Appendix D

Packing Guideline Purchased Parts

Inhaltsverzeichnis

1 Introduction

This packing guideline defines:

- the requirements of SMP for packing provided by the supplier or in the area of responsibility of the supplier
- handling of SMP and supplier packing in the daily business
- the responsibilities between the part suppliers (hereinafter referred to as supplier) and SMP

2 Validity

This packing guideline applies for deliveries to all SMP factories and their service providers or the module centre. If different or further factory-specific or process-related rules are necessary, these will be summarised in a separate document by the responsible factory logistics/technical planning (hereinafter referred to as specialized department) and appended to this guideline.

The packing guideline applies for all types of packing (steel, plastic, cardboard)

Deviations require approval with written release by the responsible SMP specialized department.

This packing guideline document may only be provided to external parties (suppliers) as a pdf file.

3 Requirements for the Packing

3.1 General

The following requirements must be met regardless of the choice of packing type:

- Damage-free part delivery (no quality impairments).
- Formation of rational loading units.
- One part number per packing unit (PU). Mixed pallets are, however, permitted.
- Optimum utilization of the load carriers.
- Secure transport (e.g. strapping of pallets).
- Easy unloadability of the transport vehicles by industrial trucks.
- Stackability (e.g. lids and pallets must be compatible).
- Optimisation of the load carrier dimensions to the inside dimensions of the used means of transport. As a rule, these are the following standard dimensions:
    1. Standard trucks in Europe: Areas 1200x800 [mm] and 1200x1000 [mm] and height 1000 mm (1200 mm in exceptional cases)
    2. Mega-trailers/jumbo trucks: Area 1200x800 [mm] and 1200x1000 [mm] and height 1000 mm and 1500 mm
    3. High Cube 40’ sea container L x W x H: 12024x2350x2697 [mm]
- Ergonomic and easy-to-handle structure.
- Convenient part removal.
- Recyclable materials.
- Minimal use of disposable packing materials.
- Life of the packing material at least longer than product life cycle.
- Conformity with recognised rules and valid national work safety and ergonomy laws in the countries in which the packing is used.

3.2 Special Requirements for Packing of Purchased Parts

The supplier is familiar with the special requirements for the packing concept of his products. The following aspects are conceivable among others:

- Necessary measures against corrosion.
- The parts may only be transported and stored in a certain position.
- The parts are sensitive to damage.
- No load may be exerted on the parts.
- Protection against direct sunlight.
- Necessity for electrical conductivity of packing for transport of component parts.
- Hazardous goods.

The supplier must notify the specialized department explicitly about these requirements and take them into consideration in his initial concept suggestion (see section 11).

3.3 General Requirements for Packing in SLC

The VDA recommendation 4500 must be applied!

The following applies for non-bulk components:

- The small load carrier contains only one layer of separated parts all facing in the same direction. In order to fully exploit the maximum load capacity of the SLC in the height with flat parts, these parts must be arranged vertically (if the surface allows) if necessary.
- When stacked, the space between the top edge of the part and the bottom edge of the SLC above must be at least 10 mm.
- Reusable inlays (trays, thermo-formed films, etc.) which enable several layers in one SLC should be avoided. Disposable inlays (foamed films, cardboard, etc.) are permissible!
- Special SLCs must be fitted with dust protection (SLC lid or permanently attached transparent film protection).

4 Types of Packing

4.1 Special Steel Load Carriers

Prior approval of the responsible specialized department is required for special load carriers made of steel.

4.2 Small Load Carriers (KLT)

4.2.1 PP-KLT

VDA-RL-KLTs (single-wall with smooth, closed floor) are used.

Other PP-KLTs may be used for special load carriers (KLT with part-specific fittings).

4.2.2 EPP-KLT

- EPP-SLCs are manufactured in accordance with DIN 18 360.
- The material quality (40- 60 g/dm3) depends on the size and the part to be transported.
- Only new material is used.
- Permanent labelling with our logo (on the tool side).
- Attachment of recessed grips (no reach-through handles) on all 4 sides if possible.
- Integrated label holders/defined label areas on one long and one narrow side.
- Design not with stepped but “negative” stacking edge. The empty SLCs must be returned not upside down on the pallet to avoid the EPP-SLCs slipping off the pallet.

4.3 Large Load Carriers (GLT)

- Only plastic-based large load carriers are used.
- The load carrier is collapsible to take up a minimum volume when transported empty. It is often used as an alternative to the steel lattice box pallet.

