



Expert Information

HazMat Guide

COMPRESSED GASES

▶ ***The Ultimate Storage Guide
for Compressed Gas Cylinders***

INTRODUCTION

Gases are essential in many areas of our everyday lives. They are also used in various industrial applications. Many processes, such as those in the chemical industry, pharmaceutical and cosmetics industry, metallurgy, energy production and technology, the food and drink industries, electronics, rubber and plastics processing, human and veterinary medicine, environmental protection and research and science would be impossible without gases.

Handling gases poses particular hazards due to the chemical and physical properties of the gases or due to improper handling and storage. Therefore, the first priority when storing and working with gases must always be safety, and this must be taken into consideration in the risk assessment.

This is particularly true when handling pressurised gases.

This new brochure describes the specific hazards associated with handling gases and contains guidelines for completing risk assessments and finding options for storing gases safely.

If you have any questions, you are welcome to contact us by phone or e-mail. We are happy to offer our expertise on safe storage of compressed gases.

At the end of each chapter we have provided valuable “take aways”, with a concise summary of the key information presented in the chapter.



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1.1 What are gases?

What is a gas?

A "gas" or "gaseous substance" is one of the three states of matter, the other two being "solid" and "liquid".

Gases, general definition

Gases are materials or material mixtures/preparations that

- have a vapour pressure of over 300 kPa (3 bar) at 50°C or
- are completely gaseous at 20°C and a standard pressure of 101.3 kPa (1 bar).

Pressurised gases

Pressurised gases are gases that

- are contained in a vessel under at least 200 kPa pressure (overpressure) or more,
- are liquefied or
- are liquefied and frozen.

This includes compressed, liquefied, dissolved and frozen liquefied gases.

NOTE

The term critical temperature is important in this context. The critical temperature is the temperature above which a pure gas can no longer be liquefied depending on its pressure, or can no longer change its state of matter.

Density of gases

Gases have the following properties, depending on their state, e.g. Based on the temperature of the gas and pressure in the ambient atmosphere. Gases are

- heavier than air if their density is $> 1.3 \text{ kg/m}^3$,
- just as heavy as air if their density is $\leq 1.3 \text{ kg/m}^3$ and $\geq 1.2 \text{ kg/m}^3$ and
- lighter than air if their density is $< 1.2 \text{ kg/m}^3$.

Liquefied gases are at low temperatures after extraction, and therefore are generally heavier than air in this state.

2.2 Labelling gas cylinders

The hazardous materials sticker on the shoulder of the container is conclusive

The most important information is stated first: The colour of the label on the gas cylinder is not always correct; instead, it is an initial aid and is meant to be visible from far away. Only the hazardous material sticker on the shoulder of the cylinder is conclusive.



Where can I find the label on the gas cylinder?

The colour designation is placed on the shoulder of the cylinder. The cylinder jacket also bears the colour designation. Medical gases are the only exception, for which the cylinder is white. If the cylinder contains a gas mixture, then both colours are coded alternatively as rings.

Basic colours for gas cylinders or cylinder bodies

The basic gas cylinder colours indicated here are not mandatory; however, in practice the industry has by and large agreed to use the following classifications:

- High-purity medical gases (see also, for example, our entry on oxygen): White cylinder body
- Industrial gases: Grey cylinder body or same colour as the cylinder shoulder (but not white)
- No specialised gases stipulated

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