaces in classical EDI.

1.4 Controlling of Logistics Performance

SUPPLIER shall monitor the following variables as a minimum in order to record its logistics performance and make the results available on request. Visual presentation of the results on site by SUPPLIER is recommended.

1.4.1 Delivery Performance

SUPPLIER shall operate a system to monitor and, at least on a monthly basis, measure its delivery compliance (in terms of delivery dates and quantities) to the delivery requests of the receiving BOSCH plant.

1.4.2 Premium Freight

Premium freight (also named special deliveries or expedited shipments) is considered to be outside the standard logistics handling as agreed between SUPPLIER and BOSCH in the supply contract. Premium freight is used when there is a risk to disrupt production as this cost is much higher than normal transportation.

SUPPLIER shall record, at least on a monthly basis, the premium freight for which it has been responsible (including as a minimum the instances of such shipments, the additional freight costs, and the cause). SUPPLIER must be prepared to provide information about premium freights – if required by BOSCH.

2. Packaging Logistics

2.1 Specification of Packaging

Packaging is specified between BOSCH and SUPPLIER in accordance with ecological, economic and qualitative criteria which are stipulated in a Bosch catalogue of requirements. Within the start of the product live cycle the development of the packaging can be undertaken by the supplier, in case this has an advantage due to process know-how and product know-how of the SUPPLIER.

The responsible BOSCH packaging planner and SUPPLIER finally agree on the product-specific packaging (packaging instruction) which is binding for future shipments. If the SUPPLIERS follows this packaging instruction will be considered in the supplier- evaluation.

The following basic principles must be followed:

Avoidance of packaging (as much as possible). The packaging must not be larger or more elaborate than essential to protect the goods.

Padding material should be kept to a minimum.

Where disposable and returnable packaging is used, recyclable packing materials must be used and identified according to the specifications of the waste management industry.

Use of single-type component materials. Composite Materials are not allowed.

Where disposable and returnable packaging is equal in economic and qualitative terms, returnable packaging shall be preferred.

Returnable packaging (e.g. Euro pallets, Euro box pallets, VDA "KLT" [small load carriers]) that is capable of pooling (used through multiple processes and partners) is to be preferred ahead of returnable packaging without such capability.

Returnable packaging should correspond to standard sizes. Special design and sizes should only be defined as exception in case of specific/ extraordinary requirements of the material to be delivered.

Returnable packaging must be designed to be cleaned, emptied and drained easily.

Special requirements for wooden packaging materials (international trade):

Phytosanitary regulations for international trade with packaging materials made of solid wood (ISPM 15) have been issued within the scope of the IPPC (International Plant Protection Convention), which is a sub-organisation of the FAO (Food and Agriculture Organization of the UN).

Information regarding the IPPC-Regulations.- and country specific regulations could be found under the following link.

<https://www.ippc.int/IPP/En/default.jsp>

Additional the following regional requirements are binding:
Robert Bosch GmbH, CP/LOG, 07.05.2007

REGION	Requirements FOR DELIVERIES FROM OTHER REGIONS TO ... (according to actual IPPC Status)
A. Europe	<p>IPPC Standard; debarked wood</p> <p><u>Remark:</u> Requirements does not apply to packaging materials made of solid wood from European countries which are imported as goods (not in use as packaging). Temporary provision for stored wood until 31.12.06 (free from bark and infestation).</p>
B. North America	IPPC Standard
C. South America	To be defined with, according BOSCH customer plant
D. South Africa	To be defined with, according BOSCH customer plant
E. Australia	<p>The strong Australian quarantine requirement are binding. (Australian Quarantine and Inspection Service (AQIS) www.daff.gov.au/aqis)</p> <p>A Packaging declaration has to be attached with the shipment.</p> <p>All used wooden material have to correspond to the guide line ISPM 15 (ISPM15 imprinting at the wood)</p> <p>The packaging declaration has to include if the material correspond to the ISPM15 regulation. If not a fumigation Certificate has to be available at the date of the delivery.</p> <p>For Packaging raw or brittle wood is not allowed</p> <p>FLC/LCL packaging regulation</p> <p>In the case of packaging material made of untreated wood a Treatment certification/desinfection certificate is necessary.</p> <p>The use of straw, bark or similar material is forbidden.</p> <p>Such deliveries will be cleaned and repacked from AQIS. All related costs have to be covered by the importer. A delay in delivery between 6-9 days is possible and has to be calculated.</p> <p>Certificate of packaging supplier (in case of plywood, chipboard, particle board, etc.</p>
F. Asia	To be defined with, according BOSCH customer plant – except for:
- China	<p>Debarked wood</p> <p>Heat treatment (56° C core temperature / 30 minutes)</p> <p>Technical drying (if heat treatment's values are achieved)</p> <p>Fumigation with methyl bromide</p> <p>Authorized marking</p> <p>Official plant health certificate</p> <p>A Non Wood Packaging Material Declaration must be given for using derived timber products and packaging materials which are not made of solid wood.</p>
- South Korea	IPPC Standard
- India	IPPC Standard