4.4 Cardboard Boxes

- Cardboard boxes with a separate lid are used preferably (FEFCO 03)
- so that no knife is needed for removing the flaps.
- The inlays or padding materials should be made of corrugated cardboard
- if possible.
- The cardboard box carries the internationally valid warning signs.
- The cardboard box may not be fixed to the pallet with nails or staples.
- Edge guards must be fitted when the load is secured with strapping bands.
- For better stability of the load units, the individual boxes should be stacked on the pallet in blocks and not as a column.
- The box may only be sealed with adhesive tape and not with staples (except for sea freight).

4.5 Plastic Fittings and Plastic Coatings

- No recyclate may be used unless specified otherwise.
- The fittings/coatings must retain their required properties for the duration of the project and must not show signs of wear that impair their function.
- The fittings/coatings must retain the required properties in the temperature range from -20°C to 80°C.
- They must not become brittle, harden, split or come loose from the base material and must be resistant to oil, solvents and UV light. They must not emit any substances.
- The fittings must carry a material identification.
- Tools for production of the packing paid for by SMP in the part price or directly become the property of SMP or, in the event of an agreement between SMP and the OEM - the property of the OEM.
- Use of these tools for third parties is prohibited.

4.6 Hollow Chamber Plates or Lightweight Plates (HKP)

The supplier is responsible for selecting the size, alignment of the struts, colour and area weight of the plates. The result must meet all requirements for planned utilization time (see 4.1).

The plates must have the following properties:

- oil and solvent-resistant
- rot-proof
- UV-stable
- emission-free
- printable
- weldable
- formable
- anti-static if necessary
- smooth
- recyclable

4.7 Tarpaulin Materials

The tarpaulins must have the following properties:

- UV-stable
- rot-proof
- crease and tear-proof
- printable
- weldable
- transparent if necessary with yellowing protection

4.8 Ergonomy

- The small load carriers (all materials including cardboard) should be easily movable by hand empty and filled and should not weigh more than 10 kg. Exceptions must be agreed with the specialized department. However, the max. gross weight may not exceed 15 kg.
- The components inside the packing must be easily grippable.
- The small load carriers must be stacked on a standard pallet (1,200x1,000 or 1,200x800 [mm]) without leaving gaps.
- A plastic lid (at a size of 1,200 x 800 [mm] the LEAD 1208-1) that allows form-fit stacking is finally placed on top of the HU.

- Fastening according to 4.9.6.
- If it is necessary to reach into the LLC from the outside to remove the parts, the reach distance must not exceed 800 mm. Otherwise the LLC must be designed as walkable.

4.9 Dimensions of the Small and Large Load Carriers

KLT:

The minimum size of a packing unit (PU) is 300x200x60 [mm], the maximum size 800x600x500 [mm]. The total maximum height (incl. pallet and lid) of the SLCs (LUs) stacked on a pallet is 1,000 mm.

GLT:

The maximum size is determined by the dimensions of the component. The dimensions must be adapted to the dimensions of the means of transport listed in chapter 3.1.

5 Stackability

The supplier is responsible for specifying the stacking factor of the supplier packing.

The maximum stacking factor is determined regardless of the actual load due to the danger of tipping by the following formula:

> Smallest distance of the base (feet, rails etc.) of the load carrier on the floor [mm] multiplied by 6 and divided by the total height of the individual load carrier [mm].

The determined value without decimal places and without rounding up corresponds to the permissible stacking factor.

Example 1:

Load carrier L=1,200 x W=**800** x H=1,500 (mm)

The smaller value of L and W is 800 mm, the total height is 1,500 mm

Calculation: 800 mm x 6 : 1,500 mm = 3,2 → stacking factor = 3-fold or "1+2"

Example 2:

Load carrier L=1,600 x W=**1,200** x H=1,500 (mm)

The smaller value of L and W is 1,200 mm, the total height is 1,500 mm

Calculation: 1200 mm x 6 : 1,500 mm = 4,8 → stacking factor = 4-fold or "1+3"

6 Labelling of Load Carriers

Every load carrier in a load unit must be clearly labelled. Every load unit, every load carrier and every single packing unit must be fitted with a VDA 4902 goods tag which must face outwards when a load unit is formed. The goods tag must be inserted into the label holder.

If there is no label holder, the goods tag must be fixed by fabric glue points. This must not impair the legibility of the information on the goods tag. Double-sided gluing points are not permissible!

Old labels and test marks must be removed completely when loading the container. The packing must be labelled with the warning sign for ESDS in accordance with DIN EN 100 015 Part 1 if necessary.

