tested. Should the results of these tests fall outside the limits specified in Owner technical specification, then Owner reserves the rights to reject all production supplied from the batch.

ENERGISING QUALITY

VCS QUALITY SERVICES PVT. LTD.

STANDARD SPECIFICATION FOR STEEL REINFORCED RUBBER HOSE

VPC-SS-PE-0010

REV. No	DATE	Purpose	Prepared By	Checked By	Approved By
00	18.06.18	ISSUED AS STANDARD	BS	MVK	AD

CONTENTS

1.0 SCOPE

INDRAPRASTHA GAS LTD. (IGL) plans to augment PNG network. It supplies natural gas to domestic & commercial consumers in the city of NCT Delhi, Uttar Pradesh, Haryana & Rajasthan GA.

This present document covers the technical specification for the procurement of steel reinforced rubber hose, Type 4 used in distribution systems. It describes the general requirements, controls, tests, QA/QC examination and final acceptance criteria which need to be fulfilled.

This specification covers the requirements for steel reinforced rubber hose unless modified by this specification, requirements of IS: 9573 shall be valid.

2.0 SPECIFICATION FOR POWDER COATING

Owner	Shall mean Indraprastha Gas Ltd. (IGL).
Manufacturer	Means the Manufacturer of the Steel Reinforced Rubber Hose.
PTS	Means the present <<Particular Technical Specification>> and its appendix, if any.
Third Party Inspection Agency	Means the Inspection Agency to be appointed by IGL.
Type 4	Wire Reinforced hose for domestic / commercial installations

3.0 MATERIAL

- Lining: - It shall be nitrile – butadiene rubber (NBR) or chloroprene rubber (CR) compound. It shall be smooth in bore, uniform in thickness and free from air blisters, porosity and splits.

- Reinforcement material: - It shall have wire reinforcement in braided form in between the lining & cover.

- Cover:- It shall be manufactured out of synthetic rubber compound resistant to abrasion, weather and natural gas. The cover color shall be orange.

- The whole shall be consolidated by wrapping or any other suitable method and uniformly vulcanized to give good adhesion between reinforcement plies and the rubber lining of the cover.

4.0 DIMENSIONS & TOLERANCES

- Bore size

Nominal base (mm)	Minimum base diameter(mm)	Minimum bend radius(mm)
8mm	7.9	95

The Nominal bore size of the hose shall be accordance to table # 1 of IS 9573: 1998 shall be as given above table. It shall be tested/ checked as method defined in IS 4143.

- The Minimum thickness so lining & cover shall be 2 mm & 1 mm respectively.

- Length of hose shall be as defined in M.R. & the tolerances on length shall be permitted ±1%.

5.0 FEATURES

- **Mechanical properties**

  Tensile Strength (Lining & Cover) at break - 10 MPa (minimum)

  Elongation (Lining & Cover) in at break (%) - 200 & 250 respectively (minimum)

- **Resistance of Lining to n-pentane**

  The n-pentane absorbed and the n-pentane extractable matter as determined Clause no. 5.4.3.2 of IS 9573: 1998 shall not exceed 10% & 5% respectively to the initial mass of lining.

- **Adhesion**

  The minimum adhesion between rubber lining & reinforcement, between layers of reinforcement and between reinforcement & cover shall be 2KN/m.

- **Low temperature flexibility**

  Flexible hose is conditioned at - 40 ° C for at least 5 hrs. and then bent at 180° around a mandrel with a diameter 12 times the nominal bore diameter of the hose, no cracks or breaks shall be shown.

- **Flexibility of Hose**

  The hose shall be capable of being bent empty to the radius 95 mm without flattening and suffering structural damages.

- **Ozone resistance**

  It shall be carried out as per clause no. 5.5.of IS 9573: 1978

- **Hydro static test**

  All hoses shall be leak tightness tested at 2 MPa for a period of 1 minutes and no leakage is permitted. This test shall be performed on each size of the hoses as per clause no. 5.5.5.1 of IS 9573: 1978.

