



ÖNORM M 7137

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Also standards group H

ICS 75.160.10

Compressed wood in natural state – Woodpellets Requirements for storage of pellets at the ultimate consumer

Presslinge aus naturbelassenem Holz – Holzpellets – Anforderungen an die
Pelletslagerung beim Endkunden

Comprimés de bois non traité ou d'écorce non traitée – Granulés – Exigences pour le
stockage des granulés chez le client final

Continuation
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Preliminary note

To assure the quality of pellets according to ÖNORM M 7135 from the producer to firing, this ÖNORM specifies relevant requirements for the storage of pellets by consumers.

ÖNORM M 7135 lays down requirements and test procedures for pellets. The requirements and test procedures for automatically stoked furnaces are defined in ÖNORM EN 303-5.

Requirements for transport and storage are specified in ÖNORM M 7136.

Storage rooms of consumers built according to this ÖNORM shall assure operating safety, fire protection, compliance with static requirements and the preservation of pellet quality.

1 Scope

This ÖNORM applies to pellets HP1 according to ÖNORM M 7135 and specifies requirements for the construction and equipment of pellet storage rooms of consumers. It is intended for all persons wanting to build or equip such storage rooms.

2 Normative references

The following documents specifying standards contain regulations that, by reference in this text, shall be part of this ÖNORM Standard. Dated references do not include subsequent modifications or revisions of these publications. However, it is recommended to contract parties that apply this ÖNORM Standard to check whether it would be possible to use the latest issues of the documents specifying standards as listed below. In the case of undated references, the latest issue of the relevant document specifying standards shall be used. Any legal provisions shall be applied as amended.

ÖNORM M 7135	Compressed wood and compressed bark in natural state – Pellets and briquettes – Requirements and test specifications
ÖNORM M 7500 (all parts)	Heat requirement for buildings
DIN 14309	Aluminium alloy solid coupling type A, with sealing ring for pressure and suction purposes; nominal pressure 16
DIN 14323	Aluminium alloy delivery and suction coupling type A; nominal pressure 16
TRVB H 118	Automated wood firing systems

3 Terms and definitions

For the use of this ÖNORM, the following definition applies:

storage tank

tank that is covered at all sides and set up independently of other building structures

This includes, for instance, tanks made of metal, plastics, wood or textile fabrics.

4 Requirements

4.1 General requirements

4.1.1 Location of the storage room

The transport vehicle shall be able to get sufficiently close to the injection connectors that the quality of the pellets is not affected significantly by the mechanical stress during the filling process.

If the storage room is filled by a lorry with a bin container, the hose length should not exceed 30 m.

The relevant access routes shall be adequate for the transport vehicles used. In the case of heavy lorries, a minimum road width of 3 metres and a minimum headroom of 4 metres are required.

4.1.2 Building requirements

Any walls and supporting parts shall be constructed in such a way that they can bear the corresponding static loads.

4.1.3 Fuel demand

The storage room should be large enough to hold the fuel needed for one heating period. The fuel needed for one heating period is assumed to be between 0.6 m^3 and 0.7 m^3 pellets per kW heat load. The heat load may be calculated according to ÖNORM M 7500.

NOTE:

1 m^3 of pellets corresponds to a mass of approximately 650 kg.

4.1.4 Protection against moisture and wetness

The storage rooms shall be protected against penetration of moisture both during storage and filling. In addition, any condensation of water (e.g. on exposed water pipes) must be prevented.

Since pellets may absorb air humidity, the storage room should not be ventilated.

4.1.5 Dust protection

The storage room shall be dustproof at all sides.

4.1.6 Installations

Any electrical installations, water and waste water fittings as well as any other installations, wirings and fittings shall be concealed and adequately insulated and protected against mechanical stress. In addition, the requirements of TRVB H 118 shall be met.

For reasons of safety, a storage room according to 4.2 shall not be equipped with any exposed electrical installations (lamps, wirings, distributing boxes, wall outlets, light switches, etc.).