6.1.1 Problems with Labels

The following procedure comes into effect in the case of missing, flawed or illegible labels:

- The goods are returned to the supplier unless they are needed urgently.
- If the goods are needed urgently, SMP will identify and sort them if necessary and charge this expense to the supplier.

7 Quality Impairment of the Components

- The supplier must ensure that no components are filled into wet, dirty or damaged containers. The supplier will be liable for any resulting quality defects.
- If the supplier's packing concept impairs the quality of the goods, the supplier must take immediate remedial action and develop a new packing concept in cooperation with SMP.

8 General Requirements for Avoiding Packing Waste

Packing must generally be planned under consideration of ecological aspects. The waste management goals of environmental legislation contain the ecological priorities accordingly:

- The ***avoidance*** = limited to the immediate necessary level.
- The ***reduction*** = re-use by utilization of reusable packing. Reusable load carriers are to be preferred under consideration of the above principle. The disposable volume is to be reduced.
- The ***recycling*** = environmentally friendly recycling for reusable and
- disposable packing must be possible. In order to meet the requirements of the packing directive and to avoid an unnecessary environmental burden, only environmentally friendly materials should be used.

8.1 Approved and Unapproved Packing Materials

The packing material must be generally extensively recyclable and clearly and visibly labelled. The packing classification must not rule out material or energetic recycling.

8.1.1 Composite Materials

Composite materials are not permitted! Exception: Protective profiles.

8.1.2 Plastics in General

The following materials are approved for disposable packing:

PE and PP, they must be labelled in accordance with DIN 6120 (pictogram with abbreviations).

The following materials are approved for reusable packing:

ABS, PE and PP, they must be labelled in accordance with DIN 6120.

The following materials are approved in special cases and only in agreement with SMP:

PVC, PU, PC, EPS

8.1.3 Plastic Packing Materials

The following rules apply:

- Only PE is approved for protective and insulating caps unless specified otherwise.
- Packing chips are not permitted.
- Foams (disposable or reusable): only PE, PP approved.
- Shrink and stretch films: only PE with material identification according to DIN 6120.
- Film bags and sacks: only PE with material identification according to DIN 6120.
- Use of adhesive labels and strips of the same material.
- Printing may not take up more than 3% of the film area.

8.1.4 Paper and Cardboard

The following rules apply:

- Corrosion protection paper: Must be free from pollutant materials from paper production and be labelled with the RESY symbol. Sealing with plastic or textile bands.
- Papers with water-insoluble coatings or adhesives, e.g. wax, paraffin, bitumen, oil papers, self-adhesive paper tapes are not permitted.

8.1.5 Wood

Directive 2001/219/EC must be followed for the approval of wood.

The following must be observed (IPPC) to avoid spreading of pests:

With the decision 2001/218/EC and 2001/219/EC of the EC Commission, the following applies for packing wood made wholly or partly from untreated coniferous wood (with the exception of wood from thuja l.) and originating from Canada, China, Japan, USA and Portugal and used or to be used in the form of packing cases, boxes, lattice boxes, barrels, crates, drums and similar means of packing, pallets, box pallets and other load carriers as well as pallet mounting frames:

- The wood must either be thermally treated in a closed chamber for at least 30 minutes at a minimum temperature of 56°C or dried artificially in a drying oven whereby the chamber or oven must be tested, evaluated and officially approved for this purpose.
- Or it must be purged with a chemical medium according to an officially recognised technical method.
- The wood must carry a recognised label of approval for the respective treatment which shows where and by whom this treatment was administered.

- Packing material made of deciduous wood originating from China (except Hong Kong) must be accompanied by a plant health certificate according to Art. 7 and 8 of the 2001/29/EC directive in addition to the aforementioned measures.
- The bark must be removed from the wood and must have no bore holes larger than 3 mm in diameter caused by insects.
- The wood must have been subjected to artificial drying in a suitable temperature/time relation up to a moisture content of less than 20% dry substance.

9 Strapping Bands for Securing the Load

- Strapping bands must be made of PP
- Polyamide, polyester and steel bands (except for sea freight) are not allowed.

10 Pyrotechnical Objects

The supplier is responsible for the examination and classification of pyrotechnical objects (airbag modules, seat-belt tighteners, etc.) according to hazardous goods laws. Classification in accordance with UN recommendations (Test 4b, 6a, 6b, 6c) in class 9 must be ensured.

The testing and classification must be carried out and documented by a recognised expert/hazardous goods container supplier. The approval documents must be submitted to the appropriate specialized department at SMP.

