

# National Bureau of Standards

## Certificate of Analysis

Standard Reference Material 2654

Nitrogen Dioxide in Air

(Nominal Concentration 500 ppm)

(Stationary Source Emission Gas Standard)

This Standard Reference Material is intended for use in the calibration of instruments used for the analysis of nitrogen dioxide in stationary source emissions. It is not intended as a working standard, but rather as a primary laboratory standard to which the concentration of other standards may be related.

Nitrogen dioxide concentration:  $\pm$   $\mu\text{mole/mole(ppm)}$   
Cylinder Number: Sample Number:

The concentration of nitrogen dioxide is relative to all other constituents of the gas. The uncertainty shown is the estimated upper limit of error of the nitrogen dioxide concentration and is the 95 percent confidence interval based on allowances for known sources of possible error.

Each cylinder of gas is individually analyzed, and the concentration given above applies only to the cylinder identified by cylinder number and sample number on this certificate.

**CAUTION:** Care must be taken to avoid accidental contamination of the sample during the use of the cylinder with any gas handling system.

The original development and evaluation of this Standard Reference Material was performed in the Gas and Particulate Science Division by W. D. Dorko and G. Rhoderick.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of E. E. Hughes and H. L. Rook of the Gas and Particulate Science Division.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by T. E. Gills.

Washington, D.C. 20234  
June 7, 1982

George A. Uriano, Chief  
Office of Standard Reference Materials

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### Certification Information

The cylinder identified on this certificate is one of a group or "lot" of cylinders. A lot contains a minimum of 26 cylinders and is prepared commercially according to rigid specifications so that the lot is homogeneous and stable. Each cylinder in the lot is individually analyzed at NBS for nitrogen dioxide content.

### Analysis

The nitrogen dioxide content of this Standard Reference Material was determined by comparison with secondary standards that had been previously compared with a set of primary gravimetric standards of nitric oxide in nitrogen. The method of comparison utilized the chemiluminescent reaction of nitric oxide with ozone after the nitrogen dioxide had been catalytically converted to nitric oxide. The analysis was carefully evaluated to avoid errors arising from the use of nitric oxide in nitrogen standards to analyze nitrogen dioxide in air samples.

### Stability

Loss of nitrogen dioxide by adsorption on the container walls may occur in new cylinders not previously used for nitrogen dioxide mixtures. To ensure stability, a moderate preconditioning procedure was used for these cylinders. The use of this preconditioning procedure may result in desorption of nitrogen dioxide from the cylinder walls when the cylinder pressure is reduced. It is not recommended that the sample be used for accurate analyses at cylinder pressures below 2.8 MPa (400 psi).

The concentration on this certificate is valid for one year from the date of purchase from NBS. Periodic reanalyses of representative samples from this lot will be performed at NBS, and if significant changes are observed within one year, the purchasers of samples from the lot will be notified.

### Cylinder

This SRM is supplied in cylinders with a deliverable volume of 0.85 m<sup>3</sup> (30 cubic feet) at STP. The cylinders conform to DOT specifications and are equipped with CGA-660 valves.

The cylinder becomes the property of the purchaser.