	Official plant health certificate
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Other applicable documents:

REGION	DOCUMENTS
A. Europe	VDA 4500 (small load carrier ["KLT"] system) VDA 4902 (barcode labels) ESD standards laid down in DIN EN 61340-5-1 EU packaging directives DIN EN 13427 – DIN EN 13432
B. North America	See www.Boschnasuppliers.com
C. South America	VDA 3214 (for very small parts. "KLT" system) VDA 4314, VDA 6421 and VDA 6428 (also "KLT" system. For small parts)
D. South Africa	VDA 4500 (small load carrier ["KLT"] system) VDA 4902 (barcode labels) ESD standards laid down in DIN EN 61340-5-1 EU packaging directives DIN EN 13427 – DIN EN 13432
E. Australia	QSP0703-906 (Internal procedure)
F. Asia	Other applicable documents to be defined with according BOSCH customer plant – Standards are valid for:
- China	GB10819-89 Wooden pallet GB12464-90 Wooden box; GB6453-86 Carton box

2.1.1 Returnable Packaging

a) Standard load carriers

Before first delivery the used packaging has to be agreed with the RB-plant

REGION	LOAD CARRIERS
A. Europe	Euro pallets and Euro box pallets, up to max. 1000 kg load capacity According to VDA Recommendation 4500 VDA "KLT" small load carriers (RL). According to VDA Recommendation 4504 VDA-R-KLT(small load carriers)-ESD (electrical conductive)
B. North America	See www.Boschnasuppliers.com
C. South America	PBR pallets (Brazilian standard) 1000mmX1200mm. Preferred: According to VDA-Recommendation 4500 VDA "KLT" small load carriers (RL). According to VDA-Recommendation 4504 VDA-R-KLT-ESD (electrical

	conductive) Special process: C,-R-KLT, cover related VDA 4500, plastic pallets It is necessary that the boxes are stored and are arranged to assure non damaged sea and airfreight.
D. South Africa	CHEP and TRENSTAR
E. Australia	CHEP, CEVOL Stillages
F. Asia	Load carriers to be defined with according BOSCH customer plant – Standard are valid for:
- China	Worm-free pallets
- Hong Kong	Wooden (worm-free) pallets. Size is based on European standard.
- Malaysia	Plastic Bins & Corrugated Bins
- Japan	Wooden pallets. Standard returnable plastic box. Special returnable plastic box.

b) Special load carriers

The use of special load carriers is only allowed if standard load carriers cannot be used due to product requirements. In any case before delivery an agreement from RB to use non standard load carriers has to exist.

These include, for example:

- self supporting load carriers
- other plastic containers, possibly with inserts and / or provided with electrical conductance
plastic pallets for high-shelf storage systems (Standard:1200 x 800 mm)
- Box pallets with inserts

2.1.2 Disposable Packaging

Preferred packing materials:

REGION	MATERIALS
A. Europe	Plastics: ABS, PS, PE, PP, EPP Corrugated board to DIN 55468 Solid board Wood (for pallets only)
B. North America	See www.Boschnasuppliers.com
C. South America	The same as the European standard. It is necessary that the boxes are prepared stockpiled and arranged to guarantee non damaged sea and air freight

D. South Africa	Corrugated board to DIN 55468
E. Australia	Plastic, Cardboard, Trays (Polystyrene)
F. Asia	Preferred packaging materials to be defined with according BOSCH customer plant – except for:
- Hong Kong	Wooden pallets
- Malaysia	Paper Pulp
- Japan	Plastic, Cardboard, Wooden pallets, Paper, Corrugated board

b) Inadmissible packing materials:

- PVC
- Food-based packing
- Plastic compounds
- Coated plastic bags (Dry-Shield bags)
- Packing foam

These may only be used in exceptional cases, following consultation with BOSCH.