Testing and classification take place, among other things, by means of the Bonfire-Test (6c) with different packings for assembly, part supply and CKD overseas production.

The requirements for the packing are recorded in the packing data sheets and are a part of the purchasing conditions. Details are agreed with SMP. The specifications in the product requirements specification of the pyrotechnical objects concerned must be observed. This does not affect the approval under explosives legislation.

<u>The following applies for ready-to-install vehicle parts with pyrotechnical objects:</u>

In accordance with special regulation 289 of the UN recommendations, airbags that are installed in vehicles or ready-to-install vehicle parts such as steering columns/steering wheels, are not subject to hazardous goods regulations.

Nevertheless, ready-to-install vehicle parts with pyrotechnical objects must be arranged (packed or unpacked) in suitable handling devices or in specially equipped vehicles or large containers in such a way that no additional hazard (such as splinters, smoke, heat, fire or loud noise) occurs in the event of accidental release of the pyrotechnical object. The supplier is responsible for providing proof of safety. An amendment to this facilitation is currently being discussed and is expected in the next few years. We recommend an expertise based on the UN recommendations.

11 Special Requirements for the Packing

11.1 Overseas Delivery

11.1.1 Development Requirements

- Increased mechanical stress (e.g. movements of the ship, harbour handling).
- Temperature - 30 °C to + 80 °C.
- Humidity up to 100%.
- Transport or storage time up to 6 months.
- SMP does not provide disposable packing means on principle.
- Load units must be secured intrinsically against slipping (bands, stretch films, etc.).

In view of the above-mentioned aspects, the packing (especially corrugated cardboard) will fail already at slight stacking pressure in comparison with transport by land!

11.1.2 Complete HU in Sea Transport

- By sea freight: Adaptation of the packing dimensions with factory logistics to the interior dimensions of 40'-HC sea containers (L x W x H: 12,024 x 2,350 x 2,697 [mm]; 2,597 mm drive-in height of the door).
- The gaps left between the palleted (!) handling units must be selected so that uncomplicated handling when unloading the containers is possible. To ensure high container utilization, these gaps should not exceed 100 mm.
- Stackability of identical delivery/load units; the stack height here is the drive-in height (see above) minus 30 mm to minus 100 mm.
- For wooden packing materials (e.g. pallets), the import regulations for the country of destination must be satisfied and confirmed on the delivery note for every delivery. The quality of the pallets must meet the requirements for the goods flow from the supplier to the place of installation by all normal industrial trucks.

11.2 Air Transport

The packing must be agreed with the specialized department at an early stage. The supplier is responsible.

11.2.1 Small Delivery Quantities

- Gross weight of the smallest packing for manual handling by one person is max. 15 kg.
- Adaptation of the dimensions to our packing modules for overseas deliveries.

12 Rules for Accepting Costs and/or Responsibility

Unless otherwise agreed between SMP and the supplier, repair costs for SMP load carriers and inlays will be shared equally (50% / 50%). If the SMP load carriers are used by several suppliers, the costs will be set in the ratio of the load carrier circulation quantities of the individual suppliers.

13 Securing of Loads

Loads must be secured in accordance with national and international regulations. Maximum utilization of the means of transport must be ensured. The load must be secured according to the transport route and type of load (truck, rail, ship, aircraft).

14 Optimisation and Container Filling Level

The supplier must deliver containers filled to the maximum level. If the filling level should change (e.g. due to component modifications or other required arrangement of the parts inside the container), the supplier is obliged to inform the specialized department in advance and agree the changes with them.

Container filling level optimisations must be suggested by the supplier and implemented in cooperation with the specialized department. Only then can it be ensured that the packing data are recorded correctly and a new packing agreement can be transmitted.

15 Packing Planning

The following order should be observed for the definition of a packing concept:

Check for use of a packing solution with optimum properties, these are:

- Standard load carriers
- Small PUs/LUs
- Reusable packing
- Use of compromise solutions because special basic conditions demand deviations from the optimum, e.g. disposable packing for overseas transport.
- Packing solutions with the following properties should be avoided:
- Special load carriers
- Large PUs/LUs
- Disposable packing

