

SUPPLIER LOGISTICS MANUAL

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ROHDE & SCHWARZ

Make ideas real



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1 Scope of Application

This manual describes the logistics requirements that Rohde & Schwarz suppliers are expected to meet.

1.1 Scope of Validity

This supplier logistics manual applies to all goods and services supplied to Rohde & Schwarz. The guidelines contained in this manual supplement any location- or part-specific regulations and/or agreements in place that pertain to individual requirements. If the regulations in the supplier logistics manual contradict location- or part-specific regulations, agreements (including annexes), orders placed, or the Purchase Order Condition of the ROHDE & SCHWARZ Group of Companies, the said location- or part-specific regulations, agreements (including annexes), orders placed or the Purchase Order Condition of the ROHDE & SCHWARZ Group of Companies take precedence over the regulations in the manual. In the event of a conflict, the subordinate requirements only do not apply insofar as they contradict the overriding requirements.

1.2 Purpose

The field of logistics has moved beyond its classic role of material flow management and today provides a means of developing, designing, implementing and controlling lean and efficient processes in value chain systems. The quality of logistics plays an increasingly important part in enterprises' ability to compete effectively and is thus becoming a strategic success factor.

Rohde & Schwarz can only achieve a high level of logistics quality with the support of suppliers that share the same ambitious goal of achieving optimally coordinated, company-wide collaboration based on streamlined, efficient information and material flows without transition losses.

This manual describes the logistics requirements that Rohde & Schwarz suppliers are expected to meet.

2 Abbreviation/Definitions

ABS	Acrylonitrile butadiene styrene (thermosetting plastic)
ADR	Accord européen relatif au transport international des marchandises Dangereuses par Route
COC	Certificate of conformity
DIN	Deutsche Industrie Norm (German Institute for Standardization)
EDI	Electronic data interchange
EDIFACT	Electronic data interchange for administration, commerce and transport
EN	European Norm
EPAL	European Pallet Association
EPP	Expanded polypropylene (thermosetting plastic)
EPS	Expanded polystyrene
ESD	Electrostatic discharge
FIFO	First in, first out
IATA	DGR International Air Transport Association Dangerous Goods Regulations
IC	Integrated circuit
IPPC	International Plant Protection Convention
IPC	Association Connecting Electronics Industries (formerly, Institute for Interconnecting and Packaging Electronic Circuits)
IMDG	Code International Maritime Code for Dangerous Goods
ISPM	International Standard of Phytosanitary Measures
JEDEC	Joint Electron Devices Engineering Council
M&L	Material- und Lieferantenmanagement (component and supplier management)
PE	Polyethylene (thermosetting plastic)
PP	Polypropylene (thermosetting plastic)
PS	Polystyrene
RESY	RESY Organisation für Wertstoffentsorgung GmbH
R&S	Rohde & Schwarz group of companies (www.rohde-schwarz.com)
SCM	Supply chain management
SMD	Surface-mounted device
VCI	Volatile corrosion inhibitor
VMI	Vendor-managed inventory

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4 Order processing

4.1 Communications

Suppliers must provide a designated contact person (with phone and fax numbers and an e-mail address) to ensure efficient communications with Rohde & Schwarz.

The contact person designated by a supplier or their substitute should be available from at least 8 a.m. until 4 p.m. on workdays (supplier's local time).

4.2 Information

4.2.1 Information policy

Suppliers must continually track orders internally. They must also be able to provide information on orders' processing status at all times.

Suppliers must respond to inquiries from Rohde & Schwarz concerning delivery dates, the supply situation and the tracking of shipped goods either immediately or within a time frame agreed with the relevant contact person.

4.2.2 Information interchange

The preferred method of exchanging delivery schedules, forecasts and order confirmations is EDI. Purchase order data is transmitted in the standard EDIFACT format.

With suppliers who do not support EDI, the information is transmitted by fax or e-mail instead.

4.2.3 Order acknowledgements

To every order acknowledgement only **one** order number should be given. Order acknowledgments must contain at least the following information:

Information on order confirmation	Text	Barcode ¹
Supplier's order acknowledgement number	x	o
Purchase order number	x	o
Purchase order item	x	o
R&S material number	x	o

Goods description	x	o
Quantity to be delivered	x	o
Price (incl. price unit and currency)	x	o
Delivery conditions/ Incoterms	x	o
Delivery date arriving at R&S	x	o
Delivery address	x	o
Payment terms	x	o
Free text with agreements from the order	x	o

(x) mandatory

(o) optional

¹ Following Barcodes are possible at Rohde & Schwarz: 2/5 Interleaved, Barcode 39

4.2.4 Emergency strategy

Suppliers must set up a suitable early warning system to identify possible supply problems. They must also ensure that they have a fully transparent system of order tracking for sub-suppliers. Ideally, there should be additionally emergency plans and an effective system of emergency management in place.

