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Report of Manufacture and Certificate of Conformance

Fibre Reinforced Steel Cylinders

Certificate N° TRI 0600301/948
54

REPORT OF MANUFACTURE AND CERTIFICATE OF CONFORMANCE
FIBRE REINFORCED STEEL CYLINDERS
BATCH N° 06/8677

Manufacturer : FABER INDUSTRIE S.p.A
Cividale del Friuli
Udine - Italy

Inspection Body: LLOYD'S REGISTER EMEA
For Lloyd's Register
Trieste Office – Italy

This certificate is issued to Faber Industrie S.p.A. to certify that the cylinders, particulars of which are given below, hav been manufactured, inspected and tested in compliance with the following drawing and specification:

Drawing No.: ISO-420-375-840/COMP REV.1
Design Standard: ISO 11439:2000
Cylinder Type: CNG-2 – High Pressure for on board storage of Natural Gas for Automotive Vehicles
Cylinder Size: Outside Diameter 424 mm, Length 1785 mm, Wall Thickness 6.4 mm (L) 7.7 mm (C)

Quantity: 172 **Serial Number:** 06/8677/022+201

Marks stamped on the shoulder or on labels of the cylinder are:

1 Content.....CNG ONLY
2 Validity.....DO NOT USE AFTER 06-2021
3 Neck thread.....W 28.8
4 Manufacturer.....FABER
5 Serial Number.....06/8677/022+201
6 Capacity.....195L
7 Filling pressure/Temp. .....250BAR/15°C
8 Test pressure..... TP 375 BAR
9 Weight.....XXX Kg
10 Intern. Standard..... .....ISO 11439:2000
11 Cylinder Type.....CNG-2
12 Man. Date (month/year).....07/06
13 Inspection Authority.....LR
14 Fire Protection..... USE ONLY FABER- APPROVED PRD

Each cylinder was made in compliance with all requirements of ISO 11439 in accordance with the specified type.

Results of required tests are recorded in the attached Manufacturer's inspection and test certificate n° 06/8677 dated 31 July 2006 endorsed by Lloyd's Register for acceptance.

I hereby certify that all these results proved satisfactory in every way and are in compliance with the requirements of ISO 11439 for the type listed above.

Date of issue: 31 July 2006

Note: cylinders n° 076-156-162-164-189-199 rejected

P. Stradi
Inspector to Lloyd's Register EMEA
For Lloyd's Register

Faber INDUSTRIE SPA	REPORT OF MANUFACTURER AND CERTIFICATION OF CONFORMANCE	PAG. 1 OF 11

Manufactured by: **FABER INDUSTRIE SPA**
Located at: **CIVIDALE DEL FRIULI - UDINE - ITALY**
Customer: **Super Central Gas Co.,LTD**
Customer's order No. : **FA-01-2006 (REV)20060316**

Manufacturer Serial No(s) from: **06/8677/022** to **06/8677/201**

Total cylinders: **172** Inspection Agency: **LLOYD'S REGISTER**
Cylinder description: **Lightweight Refillable Gas Cylinder for the on-board storage of high pressure compressed natural gas as a fuel for automotive vehicles.**

Cylinder Type: **CNG-2**
Manufacturing date: **07/2006** Service life: **15 years** Gas: **CNG**
Working Temperatures: **-40° ÷ +65** Neck thread: **W28,8X1/14 TAP DIN477 P.1 1990**

Drawing number	Working pressure at 15 °C (bar)	Test pressure (bar)	Minimum design thickness wall (mm)	Minimum design thickness base (mm)	Minimum design composite thickness (mm)	Nominal diameter (mm)	Nominal length without valve (mm)	Nominal water capacity (l)	Nominal weight (Kg)
ISO-420-375-840/COMP REV.1	250	375	6.4	10.0	7.7	424	1785	195	164.0

HEAT TREATMENT
All liners have been quenched and tempered.
HARDNESS RANGE
All liners have been controlled. Hardness values of all liners are within: Min 295 HB ;Max 350 HB
MINIMUM DESIGN COMPOSITE THICKNESS
The minimum thickness of the composite has been measured and found to be not less than 7.7 mm
MARKINGS
Each cylinder has been marked / labelled according to drawing: **PISO0340**
The following information have been marked on the shoulder / stamped on the labels of the cylinders:
Manufacturer: **FABER**
Manufacturer Serial No: 06/8677/ . . .
Nominal water capacity: 195 L
Weight: . . . Kg
Working pressure at 15° C: 250 bar
Content: **CNG ONLY**
Service life: **DO NOT USE AFTER 06/2021**
Cylinder Type: **CNG-2**
Manufacturing date: **07/06**
Design Standard: **ISO 11439**
Statement: **USE ONLY FABER APPROVED P.R.D.**

Each cylinder was made in compliance with all requirements of ISO 11439 and in accordance with the cylinder description above.
Required records of tests results are attached.
We hereby certify that all this test results proved satisfactory and are in compliance with the ISO 11439 requirements.

