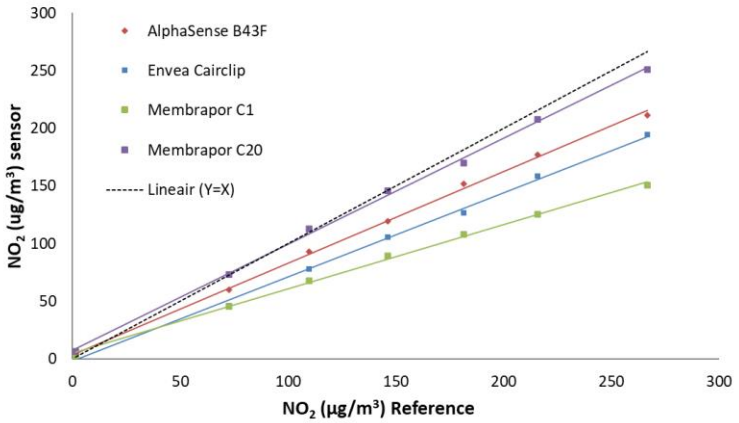
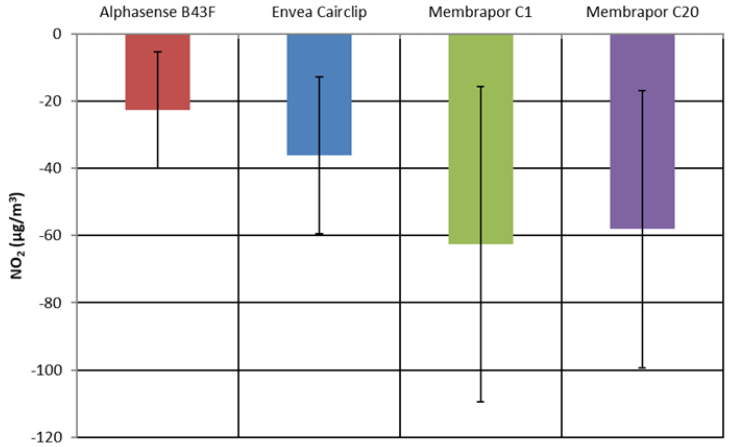
NO_2-sensors

Linearity of sensor system
(uncalibrated)



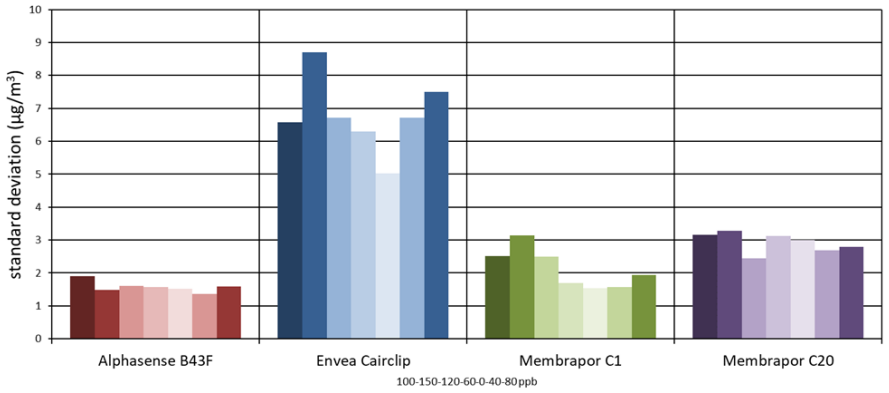
Deviation from reference
(uncalibrated)



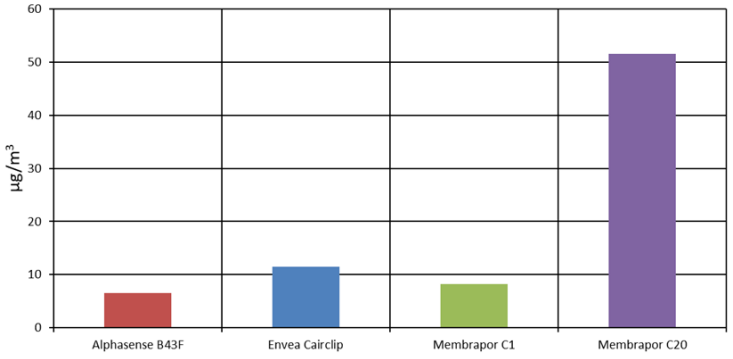
Average linear regression coefficients
(uncalibrated)

y = ax+b	a	b	n
Alphasense	0.81	4	5
Cairclip	0.74	0	3
Membrapor C1	0.48	13	5
Membrapor C2	0.88	9	2