2.2 Handling of Empties

In order to attain and assure shared quality, supply and inventory goals SUPPLIERS must ensure the following standardized regulation for handling of returnable empties between BOSCH and its suppliers.

2.2.1 Procurement

a). Standard Poolable VDA-KLT / Euro Pallets / Euro-Box-Pallets

REGION	EMPTIES
A. Europe	VDA "KLT" small load carrier systems Euro pallets Euro box pallets
B. North America	See www.Boschnasuppliers.com
C. South America	"KLT" small load carrier systems PBR pallets (1000mmx1200mm)
D. South Africa	CHEP and TRENSTAR
E. Australia	CHEP, CEVOL Stillages
F. Asia	Poolable empties to be defined with according BOSCH customer plant - except for:

- Malaysia	Plastic Spool for PgW (Power Tools division)
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Unless otherwise agreed the SUPPLIER shall receive returnable packaging only to cover a defined inventory level (generally 3 days) of the product without any charge for their use (basic: future demand; Transit stock).

Standard load carriers which are used for SUPPLIER internal usage have to be procured by the supplier.

Special provisions may be made in individual cases.

Euro pallets and Euro box pallets are subject to the regulations of the European Pallet Association (Internet: <http://www.epal-pallets.org>).

b) Special load carriers

b1) BOSCH-special carriers

see a).

BOSCH-specific load carriers will be procured only by BOSCH.

Special load carriers for the supplier intern production process have to be procured by the supplier (supplier can use in that case Bosch purchasing conditions if agreed).

b2) SUPPLIER-specific load carriers

SUPPLIER specific load carriers must be procured by the supplier. The procurement costs for the specific load carriers is carried by Bosch if not included in the unit price.

The amount of the necessary inventory in circulation (see a), purchasing price has to be agreed with Bosch.

c). Non returnable packaging

Generally costs for non returnable packaging and there procurement have to be covered by the supplier.

2.2.2 Management of Returnable Balances

SUPPLIER shall keep accounts for returnable packaging and cross-check the balances with its interchange partner, i.e. BOSCH or any external logistics service provider contracted by BOSCH.

BOSCH shall keep accounts for returnable packaging for at least BOSCH-specific empties and for poolable VDA "KLT" small load carriers. SUPPLIER will be informed of balance on a monthly basis. Objections by SUPPLIER must be received within 14 calendar days by the responsible empties management office (at BOSCH or an EDL). Otherwise, SUPPLIER shall be considered to have

confirmed the stock balance quoted. Quantity discrepancies shall be eliminated by SUPPLIER with the assistance of the responsible BOSCH packaging planner and/or the EDL.

In this context and in the case of complaints (for example caused by quantity differences, waste, damage) the supplier has to provide photos, a short description with reference to the delivery note number to the responsible Bosch Returnable Packaging Planer.

If the complaint is already visible after transfer from the service provider the driver of the forwarder has to sign off on that complaint at the shipping note. This voucher must be forwarded to the Bosch packaging planner as well. Otherwise the complaint will not be accepted. The following procedure has to be agreed with the Bosch packaging planner on a case by case basis.

Euro pallets and Euro box pallets are subject to the standard local and industry specific regulations. In case of doubt, the regulations of the European Pallet Association (Internet: www.epal-pallets.org) shall apply.

Quantity discrepancies or shrinkage shall be compensated immediately at the current replacement value by the PARTY deemed responsible.

2.2.3 Supply of empties

If SUPPLIER fails to request or procure packaging at the appropriate time, it shall bear the additional costs that may be incurred (such as shipping or repacking costs).

a) Poolable Euro pallets / Euro box pallets

Euro pallets and Euro box pallets are subject to the standard local and industry-specific regulations. In cases of doubt, the regulations of the European Pallet Association (Internet: <http://www.epal-pallets.org>) shall apply.

b) BOSCH-specific empties and poolable small load carriers (e.g. VDA "KLT")

SUPPLIER shall request the required empties promptly in written form, allowing for factors such as transportation times. The call-off quantity is determined by Bosch based on the volumes due for delivery. Requested returnable empties shall be supplied by BOSCH at no extra cost to SUPPLIER, to a defined delivery point (as stated in the agreed terms and conditions of delivery). Within the framework of Kanban processing a 1:1-trade-off full against empty empties can be arranged between BOSCH and SUPPLIER.

2.2.4 Storage, Repair and Replacement Procurement

The supplier is responsible for a proper storage (weather protected) of the returnables after transfer of the returnables from the Bosch forwarder. The returnables have to be stored in that way that contamination before, during and after the production process can be avoided. If contamination occurs during this period the SUPPLIER has to clean the returnables provided by BOSCH at its own expense.

BOSCH shall repair or scrap damaged returnables as appropriate. BOSCH shall charge 50% of the repair or current replacement value to SUPPLIER – if there is no other bilateral agreement between BOSCH and SUPPLIER. Packing materials used by more than one supplier at any one time shall be

charged to each supplier involved according to its respective proportion of the total quantity of returnables used.

2.2.5 Cleaning

Empties must meet the necessary degree of cleanliness of the product or to the Bosch specification. Responsibility therefore belongs to the supplier.

a).Returnable Empties

Returnable empties have to be cleaned by the supplier. The cleaning has to meet the necessary degree of cleanliness of the product or to the Bosch specification. Empties have to be cleared of non-valid labels (e.q. labels or shipping notes).

b). Non returnable Empties

If an additional cleaning is necessary Bosch covers the costs of cleaning only upon evidence that the empties have been delivered dirty has been provided. An additional cleaning has to be agreed with BOSCH in advance (see cleaning of empties).

3. Dispatch Logistics

Within the framework of the production system (BPS) implemented by Bosch the target is to transition from two-stage inventory levels to supply chain management without inventory levels. In addition to classic transportation concepts using an area bounded forwarder (GSP), more and more milk run transport concepts are being implemented. In comparison to the GSP concept, the milk run concept uses exact predefined time windows (where applicable multiple times daily) to manage pickups. Milk runs are ideally used in combination with pull systems (e.g. KANBAN) and are used for high frequent deliveries with consistent consumption.

For overseas and regional suppliers the mentioned transport concepts will be done via cross docks.

For local suppliers and A,B parts Ship to Line deliveries are used.

Special features regarding the above-mentioned transport concepts are detailed in the following chapters.

For deliveries to BOSCH plants in North America SUPPLIER has to consider specific shipping instructions and packaging/labeling guidelines to be found at the following link:
<http://www.Boschnasuppliers.com>.

3.1 Shipping Procedure

When accepting the delivery for shipping, the carrier acknowledges receipt of the quantity and type of parcel or packing unit, but not its content, value or weight.

All paperwork including the bill of lading, the packing slip, and/or commercial invoices are to be sent with the carrier separate from the material at the time of shipment.

Pick-up times and assigned time windows at SUPPLIER's location and other specific requirements are to be agreed between SUPPLIER and carrier/ 3PL or are defined in the milk run concept.

The prompt, complete and safe delivery to BOSCH has top priority.

3.1.1 Carriers

The Bosch-specified freight forwarders and parcel services are generally to be used. Exceptions shall be permitted only in specific cases and only upon prior written consent of the respective BOSCH facility.

3.1.2 Premium Freight

Premium freight is usually organized by SUPPLIER. SUPPLIER shall agree with the receiving BOSCH plant on the carriers to be used.

The costs of premium freight shall be borne by the responsible PARTY. Where BOSCH bears the cost, a prior written declaration of acceptance is required from the responsible BOSCH plant or 3PL provider in charge.

3.1.3 Combining of Shipping Units

In case of GSP processing all shipping units must be handed over in a logistically optimized form to the carrier (freight forwarders, parcel services).