15.1 Packaging Planning Procedure

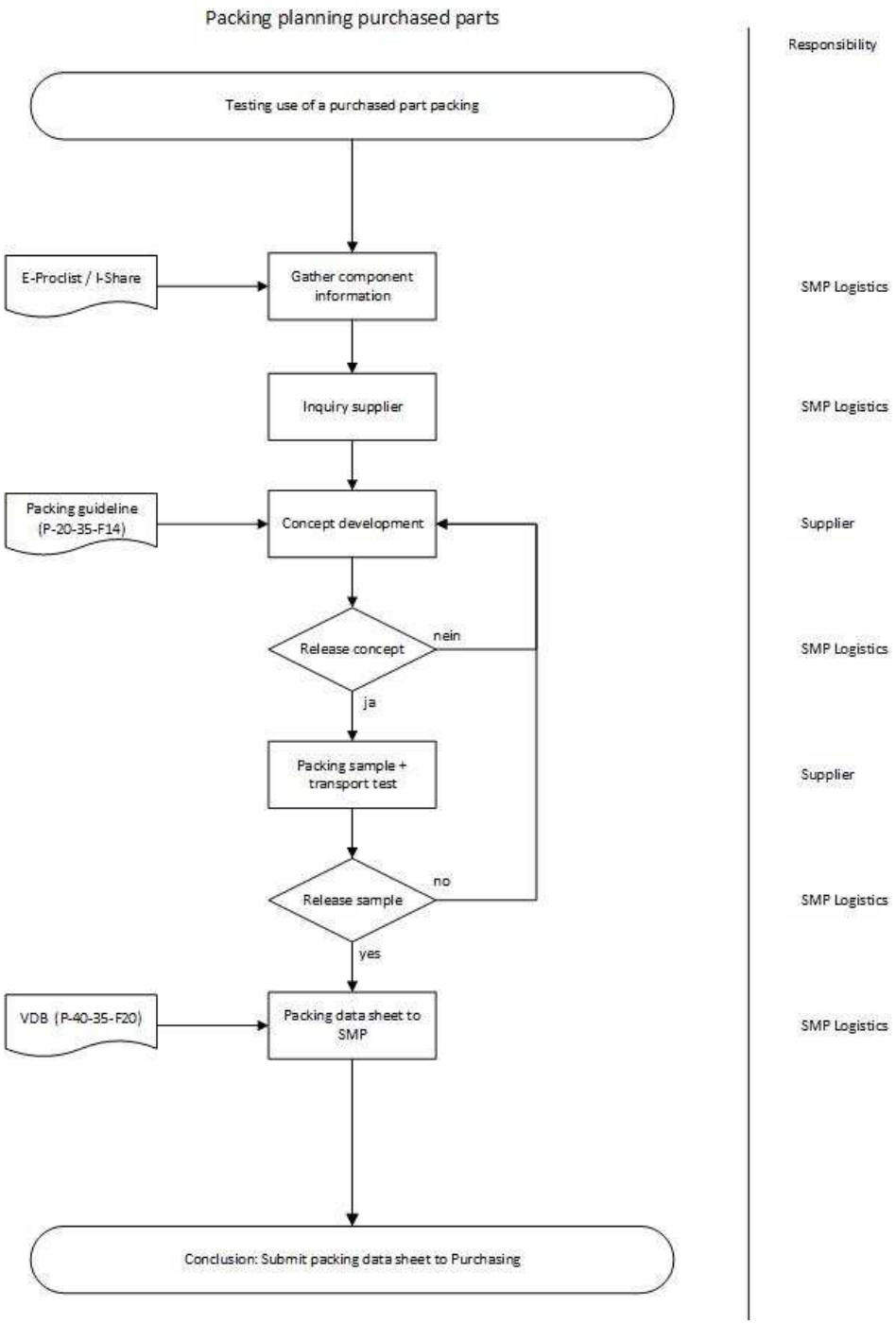
- The supplier will contact the specialized department to ask about the responsibility for the packing development (for “real” purchased parts of the supplier, for articles of merchandise of the OEMs or supplier) and the requirements for the packing (product requirement specification).
- The supplier will develop an initial proposal (or several alternatives) under consideration of this guideline and submit this to the specialized department.
- The packing concept will be assessed by the specialized department.
- SMP agrees a common packing concept with the supplier.
- The supplier creates a packing sample and conducts suitable packing and transport tests. No costs will be incurred by SMP.
- After a positive result, the packing concept is documented by filling in the packing data sheet (see attachment).

- The packing data sheet is sent to SMP Purchasing who take this into consideration in the contract of delivery/order.
- Conclusion of a logistics agreement including the packing conditions which are a part of the order.

Attention: The packing requirements specified in the packing data sheets are legally binding. An agreement made with a supplier is part of the purchasing conditions.