4.1.7 Access to the storage room

Access to the storage room shall be ensured in such a way that necessary maintenance and cleaning operations can be carried out.

4.1.8 Fire protection

The basic fire protection requirements for pellet storage rooms according to TRVB H 118 shall be met.

NOTE:

In addition, any applicable legal provisions shall be observed.

4.1.9 Injection connectors and injection pipes

When the storage room is filled from a lorry with a bin container, the following requirements shall be met:

- The injection and suction connectors should preferably lead to outdoor areas. In any case, sufficient space for turning the vehicles to connect the injection hoses shall be provided.
- Injection pipes should be as short as possible (maximum length 10 m) and changes of direction shall be reduced to a minimum. In the case of changes of direction, only curves shall be used.
- If the injection connectors are not located outdoors and the injection pipes pass other rooms, these rooms shall be designed according to TRVB H 118.
- The injection and suction connectors shall be made of metallic materials and shall be installed as to prevent torsion. They shall be earthed.
- The coupling of the injection connector shall either be a delivery and suction coupling according to DIN 14323-A, but for hoses with inside diameters of $d = 100 \text{ mm}$, or it shall be a solid coupling according to DIN 14309-A, but with a G 4" thread (corresponding to A/110).
- The coupling of the suction connector shall either coincide with the one for the injection connector or be a coupling for hoses with inside diameters of 150 mm (F/150).
- After filling, the connectors shall be tightly closed by corresponding cap couplings.

4.1.10 Acoustic insulation

Any bearings and fixings as well as wall bushings for feed systems shall be built in such a way that the transmission of structure-borne noise to the building is prevented.

4.1.11 Measures against accumulation of fines

The manufacturers of the boiler and feed systems have to provide information on the intervals at which the storage room shall be emptied completely and on the way possible accumulations of fines shall be treated.

4.2 Storage rooms

The ideal storage room should have a rectangular ground plan. The injection and suction connectors should be located at one of the narrow sides. If possible, the storage room should have one external wall, which also holds the connectors.

NOTE:

On grounds of technical equipment, as a rule only approximately $\frac{2}{3}$ of the storage room volume is actually available as a filling volume for pellets.

