



LPG
EXCEPTIONAL ENERGY

**PRESENTATION
ON
BEST PRACTICES IN
SAFE HANDLING OF LPG CYLINDERS
BY**

Ashendra Singh
Controller of Explosives
HQ ,Nagpur



LPG

EXCEPTIONAL ENERGY

- As per section 17 of Explosives Act 1884 (4 of 1884). Any substance which appears to be specially dangerous to life or property by reason either of its explosives properties or of any process in the manufacture thereof being liable to explosion shall be deemed to be an explosive within the meaning of this Act, and the provisions of this Act shall accordingly extend to that substance in like manner as if it were included in the definition of term “explosive” in this act.



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Properties of LPG

- Domestic LPG as per IS:4576 test methods as per IS:1448.
- Density 0.525 to 0.580 at 15 degree C.
- Auto ignition temperature is around 410 to 580 degree C.
- LPG requires 50 times its own volume of air for complete combustion.
- Stanching agent (Ethyl Mercaptan) is required 1/5 times of lower limits of flammability.
- Vapour pressure at 65 degree C is 16.87 kg/cm²

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W.P./T.P./F.R. Of Some Important Refrigerants

Sr. No.	Ref. name	W.P. Kg/cm ²	T.P. Kg/cm ²	F.R. Kg/cm ²
1.	R404a	33.33	50	0.68
2.	R32	45.00	70	0.67
3.	R134a	30.00	50	0.92
4.	R12	16.66	50	1.08
5.	R11	02.63	50	1.30
6.	R407c	33.33	50	0.85
7.	R410a	43.00	70	0.68
8.	R152a	16.17	50	0.92
9.	R600a(Iso.But)	20.00	30.00	0.49
10.	R290 (Prop.)	24.00	36.00	0.43



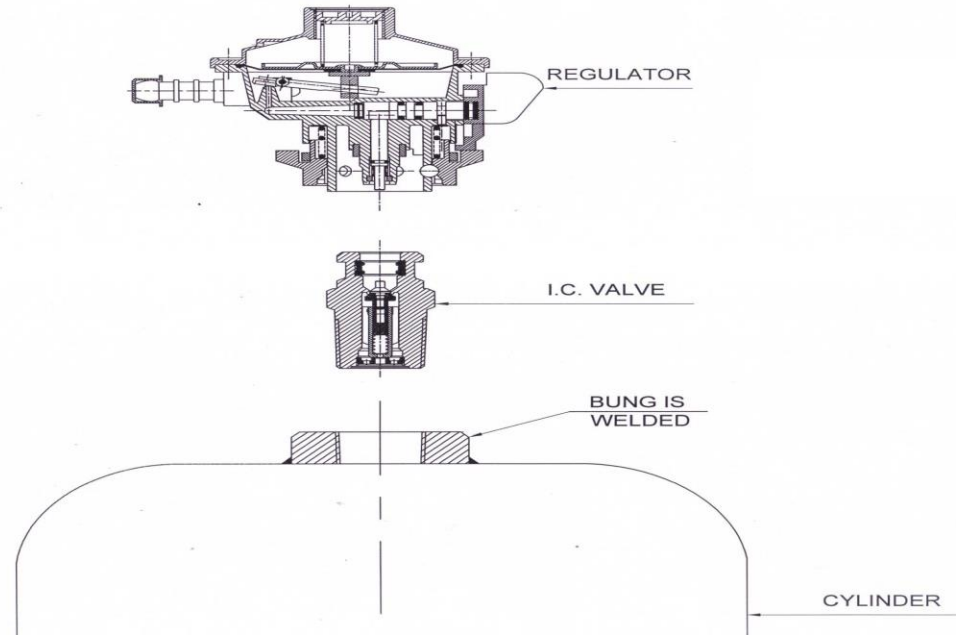
Classification of Gas Groups

Mining	Surface Industry		
Group I	Group II		
	IIA	IIB	IIC
Methane	Propane	Ethylene	Hydrogen
	Butane	Ethylene Glycol	Acetylene
	LPG	Hydrogen Sulphide	
	Ethane		