Date **31/07/2006**	MANUFACTURER stamp and signature	INDEPENDENT INSPECTION AGENCY stamp and signature

Faber INDUSTRIE S.p.A

Faber INDUSTRIE SPA

REPORT OF CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES

RECORD OF CHEMICAL ANALYSIS:

The liners in batch **06/8677** were manufactured from the following cast of steel

Material: **34CRMO4**

Steelmaker:	Cast	Code (*)	C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Mo (%)	S+P (%)
INDUSTEEL	**01703**	**CAH**	**0.34**	**0.22**	**0.70**	**0.009**	**0.004**	**0.99**	**0.21**	**0.013**

(*)marked on outside bottom surface

LINER MECHANICAL PROPERTIES :

Cylinder Serial no.	Code	Test piece dimension (mm)	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact test -50°C Individual (J/cm²)	Impact test -50°C Mean (J/cm²)
06/8677/200	CAH	10.0 x 6.7	910	1030	15.6	92 88 85	88
Minimum specified values			840	950	14	28	35

COMPOSITE MECHANICAL PROPERTIES :

	Type	Manufacturer	Batch No.	Faber code	Tensile Strength (MPa)	Interlaminar Shear Strength (MPa)
FIBER	GLASS FIBER R25HX13	OWENS-CORNING	350209	AV		
RESIN	ISOPHTALIC POLYESTER RESIN DISTITRON 166 UV	LONZA	06102	IJ	1046	75.0
HARDENER						
			Minimun Specified Values		965	13.8

CYCLING AND BURST TESTS:

Cylinder serial no.	Cycling test range pressure (bar)	Number of pressurizations (Cycles)	Result of burst test (bar) ≥ 625
06/8677/201	20 ÷ 325	15000	700

MANUFACTURER stamp and signature	INDEPENDENT INSPECTION AGENCY stamp and signature

Faber INDUSTRIE S.p.A.

Faber INDUSTRIE SPA	ULTRASONIC TEST CERTIFICATE	PAG. 3 OF 11

TESTING OBJECT:

CYLINDER ACCORDING TO DRAWING: **ISO-420-375-840/COMP REV.1**

OUTSIDE DIAMETER: **424** mm WATER CAPACITY: **195** l

MIN. WALL THICKNESS: **6.4** mm NOMINAL LENGTH: **1785** mm

FROM CYLINDER SERIAL No. : 06/8677/022 TO 06/8677/201

TEST TECHNICAL DATA:

EXAMINATION STANDARD: **ISO 11439 (E=25 MM)**

INSPECTED PART: **CYLINDRICAL WALL**

EXTENTION OF EXAMINATION: **100 %**

FABRICATION STAGE: **AFTER HEAT TREATMENT (QUENCHING AND TEMPERING), SHOT BLASTING AND BEFORE PRESSURE TESTING**

PROBES: **LONGITUDINAL,TRANSVERSAL AND THICKNESS**

COUPLANT: **EMULSIFIED WATER**

SCANNING DIRECTION: **CIRCUMFERENTIAL, AXIAL AND RADIAL DIRECTIONS**

REFERENCE REFLECTOR: **CALIBRATION CYLINDER ACCORDING TO ISO 11439 (E=25 MM)**

EXAMINATION RESULTS:

ALL LINERS HAVE BEEN CHECKED GIVING SATISFACTORY RESULTS.

NOTE:		
Date **31/07/2006**	QUALITY DEPT. stamp and signature	INDEPENDENT INSPECTION AGENCY stamp and signature

21752

Faber INDUSTRIE SPA	COATING TEST CERTIFICATE	PAG. 4 OF 11

CYLINDER CHARACTERISTICS :

CYLINDER ACCORDING TO DRAWING: **ISO-420-375-840/COMP REV.1**

OUTSIDE DIAMETER: **424** mm WATER CAPACITY: **195** l

MIN. WALL THICKNESS: 6.4 mm NOMINAL LENGTH: 1785 mm

TEST CHARACTERISTICS :

Protective coating of liners of the batch :

from 06/8677/022 to 06/8677/201

- have been evaluated for thickness test in accordance with ISO 2808
- have been verified for coating adhesion in accordance with ISO 4624

EXAMINATION RESULTS

Satisfactory

MANUFACTURER stamp and signature	INDEPENDENT INSPECTION AGENCY stamp and signature

Faber INDUSTRIE S.p.A.

21752

Faber INDUSTRIE SPA	REPORT OF HYDROSTATIC TESTS ON COMPOSITE CYLINDERS	PAG. 5 OF 11

LOT No. : 06/8677 ACCORDING TO DWG.: ISO-420-375-840/COMP REV.1 TEST DATE: 07/2006

CUSTOMER : **Super Central Gas Co.,LTD**

CYLINDER SIZE: OUTSIDE DIAMETER 424 mm LENGTH 1785 mm

TEST PRESSURE (bar): 375 AUTOFRATTAGE PRESSURE (bar): 460 WORKING PRESSURE AT 15° C (bar): 250

REMARKS : "M" = Mechanical Tests, "P" = Prototype Tests, "C" = Cycling Tests, "B" = Burst Tests, "S" = Discarded Cylinder
"C+B" = Cycling + Burst Test.

