

**GENERAL PACKAGING STANDARDS
FOR THE SUPPLY OF MATERIALS****QUALITY MANAGEMENT SYSTEM – PROCEDURE**

MODIFICATIONS

EDITION	DATE	DESCRIPTION
-	26/01/2011	Initial Edition
A	25/04/2016	Change name from "Vossloh" to "Stadler Rail Valencia S.A.U."
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1 OBJECTIVE

These specifications are aimed at standardising packaging requirements. This implies:

- Guaranteeing product quality throughout the supply chain,
- Avoiding accidents and lowering the costs from rejects and labour,
- Decreasing the space used for storage, and
- Facilitating monitoring of the material and inventory recounts.

2 SCOPE OF APPLICATION

The supply criteria in these specifications shall apply to all material for which the assembly or manufacture is done under the responsibility of Stadler Rail Valencia S.A.U.

For the first shipments it is very important to pay special attention to the method described for acceptable and appropriate packaging. Should any doubt arise, contact the corresponding logistics officer at Stadler Rail Valencia S.A.U.

3 GENERAL PACKAGING CHARACTERISTICS

3.1 General considerations

All materials must be supplied in appropriate packaging.

A package shall be understood as a pre-established group of a certain number of parts, arranged on the same pallet or special structure, that can be easily moved and safely piled by forklift.

Packaging materials must comply with European environmental regulations in terms of preventing environmental harm, making maximal use, recycling and final disposal.

When the origin of the material calls for air or sea transport, the packaging shall be subject to the specific regulations covering this kind of transport.

The different materials must be clearly differentiated in a physical manner. Cardboard boxes or bags must not contain different items.

The packages should be put together in such a way as to respect the good condition of the material inside, to protect the safety of employees handling the material, and to meet the general demands of handling and storage, which include the following:

- Quality

The packaging should guarantee the good condition of the material during transport, storage and interior movement.

- Movement

The package must be easily moved by forklift. Should this not be possible, the Logistics department must be informed of this with sufficient lead time before shipment.

- Storage.

The packaging must guarantee security and stability during storage.

- Use.

The material must be easy to unpack. The merchandise must be easily removed from the package in the shortest time possible, and with the least amount of effort.

- Safety.

The package must be handled according to the safety measures established by legal regulations and by Stadler Rail Valencia S.A.U. rules. These are as follows:

- Forklifting.

The packaging must include the hollows needed for being lifted by a forklift, assuring stability throughout this handling.

- Anchoring the load.

The load must be anchored in such a way as to avoid movements or losses.

- Protruding materials.

The material must not protrude from the external module of the loading unit.

- Surface finish.

The surface finish of the material must not present any risk to employees handling the materials. Should there be protruding parts such as burrs, sharp edges, etc. (as seen in their corresponding blueprints), they should be protected with mesh, resistant plastic or similar material in order to avoid cuts or scratches.

- Stackability

The packaging should indicate the number of packages that can be safely stacked.

If the material or packaging calls for special handling, storage and/or maintenance features or conditions, these should be properly and visibly indicated on the outside of the package. The same procedure should be followed in those cases in which the material has an expiration date. In such cases, the Stadler Logistics Department must be given sufficient advance notice before shipment.

Any kind of material positioning or pallet arrangement leading to the following will not be considered acceptable:

- Deformations or damage to the transported product.

- Damage to the installations.
- Breakage in the pallet itself.

3.2 Types of packaging.

Generally, each package should come with its own packing list.

Depending on the characteristics of the packaging, in order to best resolve possible problems, these packaging types can be the following:

- Disposable.

When the packaging/transportation structure is only used once, since the materials from which they are built are not lasting.

- Returnable.

When the packaging/transportation structure can be re-used, given that they are made of durable items and materials.

Return of reusable structures that are the property of the supplier is to be done by means of transport managed by that supplier. Should the supplier not take the necessary measures to regularly pick up the structures, after two deliveries lacking such pickup, Stadler Rail Valencia S.A.U. shall decide on this return – as long as special agreements have not been made between Stadler Rail Valencia S.A.U. and the supplier.

Returnable packaging must clearly and visibly show this through identification of that package with the information: "RETURNABLE PACKAGE", "NAME OF SUPPLIER".

3.2.1 General considerations.

As a general rule, a flat wood pallet should be used for those items weighing more than 25 kg. (except in extreme situations). The size of this "European pallet" or "EuroPallet" is 800 x 1,200 mm., with two entrances, in accordance with current European regulations.

The load supported by the pallet must in any case be under 1,000 kg. Should the load weigh more than this, it must be packaged in a special transport structure.

