

**DRAFT PHILIPPINE NATIONAL STANDARD (PNS) ON LPG DEALER'S SHOWROOM
AND WAREHOUSE REQUIREMENTS WITH SAFETY PRACTICES**

FOREWORD

This Philippine National Standard (PNS) on LPG Dealer's Showroom and Warehouse Requirements with Safety Practices was prepared under the direction of the Technical Committee on Petroleum Processes and Facilities (BPS/TC 68) through its Technical Working Group – TWG 1 - LPG Facilities. This Standard was approved for adoption as Philippine National Standard by the Bureau of Philippine Standards.

This Standard provides for the minimum facility requirements for LPG Dealers who engage in the trading or sale of LPG cylinders and canisters directly to end consumers.

It is anticipated that the user of this Standard and the materials referenced herein would form the basic requirements for a safe, environment-friendly, responsible marketing / retailing operations of LPG and act as the primary and minimum requirements in this sector of the Downstream Oil Industry.

The provisions in this PNS are voluntary in nature and may be used as a reference by any interested party. Compliance to this Standard or part/s thereof is voluntary unless otherwise imposed or referred to by law, or regulations issued by competent authorities. Existing laws or regulations shall prevail when there is a conflict with this PNS.

1 SCOPE

This Standard covers the minimum facility requirements for LPG Dealers to ensure safe and proper storage of LPG cylinders and canisters during retail operations. An LPG Dealer's facility may be a showroom, or a showroom and a warehouse. The Showroom consists of the LPG display area, office space for business transactions, and stock area for LPG cylinders available for sale, and empty or returned cylinders/ canisters.

This Standard also incorporates the Safety Practices that must be observed in the operations and upkeep of warehouses and showrooms used for the storage and sale of LPG in cylinders. Covered in the Safety Practices are the Cylinder Storage, Cylinder Stacking, Handling of LPG Cylinders, Personnel Safety and Informational Signages.

2 DEFINITION OF TERMS

For the purpose of this Standard the following definitions shall apply.

2.1

canister or cartridge

shall refer to any portable pressure vessel or container, designed or intended for LPG, with water capacity of less than that of an LPG cylinder.

2.2

cylinder or LPG cylinder

shall refer to any portable pressure vessel or container for LPG with water capacity of 1 liter to 150 liters, or as may be prescribed under PNS and designed for the sale, transportation, storage, or household/ commercial/ industrial consumption of LPG

2.3

commercial building

a low-rise building or structure situated within a designated area which allows trade of LPG products and other LPG related ancillary items as specified by the zonal regulations of the local government

2.3

dealer

refers to any duly authorized natural or juridical person who engages in the trading or sale of LPG cylinders to retail outlets or directly to end consumers

2.4

delivery personnel

refers to a person who delivers LPG cylinders / canister to customers

2.5

enclosed storage

an enclosure wherein the four walls are completely closed with fire resistive materials but provided with an opening such as louvers to ensure natural ventilation. Sometimes referred to as "storage within buildings".

2.6

LPG

shall refer to Liquefied Petroleum Gas which consists of commercial propane gas or commercial butane gas or a mixture of the two gases, with properties conforming to the standards set forth under PNS, distributed or sold to consumers either in LPG cylinders through a pipeline system, bulk storage tanks, or other means of distribution

2.7

open-air storage

any open-loading platform constructed from non-combustible materials and secured by a fence that allows natural circulation of air and dissipation of LPG in case of leak e.g., industrial type fence, chain-link fence, or its equivalent.

2.8

shall

indicates provision that is mandatory

2.9

showroom

refers to the area or floor space dedicated to display or show the LPG cylinders for sale, and / or other LPG-related devices. The showroom can also include the floor space for the conduct of sales and other business-related transactions.

