

1.0 SPECIFICATION FOR SUPPLY OF BRAND NEW GAS CYLINDERS FOR GASEOUS HELIUM, NITROGEN, ARGON FITTED AS MODULAR PALLET FOR ITPF, TUMUKURU.

(Note: Vendor shall note that the gas cylinders to be supplied as empty as purged with appropriate gases such as Helium, Argon or Nitrogen having positive blanket pressure for refilling as per the scope of work)

Scope of supply:

Supply of 47L. capacity brand new gas cylinders for gaseous Nitrogen, Helium and Argon application fitted with modular pallet of each 9 cylinders(3X3) as manifold as per the specification given below:

S.No	Description	Qty (Nos)		Remarks
		Cylinders	Pallets	
01	Brand new cylinders for gaseous Nitrogen fitted with pallet as manifolded each 3 X 3 configuration.	198	22	Detailed specification as given in section:2.1
02	Brand new cylinders for gaseous Helium fitted with pallet as manifolded each 3 X 3 configuration.	198	22	Detailed specification as given in section:2.2
03	Brand new cylinders for gaseous Argon fitted with pallet as manifolded each 3 X 3 configuration..	54	6	Detailed specification as given in section:2.3
	Total (Nos)	450	50	

2.0 SPECIFICATION FOR GAS CYLINDERS

2.1 Specification for Supply of cylinders for Gaseous Nitrogen

Sl. No.:	Specification
1.	Brand new carbon steel cylinders (47 L at 150 bar working pressure) along with proper identification details about the cylinder and type of gas has to be filled. Color coding of GN ₂ shall be followed as per ISO standards.
2.	Quantity – 198 nos., Capacity – 47 L with 150 bar
3.	Certification for design of cylinders from PESO
4.	Party should provide the following certificates: ➤ Hydro static pressure test certificate for gas cylinders
5.	Cylinder valve outlet / MOC: BS 03 (To suit standard Pressure Regulator male interface) / Brass

6.	Cylinders shall be purged with high pure Nitrogen gas (Purity: 99.995 %).
7.	Gas cylinders shall be confirming to IS-7285/ Equivalent with neck ring valve fitted confirming IS:3224
8.	Manufacture test certificate as well as a copy of the valid filling permission issued by the chief controller of Explosives to be provided along with Brand New Cylinders.
9.	Cylinders shall be fitted with modular pallet of 9 cylinder in each pallet with interconnection and common Mani folded outlet with shut off valve and pressure gauge as per section-3

2.2 Specification for Supply of cylinders for Gaseous Helium

Sl. No.:	Specification
1.	Brand new carbon steel cylinders (47 L at 150 bar working pressure) along with proper identification details about the cylinder and type of gas to be filled. Color coding of GH _e should be followed as per ISO standards.
2.	Quantity – 198 nos., Capacity – 47 L with 150 bar
3.	Certification for designing of cylinders should comply from PESO
4.	Part should provide following certificates: <ul style="list-style-type: none"> ➤ Hydro static testing certificate for gas cylinders
5.	Cylinder valve outlet / MOC: BS 03 (To suit standard Pressure Regulator male interface) / Brass
6.	Cylinders shall be purged with High pure Helium gas –XL Grade Helium (Purity: 99.999%).
7.	Gas cylinders shall be confirming to IS-7285/ Equivalent with neck ring valve fitted confirming IS:3224
8.	Manufacture test certificate as well as a copy of the valid filling permission issued by the chief controller of Explosives to be provided along with Brand New Cylinders. Gas cylinders shall be confirming to IS-7285/ Equivalent with neck ring valve fitted confirming IS:3224
9.	Cylinders shall be fitted with modular pallet of 9 cylinder in each pallet with interconnection and common Mani folded outlet with shut off valve and pressure gauge as per section-3

2.3 Specification for Supply of cylinders for Gaseous Argon

Sl. No.:	Specification
1.	Brand new carbon steel cylinders (47 L at 150 bar working pressure) along with proper identification details about the cylinder and type of gas to be filled. Color coding of Argon shall be followed as per ISO standards.
2.	Quantity – 54 nos., Capacity – 47 L with 150 bar
3.	Certification for designing of cylinders should comply from PESO
4.	Part should provide following certificates: <ul style="list-style-type: none"> ➤ Hydro static testing certificate for the cylinders
5.	Cylinder valve outlet / MOC: BS 03 (To suit standard Pressure Regulator male interface) / Brass
6.	Cylinders shall be purged with Ultra High pure Argon gas with purity of 99.9995 %.
7.	Gas cylinders shall be conforming to IS-7285/ Equivalent with neck ring valve fitted confirming IS:3224
8.	Manufacture test certificate as well as a copy of the valid filling permission issued by the chief controller of Explosives to be provided along with Brand New Cylinders. Gas cylinders shall be conforming to IS-7285/ Equivalent with neck ring valve fitted confirming IS:3224
9	Cylinders shall be fitted with modular pallet of 9 cylinder in each pallet with interconnection and common Manifold outlet with shut off valve and pressure gauge as per section-3

3.0 SPECIFICATION OF CYLINDER PALLET WITH MANIFOLD:

Manifold - Cylinder pallet/bundle is a modular design concept as given in drawing (**figure -1**) and it is a portable assembly which is designed to be routinely lifted and consist of a frame and 9 high pressure gas cylinders stacked and connected to a common manifold by Stainless steel tubes, valves, fittings and pressure gauge, so that the cylinders can be filled, transported and emptied without disassembly.

The following are the detailed specification of manifold-cylinder Pallet for 9 cylinders (3 X 3 configuration).

- 1) **Frame:** The bolted, galvanized steel (MS structure) frame should be strong enough for providing protection for the bundle's cylinders, valves and manifold, which enable the bundle to be transported. Top of the pallet & front side, door type MS mesh coverage.

- 2) The cylinder pallets shall be provided with rotatable castor wheels of 4 nos at four edges with suitable locking arrangement for easy mobility.
- 3) The cylinder pallets shall be provided with screw jack arrangement in all four edges which is having provision to idle the wheels while usage.
- 4) **Manifold:** Each pallet shall be fitted/stacked with 9 cylinders in vertical /standing position as 3 X 3 matrixes. All the 9 gas cylinders in each pallet shall be inter- connected by stainless steel (SS) tube and SS tube fittings as common manifold with single common outlet having shutoff valve and pressure gauge of 4" dial size with range of 0-300 bar. All the tubes, valves, fittings shall be made up of stainless steel material.
- 5) The frame work and the castor wheels etc. Shall be designed to withstand the total working load of approx.600 Kg .
- 6) **Pressure testing:** The operating pressure for the manifold, pipelines, valves and fittings shall be 150 Bar(G) and as integrated pallet with gas cylinders shall be pressure tested to 225 bar (1.5 times of operating pressure of 150 bar).
- 7) Ramp or suitable provision in the module should be provided for loading/unloading of high pressure gas cylinders.
- 8) The bottom side of the pallet shall be provided with provision for handling/lifting by Forklift and lifting hook provision at the top for lifting/handling with crane hook.
- 9) The cylinder pallet shall be painted with Grey color enamel paint.
- 10) Design, manufacture & testing of manifolded cylinder bundle should be complied with IS 10961:2010.
- 11) One side caution board with HAZCHEM number has to be provided.

SI.NO	PALLET FOR TYPE OF GAS USAGE	QUANTITY OF MANIFOLD-CYLINDER PALLET (3 X 3) NEEDED (NOS)
1	Helium(GHe)	22
2	Nitrogen(GN ₂)	22
3	Argon(GAr)	6
4	TOTAL PALLETS	50

4.0 Other conditions:

- 4.1 Each pallet with gas cylinders (9 nos) fitted / stacked shall be pressure tested as per section-3 (6) at vendor premises. Necessary test certificate for the pressure test shall be submitted for each pallet by the supplier.
- 4.2 LPSCB will depute their representative to witness the pressure testing of the cylinders with pallets as part of pre-dispatch inspection (PDI) in their discretion. Supplier shall provide advance intimation of minimum 2 weeks to LPSCB.

- 4.3 The gas cylinders as fitted with pallets and cylinders to be purged with relevant high pure gases such as Nitrogen, Helium and Argon. **Vendor shall note that the gas cylinders to be supplied as empty as purged with appropriate gases such as Helium, Argon or Nitrogen having positive blanket pressure for refilling.**
- 4.4 Supplier shall supply all the items as single lot. No split purchase order will be considered.
- 4.5 The supplier shall provide detailed catalog with clear technical specification indicating, make and model etc. along with offer/quotation.
- 4.6 Supplier shall provide filled compliance matrix with respect to each specification at the time providing the quotation.

5.0 Delivery Schedule:

The delivery schedule for supply of gas cylinders with pallets shall be 6 months from the date of placement of purchase order.

6.0 Delivery Place:

The gas cylinders with pallets shall be delivered at Integrated Titanium Alloy Propellant Tank Fabrication Facility (ITPF, LPSC Extension Campus in Tumukuru, Karnataka.

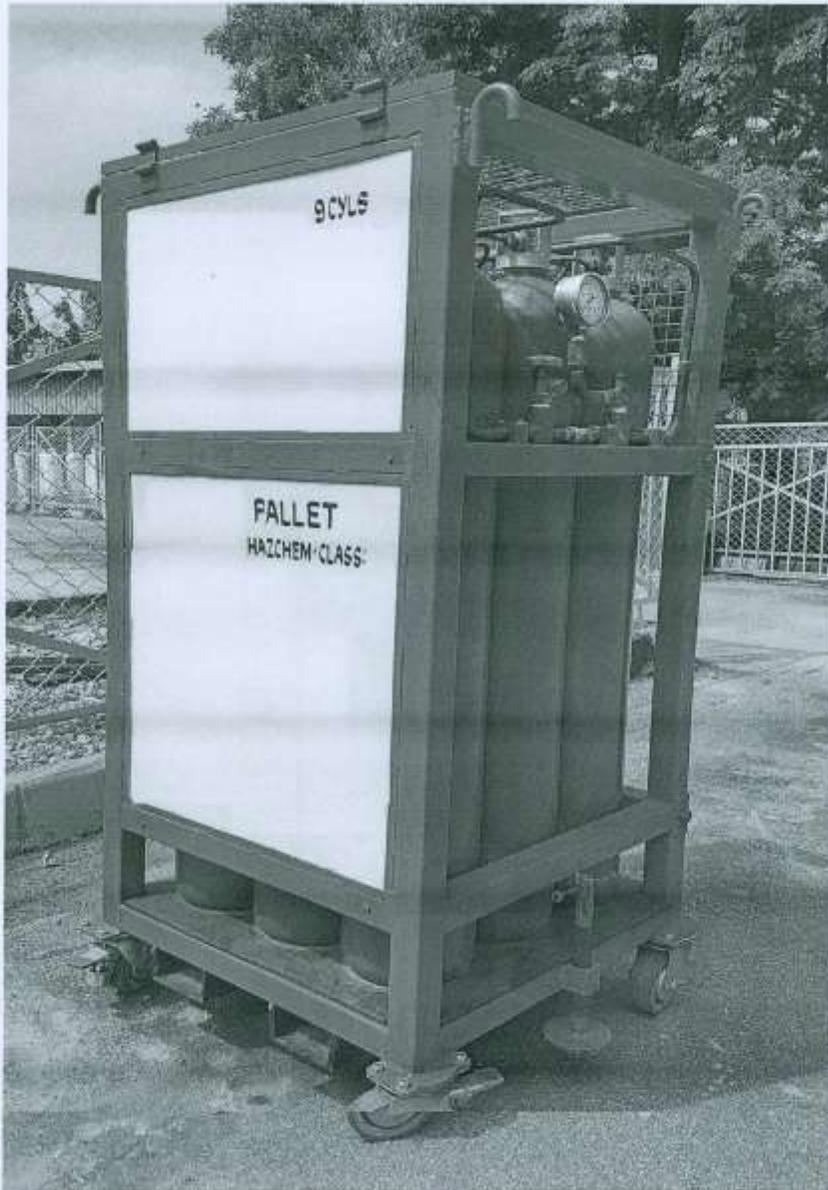
7.0 Deliverables:

7.1 Pallets fitted with each 9 cylinders, interconnected as common manifold and tested

si.no	pallet for type of gas usage	quantity of manifold-cylinder pallet (3 x 3) (nos)
1	Helium(GHe)	22
2	Nitrogen(GN ₂)	22
3	Argon(GAr)	6
4	TOTAL PALLETS	50

7.2 Documents to be provided along with supply:

- 1.0 Test certificate and filling permission for refilling of each cylinder from PESO.
- 2.0 Pressure test certificates for each cylinder pallet.