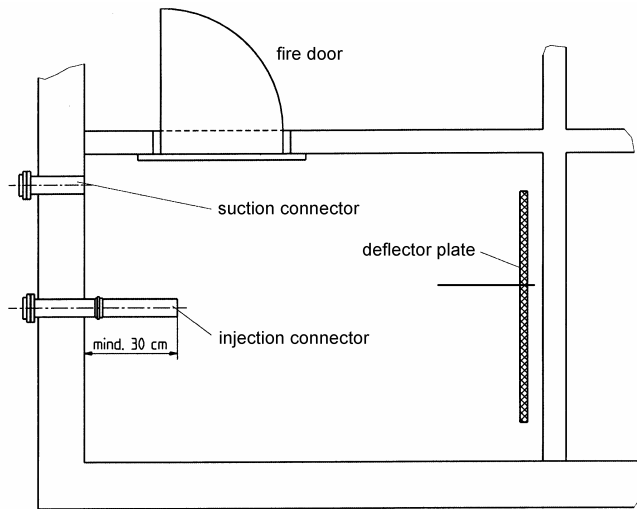


Figure 1 – View of a pellet storage room from above

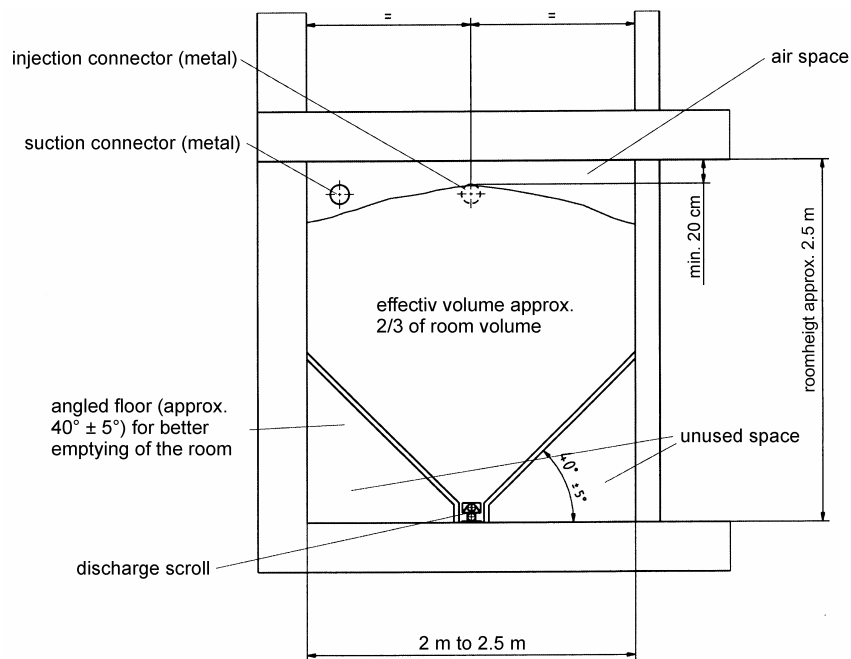


Figure 2 – Cross-section of a pellet storage room

4.2.1 Protection against moisture and wetness

Protection against rising moisture in the walls shall be ensured.

4.2.2 Dust protection

Special care should be taken to ensure a dust-proof door or access hatch (see [Figure 3](#)).

In order to prevent dust from being carried to other rooms, any existing installations (e.g. wall outlets, light switches, distributing boxes, etc.) shall be removed, and all corresponding openings shall be closed and plastered.

4.2.3 Building requirements

4.2.3.1 Walls and ceilings

The walls of the storage room as well as their connections with the surrounding building structures shall be constructed appropriately, according to the relevant technical rules.

The ceilings and walls shall be designed in such a way that the fuel is not contaminated due to abrasion or separation of particles.

With regard to fire resistance classes, the requirements of TRVB H 118 shall be met.

4.2.3.2 Access to the storage room

The door or access hatch shall correspond at least to fire resistance class T30 and shall open outwards. At the interior side, a pressure relief against the stored pellets is required so that the room is accessible at any time.

NOTE:

If possible, the door should be near the injection connector. In this way, the storage room will remain accessible for the longest possible time, because during the filling process the pellets will accumulate at the wall opposite the injection connector.

The pressure relief device for the door may consist of large wooden boards or groove-and-tongue boards that are laterally fitted into corresponding profiles.

It is recommended to provide an optical filling check device (e.g. a window).

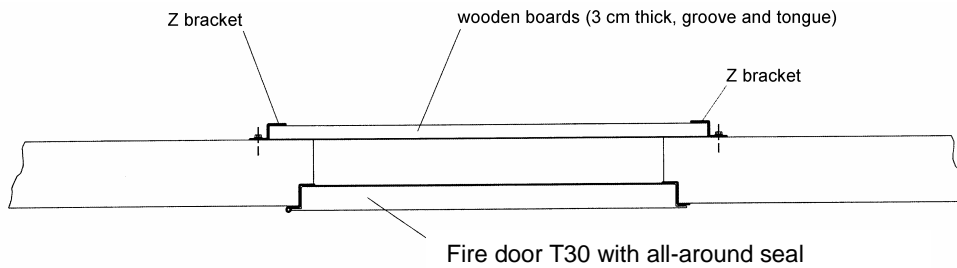


Figure 3 – Installation situation of a storage room door

4.2.4 Equipment

4.2.4.1 Injection and suction connectors

The injection and suction connectors shall be labelled permanently and unambiguously as such. The length of the storage room, measured towards the injection connector, shall be mentioned on a plate near the couplings.

The connectors shall be mounted to the same wall, at a minimum distance of 20 cm (measured between ceiling and upper pipe edge) to the ceiling.

The suction pipe shall be flush with the wall at the interior side of the room and should be located near the door.

The injection pipe should be installed centrally in the wall and at least 30 cm of the pipe should extend into the room.

