

Instrumental Technique

GAS CYLINDER

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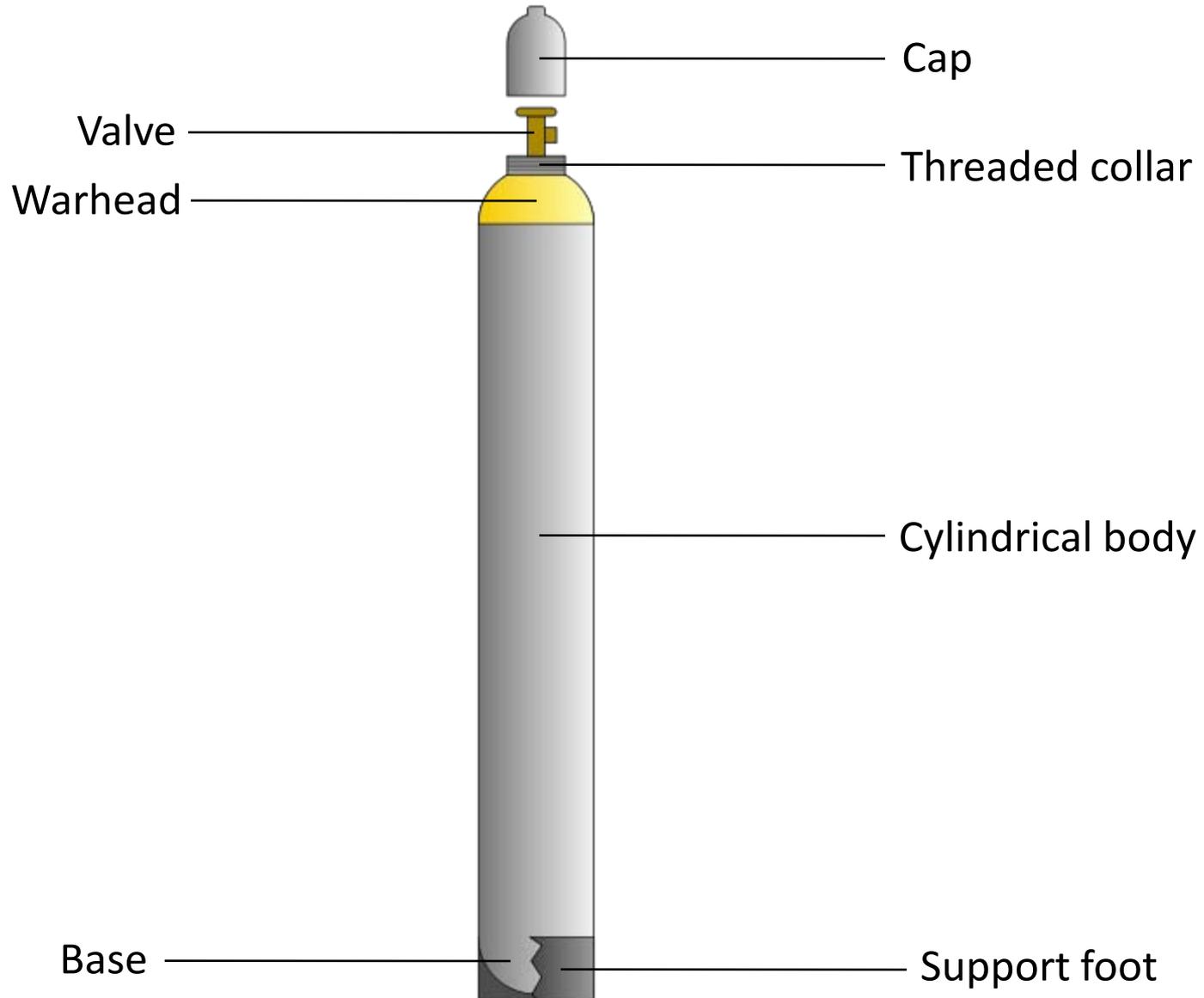


Gas cylinder is a pressure vessel used to store gas above atmospheric pressure.

Used in:

- Diving
- Mining operations
- Oil refineries
- Petrochemical plants
- Chemical industries
- Submarines
- Space ships
- Research labs
- Medical purposes
- Fuel storage

Different parts of a gas cylinder



Size:

United States measures cylinder volume by the amount of free air that can be compressed into the cylinder and Europe measures the cylinder volume as the internal volume of the cylinder.

