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Packaging Manual for The Central Warehouse in Liederbach

For use when introducing new packaging and when modifying existing packaging

Techem Energy Services GmbH

Zentrallager

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hereinafter referred to as “Techem”

Date: 01/05/2019

Overview

More than 60 years' experience in the evaluation of technical-chemical processes and patents and the vision as a globally active energy services provider characterise Techem.

As the market leader in Germany, Techem acts in consumer-friendly data collection and billing of heat and water.

One of the reasons for the company's successful market positioning is its close collaboration and trust establishment over the course of many years with our suppliers. Today, the supply chain is no longer only reduced to lowering purchasing costs and securing global production locations.

In the meantime, a modernly established supply chain provides considerable value contributions for company growth via product innovations from the side of the supplier. Here, the quality of the end products also plays a central role.

The latter is particularly relevant for Techem and above all for our installation work and customers.

Techem is synonymous with quality. In order to guarantee it, the selection of the appropriate packaging for production material plays a significant role.

Therefore, as a strategic partner, the supplier should be able to identify with the quality, environmental protection and work protection requirements of Techem and implement them. The respective country's laws must be considered here. About the overall costs of the optimised logistics chain from the supplier to Techem and finally also to the end customer, the smooth procedure and efficient as possible order processing are important.

This packaging manual contains guidelines and regulations for the use of packaging for the Techem products. In the interest of our suppliers and customers, it is necessary to adhere to these guidelines and to support them qualitatively.

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1. Introduction

The following Techem guidelines and regulations form the basis for the delivery of goods. The locations to be supplied are considered to be supplementary contractual agreements to the General Purchasing Terms.
The packaging manual is distributed to Techem suppliers and applicants.
It is stored under http://www.techem.de/SupplyChainManagement .

1.1 Background of The Packaging Manual

The packaging manual informs the suppliers about Techem's packaging regulations so that they can develop an optimised packaging system based on these regulations.
This is intended to guarantee a disturbance-free material flow between the supplier and Techem up to the external organisation. This must be observed whilst taking all qualitative, ecological and economic aspects into consideration.

Moreover, the packaging manual is intended to serve as a guide for internal specialist areas in order to simultaneously be able to advise and support suppliers regarding the selection and use of the optimum packaging for deliveries.
Possible negative environmental effects must be avoided as long as this is economically justified.
The target is the consistent design of the logistics chain as well as the cooperative utilization of the connected optimisation potential.

1.2 Explanation of Terminology

Items

Goods with the marking “Item number, description”.

Packaging

Description of the container in which the goods are packed. The following packaging is distinguished by cartons, bags, etc.

Packaging aids

Accessories which in addition to securing the packaging or load units also serve to protect the packaged goods (e.g. stretch film, adhesive tape, straps).

Packaging

Physical wrapping of packaged goods for differentiating the goods quantity or securing the goods. The packaging should protect the packaged goods themselves as well as other goods against damages.

Separate packaging

Separate packaging is packaging with only one part plus the corresponding accessories belonging to it (operating instructions, seals, etc.)

Reusable packaging

Reusable packaging is packaging which contains several identical items without separate packaging plus operating instructions.

Outer packaging

Outer packaging is packaging that contains several parts of the same item in separate packaging.

Charge carrier

Carrying means for collating packaging units as a load unit, e.g. pallets and crates. The load carrier has the task to protect the packaged goods and to guarantee safe transport and storage.

2. General Packaging Requirements

To reach the target location, the supplier must guarantee that both internally and externally parts supplied are correctly and adequately protected and packed.
The supplier must adhere to the regulations in the packaging manual and must observe any national and international regulations.

The packaging waste must be kept to a minimum by him only limiting himself to the necessary packaging materials without endangering the quality of the goods.

Independent of the selection of the packaging type, the following delivery requirements must always be met:

- ✓ Undamaged delivery
- ✓ Qualitatively sufficient packaging
- ✓ Easily recognisable external labelling of the packaging
- ✓ Containers as plastic bags must be sealed
- ✓ Delivery only in clean packaging
- ✓ Stacking capability
- ✓ Optimum use of space
- ✓ Forming of rational load units
- ✓ Transport safety
- ✓ Easy unloading and handling of the delivery

2.1 Determination of The Packaging

The packaging is always determined by the supplier, based on the requirements of the Techem packaging manual. Therefore, it is the supplier's responsibility to meaningfully implement the regulations from the packaging manual.

Independent of this, Techem is always entitled to mandatorily prescribe the packaging to be used, e.g. for sensitive parts with specific protection requirements. The supplier carries the responsibility to guarantee undamaged delivery of the goods to the target location.

If the specified packaging is not adhered to or regulations from the packaging manual are not observed, Techem reserves the right to charge the supplier with additional costs which arise such as handling work, packaging required or the disposal of waste.

The supplier is held liable for quality loss due to inadequate, damaged or soiled packaging.