Connectors mounted in subterranean cellar windows (light wells) shall be led upwards in a curve (see Figure 4) so that the couplings are freely accessible. 90°-curves shall be avoided.

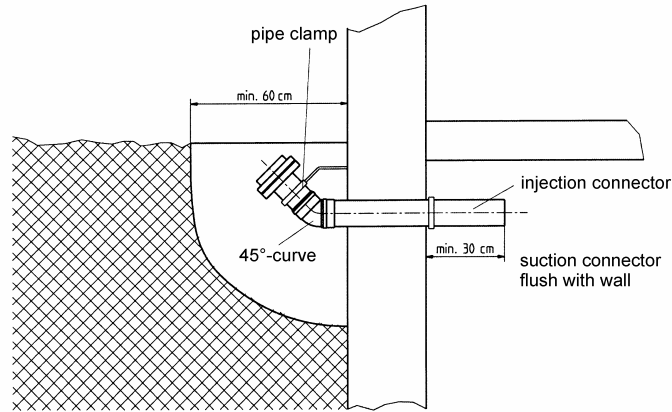


Figure 4 – Injection and suction connectors in a light well

If, due to the specific situation of the room, a standard configuration is not possible, special solutions may be adopted after consultation with experts of a specialized company (e.g. storage rooms that have to be fed from the longer side – two filling connectors or diagonal filling, see [Figures 5 and 6](#)).

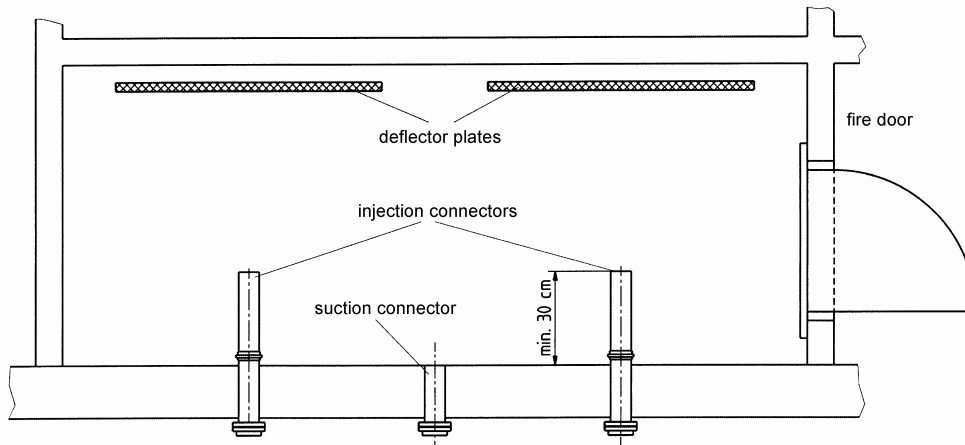


Figure 5 – Pellet storage room with connectors at the longer side of the room

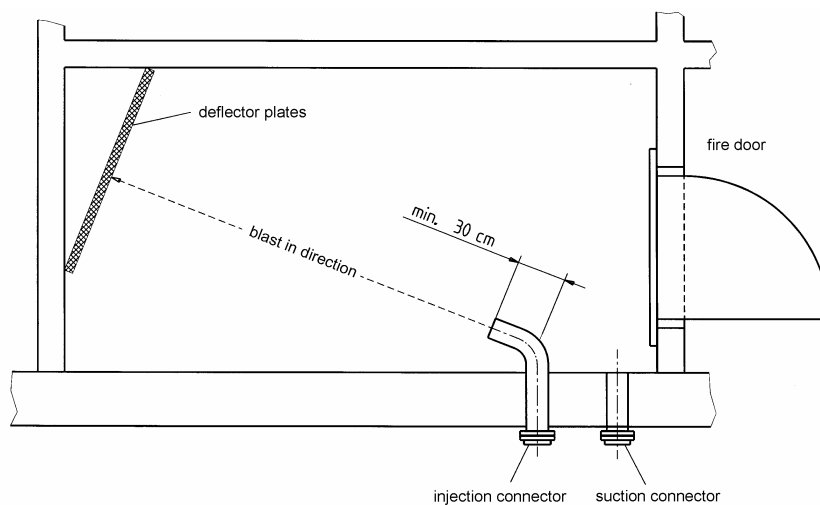


Figure 6 – Pellet storage room with diagonal injection connector end for better filling of the storage room