- **Bursting pressure**

It shall be carried out as per Clause 5.5.2 of IS 9573. The minimum burst pressure shall be 5 Mpa.

- **Grip strength test**

  The hose shall comply to the requirement of Clause no. 5.5.7 of IS 9573.

- **Burning behavior**

  The burning test shall be carried out on hose as per clause no. 5.5.8 of IS9573. The hose at least shall not burn till 45second.

6.0 MARKING

Each hose shall be indelibly marked as follows:

- Manufacturer's name or trade mark., if any
- Nominal bore
- Batch no. / Lot no.
- Month and year of manufacturer
- Type of hose i.e. Type 4
- BIS marking

7.0 PACKAGING

Packing size to be mentioned to ensure uniformity in delivery conditions of the material being procured. Bidder shall submit the packaging details during offer and also complied with at the time of delivery.

8.0 INSPECTION/ DOCUMENTS

- Inspection shall be carried out as per design codes/standards, IGL Technical Specification and Inspection Plan/ Vendor's detailed QAP duly approved by owner/owner's representative.
- For all tests purposes, the minimum time between vulcanization & testing shall be 16h.
- IGL representative or third party inspection agency appointed by IGL shall carry out random inspection during manufacturing/ final inspection.
- Vendor shall furnish all the material test certificates, proof of approval/ license from

specified authority as per specified standard, if relevant, internal test/ inspection reports as per IGL Technical Specification, at the time of final inspection of each supply lot of material.

- Even after third party inspection, IGL reserves the right to select a sample of hose randomly from each manufacturing batch and have these independently tested. If the results of these tests fall outside the limits specified in IGL Technical specification, then IGL reserves the rights to reject all production supplied from the batch.

- Vendor shall prepare and submit the detail drawings of required steel reinforced rubber hose for approval by IGL /VCSQSPL before starting production.

- For any control test or examination required under the supervision of TPIA/owner/owner's representative, latter shall be informed in writing one (1) week in advance by vender about inspection date & place along with production schedule.

ENERGISING QUALITY

VCS QUALITY SERVICES PVT. LTD.

STANDARD SPECIFICATION FOR PURE POLYSTER POWDER COATING

VPC –SS-PE-0011

REV	DATE	Purpose	Prepared By	Checked By	Approved By
00	18.06.18	ISSUED AS STANDARD	BS	MVK	AD

CONTENTS

1.0 SCOPE

This Specification specifies the requirements for powder coating (Pure Polyester) of GI Pipes & fitting suitable to use for carrying Natural Gas directly expose to sunlight.

2.0 SPECIFICATION FOR POWDER COATING

Powder Material	:	Pure Polyester.
Application	:	Electrostatic Spraying (40 — 90 KV Manual/ Automatic)
Backing Schedule	:	180^0C to 200^0C for 10 mm (Metal Temperature)
Coating Thickness	:	50-60Microns

3.0 TESTING

Film Type	:	Glossy/Satin 86
Gloss60^0	:	95%
Cross Hatch Adhesion (ASTM D-5870)	:	GT = 0/100
Cylindrical bending Test (ASTM D -522) 5mm Rod dia	:	Passes
Enrichsen cupping (min)	:	8 Passes
Pencil Hardness(mm)	:	2H
Scratch Resistance (Kg. Mm)	:	3
Impact Resistance Kg. Min(ASTM D- 2794)	:	Direct 150 Indirect 150
Salt Spray Resistance (ASTM B-117)	:	1000 Hrs (min)
Porosity (DIN 53161)	:	Passes
Humidity Resistance	:	1000 Hrs(min)

4.0 MARKING

Each fitting shall be embossed with manufacture's name or trademark and the size designation. Each packing containing fittings shall carry the following stamped or written by indelible ink.

- Manufacturers name or trademark.