

FIXED-POINT PROPERTIES OF H₂O AND D₂O

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	Unit	H ₂ O	D ₂ O
Molar mass	g mol ⁻¹	18.015268	20.027508
Melting point (101.325 kPa)	°C	0.0025	3.81
Boiling point (101.325 kPa)	°C	99.974	101.40
Triple-point temperature	°C	0.01 (exact)	3.82
Triple-point pressure	Pa	611.657	661.6
Triple-point density (liq)	g cm ⁻³	0.99979	1.1053
Critical temperature	°C	373.946	370.697
Critical pressure	MPa	22.064	21.671
Critical density	g cm ⁻³	0.322	0.356
Maximum density (101.325 kPa)	g cm ⁻³	0.999975	1.1059
Temperature of maximum density	°C	3.98	11.60

References

1. International Association for the Properties of Water and Steam (IAPWS), IAPWS G5-01(2016), *Guideline on the Use of Fundamental Physical Constants and Basic Constants of Water* (2001; 2016 update), available from <http://www.iapws.org>.
2. IAPWS, IAPWS R14-08(2011), *Revised Release on the Pressure along the Melting and Sublimation Curves of Ordinary Water Substance* (2011), available from <http://www.iapws.org>.
3. IAPWS, IAPWS R2-83(1992), *IAPWS Release on the Values of Temperature, Pressure, and Density of Ordinary and Heavy Water Substances at their Respective Critical Points* (1992), available from <http://www.iapws.org>.
4. Wagner, W., and Pruß, A., The IAPWS Formulation 1995 for the Thermodynamic Properties of Ordinary Water Substance for General and Scientific Use, *J. Phys. Chem. Ref. Data* **31**, 387 (2002).
5. Herrig, S., Thol, M., Harvey, A. H., and Lemmon, E. W., A Reference Equation of State for Heavy Water, *J. Phys. Chem. Ref. Data* **47**, 043102 (2018).
6. Guildner, L. A., Johnson, D. P., and Jones, F. E., Vapor Pressure of Water at Its Triple Point, *J. Res. Nat. Bur. Stand.* **80A**, 505 (1976).
7. Harvey, A. H., and Lemmon, E.W., NIST Standard Reference Database 10: *NIST/ASME Steam Properties*, Version 3.0, National Institute of Standards and Technology, Standard Reference Data Program, Gaithersburg, Maryland, 2013 (<http://www.nist.gov/srd/nist-10>).
8. Lemmon, E. W., Bell, I. H., Huber, M. L., and McLinden, M. O., NIST Standard Reference Database 23: *Reference Fluid Thermodynamic and Transport Properties-REFPROP*, Version 10.0, National Institute of Standards and Technology, Standard Reference Data Program, Gaithersburg, Maryland, 2018 (<http://www.nist.gov/srd/refprop>).