If the part includes screws and such hardware, they must be duly protected against rust.

3.2.2. Small-sized electrical items.

Small-sized electrical items must be supplied in packaging that allows them to be easily handled. This normally implies:

- Reinforced cardboard boxes or, if not available, sealed plastic bags.
- Plastic boxes that maintain an appropriate level of strength.

In addition to the mechanical protection described above, those items sensitive to static electricity (IGBTs, electronic cards, drivers, etc.), must also be placed inside antistatic wrapping.

3.2.3 Electrical cables.

Long items such as cables, hoses, etc. must be packaged in such a way as to assure their condition during storage.

- Paper wrapping with insulating tape.
- Sealed plastic wrapping.
- Protective ties to keep from damaging the item.

In the case of electric cable spools, the format of the spool itself must serve as protective packaging for the electrical material (normally hose cable). Depending on the characteristics of that item, spools made of different materials can be used (plastic, wood, etc.). The spool should also come protected with sealed plastic wrapping or paper wrapping.

The type of spool used will depend on the section of cable or hose it holds. For cables or hoses with an exterior section (including insulation) of up to 7 mm., we recommend the use of the type I spool (or equivalent) – see annex. For 16 to 70 mm² section cables, we recommend the use of type II spool – see attached annex drawing. For cables with a section of between 95 and 300 mm² or larger, we recommend the type III spool – see attached annex drawing.

When supplying cable spools, the number of spools themselves should be minimized, while always respecting the spool format described in the paragraph above.

3.2.4 Anchoring items and inscriptions.

All screws and other types of fasteners, small sized connectors and hardware in general (mostly standardised) must be supplied in:

- Reinforced cardboard boxes, or in their absence, in sealed plastic bags.

Arrangements that group different sized items into the same packaging are not admissible.

Stickers, anagrams and adhesive sheets must be shipped with individual protection to avoid folding or sticking together. Group packaging may consist of rigid cardboard boxes or sealed and plastic laminated envelopes.

3.2.5 Boiler parts. Mechanised and/or painted parts.

3.2.5.1.- Non-mechanised and unpainted boiler parts.

a) Parts with sizes of up to 800 x 1200 mm.:

Must be packaged onto a EuroPallet, secured with metal or non-metal strips and shrink wrapped. *Must include a visible contents label.* Each lesser part that can be

packed into boxes up to 400 x 800 mm must either be packaged in cardboard boxes or plastic packages, and the boxes or packages piled on the pallet and shrink wrapped in plastic.

Metal hoops or cages may substitute for the plastic shrink wrapping. In such a case, the subcontractor will be able to recover their hoops and cages. Stadler will help the subcontractor with the removal of their hoops and cages, upon prior agreement between the parties.

The height of the packed bulk pallet may not exceed 700 mm.

b) Parts up to 3,600 mm. long:

Must be packaged onto a EuroPallet, secured with metal or non-metal strips, without shrink wrapping. *Must include a visible contents label.*

Such pallets are not destined to be stored on conventional shelves, but rather stackable shelves set on the warehouse floor.

The height of the packed bulk pallet may not exceed 1000 mm.

The ends of the protruding parts of the EuroPallet must be protected with cardboard, mesh, resistant plastic or other such material so as to avoid cuts or scratches.

c) Parts between 3,600 mm. and 5,000 mm. long:

Must be secured with metal strips over wooden chocks that make them easier to handle with a hand powered pallet fork/forklift or crane, in a manner that assures their stability and stackability (if the shape of the parts so allows). *Must include a visible contents label*

The ends of the protruding parts of the EuroPallet must be protected with cardboard, mesh, resistant plastic or other such material so as to avoid cuts or scratches.

d) Parts over 5,000mm long:

See point 3.2.8. (Very large sized structures must be strip secured with wooden chocks that ease their positioning and stacking).

Particular circumstances: If, due to the shape of a part, the supplier or subcontractor can suggest another, more advantageous form of packaging, they shall consult with the Stadler Logistics Department through the corresponding purchaser, who may accept the proposal if convenient.

3.2.5.2.- Mechanised and/or painted boiler parts

Mechanised and/or painted parts and assemblies generally require a higher level of protection, due to their possible fragility as well as to the procedures involved in warehouse handling.

As a general rule, these parts always require a covering that will preserve the product while facilitating handling and transport inside the factory.

3.2.5.2.1 – Mechanised and unpainted boiler parts.

