Directive D-0800.7
Preservation and Packaging Specification

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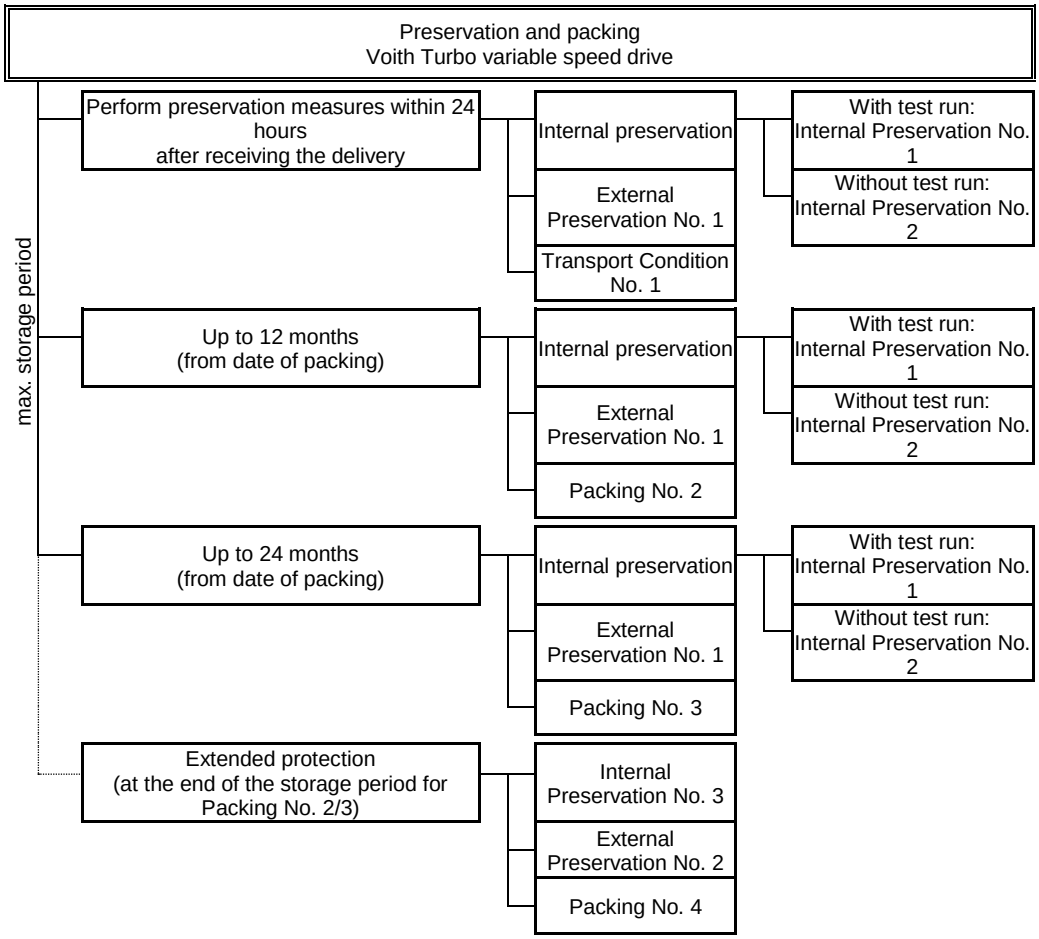
Products:	R-Coupling, S-Coupling, Vorecon, Torque Converter, Heat Exchanger, WinDrive, HyDrive		
Departments:	Sales, Design dept., Development, Quality Assurance, Projecting, Service		
Subject areas:	Preservation, packing, storage		
Confidentiality:	**released for external use (customers / subsuppliers)**		

Contents

1 Overview



Note
After delivery, Directive D-0801 (9163625-006714) applies to goods shipped without packing (Transport Condition No. 1) and to those that were unpacked. Appropriate preservation measures have to be taken within 24 hours after unpacking.

