

Establishment of National Primary Standard for Air Speed up to 90 m/s at NMIJ

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NMIJ has established the high air speed standard facility and been providing a calibration service since April 2015. The facility has the air speed range from 40 m/s up to 90 m/s with relative expanded uncertainty ($k = 2$) less than 1 %. The main purpose of this standard is to contribute to improvement of the meteorological observation and research. The reference air speed is derived from the national primary gas flowrate standard of Japan. The contraction nozzle for conversion from flowrate to air speed is installed at the test line of the closed loop gas flowrate calibration facility. The standard air speed at the nozzle exit is obtained by comparing the integral value of the velocity profile and the standard gas flowrate. Then the total pressure tube used as a transfer standard is calibrated against the standard air speed at the nozzle exit. By using this total pressure tube, the Eiffel type wind tunnel, which is a working standard for the daily calibration service, is calibrated. The paper describes the calibration system, the traceability chain, and the uncertainty analysis of the new air speed standard.