If disruptions occur that affect delivery dates or quantities, suppliers must take appropriate action without delay.

If a supplier realizes that they cannot fulfill an agreement or commitment in spite of the action taken, they must notify their contact at Rohde & Schwarz in writing about the causes, without delay or prompting.

In addition, the supplier must provide information on the following when requested:

- Production capacity for backlog items
- Scope for partial deliveries
- Scope for reducing delivery lead time through express shipments

If it is not possible to agree on a solution, the contact must escalate the issue up the hierarchy – as far as the supplier's executive management if necessary.

4.2.5 Notification and information obligations

Product change notification (PCN): Suppliers must inform Rohde & Schwarz about changes made to deliveries and the production process that could influence form, fit, function of deliveries and/or information security in writing 6 months prior to their implementation. This applies in particular for the following cases:

- Relocation of the production site/qualification of an additional production site
- Change in subcontractors
- Use/Deployment of new technologies
- Change in production processes
- Change in the product itself
- Change in or discontinuation of materials and/or components
- Change in the specifications

If requested by Rohde & Schwarz, Suppliers must make available, at least 4 months prior to the implementation of the changes and free of charge to Rohde & Schwarz, samples of the modified deliveries in sufficient quantity for an internal qualification on the part of Rohde & Schwarz. Suppliers must also submit to Rohde & Schwarz a binding offer for a last stockpiling order with unmodified deliveries or deliveries from an unmodified production process based on reasonable conditions.

End-of-life notification (EOL): Suppliers must comprehensively inform Rohde & Schwarz in writing, while observing a notice period of six (6) months, prior to discontinuing a delivery, and if available, identify replacement deliveries. Moreover, Suppliers shall submit to Rohde & Schwarz a binding offer for a last stockpiling order based on reasonable conditions.

5 Packaging

5.1 Definition of packaging

Suppliers must define parts-specific packaging based on environmental, economic and quality considerations. The appropriate packaging must be selected to suit the goods and the type of shipping so as to ensure that the goods arrive at Rohde & Schwarz undamaged. Rohde & Schwarz regulations aim to standardize delivery packaging so that, ideally, goods can go straight to production departments without having to be repackaged.

Principles:

- Avoidance of damage

The quality of goods must not be impaired through inadequate packaging or inadequate securing during transportation. Goods must be protected against jolts, vibration, compression, electrostatic discharge and environmental factors such as temperature, dust, dirt and moisture.

- Ease of handling

Loading units must comply with international standards, be stackable, ensure safe carriage by vehicles and by conveyance and storage systems, and enable easy loading and unloading. Easy removal of parts from packaging units, too, is essential.

- Avoidance and reduction of packaging

Packaging must be chosen in line with waste management targets defined in environmental legislation. Returnable packaging should be used where appropriate and economically feasible. Packaging and filling materials must be recyclable and used in volumes sufficient to properly protect the goods; excessive quantities of packaging and filling materials must be avoided.

5.1.1 Dimensions and Weight of Goods Shipments on Pallets

With the deployment of high-bay storage and conveying systems at Rohde & Schwarz, the company has standardized on the EUR flat pallet (DIN EN 13698 Part 1) and the EUR box pallet. The maximum height for a loading unit is 1000 mm. Projecting and overhanging elements must be avoided. Smaller loading units are generally permitted; larger units are only allowed if the goods' dimensions leave no alternative. Loading units must enable four-way forklift entry and have a minimum run-in height of 100 mm. The maximum gross weight of an EUR pallet is 900 kg. Exceptions up to 2000 kg are permitted to accommodate goods with larger dimensions.

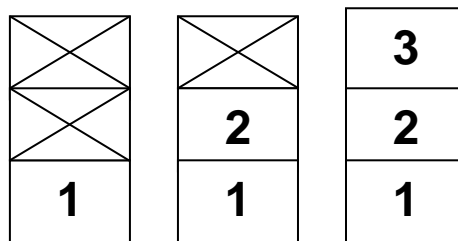


Packaging for individual items must follow the same standards as small containers (see sections 4.3.2 and 4.3.3). The gross weight of individual items of packaging must not exceed 11 kg.