Note
After delivery, Directive D-0804 (9163625-006426) applies to packed goods (Packing No. 2/3).

Note
The specifications apply to the protection of internal and external surfaces (insofar as the surfaces are not coated and/or corrosion-resistant or made of cast aluminum) as well as to the packing of goods to be consigned.

Note
If the use of volatile/vapor corrosion inhibitor preservatives (VCI) is ensured throughout the entire packaging chain for an order, corrosion protection based on this method is also permissible if agreed upon.

Note
Observe the respective transportation specifications.

2 Kinds of Preservation and Packings

2.1 Internal preservation

2.1.1 A test run is provided (Internal Preservation No. 1)

The test oil is used for internal preservation during the test run.
If the ordering documents specify an "Inspection after the test run", spray the inner parts, as far as accessible, with solvent-free corrosion-preventing oil ("Houghton Int. Ensis Motor Oil 20" is used at the factory; for alternatives, see Directive D-0803 (9163625-006237)).

2.1.2 No test run is provided (Internal Preservation No. 2)

Spray, immerse or flush all surfaces of iron parts (including boreholes, cavities and internal surfaces of pipes) with solvent-free corrosion-preventing oil ("Houghton Int. Ensis Motor Oil 20" is used at the factory, for alternatives, see Directive D-0803 (9163625-006237)) during assembly depending on the assembly progress. Spray the assemblies during mounting as far as these are accessible.

2.1.3 Further measures for internal preservation

2.1.3.1 Vorecon

a) Fill / spray the inside with VCI preservation oil ("Bantleon Avilub VCI 1410" is used at the factory) through the upper inspection cover or accessible flanges.

Note
The quantities of VCI required depend on the product. The quantities indicated apply to Bantleon Avilub VCI1410.

The quantity of "Bantleon Avilub VCI 1410" required is according to the following formula and table:

$V_{VCI\text{-}oil}$ [l]= ($V_{nominal\ oil\ filling}$ [m³] * 1.5 + $V_{Vorecon}$ [m³]) * 0.6 [l / m³]

Vorecon shaft height [mm]	$V_{Vorecon}$ [m³]
650	1.5
710M	7
750	2.5
800M	14
850(s)	3.5
1000	7.5
1000L	8.5
1100	13.5
1200	18

b) Screw in and start the Voith Humidity Temperature Data Logger (HTDL).

Note
HTDL serves to record the relative humidity and temperature prevailing inside during the transport and storage period.

Note
For HTDL settings and scope of supply, see Voith Turbo Document 91601253300.

DANGER

Explosion hazard
HTDL is not approved for explosive atmospheres.

c) Close the vent filter (if any) using the blind flanges, or similar.

d) Close all flange openings and the shaft ends air-tight using suitable means.

e) Fill the variable speed drive inside with dry air.
Relative air humidity of the interior < 10% RH at 25°C or < 2g/kg dry air (see Mollier hx diagram).

2.1.3.2 Geard variable speed coupling (type R) and variable speed turbo coupling (type S) from coupling size 1000

a) Close the vent filter (if any) by means of a plastic cover, or similar.

b) Close the flange openings and shaft ends air-tight using suitable means.

c) Fill the variable speed drive inside with dry air.
Relative air humidity of the interior < 10% RH at 25°C or < 2g/kg dry air (see Mollier hx diagram).

Internal preservation is not necessary for the variable speed turbo coupling using water as operating medium (type SVTW).

2.2 External Preservation No. 1

a) Painting shall be applied as specified in the ordering documents.

b) Coat bright iron parts with film-forming, water-displacing anticorrosive agent (application by means of painting/spraying; "Shell Gadus S2 V100 2" is used at the factory).

2.3 Packing

Note
Maximum transportation and storage period is dependent on the kind of packing and is valid from the date of packing.

2.3.1 Transport Condition/Packing No. 1

Overland/air transport for immediate use at the destination and/or storage in a closed building with low temperature fluctuations (<3K during the daily cycle).

Note
Perform preservation measures within 24 hours after receiving the delivery.

a) Means suitable for transport (e.g. shipping crate, holder, support).

b) Weather protection provided by the means of transport or a tarpaulin (has to be ensured by the person responsible for shipment).

Note
Variable speed drives that are shipped by VTCR with "Transport Condition No. 1" are not suitable for a storage without taking corresponding preservation measures. In case of a storage, it is necessary to check and document the relative humidity (e.g. by means of HTDL) in regular intervals.

2.3.2 Packing No. 2

Sea transport and/or storage (in the packing up to 12 months).

Note
Max. storage period with "Packing No. 2" is 12 months from the date of packing.

a) Means suitable for transport (e.g. shipping crate, holder, support)

b) Packing is made in accordance with the latest edition of the packing directives of the Bundesverbandes Holzpackmittel-Paletten-Exportverpackung (HPE) e.V. (Federal Association for wood packing materials-pallets-export packing (WPE) e.V.

c) Sharp edges and contact zones are rounded off by flexible materials.

d) Shrink-wrapped in PE foil with low density (PE-LD, > 0.2 mm thick) according to DIN 55530; water vapor permeability of PE foil $WVP_{Climate\ B}$ = 2 g/m²/24h (tropical test climate B: 38°C, 90% rel. humidity) or $WWP_{Climate\ E}$ = 0.4 g/m²/24h (moderate test climante E: 20°C, 85% rel. humidity) according to DIN 53122-2.

e) Desiccant bag as per DIN 55473. The desiccant shall be packed in a dustproof bag (type D).

f) Required desiccant units in accordance with DIN 55474 for permissible final humidity level < 40% relative humidity.

g) Sheathing by means of a wooden crate suitable for transportation.
Ensure that the load is supported accordingly.
Smaller spare parts will be packed in a waterproof cardboard.

h) Line the inside of the crate lid with sealed ribbed PE sheets (Akylux). PVC foil is put underneath at butt joints.

i) For checking relative humidity, integrate a humidity control window (d = 90 mm) with moisture indicator (30, 40, 50 % RH) into the PE foil (recommendation: big humidity control window, Art. No. Z004101 with 3701, make CLARIANT Produkte (Deutschland) GmbH, Ostenriederstraße 15, D-85368 Moosburg; or similar product); fit a swiveling lid to the box/crate located in front of the control window (recommendation: swiveling lid with ventilation slots, form B 180, Art. No. 143 32 01 00, make CLARIANT Produkte (Deutschland) GmbH, Ostenriederstraße 15, D-85368 Moosburg, or similar product).

2.3.3 Packing No.3

Sea transport and/or storage (in the packing up to 24 months).

Note
Max. storage period with "Packing No. 3" is 24 months from the date of packing.

a) Means suitable for transport (e.g. shipping crate, holder, support)

b) Packing is made in accordance with the latest edition of the packing directives of the Bundesverbandes Holzpackmittel-Paletten-Exportverpackung (HPE) e.V. (Federal Association for wood packing materials-pallets-export packing (WPE))

c) Sharp edges and contact zones are rounded off by flexible materials.

d) Shrink-wrapped in aluminum compound foil according to DIN 55531; water vapor permeability of aluminum compound foil WVP Climate B = 0.1 g/m²/24h (tropical test Climate B: 38 °C, 90 % RH) to DIN 53122-2 1.

e) Desiccant bag as per DIN 55473. The desiccant shall be packed in a dustproof bag (type D).

f) Required desiccant units in accordance with DIN 55474 for permissible final humidity level ≤ 40% RH.

g) Sheathing by means of a wooden crate suitable for transportation.
Ensure that the load is supported accordingly.
Smaller spare parts will be packed in a waterproof cardboard.

h) Line the inside of the crate lid with sealed ribbed PE sheets (Akylux). PVC foil is put underneath at butt joints.