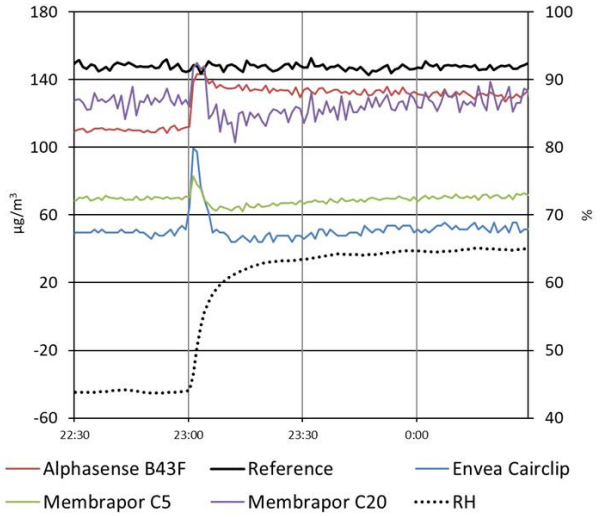
Sensor stability
(calibrated)



Between-sensor uncertainty
(calibrated)



Sensor response to change in relative humidity

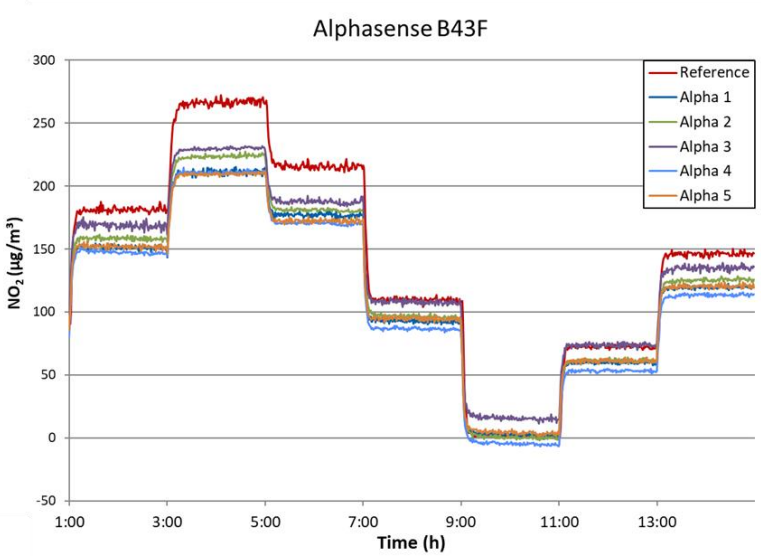


LAB TEST FACT SHEET

For setup and definitions see: test protocol and test report

Alphasense NO2-B43F

Uncalibrated sensor versus reference

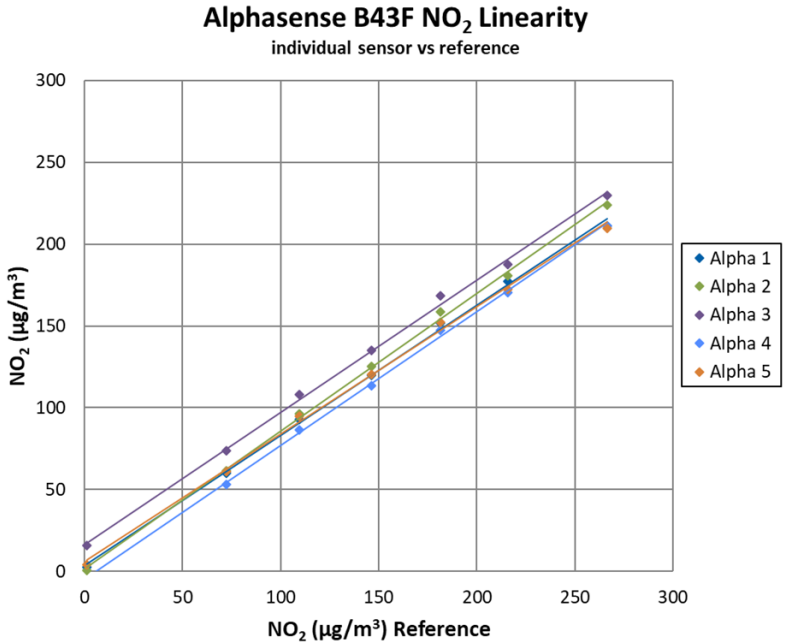


Accuracy (uncalibrated)

