

Transport of Hydraulic Accumulators

Transport regulations



Diaphragm accumulator type AC
Piston type accumulator type HPS

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Printing date / document generated on: 17.08.2018

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1 Transport of accumulators

When in a state ready for use, accumulators are filled with a gas under pressure which generates what is known as the gas filling pressure. Nitrogen (N₂) is normally used as the filling gas. Objects under pressure are deemed to be dangerous goods and are thus subject to certain statutory regulations.

HAWE supplies diaphragm accumulators as per technical documentation D 7969 and piston type accumulators as per documentation D 7969 HPS.



Warning

Risk of injury due to incorrect transportation

Risk of minor injury

- Comply with the regulations on transportation and safety.
- Wear protective gloves and safety shoes.



Note

Storage of accumulators

- Protect from direct sunlight.
- Protect from soiling.
- Recommendation with long storage periods: Reduce gas pre-load pressure to approx. 10 bar.
- Close connection liquid side e.g. with a plastic plug.

2 Accumulators without gas filling pressure

Accumulators without gas filling pressure are not dangerous goods and are thus subject to normal transport regulations.

Accumulators without gas filling pressure can be shipped via all means of transport without restriction.



Note

When transporting accumulators without gas filling pressure, we recommend using the following designation in the shipping documents:

- Empty accumulator or
- Accumulator, not pressurized

3 Accumulators with gas filling pressure

Accumulators with gas filling pressure are dangerous goods and are assigned the UN Number 3164.

UN 3164: ARTICLES, PRESSURIZED, PNEUMATIC or HYDRAULIC (containing non-flammable gas)



Danger

Risk of asphyxiation with escape of nitrogen

With damage to accumulators nitrogen may escape. In high concentrations nitrogen has an asphyxiating effect.

- Accumulators must be stored so that they cannot tip over or fall during transportation.
- Packages must not be thrown or subjected to impacts/shocks.
- Transport in vehicles whose loading space is separated from the operator's cab.
- The operator must be familiar with the possible hazards of the consignment.
- The operator must know what should be done following an accident or emergency.
- Passage forbidden through tunnels of category E.



Danger

Risk of explosion with accumulators filled with nitrogen

Heat / effect of fire may cause the container to burst / explode.

- Protect accumulators from overheating, e.g. through sunlight or fire.
- Regularly inspect accumulators for damage to surfaces or material.

3.1 Road and rail transport

Transport by road is subject to the dangerous goods regulations, the **European Agreement on the International Carriage of Dangerous Goods by Road (ADR)**.

Transport by rail is subject to the dangerous goods regulations, the **Regulations concerning the International Carriage of Dangerous Goods by Rail (RID)**.



Note

This generally means that accumulators with gas filling pressure may in conformity with the stipulated construction (Special Provision 594, b) be transported as non-dangerous goods where packaged in a strong (stable) outer packaging.



Note

Exemption from the dangerous goods regulations is permitted with application of the following Special Provisions where their regulations are observed.

Special Provision 283

Articles, containing gas, intended to function as shock absorbers, including impact energy-absorbing devices, or pneumatic springs are not subject to the regulations provided:

- a) Each article has a gas space capacity not exceeding 1.6 litres and a charge pressure not exceeding 280 bar where the product of the capacity (litres) and charge pressure (bars) does not exceed 80 (i.e. 0.5 litres gas space and 160 bar charge pressure, 1 litre gas space and 80 bar charge pressure, 1.6 litres gas space and 50 bar charge pressure, 0.28 litres gas space and 280 bar charge pressure);
- b) Each article has a minimum burst pressure of 4 times the charge pressure at 20 °C for products not exceeding 0.5 litres gas space capacity and 5 times charge pressure for products greater than 0.5 litres gas space capacity;
- c) Each article is manufactured from material which will not fragment upon rupture;
- d) Each article is manufactured in accordance with a quality assurance standard acceptable to the competent authority; and
- e) The design type has been subjected to a fire test demonstrating that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, such that the article will not fragment and that the article does not rocket.

Special Provision 594

The following articles, manufactured and filled according to the provisions applied in the country of manufacture, are not subject to the regulations of ADR/RID:

- a) UN 1044: fire extinguishers provided with protection against inadvertent discharge;
- b) UN 3164: Articles, pressurized pneumatic or hydraulic, designed to withstand stresses greater than the internal gas pressure by virtue of transmission of force, intrinsic strength or construction.

3.2 Transport by sea

Transport by sea is subject to the dangerous goods regulations, the **International Maritime Dangerous Goods Code (IMDG)**.

i Note

This generally means that accumulators with gas filling pressure must be treated as dangerous goods in maritime transport and prepared for carriage accordingly.

i Note

Exemption from the dangerous goods regulations is permitted with application of the following Special Provisions where their regulations are observed.

Special Provision 283

Articles, containing gas, intended to function as shock absorbers, including impact energy-absorbing devices, or pneumatic springs are not subject to the regulations provided:

- a) Each article has a gas space capacity not exceeding 1.6 litres and a charge pressure not exceeding 280 bar where the product of the capacity (litres) and charge pressure (bars) does not exceed 80 (i.e. 0.5 litres gas space and 160 bar charge pressure, 1 litre gas space and 80 bar charge pressure, 1.6 litres gas space and 50 bar charge pressure, 0.28 litres gas space and 280 bar charge pressure);
- b) Each article has a minimum burst pressure of 4 times the charge pressure at 20 °C for products not exceeding 0.5 litres gas space capacity and 5 times charge pressure for products greater than 0.5 litres gas space capacity;
- c) Each article is manufactured from material which will not fragment upon rupture;
- d) Each article is manufactured in accordance with a quality assurance standard acceptable to the competent authority; and
- e) The design type has been subjected to a fire test demonstrating that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, such that the article will not fragment and that the article does not rocket.

3.3 Air freight

Air freight is subject to the dangerous goods regulations, the **IATA - Dangerous Goods Regulations (DGR)**.

**Note**

This generally means that accumulators with gas filling pressure must be treated as dangerous goods and shipped according to the regulations.

The country-specific supplementary conditions (State Variations) are of importance here.

For carriage a Shipper's Declaration must be drawn up by a trained member of staff.

**Note**

Exemption from the dangerous goods regulations is permitted with application of the following Special Provisions where their regulations are observed.

Special Provision A 114

Articles, containing gas, intended to function as shock absorbers, including impact energyabsorbing devices, or pneumatic springs are not subject to these regulations, provided:

- a) Each article has a gas space capacity not exceeding 1.6 litres and a charge pressure not exceeding 280 bar where the product of the capacity (litres) and charge pressure (bars) does not exceed 80 (i.e. 0.5 litres gas space and 160 bar charge pressure, 1 litre gas space and 80 bar charge pressure, 1.6 litres gas space and 50 bar charge pressure, 0.28 litres gas space and 280 bar charge pressure);
- b) Each article has a minimum burst pressure of 4 times the charge pressure at 20 °C for products not exceeding 0.5 litres gas space capacity and 5 times charge pressure for products greater than 0.5 litres gas space capacity;
- c) Each article is manufactured from material which will not fragment upon rupture;
- d) Each article is manufactured in accordance with a quality assurance standard acceptable to the competent authority; and
- e) The design type has been subjected to a fire test demonstrating that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, such that the article will not fragment and that the article does not rocket.