Faber INDUSTRIE SPA

PRODUCTION TESTING CERTIFICATE OF SEAMLESS STEEL GAS CYLINDERS

Manufacturer: **FABER INDUSTRIE SPA - CIVIDALE DEL FRIULI - UDINE- ITALY**
Inspection: **LLOYD'S REGISTER** Specification: **EN 1964-1:1999 (PED)**
Customer: **SCUBAPRO UWATEC**

Manufacturer serial No. :
From **09/0848/001** to **09/0848/104**

Gas: **1002 AIR**

Total cylinders: **100**
Type of cylinder: **Seamless steel gas cylinders**
Material: **34CRMO4**

Working pressure at 15° C: **232** bar
Working temperature: **-50° ÷ +65° C**

Nominal data

Drawing no.	Test Pressure (bar)	Minimum Thickness wall (mm)	Minimum Thickness base (mm)	Nominal Diameter (mm)	Nominal Length without valve (mm)	Nominal Water Capacity (l)	Nominal Weight (Kg)
EN-140-372-890 REV.0	**372**	**3.7**	**3.7**	**140**	**530**	**6**	**7.6**

We hereby certify that the cylinders of the batch no. **09/0848** comply with the following requirements

Manufacturing process: cylinders manufactured from **plate**

Neck thread : **M25X2 EN 144-1 2000**

Identification marks stamped on cylinders shoulder according to drawing: **PPED004 2**

Minimum cylindrical shell thickness:

The wall thickness of all cylinders has been measured and found to be not less than : **3.7** mm

Hardness range:

All cylinders have been controlled within the following hardness values: Min **306** HB, Max **333** HB

Heat treatment:

All cylinders have been heat treated at the following temperatures:
Liquid quench: 900 °C ± 20 °C
Temper at: 570 °C ± 30 °C

Chemical analysis:

Material: **34CRMO4**

The cylinders of the batch no. **09/0848** have been manufactured from the following cast(s) of steel:

Cast Numb.	Code (*)	C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Mo (%)	S+P (%)
14324	BUB	0.33	0.24	0.64	0.012	0.005	1.01	0.22	0.017
14325	BUC	0.36	0.23	0.62	0.010	0.008	1.02	0.22	0.018

(*)marked on outer bottom surface

Date: **18/03/2009**	For and on behalf of the manufacturer: Faber INDUSTRIE S.p.A.	For and on behalf of A.I.A. Lloyd's Register EMEA

MEASUREMENTS OF SAMPLE CYLINDERS:

Cylinder Serial no.	Water Capacity (L)	Empty Weight (Kg)	Minimum measured thickness	
			of the wall (mm)	of the base (mm)
09/0848/101	6	7.74	3.9	5.8
09/0848/102	6	7.66	3.9	5.8
09/0848/103	6	7.68	3.9	6.0
09/0848/104	6	7.66	3.9	6.0

MECHANICAL TESTS CARRIED OUT ON SAMPLE CYLINDERS:

Cylinder Serial no.	Code (*)	Test piece dimension (mm)	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact test -50°C			Bend test 180° without cracking
						Direction	Individual (J/cm²)	Mean (J/cm²)	
09/0848/101	BUB	10.0 x 4.1	918	1028	15.4	LONG	86 89 89	88	SATISF.
09/0848/103	BUC	10.0 x 4.0	936	1046	15.7	TRASV	74 84 91	83	SATISF.
Minimum values specified			890	990	14		48	60	

BURST TESTS CARRIED OUT ON SAMPLE CYLINDERS:

Cylinder Serial no.	Code (*)	Hydraulic burst test bar	Description of the fracture
09/0848/102	BUB	635	LONGITUDINAL
09/0848/104	BUC	650	LONGITUDINAL
Minimum values specified		596	

For and on behalf of the manufacturer:	For and on behalf of A.I.A.
Faber INDUSTRIE S.P.A.	Lloyd's Register EMEA TRIESTE