Release of a packing does not release the supplier from his responsibility for damage-free delivery of the parts.

15.2 Flow Chart



16 Flexibility

The supplier ensures that changes to the packing agreement with regard to type, size, packing density, etc. desired by SMP before and after SOP will be implemented without costs for SMP. The changes must be implemented within a period of 4 weeks.

Different load carriers or packing concepts can be used for identical components that are delivered to different SMP factories.

17 Deviation from the Agreed Packing Concept

If no packing concept is available for a certain component, the supplier must submit a packing suggestion to SMP which meets the requirements according to 4.1. The procedure described in section 8 must be followed.

Deviations for good reason (e.g. alternative packings for series launches, extraordinary foreruns) must be agreed with the appropriate specialized departments.

An appropriate remark “Alternative packing!” with the reason and the details of the contact with whom the deviation was agreed (name, initials, phone no.) must be entered in the delivery note.

If the agreed packing concept is not observed without the consent of the specialized department, SMP reserves the right to charge any resulting handling, disposal and repacking costs to the supplier. Unapproved deviations from the packing concept agreed with SMP will be included in the supplier assessment.

18 Special Cases

All special cases must be agreed with the specialized department.

18.1 Unpalleted Goods

Deliveries in cardboard boxes, bags, etc. without a pallet should generally be avoided because these have to be handled manually (except for deliveries by a parcel service).

18.2 Packing for Sample Parts

Packing for sample parts must be clarified with Quality Inspection. The costs are generally paid by the supplier.

18.3 Disposable Packing

Disposable packing must be largely avoided. Exceptions must be agreed with the specialized department. Reasons for this may be a very small delivery quantity or a very long delivery distance. The supplier must provide an explanation why a reusable solution is uneconomical.

Disposable packing is generally provided by the supplier and is included in the purchasing price.

The following aspects must be considered in the packing development in addition to the general requirements in chapter 4.

- Damage-free, trouble-free handling by industrial trucks (DIN 15140).
- Wear aids (e.g. tensioning straps) according to size and weight of the packing unit.

- Corrosion protection if necessary
- Specification of the max. load or stacking factor.
- The type and quality of the disposable packing depends on the requirements of the transport chain which the supplier must inquire about in advance.
- The standard dimensions of the load unit (see chapter 3.1) and modular structure must be observed. Deviations must be agreed with the specialized department.

19 Repair, Cleaning and Scrapping of Containers

19.1 Repair (Functionality Impaired)

- Flaps, lids, drawers etc. immovable or deformed to such an extent that they can no longer be closed.
- Inlays missing or not working.
- Important labels missing or illegible.
- The base frame or rails/feet are bent to such an extent that the load carrier no longer stands evenly on its four feet or can no longer be stacked safely.
- The corner posts are deformed, lattices broken and wire ends protruding inwards or outwards.

19.2 Cleaning

- SMP only sends well-swept containers. SMP does not wash the load carriers.
- The supplier ensures that the components are only delivered in clean load carriers and that the components cannot be soiled before installation.

19.3 Scrapping

SMP-owned load carriers may only be scrapped with the consent of the specialized department. Otherwise the supplier will be charged at the reprocurement value.

20 Terms and Definitions

The most important abbreviations used in this guideline are listed below:

ABS = Acrylonitrile-Butadiene-Styrene-Copolymerisate

CKD = Completely Knocked Down

DIN = German Institute for Standardization

EPS = Expandable PolyStyrene

EPP = Expandable PolyPropylene

ESDS = Electrostatic Discharge Sensitive Devices

GALIA = Group for the Improvement of Liaisons in the Automotive Industry

HC = High Cube

HCP = Hollow Chamber Plates

HDPE = High Density Polyethylene

IPPC = International Plant Protection Convention

LC = Load Carrier

LLC = Large Load Carrier

LU = Load Unit, moved by industrial trucks

PE = Polyethylene

PU = Polyurethane

PP = Polypropylene

PVC = Polyvinyl chloride

RESY = Recycling System (especially for paper and cardboard)

KLT = Small Load Carrier

SLT = Special load carrier

VCI = Volatile Corrosion Inhibitor

VDA = Association of the German Automotive Industry

PU = Packing Unit, smallest packing unit; can be LU with special load carrier

VP = packing

21 Documentation

All project-related data are stored in the digital project folder according to supplier and project and administered there. The inquiry documents, proposals, price lists and packing data sheets are stored.

22 Additional Documentation

- Packing data sheet P-40-35-F20
- Ladungsträgerkatalog P-40-35-F12