Mechanised parts must be protected with oils, grease or removable lacquers that avoid rust over a period of at least 6 months. They are to be arranged on the pallet under the same conditions described in point 3.2.5.1., and in all cases shrink wrapped in plastic.

3.2.5.2.2.- Painted boiler and/or mechanised parts.

- Covered with reinforced cardboard.
- Arranged on a pallet and secured with non-metal strips and covered with bubble wrap.

When various boxes or parts are arranged on a pallet, precautions must be taken to avoid falls through the use of cages or modular hoops.

If packages are supplied with various items, these items must be supplied with individual wrapping. The main goal is to avoid scratches resulting from contact between items and damage to the packaged group itself. The individual packaging may consist of plastic bubble casings, corrugated cardboard or other material protecting the part from damage or wear.

No items or parts of items that could impede, make difficult or pose a danger for storage and conservation shall remain exposed to the exterior without protection.

3.2.6 Varied large-sized materials.

Due to its particular structure and high associated costs, this equipment must be packaged and treated with procedures that assure its good condition, required level of quality and proper functioning. Electrical, hydraulic, pneumatic, mechanical, etc. equipment must be packaged so as to protect the assembly from blows or deformations that could damage its internal structure.

As a general rule, if the load projects over the EuroPallet or surpasses a maximum height of 70 cm. (pallet plus load), the material must be shipped in packaging as described below:

The packaging must in all cases be rigid, closed and stackable at a minimum of 3 units per package. This can consist of:

- Reinforced cardboard coverage, with reinforced corners that support the weight.
- Reinforced wooden cage.
- Complete wooden box.

Interior protection elements must always be included that anchor the entire equipment to the packaging – avoiding movement. Such protective or defensive elements could be:

- Expanded cork items.
- Corrugated cardboard.
- Package anchoring by mechanical means (screws, bolts, etc.).

Assemblies or equipment that run a clear risk of damage due to environmental causes must necessarily be adjusted to closed, compact packages. Moreover, the package must be well-sealed against moisture and dust.

The height of the pallet plus load should not surpass 1.50 m., except for justified cases that must be communicated to the Logistics department with advance notice.

Gross and net weight must be clearly indicated outside the packaging and, also the manufacturer recommended lifting points.

All panes of glass and windows must be protected with a film coating in order to avoid surface scratches, with the condition of no waste after their removal and it can be done easily.

The following packaging must be used for the equipment listed below:

- Traction boxes, breakers, inverters, inductors, battery chargers, couplings, compressors, electrical cabinets, air conditioning equipment, brake panels, radiators and pantographs: Complete wooden box.
- Batteries: Complete wooden box, reinforced wooden cage or pallet covered with reinforced cardboard, with reinforced corners supporting the weight. The terminals must be protected and insulated. If the battery is charged, this should be clearly and legibly indicated.
- Traction motors: Wooden base that embraces the entire surface and makes it possible to move the equipment by forklift. The materials must be anchored to the base with non-metal strips or any other securing item that assures its stability. Areas of contact must be protected with reinforced corners or border protection in order to avoid surface scratches.
- Air chambers, water and fuel tanks and exhausts: Wooden base that embraces the entire surface and makes it possible to move the equipment by forklift. The materials must be anchored to the base with non-metal strips or any other securing item that assures its stability. Areas of contact must be protected with reinforced corners or border protection in order to avoid surface scratches. Filling necks and apertures must be capped with plastic caps, such as to avoid the entry of dirt, liquids, etc. Alternatively, it is also acceptable to use heat-sealing plastics as caps on the condition

that there is no waste after their removal and it can be done easily. (Example: <https://www.ultraclean.tech.com/seal-easy.html>).

When the material is grouped together (e.g., air chambers), each part must be individually and completely packaged with plastic bubble wrap or something similar to avoid blows and scratches between them.

3.2.7 Diesel motors and main alternators.

The following special structure must be used for materials weighing (including the packaging) over 5 tonnes.

The material must rest on wooden chocks that are arranged longitudinally and transversally around the entire piece, such that the product does not protrude above the chock with the highest vertical extension. The product must be screwed to the chocks so as to assure stability during transport and handling. These structures must be capable of being dismantled.

The structure must contain the necessary items (lugs, lifting eyes, etc.) so that it may be handled with the use of cranes and travelling cranes. Those elements must be big enough to support the weight of the product plus the support structure itself. The material must be covered with resistant plastic or something similar that protects it against inclement weather.

The alternator rotor must be mechanically blocked.

3.2.8 Extra-long metal structural parts.

A metal part is considered as extra-long if its length exceeds 5 m. In any case, the maximum weight of the entire assembly must not surpass 4.5 tonnes.