Variances in reasoned cases must be immediately coordinated with the respective Techem contact partner Basically, the selection of the packaging type relates to the product features, the protection requirements, the transport type and the conditions at the supplier's.

2.2 Contact Partner

The central warehouse is responsible for packaging inquiries. The following persons are named as contact partners:

Contact Partner	Telephone Number	Fax/Mobile
rudolf.schauer@techem.de Head of Central Warehouse	+49 (0) 69/300976-30	+49 (0) 69/300976-81
Alexander.Hess@techem.de Supervisor	+49 (0) 69/300976-39	+49 (0) 69/300976-81

2.3 Packaging Standards

To design material handling and easy order processing in Supply Chain Management, the following packaging requirements must be adhered to:

Packaging is either proposed by the supplier and approved by Techem, Supply Chain Management and Device Engineering & Quality Assurance or stipulated by Techem. If, from the supplier's view, there is a reason to change the packaging, the new proposal must always be approved by Techem. Temporary differences require a written exemption from Supply Chain Management.

The packaging must always be adapted to the qualitative and technical requirements of the goods. The packaging quality must be adapted to the respective weight and size of the goods. For overseas shipments, the packaging should consist of tested, wet strength glued corrugated cardboard in accordance with DIN 55 468 part 2.

Outer packaging must not exceed dimensions of 45 cm x 45 cm x 45 cm and a weight of 25 kg. In order to guarantee efficient exploitation of the existing outer packaging, all packaging must be coordinated with the central warehouse.

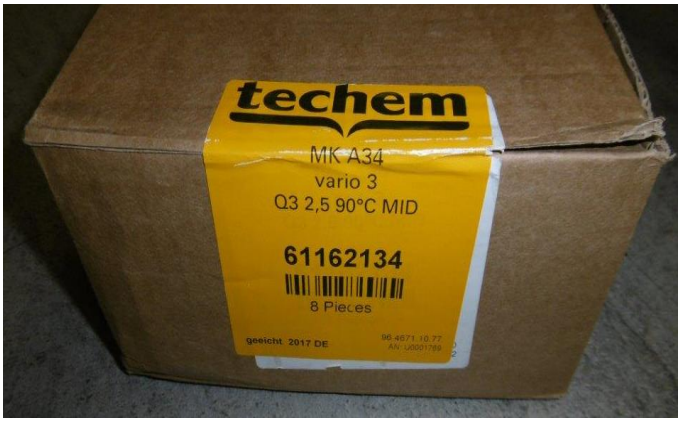
2.4. Packaging Examples:

Reusable Packaging				
Description	**Lenght**	**Height**	**Width**	**Volume**
FHKV	43.5 cm	13.5 cm	3.5 cm	2100 cm³
				
Packaging with 10 pieces		Labelling of the package with 10 pieces		
Overpack				
Description	**Lenght**	**Height**	**Width**	**Volume**
FHKV	46 cm	28.5 cm	36 cm	47200 cm³
				
Overpack with 220 pieces		Labelling of the overpack with pieces		

Reusable Packaging				
Description	**Lenght**	**Height**	**Width**	**Volume**
AP-Vario 3	11.5 cm	8 cm	7.5 cm	690 cm³
				
Packaging with 1 piece		Packaging with 1 piece		

Repacking				
Description	**Lenght**	**Height**	**Width**	**Volume**
FHKV	46 cm	28,5 cm	36 cm	47200 cm³
				
Labelling overpack with 12 pieces		Labelling overpack with 12 pieces		

Recalibrated Devices

Separate packaging recalibrated 2017 (yellow-label)	**Outer packaging recalibrated 2017 with 8 pieces (yellow label)**
	
Separate packaging **sealed** by central warehouse and recalibrated	Separate packaging recalibrated 2018 (green label)
	
Outer packaging recalibrated 2018 with 7 pieces (green label)	Separate packaging recalibrated 2019 (red label)
	

3. Information Included with the Package

3.1 Packaging Marking

Each packaging unit must be marked at a clearly visible place with a (white) label.
The label size must be at least 10.0 cm x 5.0 cm.
The label size must be adapted to the packaging for smaller packing.
The following information must be provided on the labels (as a minimum):

- Techem item number
- Techem item number as a barcode
- Techem item description
- Quantities per packaging unit

Barcodes in the format "*code 128 subset b*", exclusively printed in black on white. The barcode must have a minimum height of 10 mm, the width must be coordinated with the central warehouse. Otherwise, barcodes must always be adapted to the label.
The font size for the item numbers and quantities must be selected to be large enough to distinguish it from the remaining labelling.

For packages without an attached label, where instead the labelling is printed directly on the packaging, the same labelling rules apply as for labelling on a label.

Labelling order on the label:

- Techem item number
- Techem item number as a barcode
- Techem item description
- Quantity

The label on all packages must be positioned to function as a "seal**"**. This means that the label must be attached so that it is only possible to open the packaging by damaging the label (see separate packaging illustration).

