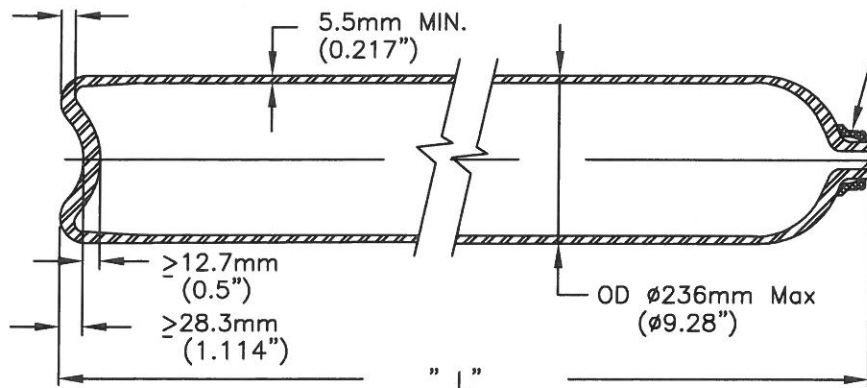


≥12.7mm  
(0.5")



ØW80 x 11 T.P.I.,  
Ø3 1/8" x 11 T.P.I.,  
OR COMPARABLE

25E, 1" - 11 - 1/2 NGT,  
3/4 - 14 NGT,  
OR COMPARABLE

OD Ø236mm Max  
(Ø9.28")

" L "

REV.	ECN - DESCRIPT.	DATE	DRWN.	CHKD.	APP.
01	2754 - Add 8BC85P	4/24/08	SAM		
02	2813 - thread opt.	1/20/09	JJM		

## DRAWING FOR REFERENCE ONLY

### 6(b). DOT 3AA CALCULATIONS:

The DOT formula can be written as:

$$t = 0.5 \times OD \times \left( 1 - \sqrt{\frac{S - 1.3 Ph}{S + 0.4 Ph}} \right)$$

Where:

S = design stress; the lower of 0.67xRg or 70ksi (483 MPa)

$$0.67 \times Rg = 0.67 \times 112.4 = 75.3 \text{ ksi}$$

(use S = 70 ksi)

$$t = 0.5 \times 9.28 \times \left( 1 - \sqrt{\frac{70000 - 1.3 \times 3834}{70000 + 0.4 \times 3834}} \right)$$

= 0.2164" (5.5mm) - DOT calculated Min.

\*For Dual ISO/DOT design t min = 5.5mm (0.217")

**SPECIFICATION:** ISO 9809/1: 1999  
DOT 3AA 2300

#### 1. Service Conditions:

- DOT rated service pressure: 158 bar (2300 psi)
- ISO rated working pressure: 176 bar (2553 psi)
- Hydraulic test pressure: 264 bar (3834 psi.)

#### 2. Material:

Cr-Mo-Steel, Fully killed and made to fine grain practice by basic oxygen or electric furnace process

#### Chemical Composition (%)

	C	Si	Mn	P	S	Cr	Mo
Min.	0.28	0.15	0.40	--	--	0.80	0.15
Max.	0.33	0.30	0.60	0.020	0.020	1.10	0.25

Note: S+P < 0.030

#### 3. Manufacture:

Hot billet extrusion followed by hot drawing

#### 4. Heat Treatment: Quenched and Tempered

- Austenitize: ~899°C (1650°F)
- Quenchant: Water based polymer.  
(temperature ≤ 60°C(140°F))
- Temper: ~649°C(1200°F) (Min. 30 minutes at temp.)

#### 5. Mechanical Properties: (at room temperature)

- Tensile (Rg): 775 - 930 MPa (112.4 - 134.8 ksi)
- Yield (Re): ≥ 658 MPa (95.4 ksi)
- Elong (A): ≥ 14% (ON 5.65 √S<sub>0</sub>)  
≥ 20% on 2" G.L. for DOT
- Hardness: 225-270 BHN
- Flattening test: Flatten to Ø6 x t without cracks
- Charpy test (-50°C, Trans): ≥ 35 J/cm<sup>2</sup> (avg.)
- UT flaw detection: Each cyld. per ISO 9809-1
- Batch burst test: Pb ≥ 423 bar (6135psi)

#### 6(a). Thickness Calculations: (ISO 9809/1: 1999)

$$a = 0.5 \times D \left( 1 - \sqrt{\frac{(10FR_e - \sqrt{3} Ph)}{(10FR_e)}} \right)$$

Where:

Ph = Test Pressure (bar) = 264 bar (3834psi)

D = External diameter of container = Ø236 mm Max

F = Lesser of 0.65/(Re/Rg) or 0.85; Re/Rg ≤ 0.9

= Lesser of 0.65/0.85 or 0.85 = 0.765 (for Re/Rg = 0.85)

$$a = 0.5 \times 236 \left( 1 - \sqrt{\frac{(10 \times 0.765 \times 658 - \sqrt{3} \times 264)}{(10 \times 0.765 \times 658)}} \right) = 5.49 \text{ mm} (0.2162")$$

NOTE: a', the guaranteed min thickness = 5.5mm (0.217") exceeds calculated min thickness, a.

MODEL	LENGTH 'L'		Min WATER CAPACITY		APPROX. WGT. W/O FITTINGS	
	MM	IN	LITERS	IN <sup>3</sup>	KG	LBS
8BC75P	1422	56	50.0	3058	61	135
8BC85P	1490	58.7	52.1	3179	63.5	140
*Vmin	708	27.9	21.7	1325	33	73
*Vmax	2133	83.9	76.5	4670	88	194

\*Note: Model 8BC75P is the design qualification test cylinder. Vmin and Vmax represent the range covered by the same design family.



**NORRIS CYLINDER COMPANY**

P.O. BOX 7486 LONGVIEW, TEXAS 75607

REFILLABLE SEAMLESS STEEL  
CYLINDER FOR CARBON DIOXIDE AND  
RELATED MIXTURES

SCALE	NOT TO SCALE	DRAWING NO.	REV.
DWN. BY	R.S.	6/14/04	901A-A-9646 02
CHK'D BY			
APP'D BY		SHEET NO. 1	OF 1 SHEETS