Shapes:

Shapes can theoretically be almost anything, but shapes made of sections of spheres, cylinders, and cones are usually employed. Most common design is a cylinder with end cap.

Construction materials:

Generally these are made of steel. In some cases where carbon steel suffer corrosion, special corrosion resistant materials are used.

Colour coding (European standard):

Property	Colour	Examples
Toxic or corrosive	Yellow shoulder	Ammonia, chlorine, fluorine, arsine, carbon monoxide, sulfur dioxide
Flammable	Red shoulder	Hydrogen, methane, ethylene
Oxidising	Light blue shoulder	Nitrous oxide, oxygen containing blends
Inert (nontoxic, nonflammable, nonoxidising)	Bright green shoulder	Neon, krypton, xenon
Toxic and flammable or toxic and corrosive	Yellow and red shoulders (either two bands or quartered)	
Toxic and oxidising or corrosive and oxidising	Yellow and light blue shoulders (either two bands or quartered)	

Colour coding (European standard):

Gas	Colour
Acetylene	Maroon cylinder
Argon	Dark green shoulder
Carbon dioxide	Grey shoulder
Chlorine	Yellow shoulder
Helium	Brown shoulder
Hydrogen	Red shoulder
Nitrous oxide	Blue shoulder
Nitrogen	Black shoulder
Oxygen	White shoulder

Class diamonds:



Hazards related with handling and storing of compressed gases

Asphyxiation: Simple asphyxiation is the primary hazard associated with inert gases.

Fire and explosion: Fire and explosion are the primary hazards associated with flammable gases, oxygen and other oxidizing gases.

Chemical burns: Corrosive gases can chemically attack various materials, including fire-resistant clothing.

Chemical poisoning: Chemical poisoning is the primary hazard of toxic gases.

High pressure: All compressed gases are potentially hazardous because of the high pressure stored inside the cylinder which makes it a potential rocket.

Cylinder weight: A full size cylinder may weigh more than 130 pounds. Moving a cylinder manually may lead to back or muscle injury. Dropping or dragging a cylinder could cause serious injury.

Handling precautions

- Avoid dropping, dragging or sliding cylinders.
- Do not permit cylinders to strike each other violently.
- Cylinder caps should be left on each cylinder until it has been secured against a wall and is ready for installation of the regulator.
- Never tamper with pressure relief devices in valves or cylinders.
- Keep the cylinder valve closed except when in use.
- Position cylinders so that the cylinder valve is accessible at all times.
- Use compressed gases only in a well-ventilated area.
- Toxic, flammable and corrosive gases should be carefully handled in a hood or gas cabinet.
- When discharging gas into a liquid, a trap or suitable check valve should be used to prevent liquid from getting back into the cylinder or regulator.
- Where more than one type of gas is in use, label gas lines. This is particularly important when the gas supply is not in the same room or area as the operation using the gases.
- Do not use the cylinder valve itself to control flow by adjusting the pressure.

Storage of compressed gas cylinders

- All cylinders must be secured to a wall, bench or fixed support using a chain or strap placed 2/3 of the way up.
- Cylinders should be strapped individually.
- Cylinders should not be stored with a regulator attached. Secure the proper gas cap to the threaded portion on the top of the cylinder to protect the valve.
- Oxidizers and flammable gases should be stored in areas separated by at least 20 feet or by a non-combustible wall.
- Cylinders should not be stored near radiators or other heat sources.
- No part of a cylinder should be subjected to a temperature higher than 125 °F. A flame should never be permitted to come in contact with any part of a compressed gas cylinder.
- Do not place cylinders where they may become part of an electric circuit.
- Keep the number of cylinders in a laboratory to a minimum to reduce the fire and toxicity hazards.
- Ensure that the cylinder is properly and prominently labelled as to its contents.

Gases requiring special handling

The following gases present special hazards either due to their toxicity or physical properties.

- Acetylene
- Arsine
- Boron trifluoride
- Diborane
- Ethylene oxide
- Fluorine
- Germane
- Hydrogen cyanide
- Oxygen
- Phosgene
- Silane

THANK YOU