5.1.2 Formation of loading units

If a loading unit is modular and consists of a number of separate packages, these packages must be chosen to fit standard loading-unit dimensions.

Loading units must be stackable. Each loading unit must be marked to indicate its maximum superimposed load and/or stacking factor.

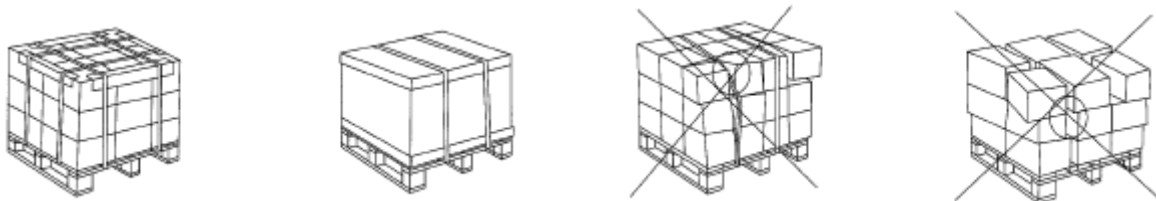


International symbols indicating stackability

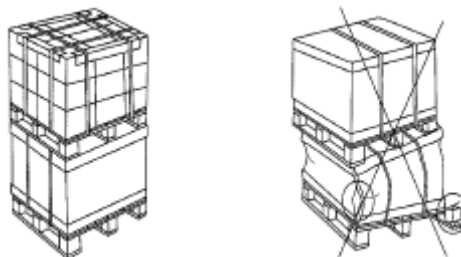
If the delivery quantity is not sufficient to fill a complete layer, the layer must be made up with empty receptacles to ensure that it provides an even surface for stacking. Containers in the topmost layer must be closed with a lid.



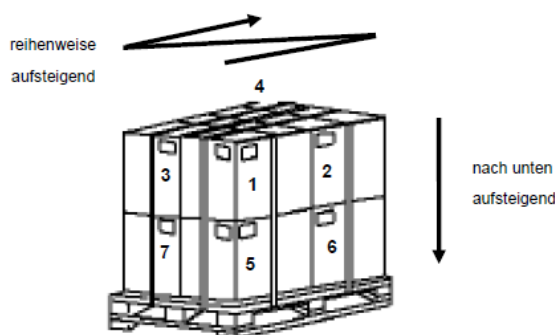
The individual elements must be secured in such a way that they cannot slip during storage or transportation. Fasteners must be of a suitable type for securing the specific packaging format, weight and material. The packaging must not be damaged by the strapping used to secure it; if necessary, the corners must be reinforced.



If several containers are stacked, heavier containers must be at the bottom and lighter ones at the top to ensure that they do not damage each other.



With goods requiring the tracking of serial numbers, containers must allow the processing of the goods according to the FIFO principle. To avoid Rohde & Schwarz having to spend unnecessary time locating items, containers of goods must be packed in such a way that the individual items of goods or packages are sorted by serial number. Those with most recent (i.e. highest) serial numbers must be on the bottom layer and those with the least recent (i.e. lowest) on the top. Within each layer, individual goods or packages must be sorted in rows in descending order. The individual goods and packages must be marked with their serial numbers. The requirements are defined by the relevant Rohde & Schwarz quality management department.



Mixed shipments must be packaged in such a way that goods of the same type are grouped together. It is especially important to ensure that every individual package in the shipment is labeled. Shipments may only be collated if they are intended for the same unloading point.

5.1.3 ESD protection

Suppliers must comply with ESD requirements as defined in the DIN EN 61340-5-1 standard. Direct-contact packaging should be conductive. If packaging is only anti-static (this is often the case with transparent IC tubes or pink polyethylene bags, for example), it must be enclosed additionally in conductive outer packaging. It must also always be marked with the ESD symbol.



Any pins or contacts must be protected against mechanical force.

5.1.4 Moisture protection

Components sensitive to moisture require special dry-pack packaging that conforms to the IPC JEDEC J-STD-033B standard, which prevents the connectors from oxidizing. If the packaging is damaged or not sealed properly, the goods' durability is reduced. The moisture sensitive level (declared by the manufacturer) must be indicated on the goods labeling.



5.1.5 Corrosion protection

Metallic components must be properly protected against corrosion. This is especially important when they are transported by sea. We recommend using desiccants or VCI materials that are capable of being recycled along with cardboard.