General arrangement of gas cylinders with Pallet

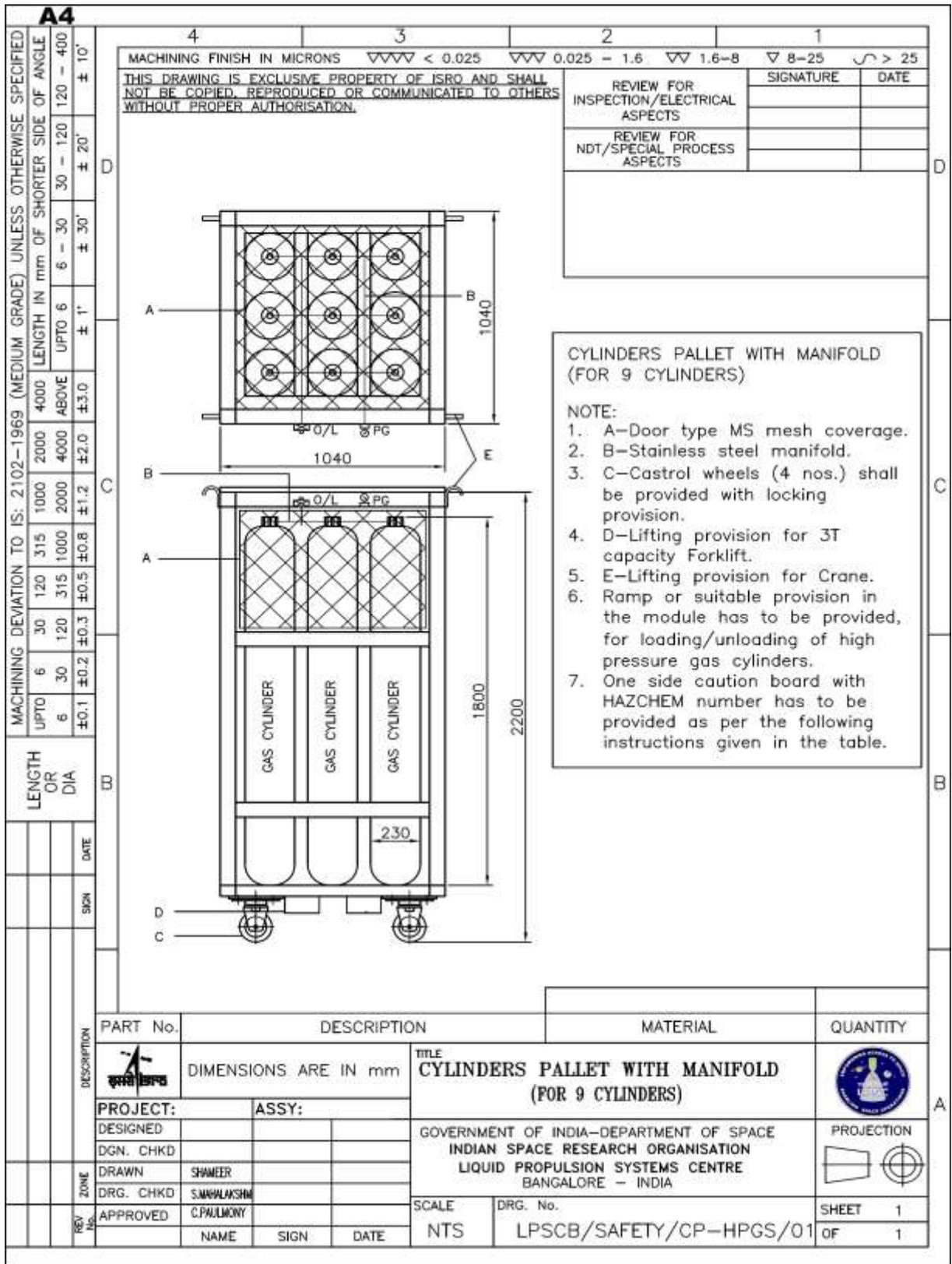


FIGURE-1