Where possible, multiple smaller units should be combined to form one larger unit, taking account of the generally recognized dimensional and weight limits.

3.1.4 Parcels (GSP processing)

Packing items weighing up to a maximum of 31.5 kg and within the maximum outer dimension limits of the parcel services are generally dispatched by the specified parcel services.

10 single packaging items or more per working day per BOSCH unloading point are to be combined to form one logistically efficient shipping unit and shipped by the specified freight forwarders.

3.1.5 Pallets, box pallets and large containers

Shipping units shall contain only one single type of load carrier as a matter of principle.

3.1.6 Maximum weight of packing units

Regional/ local regulations concerning maximum weight for single packing units has to be considered.

3.2 Delivery specifications

The basic outer dimensions of pallets must be maintained. Protrusions and overhangs must be avoided.

All shipping units must be packed by SUPPLIER in a manner which is safe for transportation and protected from unauthorised access.

The pack items should be packed in single-type batches. Parts of different releases must not be combined in one pack item.

Packing items are combined to form a safe unit on the shipping unit, and safeguarded against slippage in transit.

At least the top layer must be covered.

Available label pockets must be used.

Tags must be attached to returnable packaging by means of easily removable, residue-free adhesive spots or adhesive tape. Tags must not be glued onto returnable packaging.

In the case of deliveries in "KLT" small load carriers on pallets the top layer must form a single, even plane.

The undamaged condition of pallets and box pallets (e.g. in accordance with the exchange criteria of the [European Pallet Association EPAL](http://www.epal-pallets.org) (Internet: <http://www.epal-pallets.org>)) and other containers must be ensured.

The packaging must be clean. Compliance with BOSCH-specific cleanliness regulations and conditions in the delivery and production areas must be ensured.

Special requirements apply to electrostatic sensitive devices.

Compliance with VDE, DIN and BOSCH standards where applicable must be ensured.

Mixed consignments are permitted in principle, unless otherwise agreed. The number of mixed consignments should be kept to a minimum. Identical items should be distributed across the smallest possible number of shipping units.

3.3 Labeling of Shipping Units

3.3.1 Labeling Methods

All shipping units are to be identified by a master label. The following minimum data are required:

- BOSCH type/ BOSCH part number
- Total quantity
- Name of SUPPLIER/ SUPPLIER number

In the case of heterogeneous shipping units (mixed containers) it must be ensured by SUPPLIER that:

- the transport packaging is identified as a "mixed shipment"
- all BOSCH part numbers in the container are identified with their respective total quantities and
- different releases within the shipping unit are physically separated from each other and clearly identified.

The smallest packing units generally should be marked by a barcode. The introduction of barcodes must be agreed with the receiving BOSCH plant concerned. All barcodes must correspond to code 39.

- Label information:
- BOSCH type/ BOSCH part number

- Quantity per packing unit
- Name of SUPPLIER/ SUPPLIER number
- Batch identification

According to the KANBAN process agreed with the plant, KANBANS cards have to be attached at the containers by the supplier

The KANBAN cards are provided by Bosch (e.g. internet portal)

3.3.2 Format and Attachment

REGION	STANDARD
A. Europe	The master label on the shipping unit must be in DIN A5 landscape format. The secondary label must be 210 x 74 mm (VDA standard format). The fixings on the "KLT" small load carrier must be used. Adhesive labels are prohibited The formats conform to the regional standards (VDA, GALIA, AIAG, ODETTE, ...)
B. North America	AIAG
C. South America	Master and secondary label: VDA standard format. Adhesive: to be avoided The fixings on the "KLT" small load carrier must be used.
D. South Africa	Standard VDA label
E. Australia	QSP0703-906 (internal procedure)
F. Asia	Format and attachment to be defined with according BOSCH customer plant
- Japan	Local supply: RBAJ designated cards. Import: SUPPLIER's label & Packing list

3.4 Shipping Advice (with GSP processing)

SUPPLIER's advice of shipping to the responsible carrier must be sent in time to comply with the due date of delivery to the destination (unloading point) specified by BOSCH.

The carrier must be provided with all data relevant to the delivery prior to shipping.

