A typical packaged indirect evaporative cooling (IEC) system delivering cold air to industrial building consist of a primary (supply fan) and secondary air moving device (exhaust fan), an evaporative heat exchanger, and a water collection and recirculation system that includes a wetting apparatus and pump as shown in fig. 502.20(1).

The indirect evaporative cooling lowers the temperature of primary air via heat exchanger arrangement, in which secondary air stream is cooled by water and which in turn cools the primary air stream. In this process, the cooled air never comes in direct contact with water or environment and humidity ratio of the supply air is maintained constant during process.

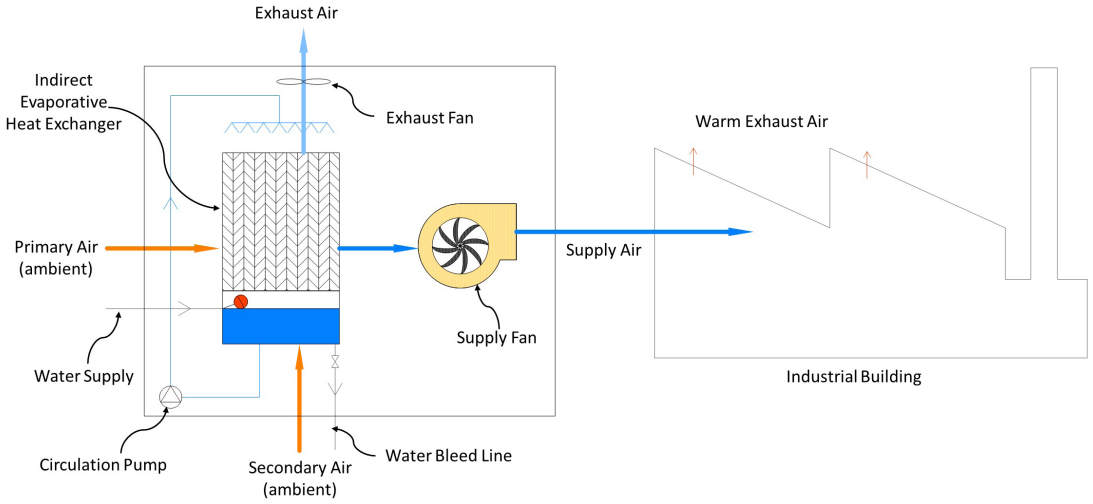

Fig. 502.20(1): Indirect Evaporative Cooling System

The fig. 502.20(2) represents the psychometric process during indirect evaporative cooling where primary air enters at 40 °C DBT and 20% RH and leaves at 30 °C DBT. The humidity ratio is constant over the process as there is no addition of moisture in the primary air stream.

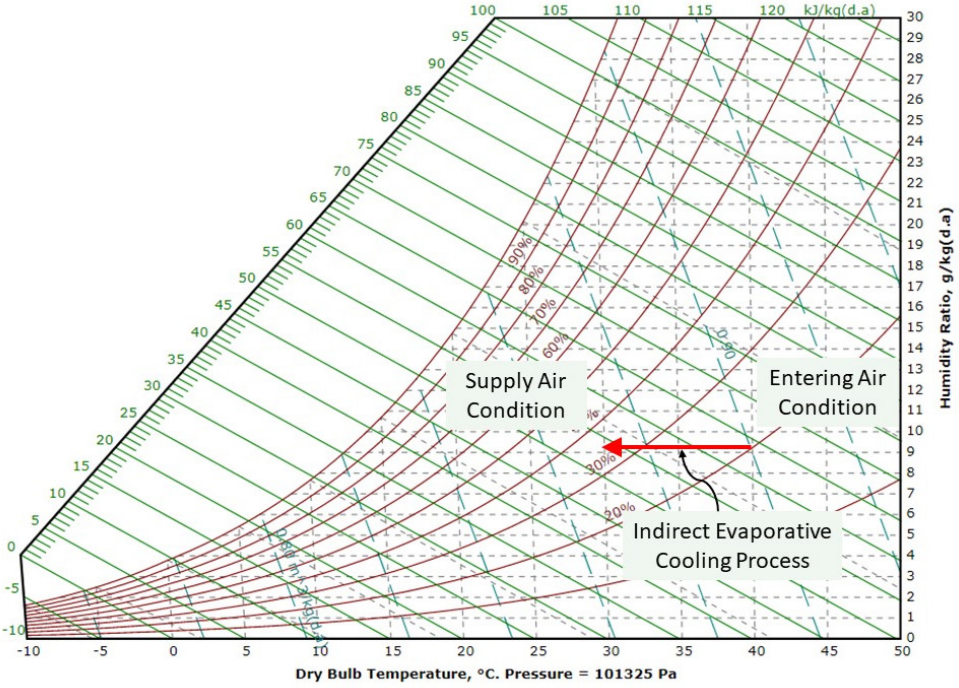

Fig. 502.20(2): Psychrometric Chart Showing The Outside Air Condition and Supply Air From Indirect Unit