CYLINDER SERIAL No.	HEAT CODE AND NUMBER		CYLINDER WATER CAPACITY (l)	TARE WEIGHT (Kg)	CYLINDER EXPANSION (cc) AT AUTOFRATTAGE PRESSURE TOTAL (cc)	PERMANENT (cc)	RATIO >10% (per / tot)	CYLINDER EXPANSION (cc) AT TEST PRESSURE TOTAL (cc)	PERMANENT (cc)	RATIO <5% (per / tot)	REMARKS
06/8677/022	CAH	01703	195.0	165.0	3844	1393	36.2%	1727	1.2	0.1%	
06/8677/023	CAH	01703	195.0	166.0	3642	1272	34.9%	1726	0.9	0.1%	
06/8677/024	CAH	01703	195.0	165.0	3861	1402	36.3%	1721	0.8	0.0%	
06/8677/025	CAH	01703	195.0	166.0	3580	1209	33.8%	1683	0.6	0.0%	
06/8677/026	CAH	01703	195.0	166.0	3725	1299	34.9%	1723	0.7	0.0%	
06/8677/027	CAH	01703	195.0	165.0	3285	980	29.8%	1733	0.5	0.0%	
06/8677/028	CAH	01703	195.0	166.0	3042	810	26.6%	1695	0.4	0.0%	
06/8677/029	CAH	01703	195.0	166.0	3100	865	27.9%	1688	0.4	0.0%	
06/8677/030	CAH	01703	195.0	165.0	3353	1067	31.8%	1606	1.0	0.1%	
06/8677/031	CAH	01703	195.0	165.0	3545	1171	33.0%	1717	1.1	0.1%	
06/8677/032	CAH	01703	195.0	166.0	3233	970	30.0%	1704	0.8	0.0%	
06/8677/033	CAH	01703	195.0	166.0	3568	1196	33.5%	1694	0.6	0.0%	
06/8677/034	CAH	01703	195.0	166.0	3414	1083	31.7%	1709	0.9	0.1%	
06/8677/035	CAH	01703	195.0	165.0	3515	1156	32.9%	1732	1.0	0.1%	
06/8677/036	CAH	01703	195.0	166.0	3436	1107	32.2%	1728	1.1	0.1%	
06/8677/037	CAH	01703	195.0	166.0	3588	1215	33.9%	1715	1.4	0.1%	
06/8677/038	CAH	01703	195.0	166.0	3223	962	29.8%	1649	0.6	0.0%	
06/8677/039	CAH	01703	195.0	165.0	3296	1007	30.6%	1702	0.8	0.0%	
06/8677/040	CAH	01703	195.0	164.0	3200	956	29.9%	1684	0.4	0.0%	
06/8677/041	CAH	01703	195.0	165.0	3847	1414	36.8%	1760	0.6	0.0%	
06/8677/042	CAH	01703	195.0	167.0	2983	798	26.8%	1677	1.2	0.1%	
06/8677/043	CAH	01703	195.0	166.0	3612	1237	34.2%	1746	1.5	0.1%	
06/8677/044	CAH	01703	195.0	165.0	3495	1140	32.6%	1726	1.2	0.1%	
06/8677/045	CAH	01703	195.0	166.0	3288	1001	30.4%	1702	1.1	0.1%	
06/8677/046	CAH	01703	195.0	167.0	3237	963	29.7%	1692	0.8	0.0%	
06/8677/047	CAH	01703	195.0	166.0	3447	1140	33.1%	1663	0.9	0.1%	
06/8677/048	CAH	01703	195.0	166.0	3204	978	30.5%	1690	1.5	0.1%	
06/8677/049	CAH	01703	195.0	167.0	3433	1089	31.7%	1753	0.8	0.0%	
06/8677/050	CAH	01703	195.0	166.0	3375	1194	35.4%	1770	1.6	0.1%	
06/8677/051	CAH	01703	195.0	166.0	3494	1170	33.5%	1711	0.9	0.1%	
06/8677/052	CAH	01703	195.0	165.0	3742	1344	35.9%	1748	7.8	0.4%	
06/8677/053	CAH	01703	195.0	165.0	3625	1266	34.9%	1716	1.2	0.1%	
06/8677/054	CAH	01703	195.0	166.0	3494	1166	33.4%	1714	0.8	0.0%	
06/8677/055	CAH	01703	195.0	165.0	3623	1229	33.9%	1720	0.6	0.0%	
06/8677/056	CAH	01703	195.0	165.0	3593	1215	33.8%	1740	0.5	0.0%	
06/8677/057	CAH	01703	195.0	165.0	3429	1126	32.8%	1704	1.0	0.1%	
06/8677/058	CAH	01703	195.0	165.0	3756	1346	35.8%	1706	1.2	0.1%	
06/8677/059	CAH	01703	195.0	166.0	3396	1081	31.8%	1712	0.4	0.0%	
06/8677/060	CAH	01703	195.0	165.0	3484	1142	32.8%	1729	1.4	0.1%	
06/8677/061	CAH	01703	195.0	165.0	3516	1134	32.3%	1762	1.0	0.1%	

Date 07/2006	MANUFACTURER STAMP AND SIGNATURE	INDEPENDENT INSPECTION AUTHORITY
	K. Faber Industrie S.p.A.	

21752

Faber INDUSTRIE SPA	REPORT OF HYDROSTATIC TESTS ON COMPOSITE CYLINDERS	PAG. 6 OF 11

LOT No. : 06/8677 ACCORDING TO DWG.: ISO-420-375-840/COMP REV.1 TEST DATE: 07/2006

CUSTOMER : **Super Central Gas Co.,LTD**

CYLINDER SIZE: OUTSIDE DIAMETER 424 mm LENGTH 1785 mm

TEST PRESSURE (bar): 375 AUTOFRATTAGE PRESSURE (bar): 460 WORKING PRESSURE AT 15° C (bar): 250

REMARKS : "M" = Mechanical Tests, "P" = Prototype Tests, "C" = Cycling Tests, "B" = Burst Tests, "S" = Discarded Cylinder
"C+B" = Cycling + Burst Test.