These data include:

- Collection address:

- Address of SUPPLIER
- BOSCH SUPPLIER number (as on the delivery call-off)
- Collection date and time

Delivery address:

- Destination/ unloading point
- Delivery date

Consignment data:

- Quantity, type of shipping units, where appropriate load meter
- Gross weight
- Where appropriate, customs declaration

The advice of shipping from SUPPLIER to the carrier designated by BOSCH should be sent by EDI/ WebEDI. Until implementation of EDI/ WebEDI, the advice forms and procedures of the respective carrier are to be used.

The carrier shall collect the shipment within a specific time slot, or at the specific time agreed between SUPPLIER and the carrier.

Advice of shipping of hazardous goods must be sent separately. In the case of hazardous goods, SUPPLIER is responsible for ensuring that the collecting carrier is provided with all necessary complete and correct documentation. Components that require extra-ordinary packaging due to their volume, shape or design must be announced to the carrier prior to shipping.

Any temperature control required due to sensitivity to heat or frost must be stated to the carrier in time prior to shipping.

3.5 Shipping Documents

To identify each delivery, the carrier draws up a separate hand-over document to be handed to the recipients at the destination.

In order to record the delivery, carriers are usually to be provided with the following information:

3.5.1 Delivery Note

Sender's address

SUPPLIER number

Recipient's address (receiving plant, unloading point as per delivery call-off)

Total quantity in delivery and quantities per shipping unit

Usage identification (optional)

BOSCH part number, incl. quantity and type of packaging (e.g. "KLT", parcel, Euro pallet)

Number of exchange pallets used per order

Delivery note number

Order number / blanket order number

Batch number and, where appropriate, shelf life/expiry date

Part modification / revision status

3.5.2 Transport Documents

Standardized transportation/shipping order, e.g. VDA 4922

3.5.3 Customs Documents

The carrier must be provided with all documents and information relevant to customer regulations. This includes as preference papers and where required National Certificates of Origin.

REGION	STANDARD
A. Europe	EUR. 1, UZ FORM A and commercial invoice
B. North America	Bill of Lading and Commercial Invoice
C. South America	Signed original commercial invoice, certificate of origin (FORM A) and packing list.
D. South Africa	EUR 1, F178, DA550, PACKING LIST, COMMERCIAL INVOICE
E. Australia	Tax Invoice, Treatment Certificate (Timber), Preferential duty documentation
F. Asia	Customs documents to be defined with according BOSCH plants – except for:
- China	Shipping invoice, packing list, import license if required, customs clearance form
- Hong Kong	Local HK suppliers must provide Proforma Invoice, & packaging slip
- India	Bill of entry, Commercial invoice, Certificate of Origin, Purchase Order & catalogue
- Malaysia	Manufacturing License, Custom Form, CJ5.
- Japan	Commercial Invoice, Packing List

3.6 Security in the transportation of goods

SUPPLIER declares itself as a "known dispatcher" towards all assigned service providers (Regulated representative) by issuing the "security explanation" (actual regulations, forms and explanations see homepage LBA: www.lba.de) in accordance with VO (EC) 2320/2002 and commits to fulfilling the

resulting requirements. For Airfreight only the cooperation with "regulated representatives" is allowed. Alternatively the cooperation with service providers is allowed who do not have the admittance to the "regulated representative", by obtaining the "sub-contractor explanation" (homepage LBA).

The written declaration on the dispatch documents is required for each type of transportation carrier. It cannot be expelled that the mode of transportation will change into air freight later or that air freight transportation take place afterwards.

With the following dispatches of goods the US American regulations are to be considered additionally:

- Into USA
- Goods with AMERICAN origin
- Goods proportionately consisting of US products
- Goods being developed / produced with the US Know How
- Goods being developed / produced with US-financial support

Beside other things the C TPAT regulations are to be considered.
(http://www.cbp.gov/xp/cgov/import/commercial_enforcement/ctpat/).

4.0 Logistics Quality

4.1 Supplier Performance Assessment (LEB) – Logistics

The aim of Supplier Performance Assessment (LEB) is to provide an objective overall analysis of the purchase decision. It also provides a systematic, comprehensive assessment of BOSCH suppliers based on uniform criteria.