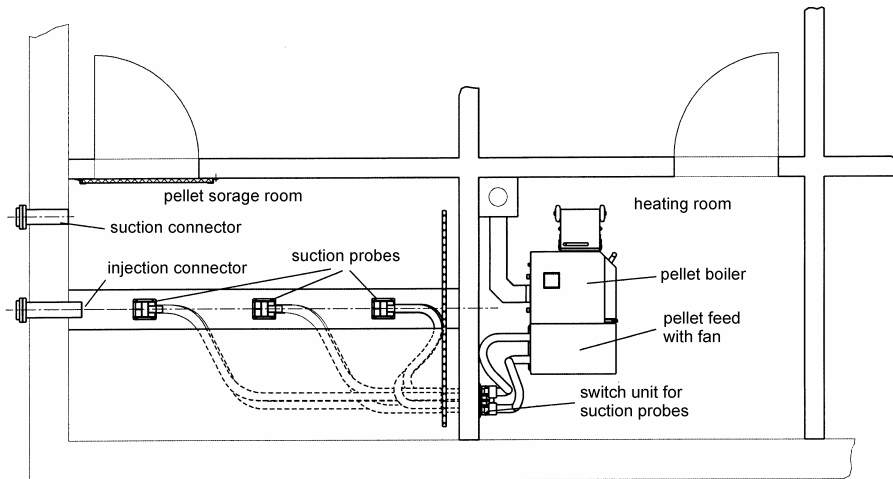


Figure 7 – Pellet storage room and heating room with fan feed

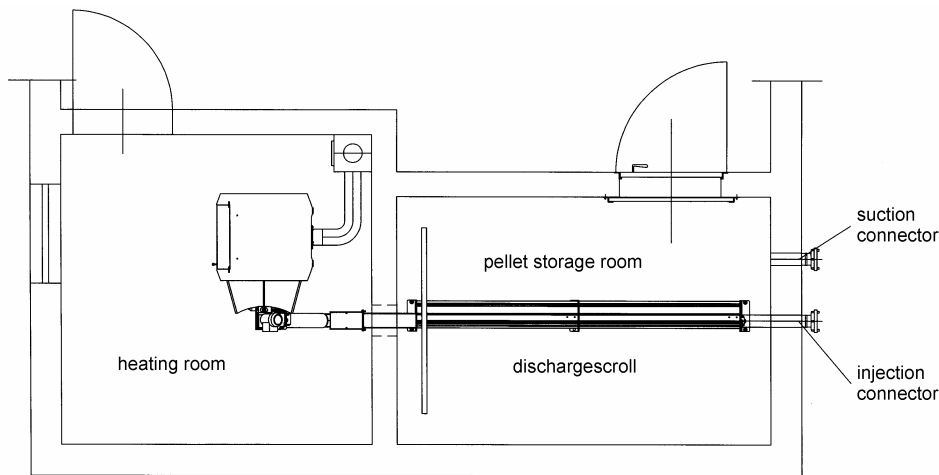


Figure 8 – Pellet storage room and heating room with screw feed

4.2.4.2 Deflector plate

It is necessary to mount a deflector plate resistant to abrasion and tearing. It shall be placed in a right angle to the injecting direction or in front of the wall opposite the injection connector.

NOTE:

HDPE sheets of a thickness of 1 mm or more, sized 1.5 m x 1.5 m, have proved to be a reliable deflector plate.

4.2.4.3 Wall outlet for suction fan

A wall outlet with a voltage of 230 V and 16 A fuse protection has to be accessible outside the storage room.