In these cases, the parts must be secured with strips, protecting the points of contact between the strips and the parts with plastic or cardboard border protectors, in order to preserve the good condition of the assembly. Similarly, the assembly must be anchored over wooden chocks or beams that make it possible to use forklifts and/or cranes for handling.

When the parts have sharp edges at the ends, these must be protected with cardboard, mesh, resistant plastic or something similar in order to avoid cuts or scratches.

The supplier should make sure that the assembly is as rigid as possible, in order to minimise wobbling while being lifted by the abovementioned means.

The parts must be protected against bad weather during transport, avoiding exposure to rain and other inclement weather.

3.2.9 Pneumatic and hydraulic pipes.

In the case that pipes are not placed on a specific transport jig, they must be placed on pallets. The wrapping is not mandatory but desirable. The total height (pallet included) must be below 1000 mm.

A packing list must be included and be easy to see, showing the total content.

The outer part of the pipes must be protected with cardboard, plastic mesh, resistant plastic or similar, in order to avoid cuts or rubbing. Pipes must be lashed to the base with non-metallic strips or other elements that ensures their stability, protecting contact parts with reinforced corners or similar in order to avoid surface scratches.

Filling necks and holes must be capped with plastic caps (without waste after removal) in order to avoid dust or liquid entrance. Alternatively, it is also acceptable to use heat-sealing plastics as caps on the condition that there is no waste after their removal and it can be done easily. (Example: <https://www.ultraclean.tech.com/seal-easy.html>).

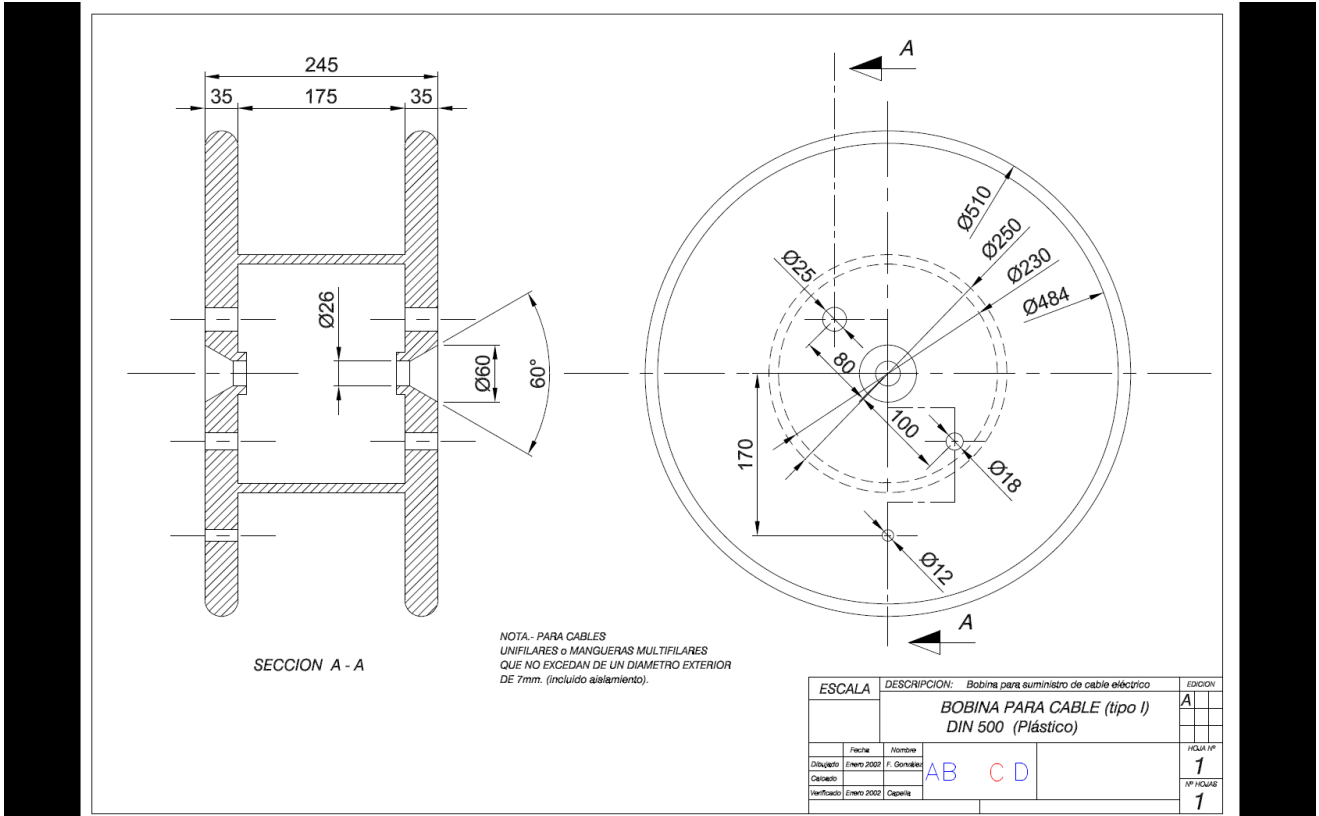
3.2.10 Others.

