

# HIGH PRESSURE GAS CYLINDER

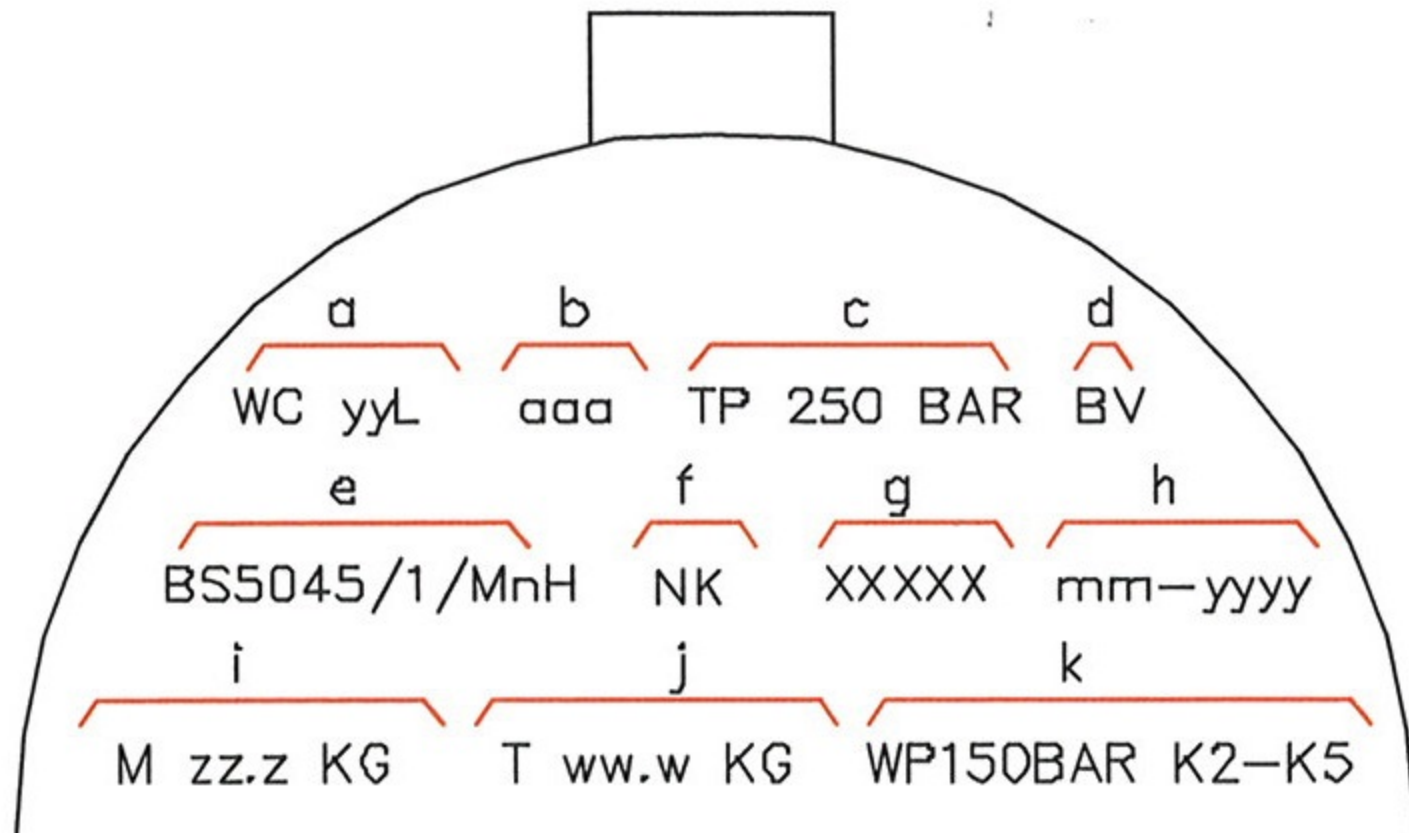
– SPECIFICATION : BS 5045, Part1, 1982  
Incl. AMD 1, 2 and 3

– REF : DRAWING No. ; 600-017

– LETTERING SIZE : 6 mm

MODEL No. ; NB-17  
NB-34  
NB-35  
NB-39

FRONT



DESCRIPTION

- a) Minimum water capacity.
- b) Gas name.
- c) Test pressure.
- d) Independent Inspector's mark.
- e) Specification and material of construction.
- f) Manufacture's mark.
- g) Serial Number.
- h) Date of test.
- i) Weight of empty cylinder including valve and any permanently fitted guard.
- j) Weight of full cylinder.
- k) Customer demand fact

NOTE

All markings to be hard stamp on the cylinder shoulder area.

