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Please refer to the last page for document information!

Validity

Product series / Turbine type	Product
Delta, Delta4000	All small components for Nordex Nacelle and Nordex Service that are not subject to an individual logistic specification

Revision index

Rev.	Date	Author	Reason for modification / chapter	AST
0	2019-05-27	Jonas Rode	First issue	11718
1	2020-01-24	Christian Heinrichs	Include the chapters delivery note and labelling	-
2	2020-06-23	Christian Heinrichs	Updating the glossary and referenced documents / 1.2 No obligation to use a lid / 3.2.1 Provision of containers is based on monthly demand / 3.2.2 Addition of the notes "fragile" and "do not stack" / 5	-
3	2023-05-16	Tommy Reschka	General rework and update of the document trough all chapters (including land/sea/air freight and global logistic requirements)	-
4	2023-09-16	Tommy Reschka	Administrative changes	-
5	2024-11-11	Tommy Reschka	- Adjusted requirements for packaging (mixed loading units, visual inspection, return of multiway transport tools) / 2 - Adjusted requirements for labelling (four levels of labelling) / 3	-
6	2025-06-17	Tommy Reschka	- Adapted validity (all Nordex Nacelle deliveries + Nordex Service deliveries) - Packaging boxes non-mixed (only one material number and batch number) / 2 - Adjusted requirements for labelling (batch information; Nordex Service requirements for dangerous goods labelling) / 3 - Included annex / 6	-

Table of contents

1 General

1.1 Aim and purpose

Proper selection, design and construction of the packaging for Nordex components is of high importance for a damage-free transport from production sites of our suppliers to the respective delivery location of Nordex as well as during storage. The packaging must adhere to mechanical, climatic, biotic and chemical requirements during transport, handling and storage.

This document is valid for all Nordex Nacelle deliveries and Nordex Service deliveries. It considers all components for which no individual logistics specification exists. If there is an individual logistic specification for a specific component this must be followed.

1.2 Glossary

Abbreviation	Designation	Description
COG	Center of gravity	Position of the center of the mass of an object
	Cold hall storage	Indoor storage without any heating / air-conditioning
	Delivery quantity	Complete quantity per delivery of the same good
EPAL	European pallet	DIN 13698-1
	Gross weight	Sum of the weight of the goods and loading equipment
GTIN	Global Trade Item No.	International identification number and barcode
	Net weight	Weight of a good without loading equipment
LAP	Load attachment point	Lifting equipment that connects the component to a LHD, e.g. lifting point
LHD	Load handling device	Lifting equipment that connects the component/LAP to the hoist device, e. g. lifting chain sling
	Load securing	Securing of cargo for transportation
	Loading equipment	Equipment used for the movement, storage, control and protection of the goods, e.g. European pallet
LU	loading unit	composition of loading equipment and the goods
	Loading unit quantity	Quantity of parts per loading unit
VCI	Volatile Corrosion Inhibitor	Substance selected from vapor phase to protect metallic materials against corrosion

1.3 Referenced documents

Name	Definition
ISPM-15	International Standards for Phytosanitary Measures No.15: The aim is to prevent the introduction and spread of harmful organisms with wood packaging
DIN EN 10230	Steel wire nails Loose nails for general applications
DIN 55402	Marking of packages
VDI 2700	Securing loads on road vehicles
CTU- Guidelines	Guidelines for the packing of loads except bulk goods either in or on CTUs for transport by means of any method of land-based or water-based transportation
EN 61340-5-2	Electrostatics: Protection of electronic devices from electrostatic phenomena.
CLP-Regulation 1272/2008	Classification, labelling and packaging of substances and mixtures (dangerous / hazardous goods).

All other specifications and documents relating to the part have to be observed!

2 Packaging

Defines all processes and materials employed to contain, handle, identify, protect, and/or transport goods. Adjustments to the described packaging procedure can be aligned with Nordex individually. Safety data sheets of special packaging materials must be forwarded unrequested to Nordex.

