

# Why the dew point in compressed air is important to us

Compressed air systems are often used in industrial production processes for cooling, heat generation, equipment maintenance and power tool operation. An unavoidable by-product of the compressed air production process is water vapor, which condenses on the air compressor system or additional equipment parts.

While a little moisture within the compressed air system is to be expected, the accumulation of large amounts of condensate can damage sensitive equipment and degrade the quality of the finished product. In this regard, monitoring compressed air dew points is critical to ensure standardization of machine operating life and product quality.

ISO 8573.1 addresses three key impurities in compressed air: excess moisture, particulates and oil. This compressed air standard specifies test parameters designed to maintain the proper purity level of compressed air.

What is the dew point of a compressed air system?

The dew point of an air compressor system is the temperature at which vaporized water condenses to a liquid state at the same rate of evaporation. At this temperature, the compressed air is fully saturated and can no longer hold water vapor.

For industrial operators using compressed air systems for production, continuous monitoring of the dew point is necessary to prevent damage to instruments and to minimize process contamination.

Is dew point measured in degrees?

The dew point temperature of compressed air is measured in degrees Fahrenheit using a dew point thermal sensor. For most systems, the dew point temperature of the air is maintained in the range of 50°F to 94°F. At this temperature, water suspended in the air settles and begins to collect on the compressor components.

If read accurately, a dew point sensor will allow operators to implement different methods of water removal and protect the integrity of their machines.

Why is dew point important in compressed air applications?

Keeping moisture within certain levels is critical to protecting the function of sensitive industrial equipment. If left unchecked, moisture in compressed air precipitates at the dew point and can trigger corrosion of metal machinery, leading to costly system failures and downtime for repairs.

In addition, unwanted moisture in the compressed air supplied to industrial processes can have an adverse effect on product quality. Accumulated water vapor can transfer impurities, including dust and bacteria, to sensitive food and pharmaceutical production processes, making their output products unsafe for consumption.

The economic impact of moisture damage to air compressor systems illustrates why all operators must strictly monitor the water saturation in their air systems.

The relationship between dew point and pressure

There is a clear link between the dew point at which compressed air becomes saturated and the pressure at which compression is performed. For any gas, an increase in pressure will be followed by a corresponding increase in dew point.

A series of calculations and conversions are done manually or using software to accurately predict the dew point of the air and help the operator put proper moisture removal protocols in place.

How is dew point different from pressure dew point?

In practice, the terms "dew point" and "pressure dew point" are often used interchangeably. However, this substitution is not accurate.

Dew point is the temperature at which air becomes saturated under atmospheric pressure conditions, while pressure dew point is the dew point of a gas measured at a pressure higher than normal atmospheric pressure.

How to measure the dew point in compressed air

The dew point of compressed air can be accurately measured with a dew point sensor, a device made specifically for this purpose. Similar principles of operation apply to all dew point measurement tools, regardless of their manufacturer.

The following outlines the key factors to consider when attempting to measure the dew point of compressed air.

Instrument Selection

The first step in evaluating dew point is to select the appropriate dew point instrument. Some manufacturers produce equipment that can measure very high dew points, while other manufacturers make sensors that are best suited to measure lower dew points.

To avoid measurement errors, operators must purchase the equipment best suited for their air compression unit.

Understanding the variation in instrument pressure characteristics

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