A separate seal must be attached to the packaging which is printed directly.
Otherwise, the packaging may only have the name of the packaging, e.g. standard VDW 2.4 etc., the trade name or further Techem identification. Exceptions are only possible after a special agreement with the responsible contact partner.

For goods subject to certification, the current year of certification, e.g. "2016", and the manufacturing date must always be noted on the label.

For goods not subject to certification, the manufacturing date must always be noted.
For **national MID device recalibration,** the label colour for all packaging in which the goods are located must be **signal yellow** instead of white.

For subsequently certified goods, the old year of certification must be pasted over for all packaging containing the goods.

3.2 Shipment Papers

A freight note from the forwarding agent with the following information must accompany each delivery.
Please refer to the central warehouse's delivery conditions for further details.
http://www.techem.de/SupplyChainManagement

3.3 Delivery Notes

A delivery note (accompanying document) is a document which provides information about the goods delivered. It must accompany every shipment.
Please refer to the central warehouse's delivery conditions for further details.
http://www.techem.de/SupplyChainManagement

3.4 Barcode

Delivery notes must include a barcode to identify the delivered goods faster and avoid errors when recording goods entry.
Please refer to the central warehouse's delivery conditions for further details.
http://www.techem.de/SupplyChainManagement

3.5 Load Marking

Please refer to the central warehouse's delivery conditions for details.
http://www.techem.de/SupplyChainManagement

3.6 Symbols for Packaging / Handling

In as far as the packaged goods require special handling of the packaging unit, this must be attached externally to the packaging with clearly visible information.
The symbols for handling signs for packages are determined uniformly in ISO R/780 and in DIN 55 402 internationally. Under no ways may you do without the symbols which ensure that there are no language problems in international transport.

You can find the most important signs in the following table:

Description	Symbol	Description	Symbol
Zerbrechliches Packgut Fragile, Handle with care		Vor Nässe schützen *Keep dry*	
Kein Handhaken verwenden Use no Hooks		Bitte nicht stapeln! Do not Stack!	
Oben This way up		Zulässige Stapellast *Stacking limitation*	
Vor Hitze (Sonneneinstrahlungen) schützen Keep away from heat		Klammern in Pfeilrichtung Stacking limitation	
Schwerpunkt Centre of gravity		Gabelstapler hier nicht ansetzen Do not use fork lift truck here	
Electronically endangered construction element		Sperrschicht nicht beschädigen Do not destroy barrier	

3.7 Transportation of Dangerous Goods

A dangerous goods transport is defined as transport of goods and items within public space which contains substances due to which in view of their combination or condition during transport hold certain dangers for:

- public safety, in particular for the general public,
- important common goods,
- life and health of persons, animals and the environment

can be assumed and which due to legal regulations can be categorised as dangerous goods.

Techem works with a wide range of goods and materials, also including lithium, explicitly lithium batteries.

3.8 Lithium Batteries

Since January 01, 2017, new regulations are valid for the packaging, marking, handling and accompanying documents for lithium-based batteries, rechargeable batteries or round cell batteries. These regulations as well as further-reaching information are stipulated in the following documents:
For air freight, the rules of the pertinent packaging instructions of the DGR (Dangerous Goods Regulations), part 1 of the IATA (International Air Transport Association, version 59, 2018) are valid.

For European road traffic, the rules of the European agreement on the international transport of dangerous goods on the road (ADR, version 2017 – period of transition till 31.12.2018) are valid. For sea transport, the International Code for the Transport of Dangerous Goods with Sea Ships (IMDG code, version 2017) is valid.

To be approved for easier transport (without meeting the regulations of the Dangerous Goods Act in full), **shipments as of January 01, 2017 must meet the following requirements** (Period of transition with "old" labelling is valid till **December 31, 2018**)

- Lithium ion cells and batteries: Cells with a nominal energy of 20Wh at the most, batteries with a nominal energy of 100Wh at the most
- Lithium metal cells and batteries: Cells with 1g lithium contact at the most, batteries with an overall quantity of 2g lithium at the most
- The packaging units must pass a drop test from a height of 1.20 m without the contents being damaged
- Internal packaging must be used which completely encloses the packed batteries / cells
- Batteries / cells must be packaged protected against short-circuits
- Batteries / cells must be protected against contact with conductive material
- Packing till 25 kg per piece

Each packaging must be marked with special handling information for lithium batteries. If required, a telephone number must be provided for queries.

The following marking is to be used for this:

* **UN-NUMBER**
** **PHONE NUMBER FOR FURTHER INFORMATION**

DATA COLLECTOR

When dispatching the data collector, the Dangerous Goods Ordinance must be observed (violations will be prosecuted).

Due to its high content of lithium the installed battery in the data collector 57051 is labelled as Class 9a.

Products of this class can only be sent by freight carrier. Parcel service provider do not transport dangerous goods.

Instructions for storage and transport:

- No contact with humidity
- Storage only for temperatures between (-25 ° C) and (+75 ° C)
- Storage without dangerous goods packing is prohibited

The following label must be used: