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Operating instruction

for transportable pressure vessels (here after referred to as cylinder)

This operating instruction contains useful safety information concerning mounting, fitting, usage, maintenance and scrapping of cylinders. Failure to comply with operating instructions can endanger the safety of persons and goods.

Safety instructions

The following safety instructions are referring to hazard, that could occur during the cylinders life time. The hazards could influence the safety of the cylinder during transport, storage, mounting, maintenance, usage, testing or dismantling and scrapping.

Allowable gas service: The cylinders may be filled with compatible gases mentioned in the cylinder documentation only.

The filling with incompatible gases can cause the cylinder to explode !

Damage: The cylinder must not be exposed to excessive mechanical stress. The packing of cylinders (e.g. pallets, cartons or boxes) during the warehousing and transport must be strong enough to withstand the conditions of transport and storage. When choosing a suitable packing it is strongly advised to consider the weight of the individual cylinder. The mounting of cylinders must be carried out with utmost care and caution. The cylinders must in no way be deformed or damaged. If need be, special measures shall be taken to protect the cylinder against damage. In case of mounting only such fixations and holding devices may be used, which do not put excessive forces on the cylinders. The cylinder must under no circumstances be welded or drilled on, to secure mounting. The cylinder should under no circumstances be worked at. Improper treatment (e.g. welding, drilling, grinding or riveting) changes the mechanical properties of the cylinder (wall-thickness, UTS, yield).

The use of mounting elements which put pressure upon the cylinder - or mechanically damage it - can result in the explosion of the cylinder! Heavy damage or changing of properties can cause explosion of the cylinder!

Allowable temperature range: The cylinder must not be exposed to direct flame or heat or very high or extreme low temperatures. If necessary safety precautions to guard from heat exposure must be provided. The minimum allowable temperature is -50°C, the maximum allowable temperature is +65°C. Temperatures beyond these limits may be approved for special applications.

High and extreme low temperatures can cause a change of the mechanical properties and can lead to explosion of the cylinder!

Electrical and magnetic influence: The cylinder must not be exposed to electrical or magnetic fields which could cause heating of the cylinder. The cylinder must be safe guarded against lightening. If need be, suitable safety devices must be installed.

Overheating through electrical or magnetic fields or through lightening can lead to explosion of the cylinder!

Influence of humidity: The cylinder must be protected against humidity. During transport and storage the opening of the cylinder must be tightly closed to ensure that no ingress of moisture is possible. The outer surface of the cylinder has to be protected by painting to safe guard it from moisture and corrosion. During storage in the open extra safety measures must be taken. Temperature changes during storage can incur the danger of corrosion due to condensation. Before mounting, a thorough visual inspection has to be carried out in order that no corrosion is present. During service the cylinder is to be filled with dry gas only. The valve must also be closed in pressure less state.

Humidity activates corrosion and lead to reduction of wall thickness which can cause the cylinder to fail!

Maximum allowable pressure: It is advised that the allowed pressure is not exceeded. The max. allowed pressure (PW) is the maximum filling pressure which settles in the cylinder at a homogeneously environmental temperature of 15°C. If the temperature is raised – max. to the upper limit of the allowed temperature range (e.g. +65°C) - the pressure in the cylinder raises above the value of PW. This is admissible provided the maximum allowed pressure in the cylinder at 15°C does not exceed the value of PW.

Inadmissible exceeding the max. allowed pressure can cause explosion of the cylinder!

Mounting of fittings or valves: On the connection opening of the cylinder only suitable attachments shall be mounted that do not damage the connection. The type of the thread connection is stamp marked on the cylinder. The mounting torque shall be adjusted carefully so that the thread connection is not damaged. (Suitable torque-values see EN ISO 13341). The connection of the attachment (e.g. valve) must never be dismounted under pressure. Prior to dismounting (e.g. of valve) must be checked that there is no pressure and that the pressure vessel is totally emptied. When dismounting the connection (e.g. valve) under pressure explosive escape of fluid and dangerous hurling of parts can occur !

A damaged thread connection or dismounting under pressure can cause explosive escape of fluid !

Allowable additional stamp markings: No stamp markings are permitted on the cylindrical part of the cylinder. Additional stamp markings are permitted on the reinforced shoulder area of the cylinder only (e.g. during retesting).

Stamp markings on the cylindrical part may cause change of the mechanical properties and contribute to cracking and consequently lead to the explosion of the cylinder!

Transport: During transport in filled state the cylinder must be protected accordingly, so that the valve can not be damaged. This can be effected by packing in a box or by mounting a suitable valve-protection-cap. When transporting the filled cylinder the corresponding rules for the transport of dangerous goods shall be adhered to.

Damaging the valve under pressure can lead to explosive escape of fluid and dangerous hurling of parts!

Periodic inspection: The cylinder must be submitted to retests in accordance with the national requirements of that country where the cylinder is in service.

Disregarding the prescribed retests can cause damage, that stays undetected and consequently can result in explosion of the cylinder!

Scrapping: The cylinder must never be scrapped when under pressure. Before the cylinder is scrapped it has to be assured that the cylinder is emptied completely.

Scrapping under pressure can cause the cylinder to explode!