The results of the Supplier Assessment are incorporated into the following decision-making processes:

Selection of preferred suppliers

Exclusion of poorly performing suppliers

Supplier development measures

Selection of potential suppliers

Supplier recognition

The highest-volume suppliers and the preferred suppliers, as a minimum, are assessed at regular intervals. This assessment is based on the performance delivered in the assessment period.

The BOSCH Supplier Result Assessment is structured and weighted as follows:

Quality result

Cost/ price result

Logistics result:

- Delivery compliance
- Flexibility
- Logistics (EDI capability, shipping docum., labeling, etc.)
- Communication, Cooperation

The responsible BOSCH planner can provide information on the details of the plant-specific logistics results (LR) of the LEB. The responsible purchasing department can provide information on the overall result.

(See attachment 1: Supplier Result Assessment / Logistics Result – LR)

4.2 Logistics complaints

Logistics complaint notices may be issued if there is a disruption to BOSCH processes caused by SUPPLIER.

Logistics complaints are recorded and evaluated according to the category of failure (see attachment 2) and the costs incurred.

In the event of non-conformance with the standards set out in the Supplier Logistics Manual, or the site-specific standards imposed due to reasons within responsibility of SUPPLIER, BOSCH reserves the right (reserving other legal rights) to refuse acceptance of the shipment and/or to charge for the additional costs incurred (e.g. storage, repacking, disposal, return of packing materials, increased handling, line stoppage, etc.).

In the event of a logistics complaint SUPPLIER is notified immediately and requested to analyze the symptoms and initiate remedial action. A logistics complaint from BOSCH is processed and documented by SUPPLIER according to the 8D system. Documentation can be requested by BOSCH.

If complaint reoccurs, BOSCH may request SUPPLIER to carry out a logistics self-assessment including drafting of action plans in accordance with the guidelines (e.g.: VDA Volume 17 / ODETTE Logistics Evaluation/ AIAG MMOG).

As required, BOSCH carries out logistics audits on the basis of SUPPLIER's logistics self-assessment.

5. Outlook

BOSCH is continuously striving to improve its incoming and outgoing logistics processes. This means that the requirements placed on suppliers will continue to change in future.

The goal is to formulate standardized requirements and to limit logistics concepts to a manageable variety.

In this, the focus will be on:

- Establishment of the e-business capability of BOSCH suppliers and increased digitalization of the supply chain through EDI/WebEDI.
- Introduction of the relevant BPS procurement control and transportation concepts (compare to 1.2.3,3)
- Integration of suppliers into concepts such as BPS (BOSCH Production System)
- Introduction of the Global Transport Label (GTL).
- Implementation of measures to simplify the returnable management process, for example the introduction of purchase/ sale systems and RFID technology for tracking returnables.

This requires the proactive involvement of BOSCH suppliers and service providers. Only suppliers who are prepared to proactively cooperate with BOSCH in new, collaborative concepts may expect to continue business with BOSCH on a long-term basis.

6. Abbreviations

3PL	Third Party Logistics: Integrated external logistics service provider (transport and/or warehousing)
ABS	Acrylonitrile-butadiene-styrene
AIAG	Automotive Industry Action Group
ASN	Advanced Shipping Notice
AT	Working day
BPS	Bosch Production System
C-TPAT	Customs-Trade Partnership Against Terrorism
DCM	Delivery Control Monitor
DFÜ	Remote data transmission, see EDI
DIN	Deutsche Industrie-Norm (German industry standard)
EDI	Electronic data interchange
EDIFACT	Electronic data interchange for administration, commerce and transport
EDL	External logistics service provider
EPP	Expanded Polypropylene
EPS	Expanded Polystyrene
ESD	Electrostatic discharge
EN	European norm
EU	European Union
GaV	Credit advice procedure
GSP	Area Bounded Forwarder
KANBAN	pulls system based on consumption as in the Toyota production system
KLT	Standardized small load carrier
LAB	<i>delivery call-off/release process</i>
LBA	Luftfahrt Bundesamt (aeronautical federal office)
LBW	Stock movement
LEB	Supplier Result Assessment
ASN	Advance Shipping Notice