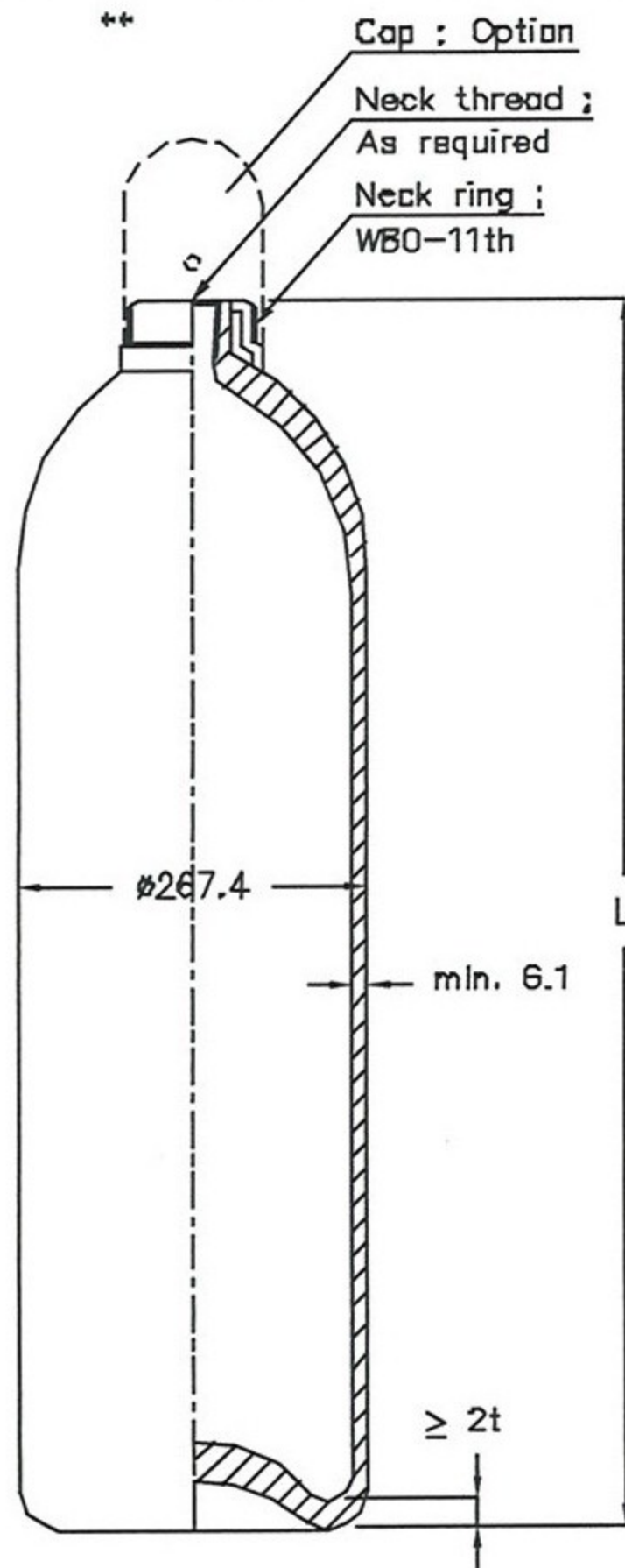


## CYLINDER MARKING

APP		DWG NO.	
CHK		630-019	
CHK		2006. 05. 26	
DWN	J. H .IM	1 of 1	REV. 0

A4(210x297mm)