Explosive Mixture

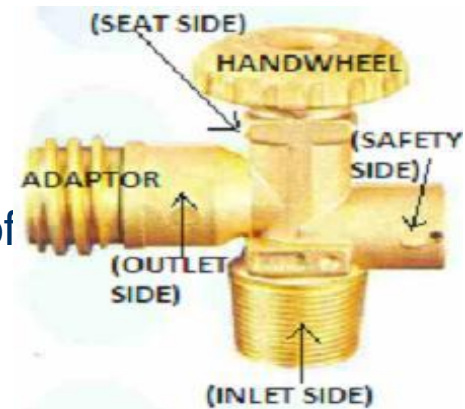
	LEL		UEL	
Weak Mixture		Ignition Area		Strong Mixture
LPG	1.8%		9.5%	
Propane (C ₃ H ₈)	2%		9.5%	
Butane (C ₄ H ₁₀)	1.8 %		8.4%	
Acetylene (C ₂ H ₂)	3%		100%	
Ethylene (C ₂ H ₄)	2.7%		34%	
Methane (CH ₄)	5%		15%	

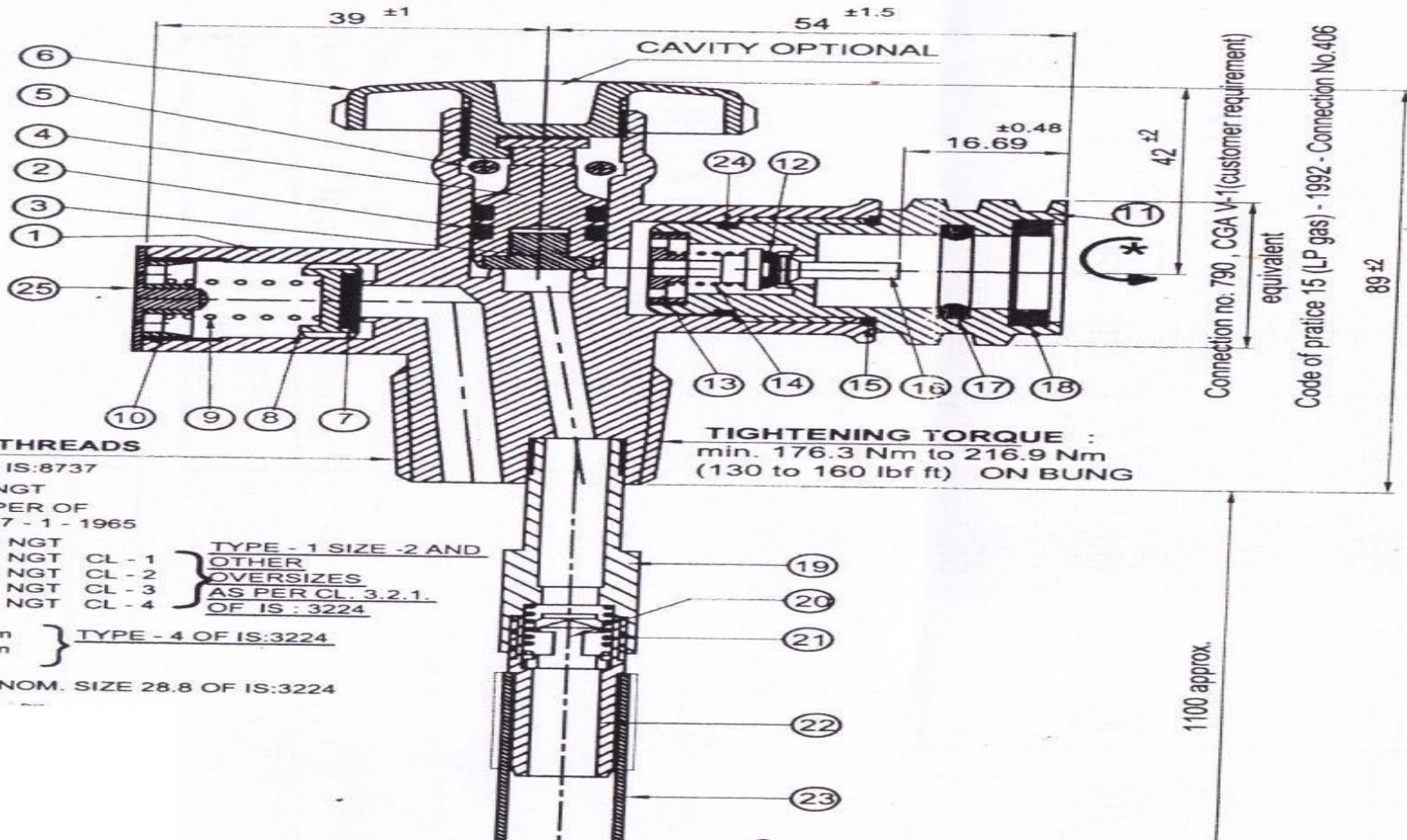




PARTS OF LOT VALVE:

- The hand wheel is provided to regulate the flow rate of liquid LPG.
- A Pressure Relief Valve is provided near the outlet & integral part of LOT Valve
- Excess flow valve is provided at the bottom inlet side of the valve at the top of liquid withdrawal tube. The EFCV will close automatically if the flow exceeds the pre set flow rating.
- The LOT valve is provided with a tube which, on screwing of valve on cylinder, shall go up to the bottom of the cylinder. This will facilitate direct removal of liquid from cylinder.
- LOT Cap with Nylon string.





INLET THREADS

AS PER IS:8737

3/4" x 14 NGT

1:16 TAPER OF

ANSI B57 - 1 - 1965

3/4" x 14 NGT

3/4" x 14 NGT CL - 1

3/4" x 14 NGT CL - 2

3/4" x 14 NGT CL - 3

3/4" x 14 NGT CL - 4

TYPE - 1 SIZE -2 AND

OTHER

OVERSIZES

AS PER CL. 3.2.1.

OF IS : 3224

25.40 mm

31.75 mm

TYPE - 4 OF IS:3224

TYPE - 2 NOM. SIZE 28.8 OF IS:3224

TIGHTENING TORQUE :

min. 176.3 Nm to 216.9 Nm

(130 to 160 lbf ft) ON BUNG

Connection no. 790, CGA V-1 (customer requirement)

equivalent

Code of practice 15 (LP gas) - 1992 - Connection No.406

1100 approx.

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Comparison of IS:15914 & IS:6240 Grade carbon Steel

Mechanical Standard	Values As per IS15914	Values As Per IS 6240
YS	345	240
UTS	490	350
EI	18%	25%
Sheet Thick.	2.1 mm	2.9 mm
Min. Cyl. Thick.	1.97 mm	2.43 mm
Nom. Cyl. Thick	2.1 mm	2.9 mm
Tare weight	12 Kg.	15 Kg.



Universal Boss

Universal Boss is made of steel, so insulated against wear & tear on any number of operations for fixing of brass valve. New 'O' ring material suited for -65°C and $+200^{\circ}\text{C}$. Time proven universal taper profile threads suitable for most valve types.

Fibre Glass Composite Layer

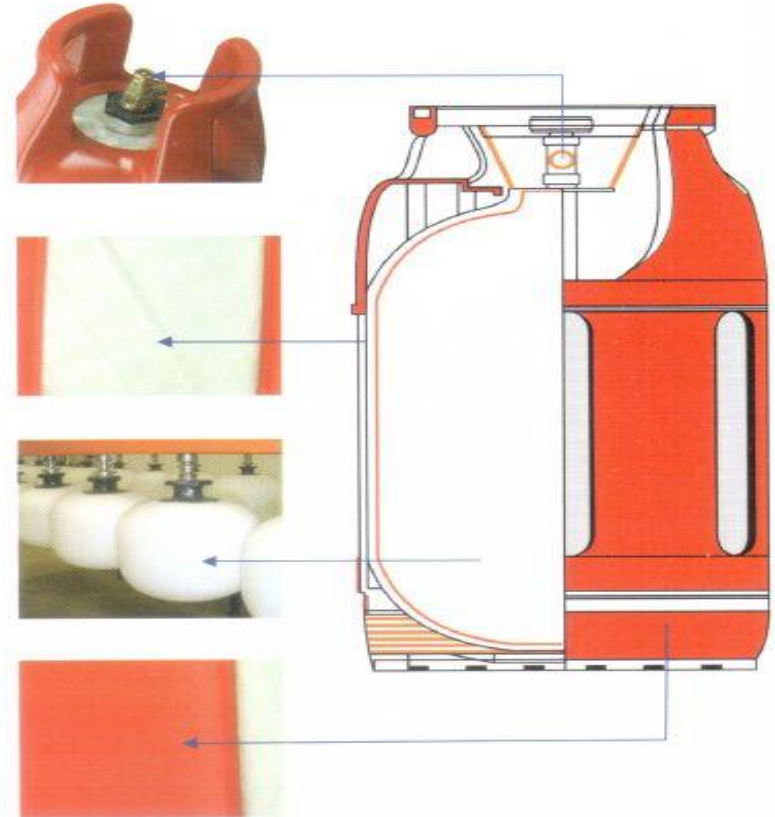
Composite material of fibre helically woven & combined with resin provides unmatched combination of high tensile strength, lightweight and UV resistance.

