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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

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Revision index

Rev.	Date	Author	Reason for modification / chapter
0	2019-05-27	Jonas Rode	First issue
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
7	2026-04-30	Tommy Reschka	- changed document structure / 2 - Glossary definitions updated / 1.2 - included air freight requirements / 2, 3, 4 - changed maximum dimensions for oversized materials / 2 - added illustration for non-mixed loading units / 2 - Tectyl 502C must be used for bare metallic surfaces / 2 - COG marking must be attached for unbalanced loading units / 3 - Nordex material number must be labeled as number and as GTIN code on the Box + Pallet label / 3

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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
ASN (AVIS)	Advanced Shipping Notification	Electronic delivery data transfer providing shipment information in advance.
COG	Center of gravity	Position of the center of the mass of an object
CP5	CP5 pallet	Container optimized standard pallet
EPAL / EURO	European pallet	European trailer optimized standard pallet (DIN 13698-1)
ESD	Electrostatic discharge	Flow of electricity between two electrically charged objects caused by contact, an electrical short, or dielectric breakdown
	Gross weight	Total weight of goods including all packaging materials (pallets, cartons, wrapping, etc.)
GTIN	Global Trade Item No.	International identification number and barcode
	Load carrier	Device to hold, bundle, handle, store and move goods (e.g. CP5 pallet)
	Load securing	Securing of cargo for transportation
LU	Loading unit	Composition of goods and packaging material
	Loading unit quantity	Quantity of parts per loading unit
	Net weight	Weight of goods excluding all packaging materials
VCI	Volatile Corrosion Inhibitor	Compound that sublimates from a carrier material to create a protective layer on metal surfaces to neutralize the corrosive effects of oxygen and moisture within an enclosed environment

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1.3 Referenced documents

Name	Definition
CLP-Regulation 1272/2008	Classification, labelling and packaging of substances and mixtures (dangerous / hazardous goods)
CTU- Guidelines	Guidelines for the packing of loads except bulk goods either in or on CTUs for transport by land or sea
DIN 55402	Marking of packages
EN 61340-5-2	Electrostatics: Protection of electronic devices from electrostatic phenomena
IATA DGR	Dangerous Goods Regulations
ICAO TIs (Doc 9284)	Technical Instructions for the safe Transport of Dangerous Goods by air
ISPM-15	International Standards for Phytosanitary Measures No.15 – to prevent the introduction and spread of harmful organisms with wood packaging

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

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2 Packaging

This chapter defines all requirements regarding packaging. The supplier is responsible for suitable packaging according to Nordex requirements. Adjustments to the packaging described must be aligned with Nordex individually. Safety data sheets of special packaging materials must be forwarded unrequested to Nordex.

2.1 General packaging instructions

The packaging must always follow the following general requirements:

- **Safe packing:** The components must be securely packed according to their function and protected against any kind of damage 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. Exposed nails, screws or staple clips are not allowed at any part of the packaging to avoid the risk of injury while handling and unpacking.
- **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).
- **Non-mixed / mixed:** Load carrier with loose / unpacked components must be non-mixed (only materials with the same material number and batch number), while load carrier with packaging boxes can be mixed (different packaging boxes; each packaging box is non-mixed). Packaging boxes and loose / unpacked components should not be transported on the same load carrier (see Figure 1).

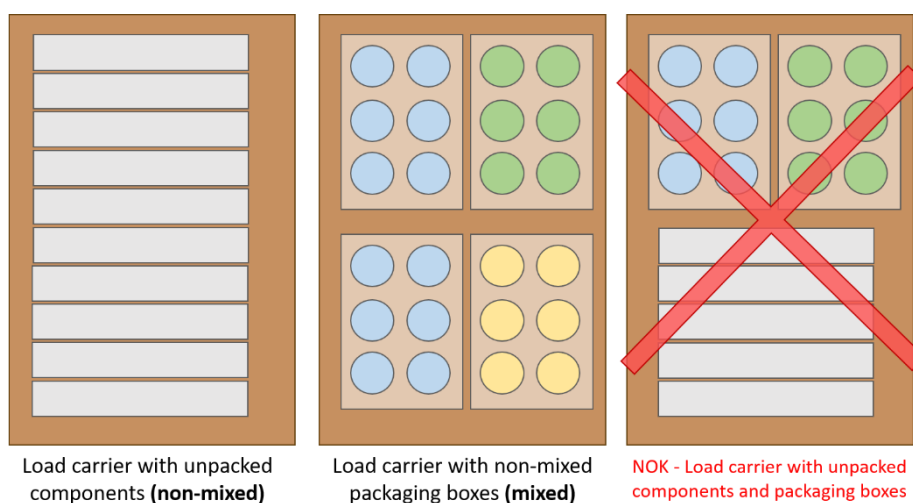


Figure 1: Acceptance of non-mixed / mixed loading units.

- **Maximum weight:** The maximum weight per packaging box is 20 kg and per loading unit 1500 kg. For air shipments carrier-specific air cargo weight limits may apply and must be aligned with the designated carrier.