CYLINDER SERIAL No.	HEAT CODE AND NUMBER		CYLINDER WATER CAPACITY (l)	TARE WEIGHT (Kg)	CYLINDER EXPANSION (cc) AT AUTOFRATTAGE PRESSURE TOTAL (cc)	PERMANENT (cc)	RATIO >10% (per / tot)	CYLINDER EXPANSION (cc) AT TEST PRESSURE TOTAL (cc)	PERMANENT (cc)	RATIO <5% (per / tot)	REMARKS
06/8677/062	CAH	01703	195.0	165.0	3590	1211	33.7%	1755	1.4	0.1%	
06/8677/063	CAH	01703	195.0	167.0	3489	1155	33.1%	1639	0.6	0.0%	
06/8677/064	CAH	01703	195.0	165.0	3553	1183	33.3%	1731	0.6	0.0%	
06/8677/065	CAH	01703	195.0	165.0	3472	1142	32.9%	1700	1.2	0.1%	
06/8677/066	CAH	01703	195.0	164.0	3371	1047	31.1%	1726	0.7	0.0%	
06/8677/067	CAH	01703	195.0	165.0	3330	1041	31.3%	1707	1.1	0.1%	
06/8677/068	CAH	01703	195.0	165.0	3503	1138	32.5%	1742	1.3	0.1%	
06/8677/069	CAH	01703	195.0	164.0	3291	1002	30.4%	1705	1.2	0.1%	
06/8677/070	CAH	01703	195.0	165.0	3545	1174	33.1%	1738	0.8	0.0%	
06/8677/071	CAH	01703	195.0	165.0	3310	1026	31.0%	1672	1.2	0.1%	
06/8677/072	CAH	01703	195.0	165.0	3268	1018	31.2%	1709	0.3	0.0%	
06/8677/073	CAH	01703	195.0	164.0	3359	1086	32.3%	1604	1.1	0.1%	
06/8677/074	CAH	01703	195.0	164.0	3538	1169	33.0%	1740	0.9	0.1%	
06/8677/075	CAH	01703	195.0	164.0	3213	961	29.9%	1674	0.9	0.1%	
06/8677/076	CAH	01703	195.0								S
06/8677/077	CAH	01703	195.0	164.0	3550	1175	33.1%	1745	0.9	0.1%	
06/8677/078	CAH	01703	195.0	166.0	3207	931	29.0%	1670	0.7	0.0%	
06/8677/079	CAH	01703	195.0	166.0	3238	938	29.0%	1730	1.0	0.1%	
06/8677/080	CAH	01703	195.0	166.0	3139	898	28.6%	1700	0.6	0.0%	
06/8677/081	CAH	01703	195.0	166.0	3038	851	28.0%	1668	0.7	0.0%	
06/8677/082	CAH	01703	195.0	166.0	3268	984	30.1%	1683	0.8	0.0%	
06/8677/083	CAH	01703	195.0	165.0	3310	1012	30.6%	1695	0.9	0.1%	
06/8677/084	CAH	01703	195.0	165.0	3287	992	30.2%	1714	0.7	0.0%	
06/8677/085	CAH	01703	195.0	166.0	3485	1161	33.3%	1715	1.1	0.1%	
06/8677/086	CAH	01703	195.0	166.0	3470	1105	31.8%	1742	1.2	0.1%	
06/8677/087	CAH	01703	195.0	164.0	3517	1158	32.9%	1692	0.8	0.0%	
06/8677/088	CAH	01703	195.0	166.0	3321	1040	31.3%	1694	0.9	0.1%	
06/8677/089	CAH	01703	195.0	164.0	3557	1179	33.1%	1741	0.7	0.0%	
06/8677/090	CAH	01703	195.0	165.0	3495	1144	32.7%	1722	1.3	0.1%	
06/8677/091	CAH	01703	195.0	165.0	3366	1057	31.4%	1703	1.1	0.1%	
06/8677/092	CAH	01703	195.0	165.0	3743	1290	34.5%	1716	1.6	0.1%	
06/8677/093	CAH	01703	195.0	165.0	3331	1013	30.4%	1692	1.0	0.1%	
06/8677/094	CAH	01703	195.0	165.0	3665	1246	34.0%	1772	0.7	0.0%	
06/8677/095	CAH	01703	195.0	166.0	3139	885	28.2%	1692	0.5	0.0%	
06/8677/096	CAH	01703	195.0	166.0	3325	1025	30.8%	1713	0.9	0.1%	
06/8677/097	CAH	01703	195.0	166.0	3307	1011	30.6%	1681	1.2	0.1%	
06/8677/098	CAH	01703	195.0	166.0	3387	1096	32.4%	1702	1.0	0.1%	
06/8677/099	CAH	01703	195.0	167.0	3365	1079	32.1%	1697	1.5	0.1%	
06/8677/100	CAH	01703	195.0	165.0	3421	1110	32.4%	1710	1.2	0.1%	
06/8677/101	CAH	01703	195.0	165.0	3596	1230	34.2%	1743	0.5	0.0%	

Date 07/2006	MANUFACTURER STAMP AND SIGNATURE	INDEPENDENT INSPECTION AUTHORITY
	F.Faber INDUSTRIE S.p.A.	

21752

Faber INDUSTRIE SPA	REPORT OF HYDROSTATIC TESTS ON COMPOSITE CYLINDERS	PAG. 7 OF 11

LOT No. : 06/8677 ACCORDING TO DWG.: ISO-420-375-840/COMP REV.1 TEST DATE: 07/2006

CUSTOMER : Super Central Gas Co.,LTD

CYLINDER SIZE: OUTSIDE DIAMETER 424 mm LENGTH 1785 mm

TEST PRESSURE (bar): 375 AUTOFRATTAGE PRESSURE (bar): 460 WORKING PRESSURE AT 15° C (bar): 250

REMARKS : "M" = Mechanical Tests, "P" = Prototype Tests, "C" = Cycling Tests, "B" = Burst Tests, "S" = Discarded Cylinder
"C+B" = Cycling + Burst Test.

CYLINDER SERIAL No.	HEAT CODE AND NUMBER		CYLINDER WATER CAPACITY (l)	TARE WEIGHT (Kg)	CYLINDER EXPANSION (cc) AT AUTOFRATTAGE PRESSURE TOTAL (cc)	PERMANENT (cc)	RATIO >10% (per / tot)	CYLINDER EXPANSION (cc) AT TEST PRESSURE TOTAL (cc)	PERMANENT (cc)	RATIO <5% (per / tot)	REMARKS
06/8677/102	CAH	01703	195.0	166.0	3435	1107	32.2%	1716	1.0	0.1%	
06/8677/103	CAH	01703	195.0	166.0	3426	1107	32.3%	1712	1.0	0.1%	
06/8677/104	CAH	01703	195.0	165.0	3824	1363	35.6%	1738	0.8	0.0%	
06/8677/105	CAH	01703	195.0	167.0	3685	1273	34.5%	1767	0.4	0.0%	
06/8677/106	CAH	01703	195.0	165.0	3331	1037	31.1%	1701	1.2	0.1%	
06/8677/107	CAH	01703	195.0	164.0	3469	1105	31.9%	1706	0.9	0.1%	
06/8677/108	CAH	01703	195.0	165.0	3446	1100	31.9%	1745	1.0	0.1%	
06/8677/109	CAH	01703	195.0	164.0	3425	1086	31.7%	1729	0.8	0.0%	
06/8677/110	CAH	01703	195.0	165.0	3651	1236	33.9%	1760	0.9	0.1%	
06/8677/111	CAH	01703	195.0	163.0	3864	1382	35.8%	1787	0.3	0.0%	
06/8677/112	CAH	01703	195.0	166.0	3517	1145	32.6%	1744	0.4	0.0%	
06/8677/113	CAH	01703	195.0	166.0	3262	988	30.3%	1693	0.9	0.1%	
06/8677/114	CAH	01703	195.0	165.0	3383	1045	30.9%	1737	0.8	0.0%	
06/8677/115	CAH	01703	195.0	166.0	3363	1065	31.7%	1706	1.0	0.1%	
06/8677/116	CAH	01703	195.0	166.0	3697	1292	34.9%	1747	0.4	0.0%	
06/8677/117	CAH	01703	195.0	166.0	3424	1080	31.5%	1751	1.0	0.1%	
06/8677/118	CAH	01703	195.0	164.0	3324	1017	30.6%	1717	0.6	0.0%	
06/8677/119	CAH	01703	195.0	166.0	3422	1082	31.6%	1706	1.0	0.1%	
06/8677/120	CAH	01703	195.0	165.0	3292	981	29.8%	1733	0.5	0.0%	
06/8677/121	CAH	01703	195.0	166.0	3308	1022	30.9%	1713	0.6	0.0%	
06/8677/122	CAH	01703	195.0	165.0	3285	979	29.8%	1720	1.4	0.1%	
06/8677/123	CAH	01703	195.0	165.0	3285	996	30.3%	1718	0.9	0.1%	
06/8677/124	CAH	01703	195.0	167.0	3554	1185	33.3%	1748	0.8	0.0%	
06/8677/125	CAH	01703	195.0	165.0	3258	982	30.1%	1708	0.6	0.0%	
06/8677/126	CAH	01703	195.0	166.0	3234	959	29.7%	1708	1.3	0.1%	
06/8677/127	CAH	01703	195.0	166.0	3210	955	29.8%	1696	1.3	0.1%	
06/8677/128	CAH	01703	195.0	164.0	3385	1061	31.3%	1736	1.0	0.1%	
06/8677/129	CAH	01703	195.0	166.0	3434	1091	31.8%	1703	0.8	0.0%	
06/8677/130	CAH	01703	195.0	166.0	3315	1014	30.6%	1716	0.5	0.0%	
06/8677/131	CAH	01703	195.0	165.0	3489	1122	32.2%	1716	1.0	0.1%	
06/8677/132	CAH	01703	195.0	164.0	3458	1105	32.0%	1724	0.6	0.0%	
06/8677/133	CAH	01703	195.0	166.0	3154	969	30.7%	1636	1.1	0.1%	
06/8677/134	CAH	01703	195.0	164.0	3322	1015	30.6%	1719	0.9	0.1%	
06/8677/135	**CAH**	**01703**	**195.0**	**165.0**	**3386**	**1040**	**30.7%**	**1744**	**0.4**	**0.0%**	
06/8677/136	**CAH**	**01703**	**195.0**	**165.0**	**3348**	**1065**	**31.8%**	**1662**	**0.6**	**0.0%**	
06/8677/137	**CAH**	**01703**	**195.0**	**164.0**	**3397**	**1068**	**31.4%**	**1716**	**0.8**	**0.0%**	
06/8677/138	**CAH**	**01703**	**195.0**	**165.0**	**3190**	**932**	**29.2%**	**1679**	**0.9**	**0.1%**	
06/8677/139	**CAH**	**01703**	**195.0**	**166.0**	**2983**	**783**	**26.2%**	**1700**	**1.1**	**0.1%**	
06/8677/140	**CAH**	**01703**	**195.0**	**164.0**	**2915**	**723**	**24.8%**	**1702**	**0.4**	**0.0%**	
06/8677/141	**CAH**	**01703**	**195.0**	**164.0**	**3150**	**888**	**28.2%**	**1713**	**0.8**	**0.0%**	