CODE & STANDARD	BS 5045/Part 1-1982, incl. AMD 1 & 2, BS 5355 (incl. AMD 3349)									
GROUP NO.	NB-68-250-267-MN-01									
GROUP RANGE volume/length/weight	34 - 93 L, 805 - 2000 mm, 43 - 97 kg									
MODEL NO.	NB-17	NB-34	NB-35	NB-39						
WATER VOLUME Liters (+5% -D)	68	75	80	82.5						
GAS CAPACITY m <sup>3</sup>	6.1	6.7	7.2	7.4						
LENGTH(L) mm (±1D)	1490	1630	1740	1790						
WEIGHT kg (+10% -5%)	74	80	84	87						



1. DESIGN OBJECTIVE & TECHNICAL DATA

- Filling ratio(kg/liters) : 0.667
- Charging pressure(CP) : - bar(- MPa) at 15 °C
- Developed pressure(P) : 202 bar( 20.2 MPa) at 70 °C
- Hyd. test pressure(P1) : 250 bar( 25 MPa)
- Climatic area : U.K
- Gas traffic : Liquefied gases
- Service application : -
- Outside diameter(ØDo) : 267.4 mm
- Dimensional tolerance : Outside diameter ; ± 1 %  
Wall thickness : +25 %  
0

2. MATERIAL : MnH steel

2.1 CHEMICAL COMPOSITION(%)

Compo- sition	C	Si	Mn	P	S	Cr	Mo
Max.	0.40	0.35	1.70	0.050	0.050	-	-
Min.	-	0.10	1.30	-	-	-	-

2.2 PHYSICAL PROPERTY

- Tensile strength : min. 775 N/mm<sup>2</sup>
- Yield stress : min. 648 N/mm<sup>2</sup>
- Elongation : min. 14 % by BS : 5.65/√So
- Hardness : 220 - 313 HB
- Bending : Ref. to BS 5045 Part 1, Table 3.

3. CALCULATION FOR MINIMUM DESIGN WALL THICKNESS

3.1 Calculation formula

$$t = \frac{0.3 \times P1 \times Do}{7 \times fe - 0.4 \times P1}$$

- t : Min. wall thickness, mm
- CP: Charging pressure, bar
- P1: Hydraulic test pressure, bar
- Do: Outside diameter, mm
- P : Developed pressure, bar
- fe : Max. permissible equivalent stress, N/mm<sup>2</sup>

3.2 According to above calculation formula minimum design wall thickness shall be as follow.

$$\text{Ratio } \frac{Y}{T} = \frac{648}{775} = 0.836 \therefore \frac{Y}{T} > 0.7$$

∴ USE Table 8, Column 2

P1 Shall be the lesser of :

$$a) \frac{PY}{0.7T} = \frac{202 \times 648}{0.7 \times 775} = 241.3 \text{ bar}$$

$$b) \frac{P}{0.85} = \frac{202}{0.85} = 237.8 \text{ bar}$$

But not less than 200 bar

Therefore, Test pressure = 238 bar

But, from the BS 5396/1976 para. 4.1.2 the container shall be designed for a minimum test pressure of 250 bar.

Therefore, 250 bar test pressure shall be applied.

Ref. Table 17, 18 and 19

$$t = \frac{0.3 \times 250 \times 267.4}{7 \times 486 - 0.4 \times 250} = 6.074 \text{ mm}$$

Therefore actual guaranteed minimum wall thickness shall be 6.1 mm

REV.	DATE	HISTORY	DWN	CHK	APP
3	01.05.02	4th issued - corrected the Hardness value.			
2	99.07.26	3rd issued - added NB-34/35/39 model.	S.Y.Park	K.K.Lee	K.K.Lee
1	98.08.17	2nd issued.	K.K.Lee	K.K.Lee	Chung
0	98.03.25	1st issued - new issued.	K.K.Lee	K.K.Lee	Chung

SCALE		GAS CYLINDER 34 ~ 93 Liters	APP	DWG NO.
NONE			CHK	6DD-017
			CHK	2001. 05. 02
			DWN	Jongsung-Cheon