

How to Size a N2 Generator for Boiler Layup



The technique for sizing a nitrogen generator for boiler layup is at the discretion of the boiler operator. Here is a recommended technique that has found success in most applications.

Once the turbine shuts down, there is a period of time required for the HRSG temperature and pressure to decrease to 3-5 psig (0.2 - 0.34 bar). Once pressure and temperature stabilize (this varies from site to site and is generally estimated to be about 150°F (66°C) and 50 psig (3.4 bar), the operator will begin to add nitrogen. Nitrogen will continue to be supplied to the HRSG until the pressure reaches 3-5 psig (0.2 - 0.34 bar). A pressure of 3-5 psig (0.2 - 0.34 bar) will be maintained inside the unit so that no outside oxygen can infiltrate. Dropping the pressure to 0 would allow air to enter and should be avoided.



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The ASME specification for nitrogen within the boiler is 99.6% (0.4% O₂). Sometimes lower purities have been used depending on the experience of the site operator.

Therefore, to size a nitrogen generator determine:

1. How long does it take for the pressure to drop from 50 psig (3.4 bar) to 5 psig (0.34 bar)? (typically 24-72 hours)
2. What is the volume of the headspace?

To determine the flow of nitrogen, divide the headspace volume (2) by the time (1). For example, an 11,000 cubic foot HRSG that drops to 5 psig in 24 hours would use a flow of:

$$\text{Flow} = 11,000/24 = 460 \text{ scfh}$$

The DB5 at 99.6% is rated for 475 scfh and would be the ideal size for this application.