	Technical Specification for Verification and Inspection of Breath Alcohol Testers and Analyzers		S/N	CNMV 126															
			Rev.	2															
<p>1. This technical specification is enacted pursuant to Paragraph 2, Articles 14 and 16 of the Weights and Measures Act.</p> <p>2. The revision, date of promulgations, document No, date of enforcement and content of the amendment are listed as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Rev.</th> <th style="text-align: center;">Date of Promulgation</th> <th style="text-align: center;">Document No. (Ching-Piao-Szu-Tsu)</th> <th style="text-align: center;">Date of Enforcement</th> <th style="text-align: center;">Content of Amendment</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">16.05.2003</td> <td style="text-align: center;">No.09240004760</td> <td style="text-align: center;">01.07.2003</td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">08.11.2006</td> <td style="text-align: center;">No.09540004710</td> <td style="text-align: center;">08.11.2006</td> <td style="text-align: center;">Table 2 amended</td> </tr> </tbody> </table> <p>3. This specification is formulated with reference to the following international specifications:</p> <p>OIML R126 Evidential breath analyzers (1998)</p>					Rev.	Date of Promulgation	Document No. (Ching-Piao-Szu-Tsu)	Date of Enforcement	Content of Amendment	1	16.05.2003	No.09240004760	01.07.2003		2	08.11.2006	No.09540004710	08.11.2006	Table 2 amended
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NO GUARANTEE ON THE TRANSLATION

In case of discrepancies between the English translation and Chinese text, the Chinese text shall govern.

1. Scope: This regulation applies to breath alcohol testers and analyzers for the verification and inspection.

2. Structure

- 2.1 The breath alcohol testers and analyzers shall be marked with manufacture's names, models and serial numbers on the instruments and sensors.
- 2.2 The shell of panel board for the breath alcohol testers and analyzers shall not have mechanical damage that would influence the operating performance and reading ability. Each functional switch shall be delicate in operation, firm in installation and correct in positioning.
- 2.3 The result of a measurement shall be displayed digitally by means of aligned figures. The name of the unit of measurement and its symbol shall be clearly indicated.
- 2.4 The breath alcohol testers and analyzers shall incorporate devices that automatically zeros or checks the zero of instruments at least at the beginning of each measurement.
- 2.5 The breath alcohol testers and analyzers shall be capable of measuring all mass concentration in the range 0.00 mg/L to at least 2.00 mg/L. The scale interval is 0.01 mg/L in normal operation, but it shall be possible to discriminate to 0.001 mg/L during metrological testing or manual calibration.
- 2.6 The breath alcohol testers and analyzers equipped with printing devices, the printout shall at least contain test dates and time, models and serial numbers of the instruments, the results and units of the measurements.
- 2.7 The breath alcohol testers and analyzers shall be equipped with display functions to monitor the message of insufficiency of voltage, exhalation and failure tests. Where the breath alcohol analyzers shall be designed to detect the presence of ethanol mass concentration in the mouth.

3. Verification, inspection and maximum permissible errors

- 3.1 Equipment for verification and inspection: certificates of traceability and uncertainty are required for equipment.
 - (1) Wet gas simulator: it can produce the standard wet alcohol mixture gas with at least 90% RH, and 34.0 ± 0.5 °C condition.
Dry gas simulator: it can produce standard dry alcohol mixed gas.
 - (2) Thermometer: the minimum scale intervals shall be below 0.1 °C.
 - (3) Barometer: ± 0.5 kPa.
 - (4) Flow meter.
- 3.2 The verification and inspection items shall be performed in the following sequence:

- (1) External appearance, structure and performance.
- (2) Maximum permissible errors (accuracy) and repeatability.
- (3) Effect of the volume delivered.
- (4) Effect of the duration of exhalation.
- (5) Effect of the duration of the plateau.
- (6) Drift test.

3.3 Verification and inspection of the appearance, structure and function shall conform to the requirements defined in Section 2.1 to 2.7.

3.4 Maximum permissible errors and repeatability: first, shall use dry alcohol gas to test five times on each of the alcohol concentration given in Table 1, second, test the maximum concentration 2.000 mg/L once, then use wet alcohol gas to test five times with 0.250 mg/L and 0.550 mg/L and correct the bias.

Table 1

Test gas No.	Mass concentration (mg/L)
1	0.000 to 0.050
2	0.150
3	0.250
4	0.350
5	0.450
6	0.550
7	0.650
8	1.000

Unless otherwise specified, the test gas shall be characterized by the following parametric values:

- (1) Delivered volume: 3 L.
- (2) Total duration of injection (into breath tester or analyzer): 5 s.
- (3) Duration of plateau of mass concentration: 3 s.
- (4) Carrier gas: pure air.
- (5) Gas temperature: $34.0 \pm 0.5^\circ\text{C}$.

Other gases may be used provided that:

- (1) Their influence on test results can be taken into consideration and corrected for.
- (2) For dry gases, it is verified that the instrument is capable of measuring moist gases.

