REAL GAS PROPERTIES FOR HUMID AIR.
THERMODYNAMIC PROPERTIES

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ABSTRACT

The modeling of the components that are used in modeling of refrigeration, HVAC equipment and plant require the knowledge of thermodynamic and transport properties of humid air. In the last few years, the development of control techniques for equipment and plants, the increasing of the computing power of microcontrollers used, requires a model conceived for design purposes at start, and air humid properties must be calculated for real fluids. Because the humid air or water are used in a cyclic process, with mixing, drying or humidifying stages, the thermodynamic and transport properties are required for the liquid, the vapour phase, and also for two-phase liquid-vapor region. Water properties are mostly necessary for the liquid phase, although the frost and ice properties may as well be required when the source fluid is atmospheric air. This paper describes the equations necessary for the calculation of the thermodynamic and transport properties of humid air considered as a mixture of real gases, and also calculations for dew-point and wet-bulb temperature.

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