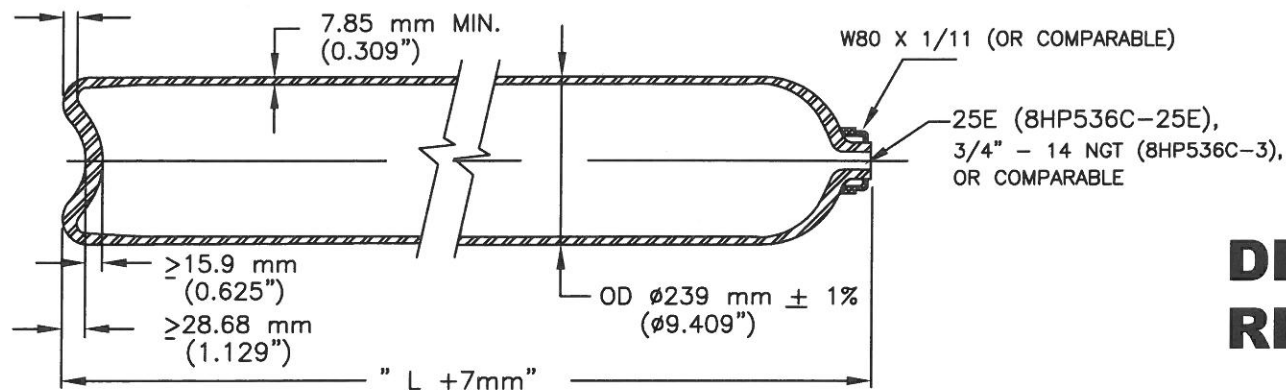


≥15.9 mm  
(0.625")



REV.	ECN - DESCRIPT.	DATE	DRWN.	CHKD.	APP.
01	2940	2/5/10	JJM		

## DRAWING FOR REFERENCE ONLY

SPECIFICATION: ISO 9809-2: 2000

**1. Service Conditions:**

- Working pressure: 345 bar (5003 psi)
- Hydraulic test pressure: 518 bar (7511 psi)  
(1 bar = 14.5 psi)

**2. Material:**

Cr-Mo-steel complying with the requirements of clause 6.2 of ISO 9809-2. Norris 4133M4

**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: ~565°C (1050°F) (Min. 30 minutes at temp.)

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

- Tensile (Rg): 1100 - 1220 MPa (159.6 - 177 ksi)
- Yield (Re): ≥ 935 MPa (135.6 ksi)
- Elong (A): ≥ 12% (ON 5.65 √S<sub>0</sub>)
- Hardness test: Each end of every cylinder
- Flattening test: Flatten to 10 x t<sub>m</sub> without cracks
- Charpy test (-50°C, Trans): ≥ 35 J/cm<sup>2</sup> (avg.)
- UT flaw detection: Each cyld. per ISO 9809-2
- Batch burst test: Pb ≥ 829 bar (12,021 psi)

**6(a). Thickness Calculations: (ISO 9809-2: 2000)**

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

Where:

- Ph = Test Pressure (bar) = 518 bar (7511 psi)
- D = External diameter of container = ø241.4mm Max
- F = Lesser of 0.65/(Re/Rg) or 0.77; Re/Rg ≤ 0.9  
= Lesser of 0.65/0.85 or 0.77 = 0.765 (for Re/Rg = 0.85)

$$a = 0.5 \times 241.4 \left( 1 - \sqrt{\frac{(10 \times 0.765 \times 935 - \sqrt{3} \times 518)}{(10 \times 0.765 \times 935)}} \right) = 7.83 \text{ mm (0.308")}$$

NOTE: a', the guaranteed min thickness = 7.85 mm (0.309") 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
8HP590C	1460	57.5	50.0	3050	83.4	184
8HP536C	1333	52.50	45.0	2750	77.1	170
*Vmin	698	27.5	20.8	1269	44.4	98
*Vmax	1987	78.25	70.0	4270	111.6	246

\*Note: Vmin and Vmax represent the range covered by the same design family. 8HP536C is the Type Approval cylinder. 1 bar = 14.5 psi



**NORRIS CYLINDER COMPANY**

4818 WEST LOOP 281 LONGVIEW, TEXAS 75603 USA

REFILLABLE SEAMLESS STEEL  
CYLINDER FOR PERMANENT GASES  
PER ISO 11114-1 FOR 239 mm OD

SCALE	NOT TO SCALE	DRAWING NO.		REV.
DWN. BY	JJM	2/19/09	901A-A-9772	01
CHK'D BY	JJM	04/15/09		
APP'D BY	FG	7/23/09	SHEET NO. 1	OF 1 SHEETS