Date 07/2006	MANUFACTURER STAMP AND SIGNATURE	INDEPENDENT INSPECTION AUTHORITY
	Faber INDUSTRIE S.p.A	

21752

Faber INDUSTRIE SPA	REPORT OF HYDROSTATIC TESTS ON COMPOSITE CYLINDERS	PAG. 8 OF 11

LOT No. : 06/8677 ACCORDING TO DWG.: ISO-420-375-840/COMP REV.1 TEST DATE: 07/2006

CUSTOMER : Super Central Gas Co.,LTD

CYLINDER SIZE: OUTSIDE DIAMETER 424 mm LENGTH 1785 mm

TEST PRESSURE (bar): 375 AUTOFRATTAGE PRESSURE (bar): 460 WORKING PRESSURE AT 15° C (bar): 250

REMARKS : "M" = Mechanical Tests, "P" = Prototype Tests, "C" = Cycling Tests, "B" = Burst Tests, "S" = Discarded Cylinder
"C+B" = Cycling + Burst Test.

CYLINDER SERIAL No.	HEAT CODE AND NUMBER		CYLINDER WATER CAPACITY (l)	TARE WEIGHT (Kg)	CYLINDER EXPANSION (cc) AT AUTOFRATTAGE PRESSURE TOTAL (cc)	PERMANENT (cc)	RATIO >10% (per / tot)	CYLINDER EXPANSION (cc) AT TEST PRESSURE TOTAL (cc)	PERMANENT (cc)	RATIO <5% (per / tot)	REMARKS
06/8677/142	CAH	01703	195.0	167.0	2968	788	26.5%	1684	0.8	0.0%	
06/8677/143	CAH	01703	195.0	167.0	2985	765	25.6%	1668	1.2	0.1%	
06/8677/144	CAH	01703	195.0	164.0	2824	665	23.5%	1684	0.9	0.1%	
06/8677/145	CAH	01703	195.0	164.0	2948	760	25.8%	1689	0.3	0.0%	
06/8677/146	CAH	01703	195.0	167.0	3183	940	29.5%	1723	1.2	0.1%	
06/8677/147	CAH	01703	195.0	164.0	3330	1030	30.9%	1715	0.7	0.0%	
06/8677/148	CAH	01703	195.0	166.0	3355	1036	30.9%	1732	1.0	0.1%	
06/8677/149	CAH	01703	195.0	166.0	3341	1017	30.4%	1689	0.4	0.0%	
06/8677/150	CAH	01703	195.0	166.0	3142	891	28.4%	1715	0.4	0.0%	
06/8677/151	CAH	01703	195.0	166.0	3078	840	27.3%	1723	1.3	0.1%	
06/8677/152	CAH	01703	195.0	166.0	3033	812	26.8%	1704	1.1	0.1%	
06/8677/153	CAH	01703	195.0	166.0	3621	1208	33.4%	1775	1.2	0.1%	
06/8677/154	CAH	01703	195.0	165.0	3461	1100	31.8%	1753	1.1	0.1%	
06/8677/155	CAH	01703	195.0	164.0	3190	896	28.1%	1742	0.9	0.1%	
06/8677/156	CAH	01703	195.0								S
06/8677/157	CAH	01703	195.0	166.0	4182	1560	37.3%	1835	1.1	0.1%	
06/8677/158	CAH	01703	195.0	164.0	3330	989	29.7%	1771	1.7	0.1%	
06/8677/159	CAH	01703	195.0	166.0	3545	1179	33.3%	1760	0.6	0.0%	
06/8677/160	CAH	01703	195.0	164.0	3540	1161	32.8%	1763	1.2	0.1%	
06/8677/161	CAH	01703	195.0	163.0	3487	1130	32.4%	1754	0.9	0.1%	
06/8677/162	CAH	01703	195.0								S
06/8677/163	CAH	01703	195.0	164.0	3152	883	28.0%	1724	1.0	0.1%	
06/8677/164	CAH	01703	195.0								S
06/8677/165	CAH	01703	195.0	165.0	3372	1064	31.6%	1716	1.7	0.1%	
06/8677/166	CAH	01703	195.0	166.0	3175	935	29.4%	1699	0.8	0.0%	
06/8677/167	CAH	01703	195.0	166.0	3286	980	29.8%	1732	1.0	0.1%	
06/8677/168	CAH	01703	195.0	164.0	3191	927	29.1%	1706	0.8	0.0%	
06/8677/169	CAH	01703	195.0	165.0	3424	1072	31.3%	1721	0.6	0.0%	
06/8677/170	CAH	01703	195.0	164.0	3382	1039	30.7%	1715	0.8	0.0%	
06/8677/171	CAH	01703	195.0	164.0	3284	958	29.2%	1746	0.5	0.0%	
06/8677/172	CAH	01703	195.0	164.0	3800	1357	35.7%	1724	1.0	0.1%	
06/8677/173	CAH	01703	195.0	165.0	3046	840	27.6%	1693	1.1	0.1%	
06/8677/174	CAH	01703	195.0	166.0	3047	857	28.1%	1684	1.0	0.1%	
06/8677/175	CAH	01703	195.0	164.0	3345	1018	30.4%	1724	1.2	0.1%	
06/8677/176	CAH	01703	195.0	165.0	2854	694	24.3%	1680	0.5	0.0%	
06/8677/177	CAH	01703	195.0	165.0	2833	673	23.8%	1689	0.7	0.0%	
06/8677/178	CAH	01703	195.0	165.0	3324	998	30.0%	1751	1.7	0.1%	
06/8677/179	CAH	01703	195.0	165.0	3306	986	29.8%	1724	0.9	0.1%	
06/8677/180	CAH	01703	195.0	166.0	3122	876	28.1%	1675	0.6	0.0%	
06/8677/181	CAH	01703	195.0	167.0	3236	969	29.9%	1703	1.1	0.1%	