4.2.4.4 Angled floor

The angled floor (see Figure 2) shall be mounted at an angle of 40°. Deviations of $\pm 5^\circ$ are permitted. The angled floor shall not deform under static load and shall have a smooth, non-abrasive surface (e.g. floor with melamine resin coating or hard-board with the smooth side facing upwards).

NOTE:

In order to ensure an unobstructed transport of the pellets to the feeding system, edges or ridges shall be avoided.

4.3 Buried tanks

4.3.1 Protection against moisture and wetness

Buried tanks shall be produced free of joints. Both the tank and the tank cover shall be made of non-corrosive and weatherproof materials. The chosen materials shall permanently prevent the access of moisture to the fuel.

The tank cover shall close the tank in a water-tight way, the fittings of the tank cover shall permit water-tight closing, or other equivalent measures shall be taken to ensure that no water may permeate into the tank.

Any uncontrolled air exchange between the tank and the outdoor environment is inadmissible.

The tank shall be equipped with a dome shaft with a walk-on or drive-on cover that prevents rain water from entering the dome shaft.

The connection between the tank and the dome shaft shall be water-tight.

The connections between the protection pipe and the pipes leading to the dome shaft as well as the connection between the protection pipe and the cellar shall be water-tight (see Figure 9).

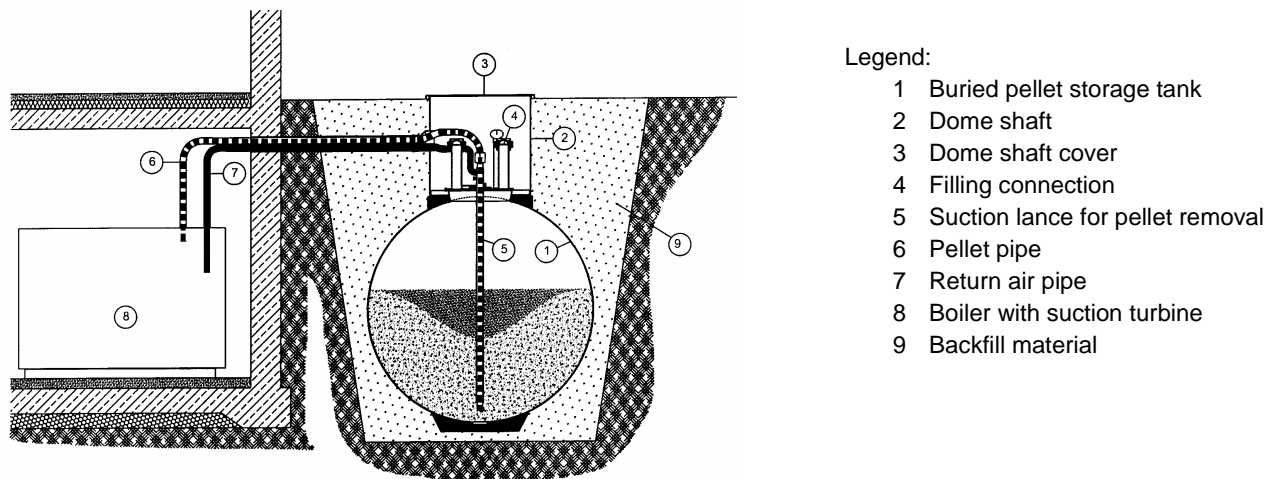


Figure 9 – Storage tank for subterranean storage of wood pellets outside the building

4.3.2 Protection against electrostatic charge

All conductive parts of the tank, of the tank cover as well as of all connecting fittings and of the removal system shall be earthed. Since electrostatic charging is possible, the storage tank shall be designed in such a way that ignition by sparking is excluded. The manufacturer of the tank has to submit the respective proof.

4.3.3 Building requirements

The walls of the tank shall be constructed in such a way that they can bear the static loads occurring during and after the installation of the tank.

The tank and the heating cellar shall be connected by means of a protection pipe that runs underground at a minimum depth of 300 mm and through which the earthed pipes of the removal system and other piping shall be conducted.