2.10

warehouse

it is an LPG cylinder storage area, either an open-air or enclosed structure only accessible to authorized personnel of the business

3 General Requirements

3.1 Showroom

- 3.1.1 The floor space for the Showroom must be properly delineated.
- 3.1.2 Filled cylinders may be allowed for display.
- 3.1.3 Maximum allowable cylinders per floor area:
 - a. 3 x 3 for 11 kg cylinders per sq. meter
 - b. 2 x 2 for 50 kg cylinders per sq. meter
 - c. 4 x 4 for 2.7 kg cylinders (without crate) per sq. meter
- 3.1.4 Maximum of two (2) stacking is allowed for 5-11 kg net content collared cylinders for both filled and empty cylinders.
- 3.1.5 Stacking of cylinders above 11 kg net content is not allowed in the Showroom area.
- 3.1.6 Maximum height of stacking for cylinders or canisters in crates shall not exceed 1.3 meters.
- 3.1.7 Collared cylinders below 5 kg net content may not exceed four (4) stacking.
- 3.1.8 The maximum allowable number of filled cylinders located at the Showroom is subject to BFP's relevant guidelines applicable for the type of building or premise where the Showroom is located.
- 3.1.9 Provision for an opening to allow natural air circulation, and to prevent accumulation of LPG vapor in the event of leak.
- 3.1.10 Electrical outlet must be properly protected from spark or possible source of ignition. Electrical outlets may also be weather / waterproof.
- 3.1.11 The gas leak detector must be mounted at the wall not more than one (1) foot from the floor.
- 3.1.12 There must be a calibrated weighing scale inside the showroom capable of measuring entire range of the Dealer's product line.
- 3.1.13 A price display board must be prominently visible within the area for the consumers.

3.2 Warehouse

The maximum number of cylinders to be stored in a warehouse is subject to BFP's technical and safety assessment. The warehouse must comply with the appropriate fire safety provisions.

The individual stockpile of cylinders must have adequate gangways to facilitate ease of retrieval or checking in case of leaks.

3.2.1 Open-air Storage

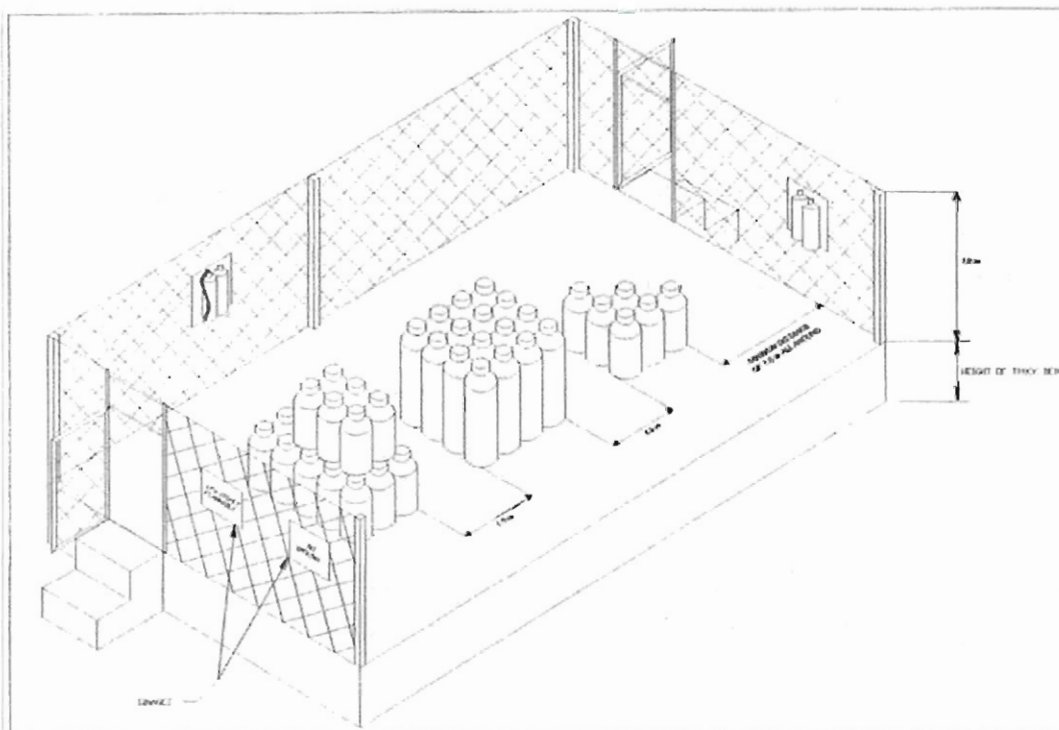


Figure 1 – Open-air storage sample layout

- 3.2.1.1 LPG cylinders should preferably be stored in a well-ventilated or open air and ground level location;
- 3.2.1.2 The storage area should be protected by an adequate security fence to prevent trespassing and vandalism or unauthorized person. Recommended minimum height of 1.8 meters;
- 3.2.1.3 In cases storage cannot comply for separation distances, a firewall may be considered to reduce separation distances;
- 3.2.1.4 Fire walls must be imperforate and substantially constructed from brick, reinforced concrete, or such other materials so that they have a standard of fire resistance of not less than 30 minutes. They shall be at least as high as the height of the highest stack of cylinders stored, but should not be more than 2.5 meters high. They shall be of such a length that the distance from any cylinder to boundary or fixed ignition source measured around the end of the wall is not less than the separation distances specified in Table 9 – Minimum separation distance for open air storage of PNS/DOE FS 2:2018 Amd. 1:2020;
- 3.2.1.5 The fire wall may be a wall of a building, in which case the following additional requirements must be met:

- b) There must be no overhanging eaves or similar projections constructed from combustible materials above any stored cylinder; and
 - c) No external stairway or fire escape shall be positioned above cylinders or allowed to terminate in the storage area.
- 3.2.1.6 The floor of the storage area should be level, free from depressions and compacted or paved with a suitable materials and design to carry the expected load;
- 3.2.1.7 The position chosen for storage shall be at ground level and never below cellars or basement and be readily accessible;
- 3.2.1.8 Any loading platform, and any roof provided over a storage place, shall be predominantly constructed from non-combustible materials;
- 3.2.1.9 The gas leak detector must be mounted at the wall not more than one (1) foot from the floor.

3.2.2 Enclosed Storage

- 3.2.2.1 Building should not be part of a Theatre, School, Hotel, Supermarket or a place of worship;
- 3.2.2.2 Posts, wall, roofing, and trusses must be made of non-combustible materials like steel/concrete.
- 3.2.2.3 Electrical outlet must be properly protected from spark or possible source of ignition. Electrical outlets may also be weather / waterproof.
- 3.2.2.4 No electrical appliances must be present within the storage area
- 3.2.2.5 Maximum aggregate quantity of LPG stored within building shall not exceed 5000 kg, unless otherwise provided with appropriate fire safety measures and equipment approved by the BFP.
- 3.2.2.6 Maximum allowable cylinders per floor area
- a. 3 x 3 for 11 kg cylinders per sq. meter
 - b. 2 x 2 for 50 kg cylinders per sq. meter
 - c. 4 x 4 for 2.7 kg cylinders (without crate) per sq. meter
- 3.2.2.7 Maximum stacking height
- a. 11 kg: 2 cylinders (filled); 3 cylinders (unfilled)
 - b. 2.7 kg: 5 cylinders (filled or unfilled)
 - c. 50 kg: no stacking allowed
- 3.2.2.8 Provision of at least one (1) meter wide gangway for every stack
- 3.2.2.9 Provision of gas detectors depending on the number of filled cylinders in storage. (Installation and location of gas detectors subject to manufacturer's recommendation).

4 Safe Operating Practices

4.1 Cylinder in Storage

Filled cylinders to be stored shall comply with PNS:03 entitled "Transportable and refillable steel cylinders for liquefied petroleum gas (LPG) - Part 1:Specification", PNS ISO 18172-1:2014 entitled "Refillable Welded Stainless Steel Cylinders - Part 1: Test Pressure 6 MPa and Below", PNS ISO 7866:2014 entitled "Gas cylinders - Refillable seamless aluminium alloy gas cylinders - Design, construction and testing", and PNS ISO 11119:2011 entitled "Gas cylinders of composite construction - Specification and test methods - Part 3: Fully wrapped fibre-reinforced composite gas cylinders with non-load-sharing metallic or non-metallic liners.";

- 4.1.1 Cylinders stored in buildings shall not be located near exits, near stairways, or in areas normally used, or intended to be used, for the safe egress of occupants;
- 4.1.2 Cylinders in storage shall be located to minimize exposure to excessive temperature rises, physical damage, or tampering;
- 4.1.3 Cylinders may be stacked against a fire wall provided the quantity involved is 400 kg or less. For quantities of more than 400 kg, a one (1) meter space should be maintained between the stacked cylinders and fire wall to allow inspection and access to leaking cylinder;
- 4.1.4 All cylinders store upright with valves in the uppermost position (for filled and empty); and
- 4.1.5 Valves of both filled and empty cylinders should always be closed while in storage (referring to POL valve type);

4.2 Handling of LPG cylinders

Vehicles used for the transport of LPG cylinders may be further guided by PNS/DOE 02:2023 – LPG transport – Bulk and cylinders – Requirements and safe operating practices.

4.2.1 For 11 kg cylinders

- 4.2.1.1 Cylinders must be transported in an upright position. They should be secured or chained to prevent them from shifting or falling. If the delivery vehicle cannot get near the cylinder installation, cylinders can be rolled on its foot ring, not on its side.
- 4.2.1.2 The cylinders should not be dropped or thrown from the vehicle, but should be eased to the ground or lowered on to shock pads if vehicles are not equipped with hydraulic lifter. A rubber pad, rope mat, or even an old tire will ease the shock of filled cylinders as they are lowered from the vehicle bed to the ground.
- 4.2.1.3 If the customer is not at home, the gas to the house line should be turned off. A note should be left behind advising the customer that the gas is shut-off at the regulator and that all burners and pilot lights must closed before opening the gas.
- 4.2.1.4 Plastic caps should always be placed on the 11 kg cylinders to prevent foreign matters such as dirt, water, etc. from entering the cylinder valves.
- 4.2.1.5 In case the relief valve on a cylinder opens while being transported or set, the cylinder should be moved to a safe place and vented until the pressure reduces and the relief valve re-sets.
- 4.2.1.6 Cylinders should be returned to the plant for reconditioning of their valves. Venting should be done in an open field. Always have the fire extinguishers ready for emergency.

4.2.2 For 50 Kg Cylinders

- 4.2.2.1 For 50 kg installations, close cylinder valve and individual isolation valves on the manifold first.
- 4.2.2.2 Slowly unscrew the flexible hose from the cylinder valve and allow residual gas to vent out completely before fully disconnecting it. If residual gas continues to vent out, close all valves and call for further assistance from an LPG technician.
- 4.2.2.3 Remove empty cylinder and position the filled cylinder where flexible hose can reach without straining.
- 4.2.2.4 Break security seal and connect flexible hose until hand tight. Do not use wrench or any hand tools to avoid over tightening and damaging the valve and connector.

4.2.2.5 Open cylinder valve and check for leaks on the connection. If connection is free of leaks, open the individual isolation valves on the manifold. The cylinder bank is now ready for use when the other bank becomes empty.

4.2.2.6 Ensure everything is in proper order before leaving the site.

4.3 Guidelines for Delivery Personnel

Before being permitted to make deliveries, a delivery man should be fully instructed on the purpose and use of equipment such as valves, gauges, and other appurtenances. The following are guidelines on making a safe and proper delivery to customers:

- Delivery personnel must always be neat-looking and in proper uniform when making delivery. They must always be courteous and polite to customers.
- Cylinders must be moved in a manner that avoids damage to the floor. Pushcart must be used in delivering 50 kg cylinders.
- Cylinders to be replaced must be checked by delivery personnel that they are indeed empty.
- Ensure there are no open flames around the cylinder during delivery. Smoking is not allowed.
- Delivery man should make a safety check on other equipment (i.e., flexible hose, regulator, changeover device, etc.) every delivery
- If there are piles of rubbish near the installation, the delivery man should ask the customer to remove them at once.

4.4 Safety Procedures and Informational Signs

4.4.1 LPG cylinders for display should not be kept beside flammable materials, staircases, exits, or anywhere that might obstruct an escape route;

4.4.2 Naked lights or smoking should be strictly prohibited anywhere near the displayed cylinder;

4.4.3 The LPG storage facility and the showroom shall be clearly marked with notices on each externally visible side and presence at entrances to storage area indicating the presence of LPG. These notices shall indicate:

- a) A warning notice – “Highly Flammable LPG”;
- b) A Globally Harmonized System (GHS) symbol for Flammable Gas;



Figure 2 – GHS symbol for Flammable chemicals

c) The prohibition sign – “No smoking or naked flames, no cellphones and cameras”, “Unauthorized person not allowed”.

d) Emergency Response Procedures and emergency contact numbers in case of gas leaks or fire: BFP, nearest hospital, LGU (Disaster Risk Reduction and Management Office).

- 4.4.4 Access of vehicles and mechanical handling equipment into the storage area must be strictly controlled to prevent collision with cylinders;
- 4.4.5 Hazardous and other known flammable products other than LPG should be stored separately in adequate distance;
- 4.4.6 Filled and empty cylinders are properly segregated and signage clearly displayed;
- 4.4.7 There should be enough gang way for access of personnel during inspection and emergency.
- 4.4.8 There should be at least 2 x 20 lbs. Dry Chemical Powder Fire Extinguishers. They should be in good working condition and are readily accessible.

4.5 Personnel Safety

- 4.5.1 There should be a Department of Labor and Employment (DOLE) compliant Safety Officer designated and trained by the LPG Company for emergency and material handling for LPG product;
- 4.5.2 All staff in the Distributor warehouse should be trained on Emergency Response Procedure;
- 4.5.3 All staff should be knowledgeable to use Fire Extinguishers in case of fire;
- 4.5.4 All staff handling cylinders should wear the appropriate Personal Protective Equipment (Pants and cotton shirt preferably made of static-free fabric, safety shoes and gloves);
and
- 4.5.5 The security guard should know the Emergency Response Procedures.

Annex A
(informative)

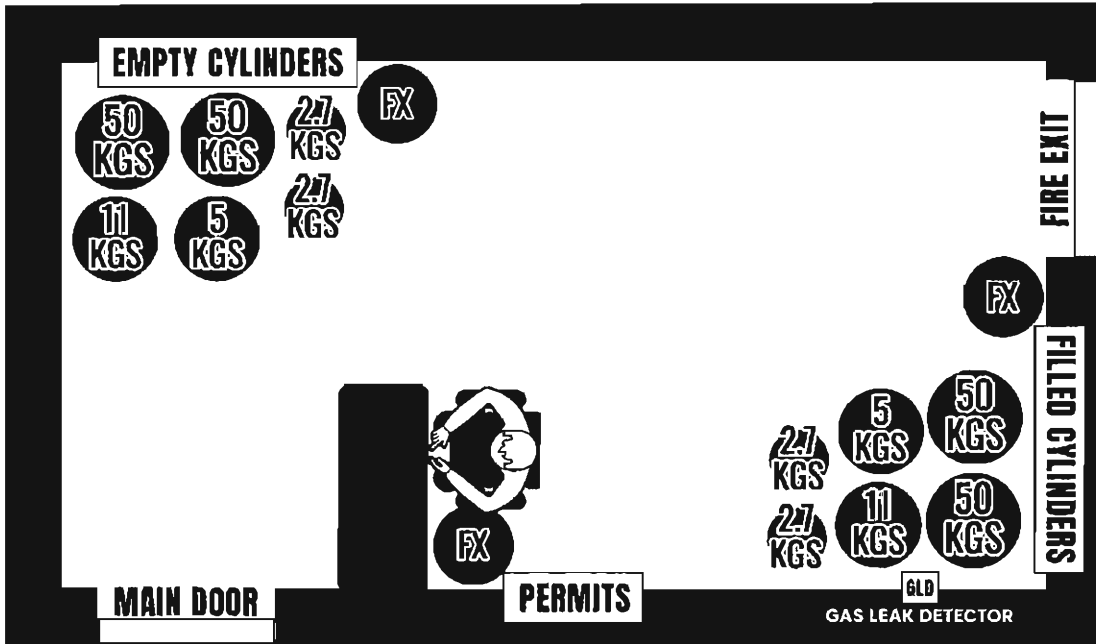


Figure 3 – Warehouse / Storage within Buildings sample layout

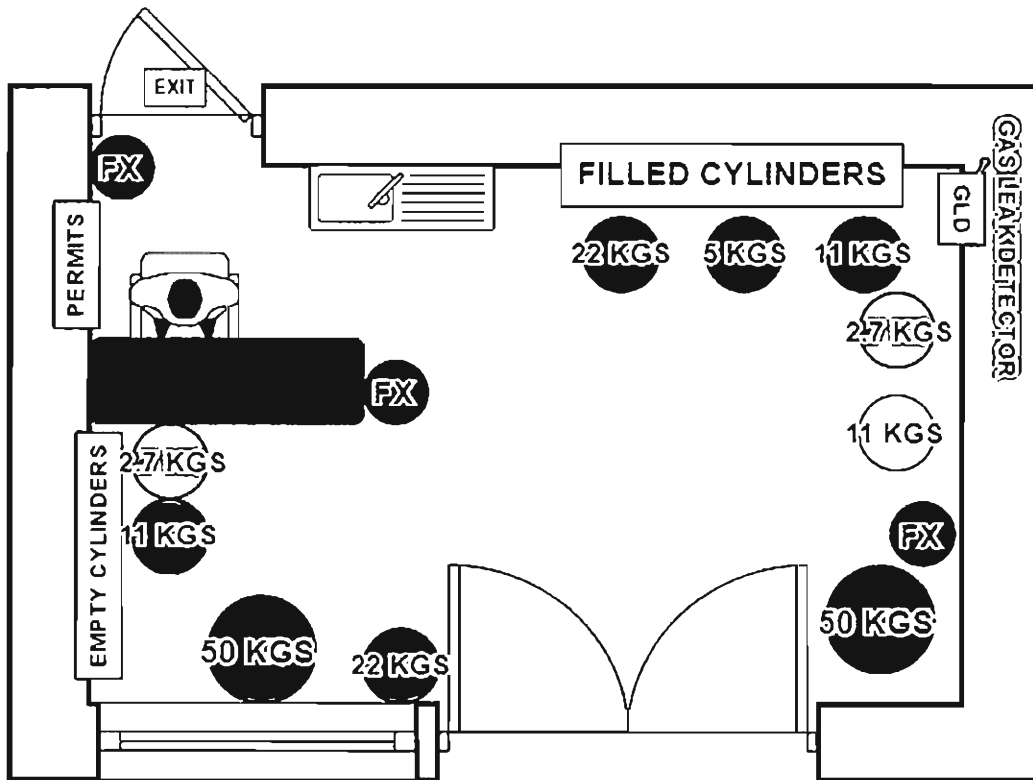


Figure 4 – Showroom / Office space sample layout

**Annex B
(informative)**

Sample LPG Cylinder Sizes and Dimensions

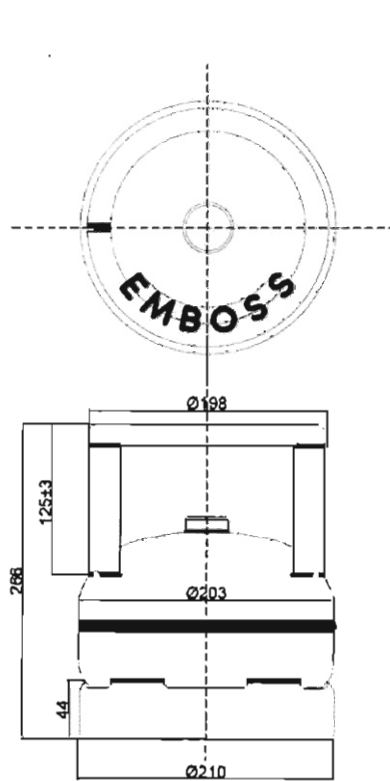


Figure 5 – 1.4 kg 203 mm diameter assembly details

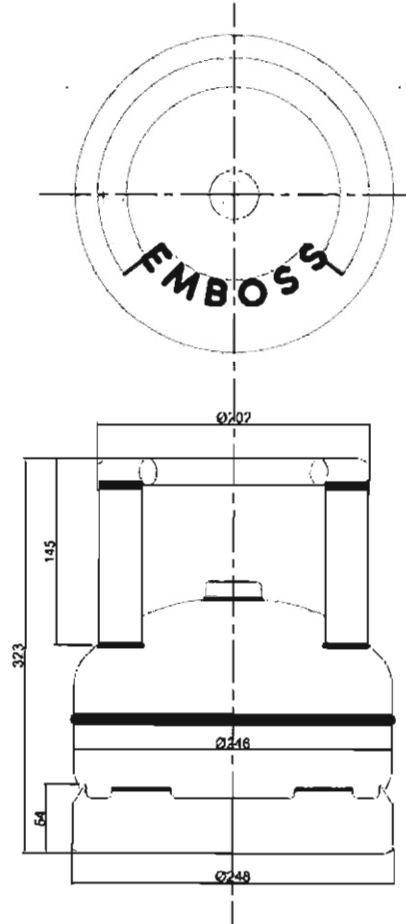


Figure 6 – 2.7 kg 246 mm diameter assembly details

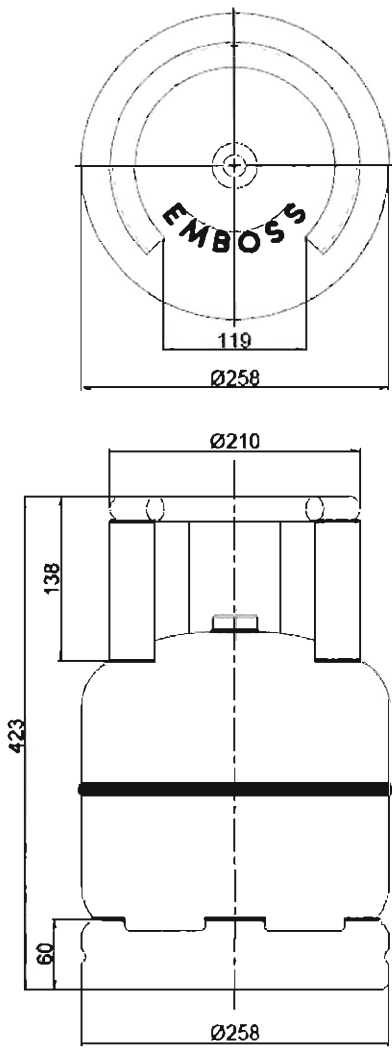


Figure 7 – 5.0 kg 258 mm diameter assembly details

