

Nitrogen Dioxide Diffusion Tubes TEA/Acetone Inter-comparison 2019

Checking Precision and Accuracy of Triplicate Tubes

| Diffusion Tubes Measurements | | | | | | | | | |
|------------------------------|--------------------------|------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------|-----------------------|-------------------------------------|-------------------|
| Period | Start Date dd/mm/yyyy | End Date dd/mm/yyyy | Tube 1 μgm^{-3} | Tube 2 μgm^{-3} | Tube 3 μgm^{-3} | Triplicate Mean | Standard Deviation | Coefficient of Variation (CV) | 95% CI of mean |
| 1 | 09/01/2019 | 06/02/2019 | 84.8 | 85.9 | 79.2 | 83 | 3.6 | 4 | 8.8 |
| 2 | 06/02/2019 | 06/03/2019 | 106.6 | 99.2 | 103.5 | 103 | 3.7 | 4 | 9.2 |
| 3 | 06/03/2019 | 03/04/2019 | 82.1 | 91.0 | 84.0 | 86 | 4.7 | 5 | 11.7 |
| 4 | 03/04/2019 | 01/05/2019 | 85.3 | 79.0 | 81.8 | 82 | 3.1 | 4 | 7.8 |
| 5 | 01/05/2019 | 05/09/2019 | 68.2 | 63.6 | 72.8 | 68 | 4.6 | 7 | 11.5 |
| 6 | 05/06/2019 | 03/07/2019 | 87.0 | 85.7 | 82.4 | 85 | 2.4 | 3 | 6.0 |
| 7 | 03/07/2019 | 07/08/2019 | 80.4 | 83.2 | 78.4 | 81 | 2.4 | 3 | 6.0 |
| 8 | 07/08/2019 | 04/09/2019 | 95.6 | 85.2 | | 90 | 7.4 | 8 | 66.1 |
| 9 | 04/09/2019 | 02/10/2019 | 78.9 | 71.2 | 76.9 | 76 | 3.9 | 5 | 9.8 |
| 10 | 02/10/2019 | 06/11/2019 | 76.0 | 90.3 | 82.3 | 83 | 7.2 | 9 | 17.8 |
| 11 | 06/11/2019 | 04/12/2019 | 79.9 | 83.1 | 83.2 | 82 | 1.9 | 2 | 4.6 |
| 12 | 04/12/2019 | 08/01/2020 | 70.1 | 73.6 | 73.2 | 72 | 1.9 | 3 | 4.8 |
| 13 | | | | | | | | | |

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

| Automatic Method | | Data Quality Check | |
|------------------------------|---------------------------|-----------------------------|------------------------------|
| Period Mean | Data Capture (% DC) | Tubes Precision Check | Automatic Monitor Data |
| 68.0 | 90.4 | Good | Good |
| 84.4 | 94.2 | Good | Good |
| 70.0 | 93.4 | Good | Good |
| 57.6 | 96.2 | Good | Good |
| 57.7 | 79.2 | Good | Good |
| 64.8 | 84.9 | Good | Good |
| 59.5 | 93.9 | Good | Good |
| 58.3 | 82.6 | Good | Good |
| 55.2 | 97.4 | Good | Good |
| 63.3 | 97.1 | Good | Good |
| 62.9 | 97.5 | Good | Good |
| 61.6 | 97.4 | Good | Good |
| | | | |
| | | | |
| Overall survey --> | | Good precision | Good Overall DC |

(Check average CV & DC from Accuracy calculations)

| | |
|-----------------------|------------------------|
| Site Name/ ID: | Marylebone Road |
|-----------------------|------------------------|

| | |
|------------------|--|
| Precision | 12 out of 12 periods have a CV smaller than 20% |
|------------------|--|

| Accuracy (with 95% confidence interval) | |
|--|----------------------------------|
| without periods with CV larger than 20% | |
| Bias calculated using 12 periods of data | |
| Bias factor A | 0.77 (0.73 - 0.81) |
| Bias B | 30% (23% - 37%) |
| ----- | |
| Diffusion Tubes Mean: | 83 μgm^{-3} |
| Mean CV (Precision): | 5 |
| ----- | |
| Automatic Mean: | 64 μgm^{-3} |
| Data Capture for periods used: | 92% |
| ----- | |
| Adjusted Tubes Mean: | 64 (60 - 67) μgm^{-3} |

| Accuracy (with 95% confidence interval) | |
|--|----------------------------------|
| WITH ALL DATA | |
| Bias calculated using 12 periods of data | |
| Bias factor A | 0.77 (0.73 - 0.81) |
| Bias B | 30% (23% - 37%) |
| ----- | |
| Diffusion Tubes Mean: | 83 μgm^{-3} |
| Mean CV (Precision): | 5 |
| ----- | |
| Automatic Mean: | 64 μgm^{-3} |
| Data Capture for periods used: | 92% |
| ----- | |
| Adjusted Tubes Mean: | 64 (60 - 67) μgm^{-3} |