4.3.4 Equipment

The tank shall be equipped with a conveying system suitable for the discharge of pellets when the tank cover and the fittings are closed.

Residual quantities in the tank that cannot be removed shall not exceed 5% of the nominal volume of the tank.

The couplings (for specifications see 4.1.9) shall be freely accessible in the dome shaft of the tank; they shall be arranged in a way to permit easy filling and emptying of the tank.

After filling, the connectors shall be tightly closed appropriate cap couplings.

4.3.5 Fire protection

The basic fire protection requirements according to TRVB H 118 shall be met.

4.4 Storage tanks

4.4.1 Building requirements

Metal tanks shall be earthed and protected against corrosion.

In the case of tanks made of non-conductive materials, any conductive parts as well as all connecting fittings and the removal system shall be earthed. Since electrostatic charging may occur, the tank shall be designed in such a way that ignition by sparking is excluded. The manufacturer of the tank has to submit the respective proof.

Flexible storage tanks shall be placed at a sufficient distance to walls and ceilings to ensure access by installation staff and to prevent damage to the fabric caused by rubbing along walls.

In the case of flexible storage tanks, antistatic materials shall be used.

4.4.2 Injection and suction connectors

Injection and suction connectors may be conducted outwards through the exterior wall of the room where the tank is placed, or, if a direct opening outwards exists like a window, door or cellar well, they may be attached directly to the storage tank.

In the case of tanks without suction connectors (e.g. flexible storage tanks), it must be possible to conduct the air removed from the tank out of the room (e.g., through an open door or window during filling).

If the suction fan is to be placed outdoors, a distance of approx. 2.5 m between the suction connector of the tank and an opening to the outside (e.g., a window) shall not be exceeded (see [Figures 10](#) and [11](#)).

4.4.3 Fire protection

The basic fire protection requirements according to TRVB H 118 shall be met.

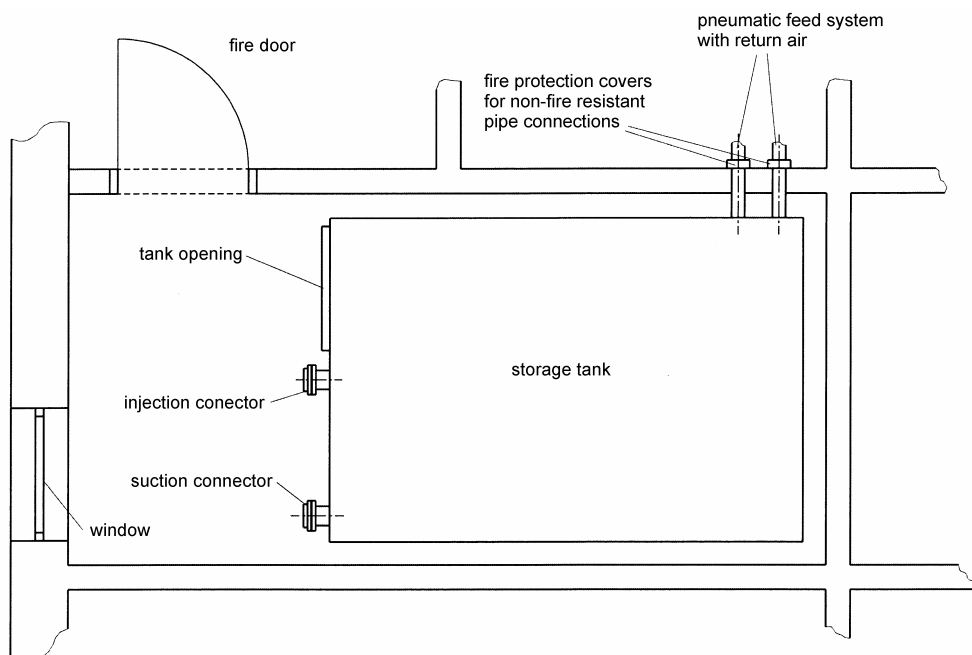


Figure 10 – Example of the installation of a pellet storage tank with interior connectors

