

Helium Gas for Nuclear Reactors

3050-DO, 5800, 5830, 5920

Application

Moisture is measured in helium gas used for nuclear reactors. The helium is used as a reactor coolant because of its excellent thermal properties and chemical inertness.

Problem

If the helium becomes contaminated with moisture, it will cause both degradation of graphite rods and an undesired change in the process's heat balance. At worst, a complete reactor shut down could result from an excessive moisture concentration in the helium.

If the degradation to the graphite rods becomes excessive, an unscheduled replacement will be needed which compounds the loss of the rods with an overall loss of reactor efficiency and uptime.

Equipment

All quartz-crystal moisture analyzers are compatible with helium. The analyzer should be chosen based upon the sample pressure available and the sensitivity and accuracy requirements of the customer.

Procedure

The helium is measured in either the dryer line or the pressurization line. Moisture content is measured continuously since leakage in the system can occur at any time. A sampling system is typically not required as the helium is usually quite pure and free from oils or other non-gas impurities. If particulate matter or oils are present, a suitable filter can be placed upstream of the analyzer.

Results

Continuous monitoring of the level of moisture in the helium with a 3050-DO, 5800, 5830, or 5920 will warn users as soon as a moisture excursion occurs thereby enabling the users to take corrective steps before the moisture has time to damage the process.

Specifications

Water Concentration Range:
0.001 to 10 ppmv

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PROCESS INSTRUMENTS

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F-0320 Rev 1 (0411)

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