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1. Scope

- 1) This document defines the execution of a flow rate test on cryogenic processing pipes. Especially for application to
 - coils and iron yoke cooling pipes,
 - vacuum chamber cooling pipes,
 - bus bar cooling pipes,
 - shield cooling pipes.
- 2) To be applied for inner diameters of 0,5mm-40mm

2. Requirements

- 1) Two calibrated pressure gauges for measuring the inlet- and outlet - pressure and determination of the pressure difference (CL 1.0).
- 2) A mass flow sensor, calibrated for the applied test gas and suitable for the expected mass flow (error tolerance <5%)
- 3) The date of calibration of the applied equipment must not be older then one year at the date of measurement.
- 4) Test gas (inert gas: Helium, Argon, Nitrogen)
- 5) Calculation of the expected mass flow.
- 6) In case of pressure equipment (according to [1]) of the class I or higher, a passed pressure test according to [2] must be proven for all piping prior to testing.

3. Execution

- 1) The test gas supply must be connected properly to the processing pipe. The pressure sensors must be mounted at the inlet and outlet; the mass flow sensor at the outlet (see Figure 1).
- 2) At the inlet a pressure must be set, lower then the design pressure of the processing pipe. Pressure difference and mass flow must be measured and logged.
- 3) A comparison with the theoretical data must be performed and logged. A deviation of -20% must not be exceeded.

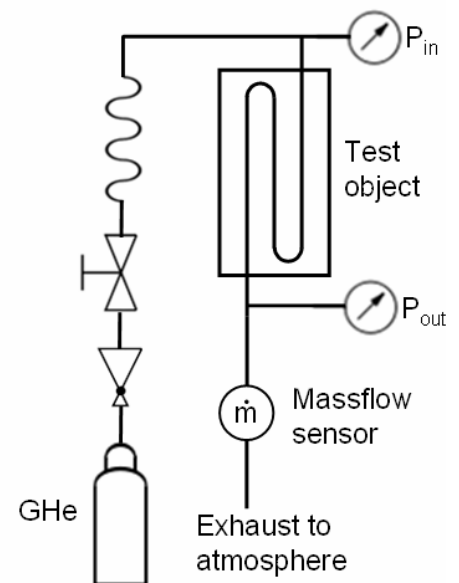


Figure 1: Test scheme



Technical Guideline

Number

7.26e

B-MT

Flow Rate Test for Cryogenic Processing Pipes

Status

2011-04-06

4. References

- [1] Directive 97/23/EC, European parliament and the council of the European Union, <http://eur-lex.europa.eu>, 1997
- [2] AD 2000-Code; Verband der TÜV e. V.; Beuth Verlag GmbH; Berlin; Germany; 2009