2.1 General packaging instructions

The supplier is responsible for the packaging and should always follow the following general guidelines when selecting the packaging:

- **Safe packing:** The components must be securely packed according to their function and protected against any kind of damages or corrosion while handling, transport and storage (especially hazardous goods). The packaging and stuffing must be done in such a way that there is no risk of slipping or falling. Furthermore, exposed nails are not allowed at any part of the packaging to avoid the risk of injury while packing, handling and unpacking.
- **Visual inspection:** Each supply chain member needs to visually inspect the integrity of the load carrier and the packaging. In case of deviations Nordex must be informed.
- **Non-mixed:** Packaging boxes must be non-mixed (only materials with the same material number and batch number). Load carriers (EURO or CP5 pallet) with loose / unpacked components must be non-mixed too, while load carriers with packaging boxes can be mixed (can contain packaging boxes with different materials) – see chapter 2.2.
- **Waste reduction:** For economic and ecological reasons, packaging waste should be avoided. Reusable packaging is generally preferable to disposable packaging. If reusable packaging cannot be used, recyclable materials should be used for packaging (e.g. cardboard instead of plastic foil).
- **Multiway transport tools:** The return process of multiway transport tools must be clarified with the local Nordex plant individually.
- **Oversea transport packaging:** For oversea transports the components must be stored in closed boxes/cages that can be accessed by forklifts from at least two sides. All used wooden materials must be according to ISPM-15-standard (IPPC-label).
- **ESD packaging:** Components which are sensitive to electrostatic discharge must be single packed and labelled according to guideline EN 61340-5-2 (one component per box only).
- **Loading equipment:** The loading equipment is used for the storage, transport and protection of the goods. The list below shows which equipment can be required:
    - Suitable and standardized load carriers (according to chapter 2.3)
    - Cardboard boxes, kanban boxes, cardboard sheets and edge protection
    - Plastic plugs, CVI foil, anti-corrosion oil and desiccant bags to prevent corrosion
    - Lashings straps made of plastic (do not use steel straps due to risk of injury)

2.2 Detailed packaging instructions

Packaging boxes (cardboard or kanban box) must be **non-mixed** (only materials with the same material number and batch number). The maximum weight of a packaging box is **20 kg**. Load carriers (EURO or CP5 pallet) with loose / unpacked components must be also **non-mixed** (see Figure 2), while load carriers with packaging boxes can be **mixed** (one load carrier can contain packaging boxes with different materials). Never mix packaging boxes and loose / unpacked components on the same load carrier. One order can consist of more than one load carrier.

Serial number requiring components must be packed in such a way that the **serial number can be read from above** (if possible in ascending order). If they are packed in packaging boxes, each component must have a **separate box** (labeled according to chapter 3 with Box Label).

Damage and corrosion protection:

- Electrical components and other corrosion-sensitive materials must be protected with a proper corrosion protection (e.g. desiccant bags or VCI foil)
- Bare boreholes and threaded holes must be covered with plastic plugs (through holes with plugs from both sides) + coated with anti-corrosion oil ("Cortec VpCI-369" or similar)

Figure 1: Example for desiccant bag (l.) and bore hole protection (r.)

- Tubes and pipes must be closed with plastic caps or foil bags
- Unpacked components must be separated by paper or cardboard, for sensitive materials edge protection can be used (it is not necessary to wrap single components in plastic foil)

Figure 2: Example for spacer between components and edge protections

2.3 Load carriers

All load carriers (pallets, cages, boxes) must comply with the corresponding regulations of land, sea or air freight and suitable depending on their purpose (sufficiently robust depending on the components and transport routs). It must be able to carry them in standardized containers or trucks with optimized stuffing and they must be accessible by forklift from four sides (100 mm access height). For sea and air shipments the loading units must be **closed** by a lid which needs to be attached by lashing straps or screws (no nails!). As alternative seaworthy cardboard boxes can be used (stackability at least 1+1). All used wood must be according to **"ISPM 15 standard"** and marked with the IPPC-label (thermal treatment only [HT], no chemical treatment!).