Date 07/2006	MANUFACTURER STAMP AND SIGNATURE	INDEPENDENT INSPECTION AUTHORITY
	Faber INDUSTRIE S.p.A	

21752

Faber INDUSTRIE SPA	REPORT OF HYDROSTATIC TESTS ON COMPOSITE CYLINDERS	PAG. 9 OF 11

LOT No. : 06/8677 ACCORDING TO DWG.: ISO-420-375-840/COMP REV.1 TEST DATE: 07/2006

CUSTOMER : Super Central Gas Co.,LTD

CYLINDER SIZE: OUTSIDE DIAMETER 424 mm LENGTH 1785 mm

TEST PRESSURE (bar): 375 AUTOFRATTAGE PRESSURE (bar): 460 WORKING PRESSURE AT 15° C (bar): 250

REMARKS : "M" = Mechanical Tests, "P" = Prototype Tests, "C" = Cycling Tests, "B" = Burst Tests, "S" = Discarded Cylinder "C+B" = Cycling + Burst Test.

CYLINDER SERIAL No.	HEAT CODE AND NUMBER		CYLINDER WATER CAPACITY (l)	TARE WEIGHT (Kg)	CYLINDER EXPANSION (cc) AT AUTOFRATTAGE PRESSURE TOTAL (cc)	PERMANENT (cc)	RATIO >10% (per / tot)	CYLINDER EXPANSION (cc) AT TEST PRESSURE TOTAL (cc)	PERMANENT (cc)	RATIO <5% (per / tot)	REMARKS
06/8677/182	CAH	01703	195.0	168.0	3061	857	28.0%	1672	0.5	0.0%	
06/8677/183	CAH	01703	195.0	166.0	2923	743	25.4%	1676	1.4	0.1%	
06/8677/184	CAH	01703	195.0	167.0	3101	864	27.9%	1680	0.4	0.0%	
06/8677/185	CAH	01703	195.0	168.0	2899	768	26.5%	1630	1.3	0.1%	
06/8677/186	CAH	01703	195.0	166.0	3059	845	27.6%	1693	0.9	0.1%	
06/8677/187	CAH	01703	195.0	166.0	3143	905	28.8%	1699	0.6	0.0%	
06/8677/188	CAH	01703	195.0	165.0	3255	987	30.3%	1700	1.2	0.1%	
06/8677/189	CAH	01703	195.0								S
06/8677/190	CAH	01703	195.0	165.0	3414	1070	31.3%	1745	1.2	0.1%	
06/8677/191	CAH	01703	195.0	165.0	3572	1196	33.5%	1748	1.4	0.1%	
06/8677/192	CAH	01703	195.0	165.0	3123	881	28.2%	1704	0.6	0.0%	
06/8677/193	CAH	01703	195.0	166.0	3166	911	28.8%	1716	1.2	0.1%	
06/8677/194	CAH	01703	195.0	165.0	2957	771	26.1%	1684	0.4	0.0%	
06/8677/195	CAH	01703	195.0	164.0	3213	938	29.2%	1722	1.2	0.1%	
06/8677/196	CAH	01703	195.0	165.0	3148	889	28.2%	1702	0.8	0.0%	
06/8677/197	CAH	01703	195.0	163.0	3173	892	28.1%	1733	0.5	0.0%	
06/8677/198	CAH	01703	195.0	163.0	3667	1238	33.8%	1782	1.4	0.1%	
06/8677/199	CAH	01703	195.0								S
06/8677/200	CAH	01703	195.0	131.0							M
06/8677/201	CAH	01703	195.0	163.0	3110	915	29.4%	1680	0.9	0.1%	C+B

Date 07/2006	MANUFACTURER STAMP AND SIGNATURE	INDEPENDENT INSPECTION AUTHORITY
	Faber Industrie S.p.A.	