5.1.6 Dangerous goods and materials

Packaging must conform to current construction, testing and use regulations for hazardous goods. The "European Agreement concerning the International Carriage of Dangerous Goods by Road" (also known by the French abbreviation "ADR") details special requirements for the packaging, securing and labeling of dangerous goods carried by road. Transportation by rail is governed by "Regulation concerning the International Carriage of Dangerous Goods by Rail" (RID). The international IMDG Code governs the transportation of hazardous goods by ships at sea. Packaging used for carriage by air must comply with IATA's Dangerous Goods Regulations (DGR).

In accordance with statutory requirements, suppliers must include a current safety data sheet on hazardous materials. In addition, suppliers must provide an updated version as soon as there are changes to a safety data sheet.

5.2 Requirements for one-way packaging

5.2.1 Environmental for protection and recycling

For Rohde & Schwarz and its suppliers, protecting the environment is an important concern. To avoid unnecessary impact on the environment, materials must be used that are environmentally compatible and recyclable. Packaging material must be marked with symbols recognized by the waste management industry (e.g. RESY or Dual System marks). The labeling on packaging must not preclude material recovery. Only as much packaging and filling material as necessary to protect the goods must be used; excessive quantities must be avoided.

Approved packaging materials:

- Wood in line with IPPC's ISPM 15 standard
- ABS, PE, PP, EPP plastics
- Steel and aluminum
- Cardboard that does not contain harmful substances
- Shrink wrap and stretch films
- Kraft paper filler materials

Materials to be avoided:

- Glass
- Minerals
- Textiles
- Polystyrene (PS, EPS)

Prohibited packaging materials

- Coated or painted wood
- Cardboard with water-insoluble coatings or adhesives
- Polyvinyl chloride (PVC)
- Composite materials
- Loose packing chips of any kind
- Filler made of newsprint or shredded paper
- Filler made of edible materials
- Used packaging

5.3 Requirements of returnable packaging

5.3.1 Standard load carriers

EUR flat pallets and EUR box pallets are governed by the regulations of by the European Pallet Association.

EUR box pallets

These are marked with the DB symbol, the EUR symbol and/or the EPAL symbol.

External dimensions: 1240 mm x 835 mm x 970 mm

Internal dimensions: 1200 mm x 800 mm x 780 mm

EUR wooden pallets

These are marked with the DB symbol, the EUR symbol and/or the EPAL symbol.

Footprint: 1200 mm x 800 mm

Plastic packaging

Conductive plastic pallets or plastic containers with the standard footprint of 1200 mm x 800 mm may be used.

5.3.2 Standard small containers

Information on where Rohde & Schwarz sources its small containers is available on request. All of the standard small containers used are conductive.

„R0“: RAKO EL Typ R4312

External dimensions: 400 mm x 300 mm x 120 mm

Internal dimensions: 358 mm x 258 mm x 117 mm

„R1“: RAKO EL Typ R6412

External dimensions: 600 mm x 400 mm x 120 mm

Internal dimensions: 558 mm x 358 mm x 116 mm

„R2“: RAKO EL Typ R6422

External dimensions: 600 mm x 400 mm x 220 mm

Internal dimensions: 558 mm x 358 mm x 216 mm

„R4“: RAKO EL Typ R6442

External dimensions: 600 mm x 400 mm x 425 mm

Internal dimensions: 558 mm x 358 mm x 422 mm

5.3.3 Standard lids

Information on where Rohde & Schwarz sources its small containers is available on request. All of the standard lids used are conductive.

Lid EL type D4030

Dimensions: 400 mm x 300 mm

Lid EL type D6040

Dimensions: 600 mm x 400 mm

6 Labeling

6.1 Labeling on goods

The smallest packaging units must be marked in a suitable place with a label that allows the goods to be identified without opening the packaging (important with SMD rolls). Labels must be sized so that they are not larger than the packaging to which they are applied and are readable for the human eye.

Materials with a minimum shelf life must be marked with the relevant date, even on the smallest packaging units.

Field label	Text	Barcode ¹
R&S material number	x	o
Manufacturer part number	x	x
Manufacturer	x	o
Fill quantity	x	x
Date code or manufacture date (if relevant)	x	x
Serial number (if relevant)	x	o
Minimum shelf – life date (if relevant)	x	x

(x) mandatory

(o) optional

¹ Following Barcodes are possible at Rohde & Schwarz: 2/5 Interleaved, Barcode 39

6.2 Labeling on packaging units

Each loading unit must carry a merchandise tag on two adjacent sides. On returnable containers, labels must be applied in the field provided using easy-to-remove, residue-free adhesive spots or strips.