Reference mean (µg/m³)	Sensor mean (µg/m³)	Accuracy (%)
72	62	85
110	96	87
146	123	84
181	156	86
216	178	82
267	217	81

average **84/100**

Linearity before calibration



- r^2 > **0.99**
- slope ≈ 0.8;
- intercept (µg/m³): << -5 --- +16 >> (used for calibration)

Steady-state stability

< 2 µg/m³
(calibrated)

Between sensor uncertainty

6.5 µg/m³
(calibrated)

Influence of T and RH

large
(T: 5-35°C; RH: 45-90%)

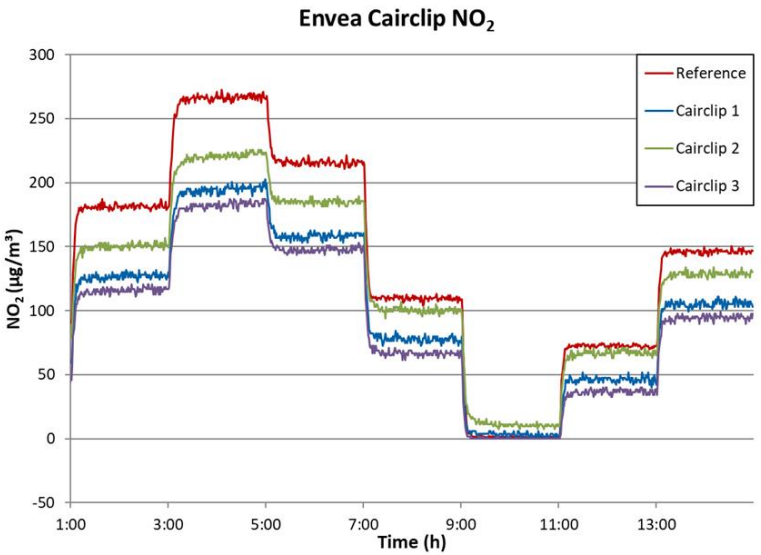
Ozone interference

small
(O_3: 30-160 ppb)

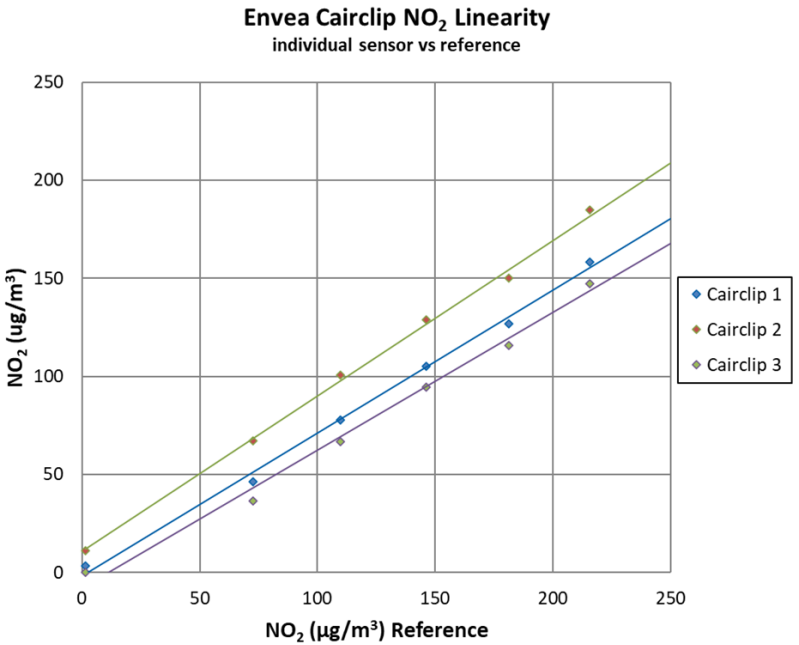
For setup and definitions see: test protocol and test report

Envea Cairclip NO_2

Uncalibrated sensor versus reference



Linearity before calibration



Steady-state stability

< 4 µg/m³
(calibrated)