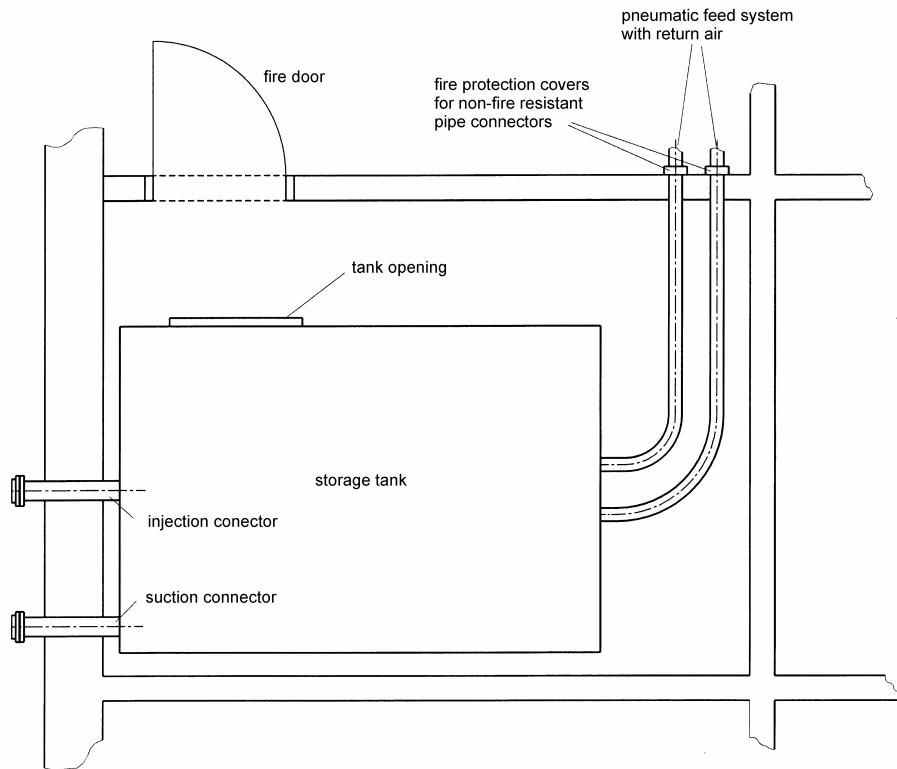


Figure 11 – Example of the installation of a pellet storage tank with exterior connectors

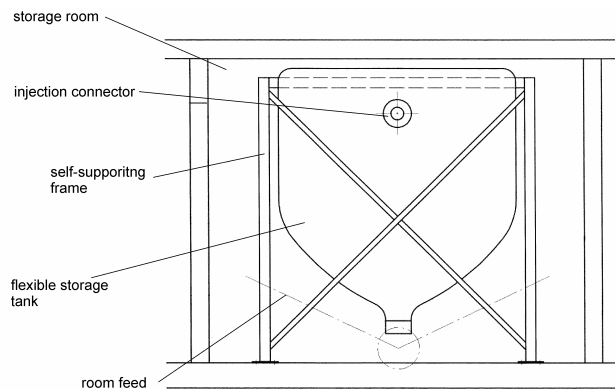


Figure 12 – Example of a flexible storage tank made of textile fabric

4.5 Storage room for small quantities

For small quantities, either in bulk or packaged, the requirements given in 4.1 shall apply mutatis mutandis. Easing of the relevant fire protection regulations may be granted in accordance with the applicable local legislation.

Annex A (informative): Bibliography

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|----------------|---|
| ÖNORM B 3350 | Load bearing walls – Calculation and construction |
| ÖNORM M 7136 | Compressed wood in natural state – Woodpellets – Quality assurance in the field of logistics of transport and storage |
| ÖNORM EN 303-5 | Heating boilers – Part 5: Heating boilers for solid fuels, hand and automatically stocked, nominal heat output of up to 300 kW – Terminology, requirements, testing and marking |