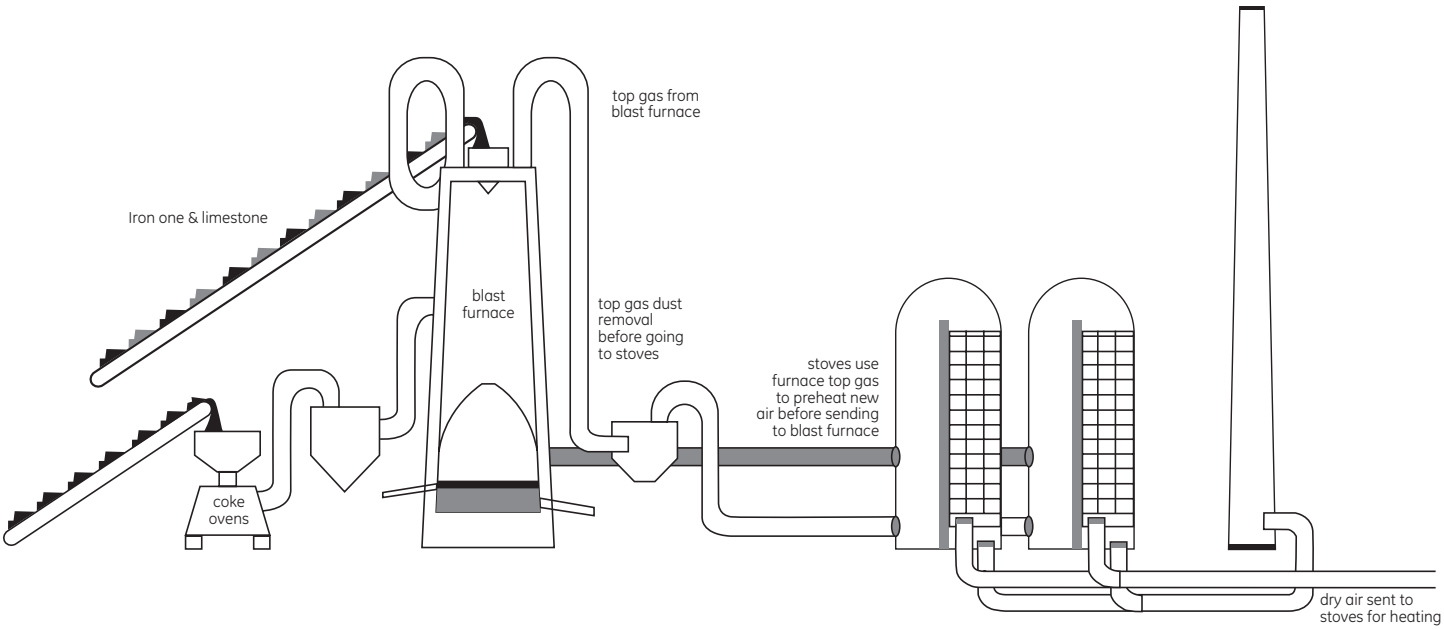
GE
Measurement & Control

Application Note

Moisture Measurement for Industrial Gases in Heat Treating



What it is?

The properties of metals, such as copper, steel and aluminum and specialty metals, such as titanium, nickel and new alloys are produced by heating in controlled atmospheres. Heat-treating uses heating or cooling to harden or soften a metal. Various types of furnaces are used in heat-treating processes, including dumbbell, brazing, sintering, and annealing furnaces. The atmosphere within the furnace is used to create the desired characteristics of the metal, to prevent the metal from corroding during the high temperature operation, and to minimize levels of impurities. Inert gases, such as nitrogen or argon, are typically used as the blanketing gas in a brazing process while hydrogen is used in an annealing processes.

Why is moisture measurement important?

During the heat-treating process, it is important to monitor or control the level of moisture, as well as oxygen, and hydrogen, in the gaseous atmosphere within the furnace to optimize the desired property of the metal. Moisture can affect the strength and surface finish of the material. In a brazing furnace, accurate moisture content in purge gas is critically controlled around 10-50 ppm_v to maintain brazing quality. The moisture content in hydrogen gas used in annealing is usually optimized from 0-40 ppm_v as high moisture content causes the metal to oxidize, adversely impacting the surface finish.

Why Aurora Moisture Analyzers?

Aurora's fast allows continuous moisture measurement for monitoring and optimization of many industrial processes. The analyzer can be calibrated for many gases including nitrogen, argon, hydrogen, CO_2, etc. The measurement is non-contact so there is no drift or need for calibration. Aurora analyzers require very little maintenance and come with a complete sample system and easy intuitive user interface for simple installation and startup. With a local service team to support the analyzers, you have the confidence of knowing that Aurora analyzers are always ready for immediate moisture measurement.
Just connect and go.

Table of critical specifications

	Aurora	Aurora 19
Accuracy	±4 ppm_v (parts per billion by volume) or ±2% of reading, whichever is greater	±4 ppm_v (parts per billion by volume) or ±2% of reading, whichever is greater
Repeatability	±2 ppb_v below 200 ppm, 1% above 200 ppm	±2 ppb_v below 200 ppm, 1% above 200 ppm
Operating Temperature	-20 to +65°C (-4 to +149°F)	-20 to +65°C (-4 to +149°F)
Hazardous Area Certification	US/Canada: Explosion-proof for Class I, Division 1, Groups B, C&D	N/A
	ATEX and IEC Ex: Ex de IIB+H2 T6 -20°C to +65°C Flameproof with increased safety compartment	N/A

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