Particular packaging specifications for the following material groups are shown in other specific documents:

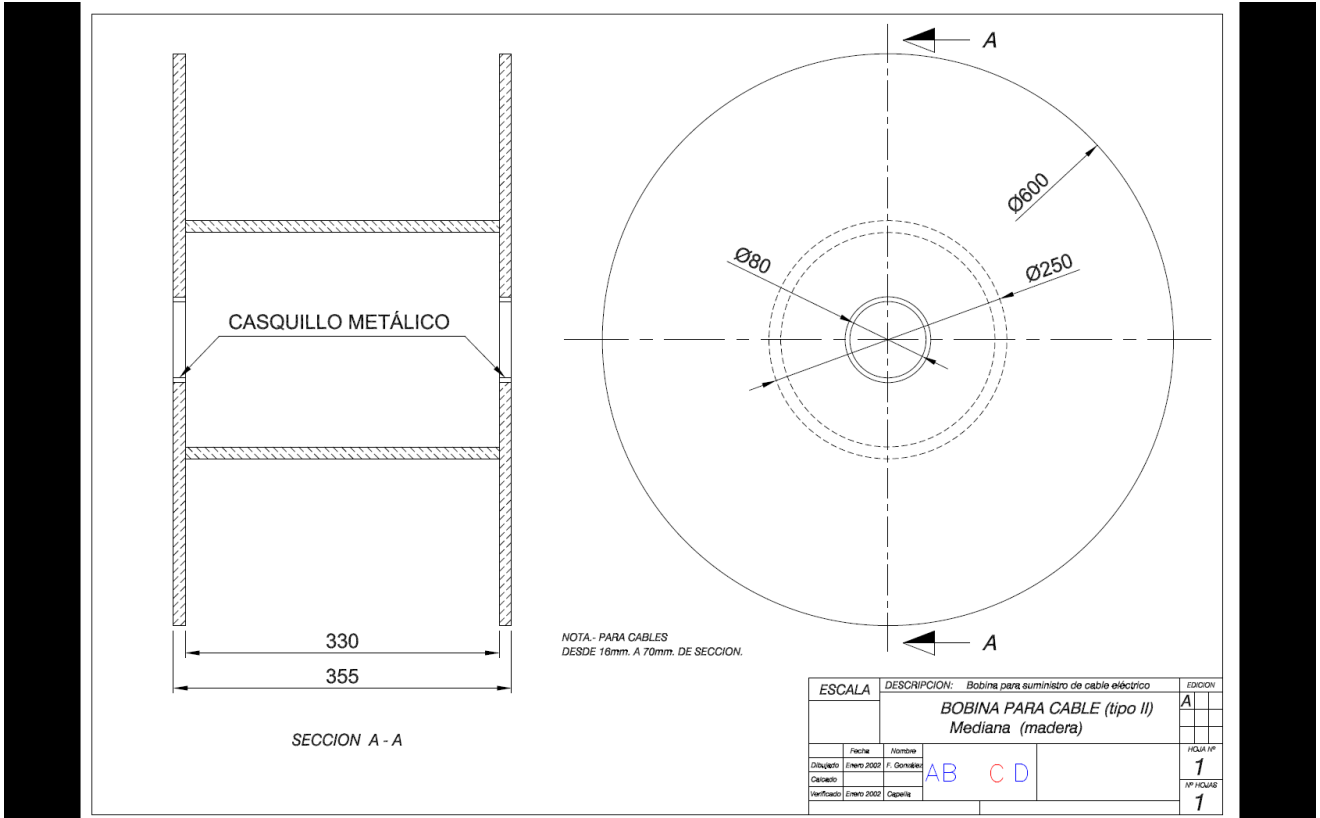
- LOGI-PRO-002.001 Polyester parts.
- LOGI-PRO-002.002 Axles, gearboxes and wheels.

4 ANNEXES

A- Cable spools (type I)



B- Cable spools (type II)



C- Cable spools (type III)