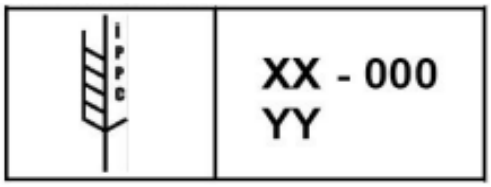

Figure 3: IPPC-label for ISPM-15-guideline

2.3.1 Reusable load carriers

If possible, use reusable load carriers for all storage and transport processes. Use stacking frames or stackable cardboard boxes to hold the packed components in position and protect them while transport (maximum of **three** stacking frames per pallet; maximum of **0,5 meters** transport good height). For all land shipments EURO pallets must be used and for all sea and air shipments CP5 pallets (container optimized size) must be used (see Figure 4).

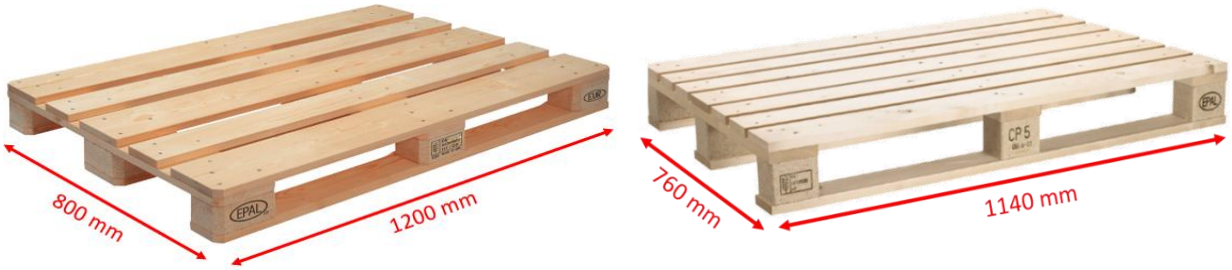

Figure 4: EURO pallet for land shipments (l.) and CP5 pallet for sea and air shipments (r.)

Figure 5: Stacking frame + lid (l.) and stackable cardboard box (r.)

Additionally small materials can be packed in multiway boxes (kanban boxes) which are provided by Nordex (the quantity is based on the regular monthly deliveries). These boxes are standard containers with defined dimensions (see Figure 6).

The maximum fill level should not affect the stacking (stacking should be always possible) and the maximum weight should not exceed **20 kg**. The material label (Box Label) must be placed in the label holder at the front of each box, old labels need to be removed.

Kanban boxes	**KB0**	**KB1**	**KB2**
Type	EF6120	EF4120	EF3120
Length (mm)	600	400	300
Width (mm)	400	300	200
Height (mm)	120	120	120

Figure 6: Kanban containers for small parts

Oversized materials (larger than EURO / CP5 pallet size) can be transported in special load carriers. These materials must be packed in such a way that the center of gravity is as low as possible and in the center of the loading unit. The maximum dimensions are **2400 x 2400 x 2000 mm (Lx W x H)** and the maximum gross weight is **1800 kg** (see Figure 7).

Figure 7: Load carrier for oversized materials - maximum dimensions

The **return process** of reusable load carriers must be clarified with the local Nordex plant individually. Reusable standard load carriers as EURO pallets and kanban boxes are generally exchanged 1:1 upon delivery.

All returnable load carriers must be kept free from contamination and damages. Each supply chain member needs to visually inspect the integrity of the load carrier and in case of deviations Nordex must be informed.

2.3.2 Disposable load carriers

If the usage of reusable load carriers is not possible, disposable load carriers must be used. For land transports these disposable load carriers must be similar to EURO pallets and for sea and air freight they must be similar to CP5 pallet and closed by a lid (max. 1140 x 760 x 750 mm and max. 1000 kg gross weight, see Figure 8). The stackability must be at least 1+1.