21752

Faber INDUSTRIE SPA

INSTRUCTIONS FOR HANDLING, USE AND PERIODIC IN-SERVICE INSPECTION OF FABER HIGH PRESSURE CYLINDERS FOR THE ON-BOARD STORAGE OF NATURAL GAS AS A FUEL FOR AUTOMOTIVE VEHICLES ACCORDING TO ISO 11439 STANDARD.

These instructions are given to the purchaser of the cylinders. The purchaser shall include them into his instructions to all parties involved in the distribution, handling installation and use of them.

1. SUBJECT

These instructions are issued in accordance with the prescription of ISO 11439 Standard. National standards and regulations may also apply in the country of use.

2. STORAGE

The cylinders shall be stored in a manner to prevent any damage either to the cylinders or to persons. The cylinders shall be protected against damage from other equipment used in the facility. The cylinders shall not be stored in a facility where they may be exposed to corrosive vapors or chemicals. The cylinders shall be stored indoor and fitted with plugs to prevent the entry of any material through openings.

3. HANDLING

The cylinders must be handled in a manner that they do not suffer any damage or contamination.

4. INSTALLATION

For the cylinders of the present instructions the mounting system is not supplied by the cylinders manufacturer.
The cylinders must always be protected from impacts and damages caused by road gravel or any other object, especially when they are installed under the vehicle. The cylinder shall be mounted in a system that holds the cylinder securely in place and does not cause damage to the cylinder or to the vehicle. The mounting system shall allow the cylinder to expand / contract causing no loosening or abrasion of the cylinder. The interface between the cylinder and the mounting brackets or straps shall be lined with a rubber pad to allow little or no movement of the cylinder in the mounting system.
For composite cylinders type CNG-2 and CNG-3 the maximum allowable unit load on the composite surface must be less than 30 N/cm² (0.3 MPa).
The cylinders must not be exposed to direct sunlight and weather. If the cylinders are installed under the vehicle or in a lateral position they must be protected from impacts or damages due to road gravel or other objects.

The installation must avoid the direct exposure of the cylinders to an environment of chemical and mechanical contacts. Liquids or solids cannot be collected in a way that can cause a damage of the cylinder material.

The cylinder shall be equipped with one or more PRD (Pressure Relieve Device). In any case the cylinder shall be equipped with a thermally activated PRD qualified by the cylinder manufacturer. In case of any doubt regarding the PRD to be used with the cylinder contact the cylinder manufacturer.

5. USE OF THE CYLINDER

The cylinders are designed and manufactured for a settled gas temperature from a minimum of –40°C to a maximum of +65°C.
The temperature of the cylinders materials may vary from a minimum of –40°C to a maximum of +82°C. Temperatures over +65°C shall be sufficiently local, or of short enough duration, that the temperature of the gas in the cylinder never exceeds +65°C.
Developed gas temperatures during filling and discharge may vary beyond the limits of –40°C and +65°C but in any case the temperature of the cylinder material shall remain within the limits of –40°C and +82°C.
The cylinder shall be filled carefully to prevent overcharging and overheating. The charging pressure shall be such that, after cooling to ambient temperature, the working pressure (settled pressure at a uniform temperature of 15° C) of the cylinder is not exceeded. Overcharging of cylinders is highly dangerous and it is forbidden.
The design service life, the working pressure and the manufacturing date are stamped on the cylinder.
The cylinder is designed and manufactured for use with natural gas meeting the conditions set by article 4.5 of ISO 11439 standard.
The cylinder is designed and manufactured to be filled up to 1000 times per year of service at the working pressure marked on the cylinder.

Faber INDUSTRIE SPA		PAG. 11 OF 11

6. PERIODIC IN-SERVICE INSPECTION

The periodic inspection must be done at least every 36 months, according to ISO 11439 standard and according to Faber instructions for CNG-1 cylinders, CNG-2 cylinders and CNG-3 cylinders.
The inspection shall be carried out by an inspector qualified and certified in the country where the cylinder is used.

7. CONDITIONS REQUIRING IMMEDIATE INSPECTION

An inspection shall be performed prior to filling or returning a cylinder to service if:
- the cylinder or vehicle in which it is installed is involved in a fire;
- the cylinder is exposed to excessive heat;
- the cylinder is dropped or subjected to impact;
- the natural gas vehicle (NGV) is involved in a collision;
- the cylinder is suspected to have been damaged by cargo, vehicle or environmental conditions;
- the cylinder is believed to have been damaged by any means;
- there is unusual behavior including, but not limited to:
- the presence of any odor added to natural gas (possible leaking cylinder or fuel system);
- unexpected loss of gas pressure;
- rattling or other indications of looseness;
- unusual snapping or hissing sounds;
- the cylinder is re-installed after removal from the vehicle;
- the cylinder installation is changed significantly;
- the cylinder is transferred to another vehicle
- the cylinder has been pressurized over the limits of its design.