TECHNICAL BULLETIN

Prepared by WG-2 TB 13/20 – November 2020

Safe Design, Use and Inspection of Cylinder Pallets

Cylinder pallets are widely used within the industrial gas industry. They secure cylinders safely during transport, storage and filling. The maximum number of large cylinders, (usually up to 50 litres) placed into a pallet, varies typically from between 4 to 18 cylinders. There are no specific CEN or ISO standard for the design and use and inspection of such pallets for gas cylinders.

Pallet Design

For a safe pallet the following points shall be considered at the design stage:

- Define the cylinder types (dimensions) and quantity, which should be transported within the cylinder pallet design.
- Define the maximum pallet dimensions (width, depth and height) and weight (gross weight), that have to fit with the truck and forklift system in use.
- Durable construction of the base area to resist distortion due to loading and unloading of cylinders into and out of the pallet along with shock loading from cylinder movement during transport.
- The base area should be designed in a way to avoid any accumulation of water, ice, snow, or debris which can promote corrosion of the cylinders bottom, especially the ones with foot rings. The use of metallic gratings, complying with the need for overall resistance and stiffness should be considered.
- Resistant to impact damage due to forklift operations. The forklift pockets and lifting lugs (hooks) shall be compatible with the handling equipment.
- The resistance of the pallet to corrosion shall be considered relative to its field of application. In particular if a hollow section is used, corrosion can occur inside if unprotected. It is recommended that pallets are galvanised.
- Simple and secure retaining system for the cylinders. This retaining system may need to accommodate cylinders of different dimensions for example anchoring points for straps shall be located at an appropriate height.
- Designed for easy loading and unloading of cylinders.
- If the pallet is equipped with a cylinder retaining bar, attention shall be paid to the design and robustness of locking devices for this bar to avoid incidents with the bar falling and causing injury.
- If the pallet is to be designed with lifting points to allow lifting by a crane, attention shall be paid to ensure that it has a sufficient robust construction. EN ISO 10961 Gas Cylinders – Cylinder bundles - Design, manufacture testing and inspection can be used for guidance for that design of lifting points for pallets.

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- Prepare a working instruction and mark pallets if lashing points maybe used as lifting points. If not, it should be marked with a pictogram and/or wording 'DO NOT CRANE!'

- For additional traceability, it is possible to attach a plate with information for the pallet design (e.g. type, manufacturer, production date YY/MM).

- There is no requirement for cylinder pallets to be CE marked.

  In addition, a protective or segregation device within the pallet frame can be used to avoid cylinder paint damage, due to friction and impact between cylinders, or between cylinder and pallet.

Important aspects for pallet manufacture

All welding processes shall be carried out by a qualified welder to ensure the welds comply with the relevant welding specification.

Important points for the use of pallets

- The operation of pallets should undergo a risk assessment including an occupational health assessment.

- Identify and quarantine any defective pallets. Do not use a defective pallet.

- Inspect the pallet frame for damage and missing parts.

- Defective pallets shall be either maintained or scrapped.

- Use appropriate personal protection equipment when loading and unloading pallets.

- Only trained personal shall load, unload and handle pallets.

- Secure cylinders in pallets, preferably in the upright position, e.g. with one or more straps.

- Do not exceed the design limits for weight and number of cylinders in the pallet.

- For pallets that have a cylinder securing bar, attention shall be paid when opening the bar and loosening the straps. In case the pallet design has a securing bar and a strap, always first open the strap, before opening the securing bar. When loosening the strap, the cylinders are unsecured and at risk of falling. Consequently, preventive actions should be taken to mitigate the risk of cylinders falling when unsecured.

- The load capacity of the forklift truck that will be used to lift the pallet shall be compatible with the pallet and its load.

- When valve protection is in use ensure that all cylinders have their valve protection in place and secured prior to moving pallets.

- Do not let loose straps hang from the pallet. This is particularly important when moving pallets.

- If pallets are fitted with lifting points that are no longer intended to be used for lifting, it is permissible to allow lift points to be removed or blanked off, for example by use of a plug that prevents lifting equipment such as a hook being attached to the pallet.

Periodic Inspection of Pallets

The use of pallets by the industrial gases industry is a well-established practice and this equipment could be subject to ageing and thus require more detailed periodic inspections. It should be noted that cylinder pallets are exposed to stresses due to road transport, handling and the environment.

There are no standards for the inspection of pallets used to transport cylinders, however there are regulations that will apply, for example European Directive 2009/104/EC Annex II - *Provisions concerning the use of work equipment* as well as a requirement to ensure load security as referenced in 7.5.7 of the Agreement Concerning the International Carriage of Dangerous Goods, (ADR).

EIGA recommends the following inspections of cylinder pallets:

- Pre-use visual inspection each time the pallet is used, the best practice is to carry this out at the filling location before loading or transport.

- A periodic inspection of the pallet at five years. This inspection should consider:

    - Corrosion, contamination;
    - Deformation or fracture which may be structurally significant (major structure, loading ramps, fork pockets);
    - Strap anchor points;
    - Uneven pallet floors, damaged open grids.

If the pallet fails the visual inspection, it shall be cleaned or repaired, as appropriate. Following any major lifting point repairs, the pallet shall be proof load tested to twice its maximum gross weight.

In all cases cylinder pallets that have lifting points for handling by overhead lifting equipment shall be proof tested to twice the maximum gross weight if there is suspicion of damages (e.g. corrosion). A pallet fitted with integral permanently attached lifting points does not require lifting equipment certification as it is classified as a load.

European Directive 2009/104/EC Annex II - *Provisions concerning the use of work equipment* states that lifting accessories (for example, screw in eye bolts, shackles, slings etc.) shall comply with, and be certified in accordance with lifting Operations and Lifting Equipment Regulations.

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