Between sensor uncertainty

11.5 µg/m³
(calibrated)

Influence T/RH

moderate
(T: 5-35°C; RH: 45-90%)

Accuracy (uncalibrated)

Reference mean (µg/m3)	Sensor mean (µg/m3)	Accuracy (%)
72	50	69
110	82	75
146	110	75
181	131	72
216	164	76
267	199	75

average
74/100

- r^2 **> 0.99**
- slope ≈ 0.74;
- intercept (µg/m³): << -8 --- 11 >>
  (used for calibration)

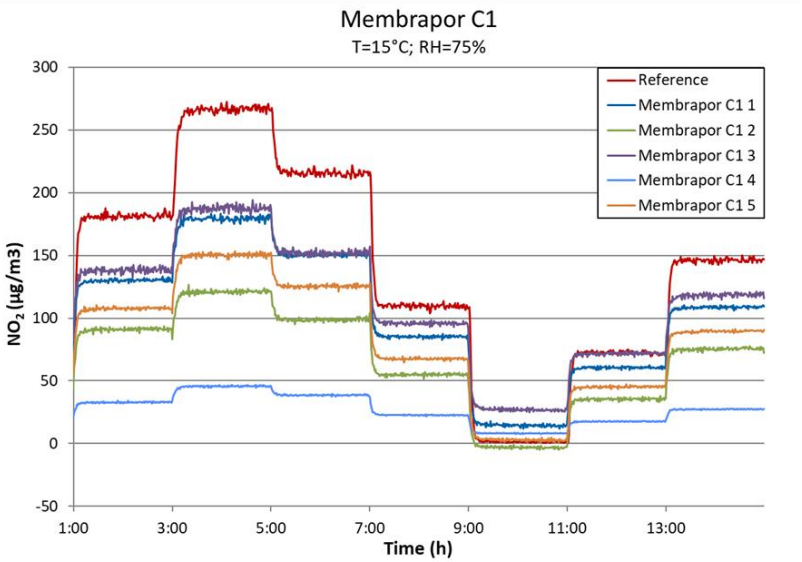
Ozone interference

moderate
(O3: 30-160 ppb)

For setup and definitions see: test protocol and test report

Membrapor C1 NO_2

Uncalibrated sensor versus reference

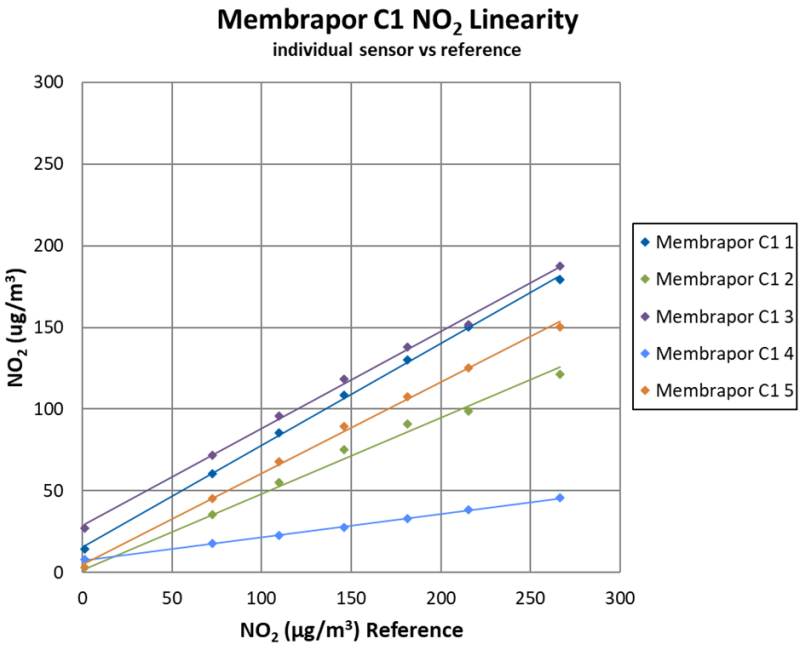


Accuracy (uncalibrated)

Reference mean (µg/m³)	Sensor mean (µg/m³)	Accuracy (%)
72	46	64
110	65	60
146	84	57
181	100	55
216	113	52
267	137	51

average **57/100**

Linearity before calibration



- r^2 **> 0.99**
- slope: << 0.14 --- 0.6 >>
- intercept (µg/m³): << 5 --- 28 >>

(used for calibration)

