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Test of alcometers

Two alcometers of model Safeway 2000. Submitted by the client. The instruments are intended for measuring/warning of alcohol content in exhaled air.

Marking:	Instruments were market as A and B.
Date of arrival:	5/4/2006
Date of test:	28/4/2006

The instruments display alcohol concentration in blood as per thousand (mg/g), Blood Alcohol Concentration (BAC).

Assignment

Checking the instruments uncertainty at room temperature ($22\pm 1^\circ\text{C}$) with 10 measurements at the level 0.2 and 0.5 ‰ alcohol in blood. The instruments were tested as delivered without further calibration.

Method

The testing was made according to manufacturers instruction with gas from two wet gas simulators trade-mark GUTH 34C. The temperature in the wet gas simulators were 34°C correspond to exhaled air temperature. The flow trough the simulators was approx. 5-6 litres per minute and blowing time was 5-6 seconds.

The reported expanded uncertainty of measurement, U for alcohol concentration in the simulator is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty, u_c takes into account all known uncertainties of important factors which are considered to influence the measurement. The standard uncertainty has been calculated according to *Eurachem/CITAC Guide, Quantifying uncertainty in analytical measurement 2nd Edition*.

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Results

The tests were made in succession for both concentrations and one hour break was made between the concentrations.

Instrument A display ‰ alcohol in blood

Number of tests	0.2±0.004 ‰ in blood	0.5±0.01 ‰ in blood
1	0.3	0.5
2	0.3	0.5
3	0.2	0.5
4	0.3	0.5
5	0.2	0.5
6	0.2	0.5
7	0.2	0.5
8	0.2	0.5
9	0.2	0.5
10	0.2	0.5

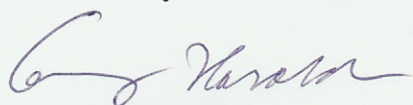
Instrument B display ‰ alcohol in blood

Number of tests	0.2±0.004 ‰ in blood	0.5±0.01 ‰ in blood
1	0.3	0.5
2	0.3	0.5
3	0.3	0.5
4	0.2	0.5
5	0.2	0.5
6	0.2	0.5
7	0.2	0.5
8	0.2	0.5
9	0.2	0.5
10	0.2	0.5

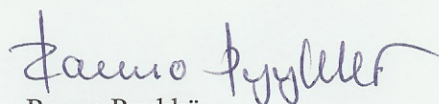
Comments

The above test does not provide any guarantee that all instruments of the same manufacturer and model have the same performance, and does not provide any information on the long-term stability of the instrument.

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Safeway