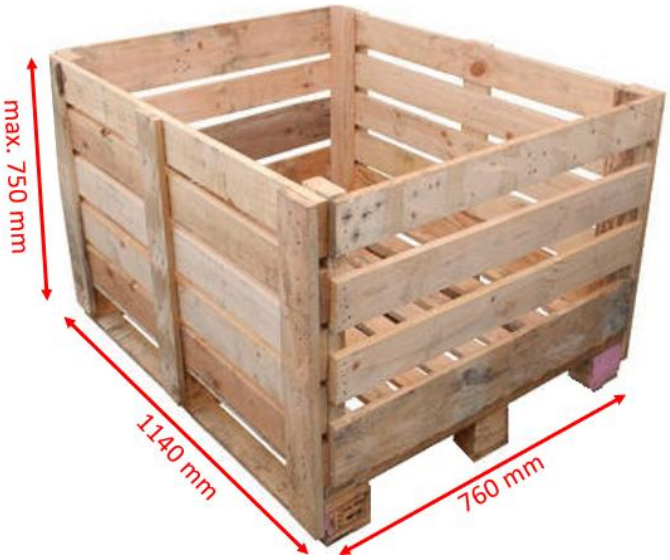

Figure 8: Disposable load carrier similar to CP5 pallet

Oversized materials (larger than EURO / CP5 pallet size) can be transported in special load carriers. These materials must be packed in such a way that the center of gravity is as low as possible and in the center of the loading unit. The maximum dimensions are **2400 x 2400 x 2000 mm (L x W x H)** and the maximum gross weight is **1800 kg** (see Figure 7).

3 Labelling

Correct labelling is absolutely necessary to enable the identification of the material. The labelling consists of different labels and documents which are described in the following. In addition the electronical delivery data transfer AVIS can be used to provide the requested information.

Individual Label

Each single component must be labeled according to the technical drawing. The label contains the following information:

- Nordex material number (ERP code)
- Vendor batch number / Vendor Code
- Serial number – if existing

Box Label – *for small materials packed in boxes only*

Each packaging box (cardboard or kanban box) must be labeled on the outside of the packaging. For the kanban boxes the label must be placed in the label holder at the front of each box and for cardboard boxes the label must be attached to the top (must be readable from above). The label must be written in English and contain the following information:

- Name of supplier
- Material description (according to the order)
- Nordex material number
- Quantity of containing components
- Serial numbers of all containing comp. (as number and as GTIN code) – if existing
- Vendor batch number of all containing components – if existing
- Expiration date of all containing components – if existing

Pallet Label

Each load carrier (EURO / CP5 pallet or special pallet) must be labeled on the outside of the load carrier on one of the short sides. The label must be written in English and contain the following information:

- Name of supplier
- Delivery note number
- Material description of all containing components (according to the order)
- Nordex material numbers of all containing components
- Quantity of containing components

- Serial numbers of all containing comp. (as number and as GTIN code) – if existing
- Vendor batch number of all containing components – if existing
- Gross weight and net weight of the loading unit (pallet)
- Expiration date of all containing components – if existing

Delivery Note

Each delivery must be labeled with a delivery note attached to the outside of the packaging on one of the load carriers that belong to the delivery in waterproof and resealable delivery note pocket. The delivery note must be written in English and contain the following information:

- Supplier name, number and address
- Recipient name and address (Nordex)
- Nordex order number (if available also as GTIN code)
- Delivery note number
- Shipping date
- Quantity of load carriers (pallets) that belong to the delivery
- Gross and net weights of all delivered loading units (pallets)
- Material description of all delivered components (according to the order)
- Nordex material number of all delivered components
- Supplier material number of all delivered components
- Quantity of all delivered components
- Serial numbers of all delivered comp. (as number and as GTIN code) – if existing
- Vendor batch number of all delivered components – if existing
- Expiration date of all delivered components – if existing
- Country of origin of all delivered components

Additional Labels:

- Components with **prototype** status must be marked as "Prototype" and components with **0-Series** status must be marked as "0-Series" on the corresponding Box Label.
- **Dangerous / hazardous goods** must be marked with pictograms according to the international labelling guidelines for hazardous goods depending on the recipient country (CLP-Regulation 1272/2008 can be used as reference). Additionally the quality certificates and safety data sheets must be available.

