

Standardized Equation for Hydrogen Gas Densities for Fuel Consumption Applications

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We have established an equation for the density of hydrogen gas that agrees with the current standard to within 0.01 % from 220 to 400 K with pressures up to 45 MPa. The equation is a truncated virial-type equation based on pressure and temperature dependent terms. The density uncertainty for this equation is the same as the current standard and is estimated as 0.2 % (combined uncertainty with a coverage factor of 2). Comparisons are presented with experimental data and with the full 32-term equation of state.