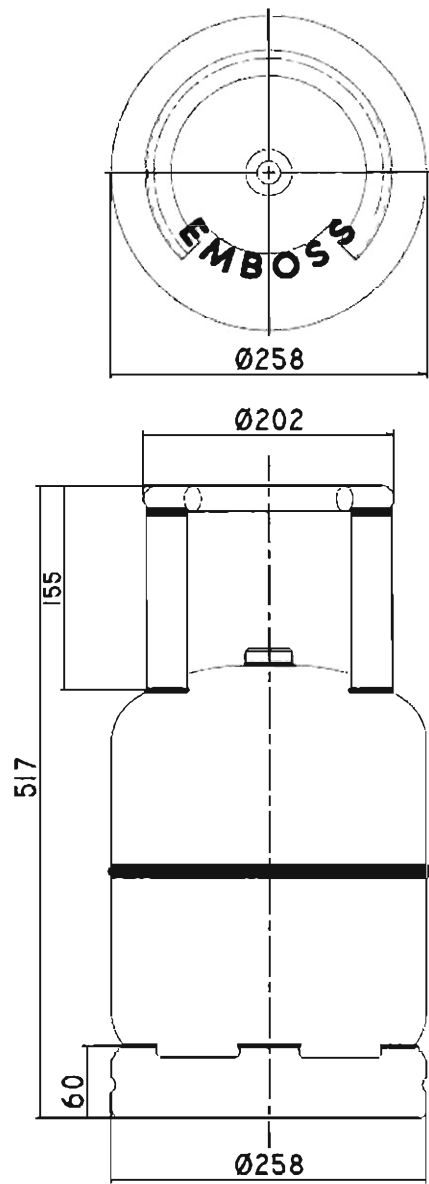


Figure 8 – 7.0 kg 258 mm diameter assembly details

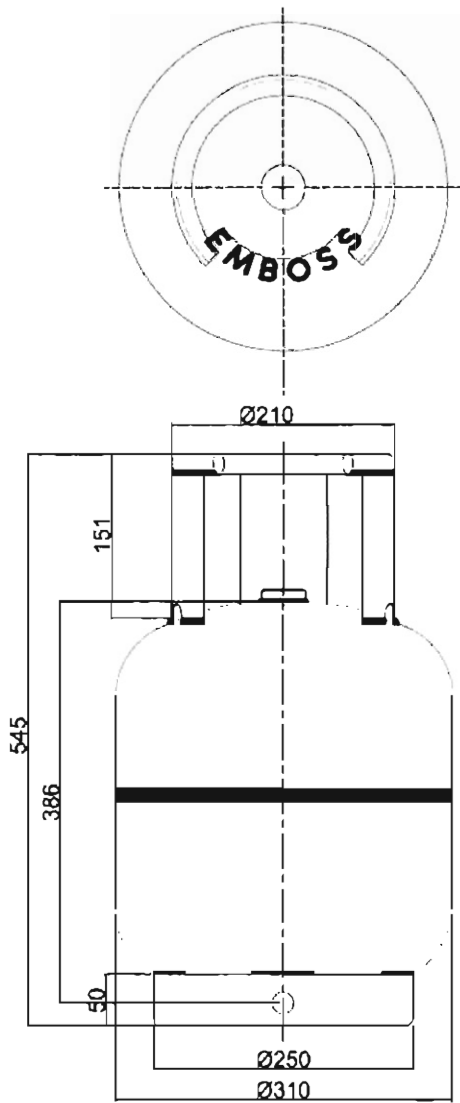


Figure 9 – 11.0 kg 310 mm diameter assembly details

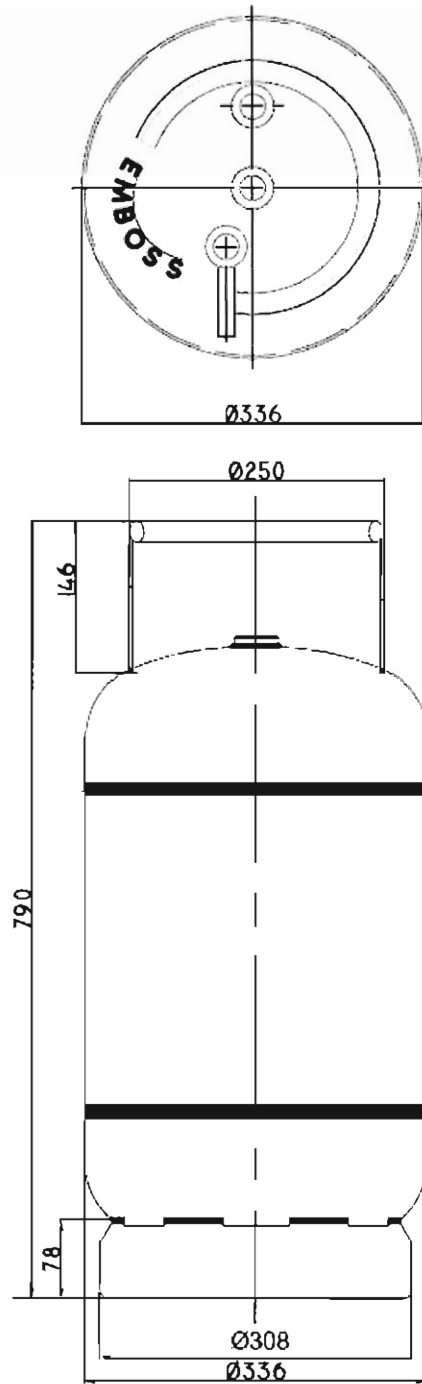


Figure 10 – 22.0 kg 336.5 mm diameter assembly details

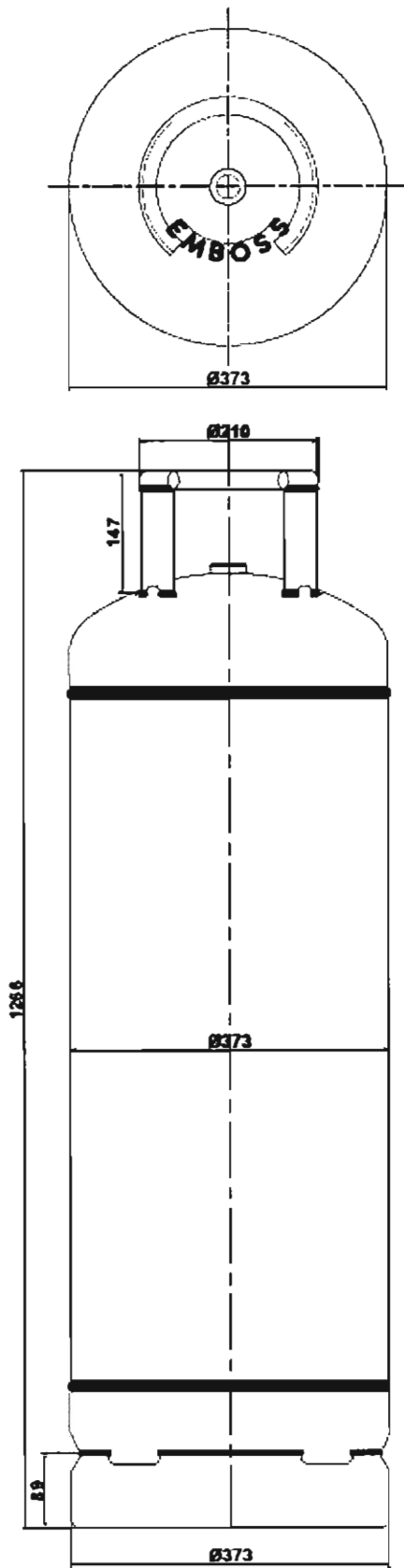


Figure 11 – 50.0 kg 373 mm diameter assembly details