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- **Maximum dimensions:** The standard dimensions for one loading unit are 1200 x 800 x 750 mm (L x W x H) for land shipments and 1140 x 760 x 750 mm (L x W x H) for sea and air shipments. The maximum dimensions are 2400 x 2200 x 2000 mm (L x W x H). For air shipments carrier-specific air cargo dimension limits may apply and must be aligned with the designated carrier.
- **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). Additionally for air freight the ICAO TIs and the IATA DGR must be followed.
- **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.
- **Multiway transport tools:** The return process of multiway transport tools must be aligned with the local Nordex plant individually.
- **Serial number requirements:** 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 (labelled according to chapter 3 with Box 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). For air freight the air transport classification (e.g. lithium batteries, electronic devices) must be verified separately under IATA DGR.
- **Corrosion protection:** Electrical components and other corrosion-sensitive materials must be protected with proper corrosion protection (e.g. desiccant bags or VCI foil packaging). Tubes and pipes must be closed with plastic caps or foil bags. Bare metallic surfaces must be protected with anti-corrosion wax "Tectyl 502C". Bare boreholes and threaded holes must be covered with plastic plugs (through holes with plugs from both sides) and protected with anti-corrosion oil "Cortec VpCI-369".
- **Touch protection:** Unpacked components must be separated by paper or cardboard (sensitive materials can be protected by edge protection additionally) – it is not required to wrap single components in plastic foil (see Figure 2).



Figure 2: Unpacked components separated by spacers / edge protections

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2.2 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 routes). 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!).

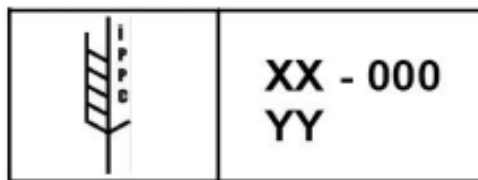


Figure 3: IPPC-label for ISPM-15-guideline

2.2.1 Reusable load carriers

Reusable load carriers should be used whenever possible. Use stacking frames or stackable cardboard boxes to hold the packed components in position and protect them while transport. A maximum of 3 stacking frames is allowed per pallet (maximum height of 550 mm per transport good). For all land shipments EURO pallets should be used and for all sea and air shipments CP5 pallets (container optimized size) should be used (see Figure 4).

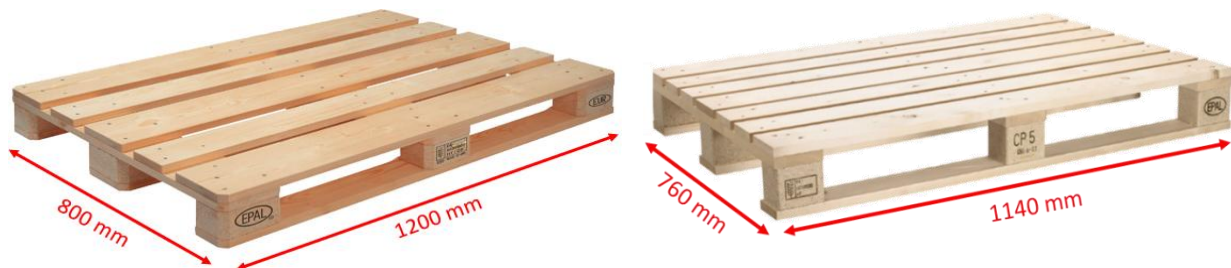


Figure 4: EURO pallet for land shipments (l.) and CP5 pallet for sea and air shipments (r.)



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

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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 (L x 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 damage. Each supply chain member needs to visually inspect the integrity of the load carrier and in case of deviations Nordex must be informed.

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2.2.2 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 (see Figure 8). The stackability must be at least 1+1.

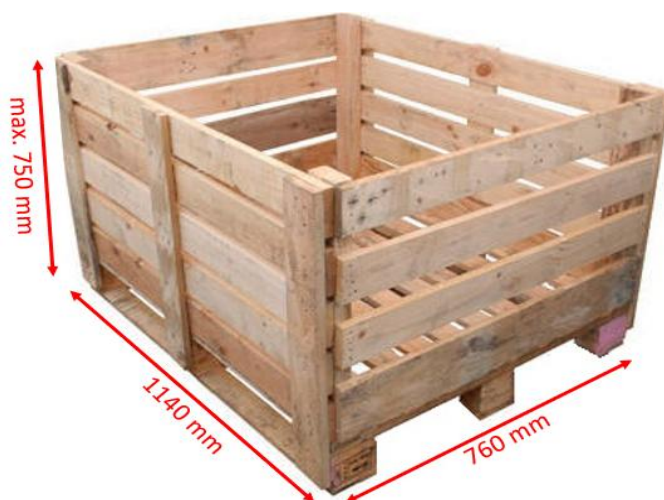


Figure 8: Disposable load carrier similar to CP5 pallet

Small materials can be packed in cardboard boxes. The maximum weight should not exceed 20 kg. The material label (Box Label) must be attached to the outside of the box.

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).

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3 Labelling

This chapter defines all requirements regarding labelling. Correct labelling is 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 electronic delivery data transfer ASN 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 (as number and as GTIN code)
- 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 comp. (as number and as GTIN code)

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- 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

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Additional Labels:

- **Prototype and 0-Series:** 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.
- **COG marking:** Loading units that do not have the center of gravity in the center of the loading unit (risk of tipping) must be labeled with COG marking on each side of the packaging.
- **Dangerous / hazardous goods:** These items 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; for air freight ICAO TIs and IATA DGR must be followed). 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:** These items 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

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4 Transport

This chapter defines all requirements regarding transport. Transport means the complete movement of the goods from the supplier to the recipient, including possible transport by land, sea and air.

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 of the affected regions.

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

All loading units should be compatible with standard sea freight containers (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

The ICAO TIs and the IATA DGR must be followed. All loading units should be compatible with standard sea freight containers (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.

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5 Storage

This chapter defines all requirements regarding storage.

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.

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6 Annex

Annex 1: Languages required for safety information.

Country	Language	Alternative language
Austria	German	
Belgium	French	Dutch, German
Bulgaria	Bulgarian	
Croatia	Croatian	
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	

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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	