i) For checking relative humidity, integrate a humidity control window (d = 90 mm) with moisture indicator (30, 40, 50 % RH) into the PE foil (recommendation: big humidity control window, Art. No. Z004101 with 3701, make CLARIANT Produkte (Deutschland) GmbH, Ostenriederstraße 15, D-85368 Moosburg; or similar product); fit a swiveling lid to the box/crate located in front of the control window (recommendation: swiveling lid with ventilation slots, form B 180, Art. No. 143 32 01 00, make CLARIANT Produkte (Deutschland) GmbH, Ostenriederstraße 15, D-85368 Moosburg, or similar product).

3 Extended Protection

(at the end of the maximum storage period)

Note
For the extended protection, it is recommended asking for Voith Turbo service staff to check/renew the internal preservation and packing.

3.1 Internal Preservation No. 3

a) Check the condition of the preservation.

b) Spray all runner parts, all wall surfaces and, as far as possible, all pipes with solvent-free corrosion-preventing oil (e.g. "Houghton Int. Ensis Motor Oil 20"; for alternatives, see 3625-006237), rotate the runner parts while spraying.
Filling additionally with VCI preservation oil is permissible (for quantity required of "Bantleon Avilub VCI 1410", see Chapter 2.1.3.1).

c) Fill the variable speed drive inside with dry air.
Relative air humidity of the interior < 10% RH at 25°C or < 2g/kg dry air (see Mollier hx diagram).

Internal preservation is not necessary for the variable speed turbo coupling using water as operating medium (type SVTW).

3.2 External Preservation No. 2

a) Check the external preservation.

b) If necessary, mend according to External Preservation No. 1.

3.3 Packing No. 4

Replace the desiccant. Also renew the packing (according to Packing No. 2/3) as the foils are not resistant to ultraviolet rays.

4 Container for Spare Parts

4.1 External preservation

a) Painting shall be applied as specified in the ordering documents.

b) Coat bright iron parts with film-forming, water-displacing anticorrosive agent (application by means of painting/spraying; "Shell Gadus S2 V100 2" is used at the factory; before installing the machines or parts, clean corresponding surfaces with solvent (white spirit or petroleum)).

4.2 Internal preservation

a) Spray, immerse or flush all surfaces of iron parts (including boreholes, cavities, internal surfaces of pipes and container surfaces) with solvent-free corrosion-preventing oil ("Houghton Int. Ensis Motor Oil 20" is used at the factory, for alternatives, see Directive D-0803 (9163625-006237)) during assembly depending on the assembly progress. Spray complete assemblies during mounting as far as these are accessible.
Alternatively/additionally, VCI preservation oil may be used ("Bantleon Avilub VCI 1410" is used at the factory).
Filling quantity: $V_{VCI\ oil}$ [l]= $V_{container}$ [m³] * 0.6 [l / m³]

b) After the container was closed, fill it with nitrogen.
- Setting of pressure relief valve: 0.2 bar
- For a sufficient preservation, flush the container with 8 to 10 times of the container volume (for quantities required, see the project-specific assembly plans).
- Flow rate: 20 l/min.
- Reference values for the number of gas bottles required:

Bottle size [l]	Filling pressure [bar]	Gas content (@15°C/1bar) [m³]	Sufficient container volume (10 times the flushing quantity) [m³]	Flushing duration at 20 l/min. [h]
5	200	1.18	0.12	1
10		1.91	0.19	1.6
20		3.82	0.38	3.2
50		9.55	0.96	8.0

- Filling pressure: 0.1 bar

DANGER

Suffocation hazard
There is the risk of suffocation when handling nitrogen.
Personal protective equipment (PPE) is required.

DANGER

Suffocation hazard!
There is the risk of suffocation when handling nitrogen.
Do not flush or fill containers close to cellars or low-lying rooms.

4.3 Packing

A special packing is not required.
The container is equivalent to a seaworthy packing.