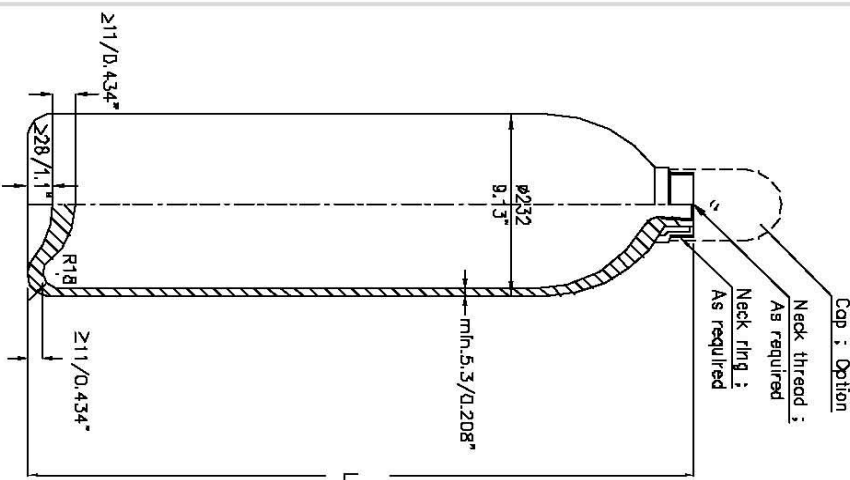


CODE & STANDARD	KS B 6210 : 2006 / KS B ISO 9809-1 : 2006 / ISO 9809-1 : 1999
FAMILY GROUP NO.	ISO-46.7-225-232-CM-01
FAMILY RANGE	21 - 70.5 L, 700 - 2000 mm, 29.5 - 74.5 kg
MODEL NO.	MKN-04
WATER VOLUME	40.2
Liters (+5 % -D)	
GAS CAPACITY	6
m <sup>3</sup> or kg	
LENGTH(L)	1180
mm (+10)	
WEIGHT	4.5
kg (+10 % -5 %)	



1. TECHNICAL DATA

- Filling ratio(kg/liters) : -
- Max. filling pressure : 150 bar ( 2175 psi )
- Hyd. test pressure : 250 bar ( 3625 psi )
- Service application : Compressed, Liquefied gases (hydrogen embrittlement)
- Outer diameter(ØD) : 232 mm
- Tare Weight(approx.) : 4.5 kg
- Dimensional tolerance : Outer diameter : ± 1 %  
Wall thickness : +25 %

2. MATERIAL : Carbon Mn steel

3. CHEMICAL COMPOSITION(%)

Compo-sition	C	Si	Mn	P	S	Cr	Mo
Max.	0.38	0.35	1.75	0.020	0.020	-	-
Min.	-	0.10	1.35	-	-	-	-

S + P : Max. 0.03

4. MECHANICAL PROPERTIES

- Tensile strength(R<sub>m</sub>) : Min. 750 N/mm<sup>2</sup> (750 MPa)  
: Max. 950 N/mm<sup>2</sup> (950 MPa)
- Yield strength(R<sub>e</sub>) : Min. 640 N/mm<sup>2</sup> (640 MPa)
- Elongation : ≥ 14 %
- Hardness : 215 ~ 290 HB

SCALE

NONE
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5. CALCULATION FOR MINIMUM DESIGN WALL THICKNESS

The guaranteed minimum thickness of the cylindrical shell (t) shall not less than the thickness calculated using equations (1) and (2), and additionally condition (3) shall be satisfied.

5.1 Calculation formula

$$t = \frac{D}{2} \left( 1 - \sqrt{\frac{10 F Re - 3 Ph}{10 F Re}} \right) \quad \text{---(1)}$$

- t : Calculated thickness of cylindrical shell, mm
- F : Design stress factor (the lesser of  $\frac{0.65}{Re/Rg}$  or 0.85)
- Ph : Hydraulic test pressure, bar
- D : Outer diameter, mm
- Re : Minimum guaranteed value of yield stress, MPa
- Ra shall not exceed 0.9 Rg

- $t \geq \frac{D}{250} + 1$  --- (2)
- with an absolute minimum of t = 1.5 mm
- $Pb/Ps \geq 1.6$  --- (3)
- Pb : Measured burst pressure, bar
- Ps : The burst ratio shall be satisfied by test

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

$$t = \frac{232}{2} \left( 1 - \sqrt{\frac{10 \times 0.76 \times 640 - \sqrt{3} \times 250}{10 \times 0.76 \times 640}} \right) = 5.283 \text{ mm} \quad \text{---(1)}$$

$$t \geq \frac{232}{250} + 1 = 1.928 \quad \text{---(2)}$$

Therefore, calculated minimum wall thickness is 5.3 mm.

5. Impact : According to ISO 148

Cylinder diameter D, mm	3-5	> 5-7.5	> 7.5-10
Width of test piece, mm	3-5	> 5-7.5	> 7.5-10
Test temperature, °C	-50	-50	-50
Impact strength J/cm <sup>2</sup>	Mean of three individual specimens	30	35
		24	28
			32

REV.	DATE	1st Issue - Non Issue.	HISTORY	DWN	CHK	APP
0	07/03/22		Gas Cylinder			
			O.D 276 mm			
				DWN	CHK	APP
						DWG NO.
						811-004
						2007. 05. 22
						1 of 1 REV. 0

NK-D43Q/94.08.07

A3(420x297mm)