Milkrun	transportation concept with predetermined routes and regular transport intervals
ODETTE	Organization for Data Exchange by Tele Transmission in Europe
PE	Polyethylene
PP	Polypropylene
PPS	Production planning system
PS	Polystyrene
PVC	Polyvinyl chloride
VDA	Verband der Automobilindustrie (German Automobile Industry Association)
VDE	Verband der Elektrotechnik (German Electrical Engineering Association)
VMI	Vendor managed inventory
WebEDI	EDI via internet, with content displayed and/or entered using a browser

7. Attachments

Attachment 1 Supplier Result Assessment (LEB): Criteria of the logistics result (LR)

Attachment 2 Categories of logistics complaints

Attachment 1: Supplier Result Assessment (LEB): Logistics Result (LR)
(Assessment Period till 31.12.2006)

BOSCH Supplier assessment- Logistic result LR												
Assessment period												
		SNO: xxxxxx		Supplier xxxxxxxx								
Index	Main criteria	Partial criteria	1	25	50	75	100	Single	Weighting	Value	Weighting	Total result
LE1	Adherence to schedule											
LE1.1		<i>Konshi-/ELL-delivery</i> - how is suppliers quality of delivery into consignment warehouse (adherence to upper / lower limits)? alternatively <i>Adherence to schedule date/ Quantity</i> - are schedules delivered in time and in the correct quantity (taking account of RB scheduling attitude)?	rarely	some times	average	normally	always	100	1,00	100,0	0,5	50,0
LE2	Flexibility											
LE2.1		<i>Reaction to ordering / Schedule attitude</i> - how flexible is supplier reaction to short noticed quantity increases or reductions resp. changes in delivery dates (consider own scheduling attitude)?	very little	little	average	high	very high	100	0,70	70,0	0,2	20,0
LE2.2		<i>Security stock</i> - does security stock exist ?						100	0,30	30,0		
LE3	Logistics											
LE3.1		<i>EDI-capability</i> - is supplier ready to use EDI, if required by RB? (delivery schedule 25 / ASN-data 25 / GAV 25 / INVRPT 25 - is incident not covered by RB, then 25)	very bad	bad	average	good	very good	100	0,30	30,0	0,2	20,0
LE3.2		<i>Quality shipping documents/ labeling of goods</i> - are shipping documents correctly filledin? Are goods correctly labeled? Do goods arrive in proper condition? Are there quantity discrepancies?						100	0,25	25,0		
LE3.3		<i>Consignment stock/Third party suppliers warehouse</i> - is supplier prepared to use consignment- or third party suppliers warehouse?						100	0,25	25,0		
LE3.4		<i>Packaging</i> - are the packaging rules correctly executed ?						100	0,20	20,0		
LE4	Communication und Co-operation											
LE4.1		<i>Information behaviour</i> - Supplier informs by his own accord and on time in case of non-, reduced or partial deliveries	never	rarely	average	often	always	100	0,30	30,0	0,1	10,0
LE4.2		<i>Availability/Deputising</i> - the supplier collaborators are customer orientated and reachable						100	0,20	20,0		
LE4.3		<i>Reaction time</i> - duration of response time for queries						100	0,20	20,0		
LE4.4		<i>Receptiveness to projects</i> - supplier is interested in joint completion of new projects and is pro-active						100	0,30	30,0		
					Total = Logistic result LR:							100,0

The current valid LEB is available from the responsible RB contact.

Attachment 2: Categories/subcategories of logistics complaints

Quantity differences (MD):

- Higher than ASN / delivery note
- Lower than ASN / delivery note

Delivery notes (LP):

- No ASN at delivery
- incorrect /missing DN data
- deviation between ASN and Delivery Note

Packaging (VP):

- Barcode/transponderfault packaging unit
- incorrect labelling of packaging unit
- wrong or missing material tag
- damage of product
- damage and pollution of container / packaging
- incorrect packaging

Incorrect Delivery (SO):

- Delivery to incorrect customer unloading point
- Delivery to incorrect customer
- mixed delivery
- incorrect product delivered

Rescheduling the production

Stop of production line Bosch plant

Stop of Production line Bosch customer