



WORKING PAPER

**DANGEROUS GOODS PANEL (DGP)
MEETING OF THE WORKING GROUP OF THE WHOLE**

Memphis, 30 April to 4 May 2007

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2009/2010 Edition

2.8: Part 8 — Provisions Concerning Passengers and Crew

SMALL OXYGEN CYLINDERS CARRIED BY PASSENGERS

(Presented by D. Brennan)

SUMMARY

This paper proposes that a maximum size and number for “small” cylinders permitted in passenger and crew baggage be specified.

Action by the DGP-WG is in paragraph 2.

1. INTRODUCTION

1.1 During the Working Group on Passenger Provisions that met in the days prior to DGP-WG/06 there was a discussion on the current provision in Part 8;1.1.2 c) that permits passengers or crew to carry “with the approval of the operator(s), small gaseous oxygen or air cylinders required for medical use;”

1.2 The Working Group agreed that there should be a number specified as to how many “cylinders” an operator could approve a passenger to carry and also that a maximum size for the cylinder should be defined as “small” is a very subjective term. It was also agreed that there should be some text added to the provision to require that the cylinder, valve and regulator be protected from damage.

1.3 Following DGP-WG/06 research was done with the major medical oxygen supply companies, BOC and Air Liquide, to determine if there was an international standard size that equated to a portable cylinder suitable for carriage in the passenger cabin or in checked baggage.

1.4 It was identified that there is no single standard size rather there were a range of cylinder sizes. Within the ranges, however, 5 kg seemed to be the upper limit for a filled oxygen cylinder that would be suitable for carriage by passengers. The next group of cylinders above that weight are in the 9 – 10 kg filled weight range or have dimensions that make them unsuitable for passenger carriage. The appendix to this working paper contains a chart from BOC UK that shows medical cylinder data.

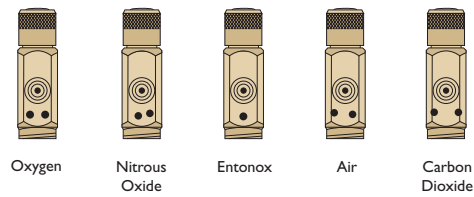
2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to amend 8;1.1.2 c) to read as follows:

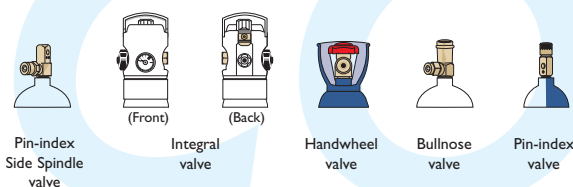
- c) with the approval of the operator(s), ~~small~~ a maximum of [3] gaseous oxygen or air cylinders per person required for medical use. Each cylinder must not exceed 5 kg gross mass with dimensions not exceeding 550 mm in length and 120 mm in diameter. Cylinders, valves and regulators, where fitted, must be protected from damage which could cause inadvertent release of the contents.

Medical Gas/ Medical Gas Mixture	Cylinder code	AZ	C	AD*	CD	DD ⁽¹⁾	PD	RD	ZD	D	E	AF ⁽¹⁾	DF ⁽¹⁾	F	LF	VF	AV	HX	ZX	G	AK	J	L
Colour Code****	New valve Technology***			Integral valve	Integral valve	Integral valve		Integral valve	Integral valve				Integral valve					Integral valve	Integral valve				
OXYGEN	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection	170 137 Pin-index	170 137 Pin-index	400 4 6mm firtree	460 4 Schraeder/ 6mm firtree	460 4 6mm firtree	300 137 Bullnose 5/8" BSP (f)	460 4 Schraeder/ 6mm firtree		340 137 Pin-index	680 137 Pin-index	1360 137 Bullnose 5/8" BSP (f)	1360 4 Schraeder/ 6mm firtree	1360 137 Bullnose 5/8" BSP (f)				2300 4 Schraeder/ 6mm firtree	3040 4 Schraeder/ 6mm firtree	3400 137 Bullnose 5/8" BSP (f)		6800 137 Pin-index (side spindle)	
NITROUS OXIDE	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection	450 44 Pin-index	450 44 Pin-index							900 44 Pin-index	1800 44 Pin-index			3600 44 Handwheel 1 1/16" x 20tpi (m)						9000 44 Handwheel 1 1/16" x 20tpi (m)		18000 44 Handwheel 1 1/16" x 20tpi (m)	
ENTONOX (50% N₂O/50% O₂)	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection				440 4 Schraeder				794 4 Schraeder	500 137 Pin-index				2000 137 Pin-index (side spindle)			2200 4 Schraeder	3970 4 Schraeder	5000 137 Pin-index				
AIR	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection	160 137 Pin-index								640 137 Pin-index				1280 137 Bullnose 5/8" BSP (f)						3200 137 Bullnose 5/8" BSP (f)		6400 137 Pin-index (side spindle)	
CARBON DIOXIDE	Contents (litres) Valve outlet pressure (bar (g))** Valve outlet connection		450 50 Pin-index							1800 50 Pin-index					3600 50 Handwheel 0.860" x 14tpi (m)	3600 50 Handwheel 0.860" x 14tpi (m)							
OXYGEN/CARBON DIOXIDE MIXTURE (95% O₂/5% CO₂)	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection													1360 137 Bullnose 5/8" BSP (f)						3400 137 Bullnose 5/8" BSP (f)		6800 137 Bullnose 5/8" BSP (f)	
HELIUM	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection									300 137 Pin-index				1200 137 Bullnose 5/8" BSP (f)									
HELIUM/OXYGEN MIXTURE (79% He/21% O₂)	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection													1200 137 Bullnose 5/8" BSP (f)				1780 4 Schraeder/ 6mm firtree					
LUNG FUNCTION MIXTURES TYPE I-4	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection																1500 200 Side outlet Handwheel 5/8" BSP (LH) (f)				6000 200 Side outlet Handwheel 5/8" BSP (LH) (f)		
CARBON DIOXIDE/OXYGEN MEDICAL GAS MIXTURES	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection																1460 200 Side outlet Handwheel 5/8" BSP (f)						6780 200 Side outlet Handwheel 5/8" BSP (f)
CARBON DIOXIDE/AIR MEDICAL GAS MIXTURE (5% CO₂/95% AIR)	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection																1350 200 Side outlet Handwheel 5/8" BSP (f)						6780 200 Side outlet Handwheel 5/8" BSP (f)
HELIUM/OXYGEN/NITROGEN MEDICAL GAS MIXTURE (56% N₂/35% O₂/19% He)	Contents (litres) Valve outlet pressure (bar (g)) Valve outlet connection																1310 200 Side outlet Handwheel 5/8" BSP (f)						6580 200 Side outlet Handwheel 5/8" BSP (f)