- (3) For cases involving dry gases in containers, variation of atmospheric pressure and variations of the compressibility factor between filling and usage conditions are taken into account.
- (4) Test reports shall indicate when dry gases were used and how their equivalence with moist gases was established.

3.5 The maximum permissible errors of verification and repeatability shall conform to the requirements given in Table 2 and 3:

Table 2

Measured result R (mg/L)	Maximum permissible errors of verification	Remark
$R < 0.250$	± 0.020 mg/L	—
$0.250 \leq R < 2.000$	$\pm 5\%$	Relative deviation percent
$R = 2.000$	$\pm 20\%$	

Table 3

Measured result R (mg/L)	Repeatability	Remark
$R < 0.250$	< 0.007 mg/L	Standard deviation
$0.250 \leq R < 2.000$	$< 1.75\%$	Relative standard deviation
$R = 2.000$	$< 6\%$	

- 3.6 The maximum permissible errors of inspection are 1.5 times of the maximum permissible errors of verification.
- 3.7 Influence of delivered volume shall use test gas No 3. Five measurements shall be made in following conditions:
 - (1) First test: delivered volume: 1.5 L;
 - (2) Second test: delivered volume: 4.5 L (with total duration of each injection: 15 s, duration of plateau: 6 s).
 - (3) For the breath alcohol tester, it is unnecessary to perform the duration of plateau.
- 3.8 Influence of duration of exhalation shall use test gas No 3. Five measurements shall be made in following conditions:
 - (1) Total duration of each injection: 15 s
 - (2) Duration of plateau: 6 s
 - (3) For the breath alcohol tester, it is unnecessary to perform the duration of plateau.

- 3.9 Influence of duration of plateau shall use test gas No 3. Five measurements shall be made in following conditions:
- (1) Duration of plateau: 1.5 s
 - (2) For the breath alcohol tester, it is unnecessary to perform this test item.
- 3.10 Drift test: the drift at 0.000 mg/L and 0.550 mg/L is tested with dry alcohol standard in 4 hours.
- 3.11 The results of measurements of the verification and inspection in Section 3.7 to Section 3.10 shall be less than or equivalent to the maximum permissible errors specified in Section 3.5 or Section 3.6.
- 3.12 The period of validity of verification for breath alcohol tester and analyzer is one year, commencing from the day of a verification compliance mark affixed on the instrument and expiring on the first day of the next month of next year. However, when a breath alcohol tester has reached 1000 time measurements within the period of validity of verification, it is regarded as expiration.
4. The verification compliance marks
- 4.1 The place of verification compliance tag of breath alcohol tester and analyzer shall be stuck on the front base of the instrument.
 - 4.2 After the breath alcohol tester or analyzer passed verification, a verification compliance certificate shall be issued.

Table Attached**Table 1: Test certificate (for testers)**



	Bureau of Standards, Metrology and Inspection, Ministry of Economic Affairs	○○○○
Certificate of Conformity of Breath Alcohol Testers		
1. Applicant	:	
2. Address	:	
3. Specification	:	
4. Brand Name	:	
5. Type No.	:	
6. Instrument No.	:	
7. No. of Verification Compliance Tag:		
8. Date of Verification	:	
9. Test run applied:		
10. The breath alcohol tester shall perform legally recognized tests only after it has been trace-back certified by a approved organization and after fulfilling calibration with dry/wet-base standard gas, under 34 ± 0.5 °C.		
11. During the period of validity of the breath alcohol tester, the instrument shall perform legally recognized tests only after it has been regularly checked and tested again with dry-base standard gas.		
12. The period of validity of verification for breath alcohol tester is one year, commencing from the day of a verification compliance mark affixed on the instrument and expiring on the first day of the next month of next year. However, when a breath alcohol tester has reached 1000 time measurements within the period of validity of verification, it is regarded as expiration. This certificate is void when the expiration of verification or the test runs has reached 1000 times.		
Remark:		
Date:		

Table 2: Test certificate (for analyzers)

	Bureau of Standards, Metrology and Inspection,	○○○○
	Ministry of Economic Affairs	
	Certificate of Conformity of Breath Alcohol Analyzers	
1. Applicant	:	
2. Address	:	
3. Specification	:	
4. Brand Name	:	
5. Type No.	:	
6. Instrument No.	:	
7. No. of Verification Compliance Tag:		
8. Date of Verification	:	
9. The breath alcohol analyzer shall perform legally recognized tests only after it has been trace-back certified by a approved organization and after fulfilling calibration with dry/wet-base standard gas, under 34 ± 0.5 □.		
10. During the period of validity of the breath alcohol analyzer, the instrument shall perform legally recognized tests only after it has been regularly checked and tested again with dry-base standard gas.		
11. The period of validity of verification for breath alcohol analyzer is one year, commencing from the day of a verification compliance mark affixed on the instrument and expiring on the first day of the next month of next year. This certificate is void when the expiration of verification.		
Remark:		
Date:		