
EMISSION MEASUREMENT TECHNICAL INFORMATION CENTER
GUIDELINE DOCUMENT

NOZZLE ORIFICE FOR SETTING ISOKINETIC RATES

INTRODUCTION

The nozzle orifice is sometimes used to set isokinetic sampling rates because it eliminates adjustments for the differences and changes in stack and ambient temperatures and molecular weights. The purpose of this document is to provide information concerning the suitability of the nozzle orifice as an alternative flow regulation device.

SUMMARY

A laboratory study has shown that the nozzle orifice produces incorrect flow rates. In some cases, the flow rates were as much as 145 percent of isokinetic. The cause was determined to be the flowing gas stream; when the nozzle orifice was calibrated in a wind tunnel at various velocities, the calibration constant was found to be a variable.

CONCLUSION

A nozzle orifice should not be used as an alternative flow control device unless it can be demonstrated that the isokinetic rates are not affected by velocity pressure.

REFERENCE

1. Preliminary Testing of the Nozzle Orifice Method, EPA Memorandum from Lori M. Tussey to Roger T. Shigehara, January 14, 1987.