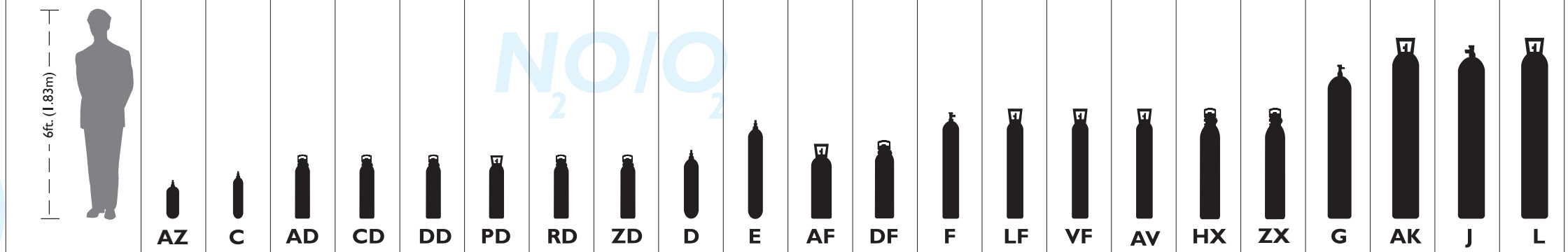
PIN INDEX VALVES



VALVE TYPES



Water Capacity (litres)	1.2	1.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.32	4.68	9.43	9.43	9.43	9.43	9.43	10.0	10.0	10.0	23.6	40.0	47.2	50.0
Approx dimensions including valve	290 x 100	430 x 89	480 x 100	520 x 100	520 x 100	455 x 100	480 x 100	485 x 100	535 x 102	865 x 102	670 x 175	690 x 175	930 x 140	930 x 140	930 x 140	680 x 180	940 x 140	940 x 143	1320 x 178	1540 x 230	1520 x 229	1540 x 230	
Approx dimensions including valve	11.4 x 3.9	16.9 x 3.5	18.9 x 3.9	20.5 x 3.9	20.5 x 3.9	17.9 x 3.9	18.9 x 3.9	19.1 x 3.9	21.1 x 4	34.1 x 4	26.4 x 6.9	27.2 x 5.5	36.6 x 5.5	36.6 x 5.5	36.6 x 5.5	26.8 x 7.1	37 x 5.5	37.0 x 5.6	52 x 7	60.6 x 9.1	59.8 x 9	60.6 x 9.1	
Approx weight (empty)	2.3	2.0	3.7	2.7	2.7	4.8	4.1	3.1	3.4	5.4	9.9	10.0	14.5	14.5	14.5	15.5	15.5	10.0	34.5	51.0	68.9	51.0	
Approx weight (empty)	5.1	4.4	8.2	6.0	6.0	10.6	9.0	6.6	7.5	11.9	21.8	22.0	32.0	32.0	32.0	34.2	34.2	22.0	76.1	112.4	151.9	112.4	



The cylinder data card indicates the water capacity, dimensions, empty weight, gas capacity and valve type. The indicated cylinder colours are those specified in BS EN 1089-3 and ISO 32. Other countries do not necessarily use the same colours and care should be taken to identify correctly gas cylinders brought into the UK from overseas. All BOC cylinders are fitted with a colour coded and date marked test ring under the cylinder valve. This allows BOC to identify cylinders requiring internal inspection or hydraulic testing before refilling.

- Suitable for use in MRI environment.
- Most common cylinders used within the hospital.
- Specialist use cylinders used within the hospital.
- Other medical cylinders used within the hospital.
- (1) Domiciliary use only.

NOTES: * The indicated cylinder is for specialised applications and availability is restricted.
 ** Vapour pressure of liquefied gas at 15 degrees celsius.
 *** Integral valve features a live content gauge, on/off handwheel, built-in flowmeter and regulator. Schraeder outlets are product specific to accept probes to BS 5682.
 **** Always identify the cylinder content by the information on the label.

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