PE Inliner

Inner container is made of polyethylene (PE) and is treated with special resins & chemicals to provide excellent anti-permeation property.

Outer Shell / Casing

Heavy duty HDPE casing to suit rough handling and logistics. Attractive design to provide space for branding unlike metal cylinders. Customized colour combination can be chosen to suit client's need.





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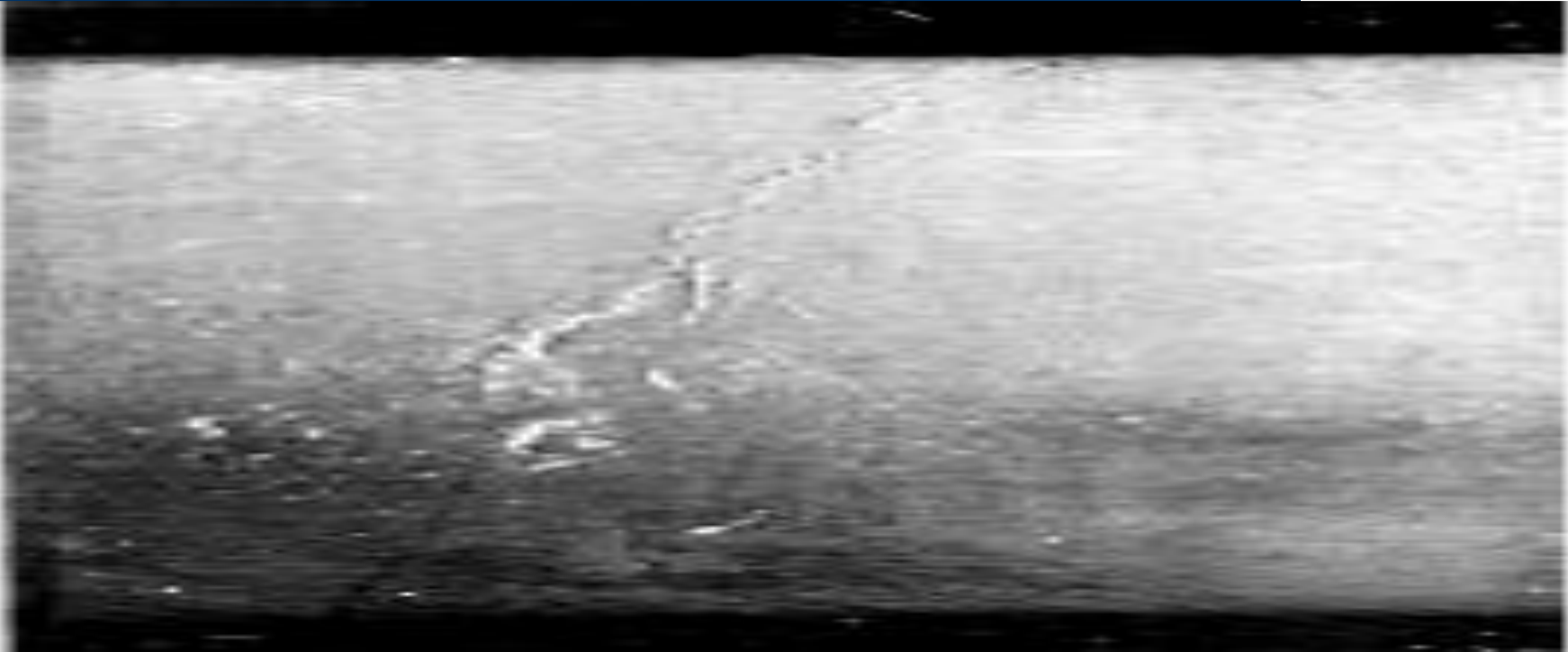
CUT OR GROOVE





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CRACKS





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GENERAL CORROSION





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CHANNEL (LINE) CORROSION



THANK YOU