  For all deliveries to Nordex Service Central Warehouses the quality certificates and safety data sheets must be sent in all languages that are listed in *Annex 1* to msds@nordex-online.com (including the Nordex material number).
- **ESD components** must be marked according to international guidelines for ESD components (see Figure 9, referring to guideline EN 61340-5-2).

Figure 9: ESD packaging label

4 Transport

Transport means the complete movement of the good from the supplier to the recipient, including possible transport by sea, air and land.

Before transport the surface coating must be dry. During transport, the components must be protected against damage, contamination and moisture.

The lashing equipment for the components and loading units is selected by the supplier or forwarder himself. They are responsible for the safe handling and the use of certified and suitable equipment. Never lift or lash with direct contact between chains slings and component.

For stacking pallets with pallet frames, stacking corners are recommended. If packages or pallets are marked with instructions such as "fragile" or "do not stack", these must be observed.

Ensure safe transport and load securing according to all current laws and rules [IMO (International Maritime Organization) - guidelines for cargo securing, DIN (EN), CTU-Code, VDI 2700, German STVO].

The Incoterms define the responsibilities between Nordex and the suppliers. With regard to the aspects of transfer of risk and place of delivery, the distribution of transport costs and risks as well as the obligation to take out transport insurance and the destination, the inferences agreed between the parties from the Incoterms apply.

4.1 Land freight

Ensure safe transport and load securing according to all current laws and rules of the respective location and country.

4.2 Sea freight

Standard sea freight container should be used for oversea shipments by sea (20ft or 40ft container). The permissible payload for a 20ft container is 21.6 t (total weight 24.0 t) and for a 40ft container 26.4 t (total weight 30.4 t). Do not screw any load carriers (pallets, boxes) to the containers.

Avoid moisture and mould by keeping the loading units dry before container loading and by using desiccant bags.

4.3 Air freight

Standard air freight container should be used for oversea shipments by air (ULD-container). The permissible payload depends on the type of ULD-container that is being used. Do not screw any load carriers (pallets, boxes) to the containers.

Use light packaging materials to keep the loading weight as low as possible.

5 Storage

Defines all requirements to place and store the material in a specific storage location for future use.

The packaging must ensure that the material can be stored **indoors** for up to six months. It is not allowed to store the material outdoors.

6 Annex

Annex 1: Languages required for safety information.

Country	**Language**	**Alternative language**
Austria	German	
Belgium	French	Dutch, German
Bulgaria	Bulgarian	
Croatia	Croation	
Cyprus	Greek	
Czech Republic	Czech	
Denmark	Danish	
Estonia	Estonian	
Finland	Finish	Swedish
France	French	
Germany	German	
Greece	Greek	
Hungary	Hungarian	
Iceland	Icelandic	
Ireland	English	
Italy	Italian	
Latvia	Latvian	
Lithuania	Lithuanian	
Netherlands	Dutch	
Norway	Norwegian	
Poland	Polish	
Portugal	Portuguese	
Romania	Romanian	

Slovakia	Slovakian	
Slovenia	Slovenian	
Spain	Spanish	
Sweden	Swedish	
United Kingdom	English	
Turkey	Turkish	
Ukraine	Ukrainian	
Australia	English	
South Africa	English	
India	English	
USA	English	
Canada	English	French
Mexico	Spanish	
Peru	English	
Argentina	Spanish	
Chile	Spanish	
Uruguay	Spanish	Portuguese
Brazil	Portuguese	
Colombia	Spanish	
Luxembourg	Luxembourgish	French, German
Pakistan	not defined	
Serbia	Serbian	