Steady-state stability

< 3 µg/m³
(calibrated)

Between sensor uncertainty

8.2 µg/m³
(calibrated)

Influence T/RH

moderate

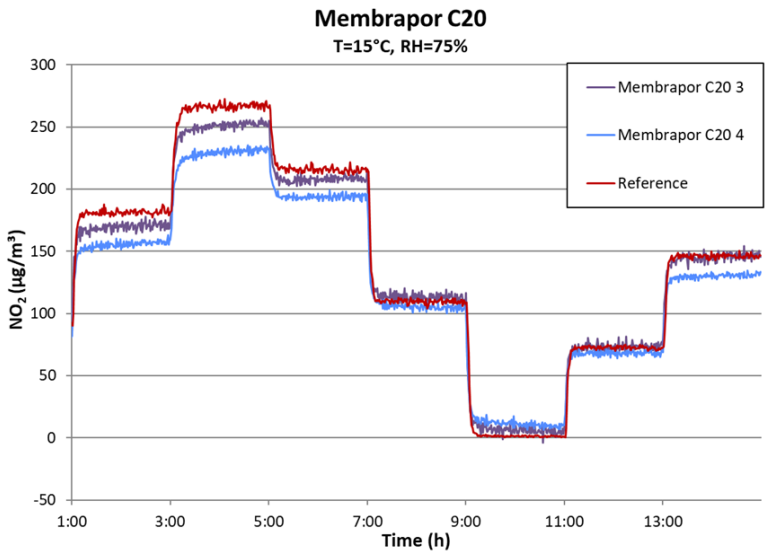
Ozone interference

large
(O3: 30-160 ppb)

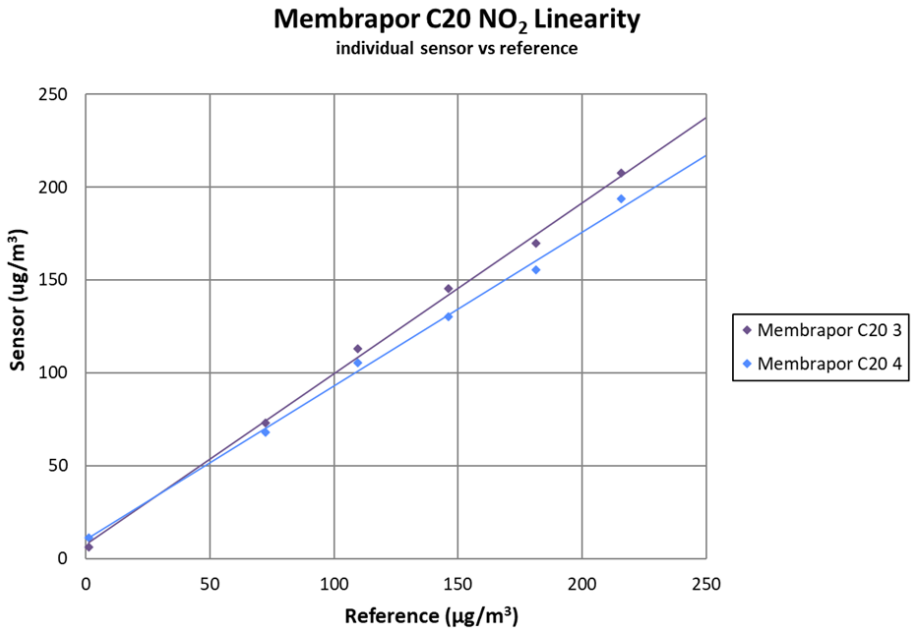
For setup and definitions see: test protocol and test report

Membrapor C20 NO_2

Uncalibrated sensor versus reference



Linearity before calibration



Steady-state stability

< 4 µg/m³
(calibrated)

Between sensor uncertainty

9.9 µg/m³
(calibrated)

Influence T/RH

moderate
(T: 5-35°C; RH: 45-90%)

Ozone interference

large
(O3: 30-160 ppb)

Accuracy (uncalibrated data)

Reference mean (ug/m3)	Sensor mean (ug/m3)	Accuracy (%)
72	71	97
110	109	100
146	138	94
181	163	90
216	201	93
267	240	90

average
94/100

- r^2 > **0.99**
- slope ≈ 0.88;
- intercept (µg/m³): << 7 --- 10 >>>
  (used for calibration)