The material used for merchandise tags must be robust enough to withstand environmental impacts and transportation, thus ensuring that tags are machine- and human-readable at the point of delivery. Elements used to secure loads (strapping, for example) must not prevent labels from being read.

Field label		Text	Barcode ¹
Supplier name or supplier number		x	o
R&S material number		x	o
Manufacturer part number		x	o
Manufacturer		x	o
Fill quantity		x	o
Date code or manufacture date (if relevant)		x	o
Serial number (if relevant)		x	o
Net weight (= Weight without packaging)		o	o
Gross weight (= Weight with packaging)		o	o

(x) mandatory

(o) optional

¹ Following Barcodes are possible at Rohde & Schwarz: 2/5 Interleaved, Barcode 39

7 Delivery

Consignments must be handed over to the carrier in sufficient time to ensure that Rohde & Schwarz receives the goods on the appointed delivery date.

7.1 Preferred carriers

Shipping documents must conform to the Purchase Order Condition of the ROHDE & SCHWARZ Group of Companies. In addition, suppliers must comply with the following requirements.

7.2 Shipping documents

Shipping documents must conform to the Purchase Order Condition of the ROHDE & SCHWARZ Group of Companies. In addition, suppliers must comply with the following requirements:

7.2.1 Delivery note

A delivery note (no duplicate required) must not apply to more than one purchase order number.

If materials have a limited shelf life, the minimum shelf-life date must be included on the delivery note.

A comprehensive delivery note contains the following information:

Information on the delivery note	Text	Barcode ¹
Delivery note number	x	o
Supplier name or supplier number	x	o
Sender's address	x	o
Sender's contact	o	o
Recipient's address, incl. unloading point	x	o
R&S purchase order number	x	o
R&S material number	x	o
Supplier material number/ goods description	x	o
Manufacturer (if different from the supplier)	x	o
Total quantity delivered	x	o
Date code (if relevant)	x	o
Serial number (if relevant)	x	o
Minimum shelf-life date (if relevant)	x	o

(x) mandatory

(o) optional

¹ Following Barcodes are possible at Rohde & Schwarz: 2/5 Interleaved, Barcode 39

7.2.2 Dangerous goods documents

Suppliers are responsible for classifying goods, labeling them in compliance with regulations, ensuring that they are transported by permitted means, and obtaining the requisite transportation permits. They must also comply with the regulations laid down in the relevant hazardous goods ordinances (see also section 5.1.6)

Suppliers must provide forwarders with correct and complete hazardous goods documents and are liable for any damage resulting from failure to comply with statutory regulations.

7.2.3 Certificate of Conformity (COC)

If a certificate of conformity is needed from a supplier, the supplier must prepare and provide one to Rohde & Schwarz on request, without delay.

7.3 Delivery

The exact delivery address, complete with the unloading point, is included with every single order.

If the goods receiving hours are not stated in the order (e.g. in EDI orders), the following times (German local time) apply:

Munich: Mon. – Thu.: 7:00 a.m. – 4:00 p.m., Fri: 7:00 a.m. - 3:00 p.m.

Memmingen: Mon. – Fri.: 7:00 a.m. - 3:00 p.m.

Teisnach: Mon. – Thu. 7:00 a.m. - 4:00 p.m., Fri: 7:00 a.m. - 12:00 noon

8 Supply logistics quality

Failures to comply with the logistics guidelines defined here are recorded during incoming goods inspections at Rohde & Schwarz and are classified according to an error catalog. The supplier is then notified in writing about any errors identified.

The supplier analyzes the causes and notifies their contact in operational purchasing at Rohde & Schwarz on how they intend to rectify the problem. Every error is documented for supplier evaluation purposes and negatively affects a supplier's quality performance rating.

9 Looking ahead

Rohde & Schwarz is engaged in ongoing efforts to improve its supply chain processes, company-wide. As a result, the requirements that suppliers are expected to fulfill will change with time.

Comprehensive standardization of procurement and incoming goods processes and the expansion of consignment storage are enabling Rohde & Schwarz to implement lean processes in supply chain management.

By systematically stepping up supplier involvement and integration, Rohde & Schwarz is working to optimize its supply chain company-wide.

The main focuses are:

- Shorter delivery lead times.
- Continuous improvements to the quality of supply logistics in close collaboration with suppliers.
- Introduction of more simplified consumption-based supply models, such as reorder point planning, KANBAN and VMI.
- Development and expansion of suppliers' e-business capabilities.

Rohde & Schwarz regards active support from suppliers in the creation of new collaborative strategies as a valuable contribution toward successful long-term business relationships and takes this into positive account in its supplier ratings.