



PRESSURE RECEPTACLES WITH BLOCKED OR INOPERABLE VALVES

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Amendments to Doc 129/17

Section	Change
8.3.3	Clarification on minimum acceptable temperature for cool down
9	Update on techniques (2 removed, 1 added)

1 Introduction

Gas receptacle valves can become blocked by corrosion and foreign material, or made inoperable due to external or internal damage. When this happens, there is a tendency for receptacles to be put to one side and left for long periods of time. If left, such receptacles can become a potentially serious hazard. It is an essential safety requirement that such receptacles are dealt with without delay – the difficult operation of safely releasing the trapped residual gas shall be carried out, the receptacle emptied, purged and made safe. It is recommended that Gas Suppliers are prepared with both equipment and trained personnel for dealing with such receptacles.

All the quoted EIGA publications are downloadable at <https://www.eiga.eu>

2 Scope and purpose

2.1 Scope

This document gives recommendations on how to handle receptacles with non-operational valves for suppliers of industrial, medical and specialty gas receptacles.

2.2 Purpose

It sets out practical techniques which have been tried and tested over some years within the Gas Industry. It shall be used in conjunction with the latest revision of Doc 30 *Disposal of Gases* [1].

The techniques described should only be followed by those who already have appropriate equipment in place and a good working knowledge of gas receptacle maintenance and who are fully trained in handling a wide range of industrial and medical gases including specialty gases.

Before any intervention on a problem receptacle, a specific risk assessment shall be carried out and documented by a competent team taking into account the type of valve, material of the cylinder and valve, the content and any other characteristic of the receptacle that would influence the risks of the operation.

3 Definitions

3.1 Publications terminology

3.1.1 Shall

Indicates that the procedure is mandatory. It is used wherever the criterion for conformance to specific recommendations allows no deviation.

3.1.2 Should

Indicates that a procedure is recommended.

3.1.3 May

Indicates that the procedure is optional.

3.1.4 Will

Is used only to indicate the future, not a degree of requirement.

3.1.5 Can

Indicates a possibility or ability.

3.2 Technical definitions

3.2.1 Receptacles

In this document “receptacles” means “pressure receptacles” as defined by the UN Recommendations on the Transport of Dangerous Goods. Pressure receptacles comprise cylinders, pressure drums, tubes, cryogenic receptacles (up to 1000 litres) and bundles of cylinders.

3.2.2 Cylinder recovery vessel

Means a pressure vessel which is designed to safely contain a cylinder and its content for transportation and storage, until it can be safely emptied. A cylinder recovery vessel could be fitted with a gauge to indicate internal pressure and valves to enable purging. A cylinder recovery vessel is identified as a “salvage pressure receptacle” in the Regulations for the international transport of dangerous goods (UN Model regulations, ADR/RID, etc.).

4 Why receptacle valves become inoperable

Receptacle valves can become either blocked or inoperable in the open or closed position. The reasons are usually one of the following:

4.1 Internal corrosion

Internal corrosion may prevent the operation of the valve where the valve operating mechanism is constructed from materials that are prone to corrosion by the environment or the gas. Many corrosive gases are hygroscopic, i.e. absorb water from the atmosphere, and if gas users fail to purge valve outlets properly before and after use, highly corrosive conditions can occur inside the valve. If the valve operating mechanism is in contact with this corrosive material, seizure can occur.

4.2 Mechanical failure

This may be directly resulting from internal corrosion as per 4.1 above (e.g. seizure of the valve operating mechanism followed by breakage due to attempts to overcome the seizure).

Mechanical failures can also occur as a result of material or construction faults, excessive wear in the valve's moving parts, impact damage and weaknesses in the valve design or because the operator has forced the valve closed by applying too much tightening torque. In some valve designs the spindle can be operated without lifting the valve sealing device. Therefore a full receptacle can appear empty but the valve sealing device may suddenly lift and release gas.

4.3 Blockages

Blockage of a receptacle valve is normally due to one or more of the following materials entering the valve and compacting at the point where there is minimal cross section in the gas passage:

4.3.1 Debris from inside the receptacle

Examples include: PTFE thread tape, shot and grit remaining from receptacle cleaning operations, rust/corrosion production/millscale from receptacle walls.

4.3.2 Debris compacted into the valve during filling

Examples include: Swarf, PTFE thread tape, grit and dirt, purifier bed packings such as alumina and molecular sieve.

4.3.3 Decomposition or other reaction products of the gas

Examples include: