

INTERNATIONAL STANDARD 1608 / II

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Vapour vacuum pumps — Measurement of performance characteristics — Part II : Measurement of critical backing pressure

*Pompes à vide à jet de vapeur — Mesurage des caractéristiques fonctionnelles —
Partie II : Mesurage de la pression critique de refoulement*

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 1608/II was developed by Technical Committee ISO/TC 112, *Vacuum technology*, and was circulated to the member bodies in October 1977.

It has been approved by the member bodies of the following countries :

Australia	Germany, F.R.	South Africa, Rep. of
Belgium	India	Spain
Brazil	Italy	Turkey
Bulgaria	Korea, Rep. of	United Kingdom
Chile	Mexico	U.S.A.
Czechoslovakia	Netherlands	Yugoslavia
France	Romania	

No member body expressed disapproval of the document.

Vapour vacuum pumps — Measurement of performance characteristics —

Part II : Measurement of critical backing pressure

0 INTRODUCTION

The purpose of this International Standard is to ensure that measurements of the performance characteristics of vapour vacuum pumps are, as far as possible, carried out by uniform procedures and under uniform conditions. It is hoped that, as a result, measurements conducted by different manufacturers or in different laboratories, and statements of performance quoted in manufacturers' literature, will be on a properly comparable basis to the benefit of both user and manufacturer.

It is envisaged that the complete International Standard will, in due course, deal comprehensively with the measurement of a wide range of performance characteristics of the main types of vapour vacuum pumps. In order, however, that useful agreements of more restricted scope may be implemented with the least possible delay, it is intended to publish this International Standard in parts.

Part I deals with the measurement of the volume rate of flow (pumping speed).

This present document for the measurement of critical backing pressure constitutes part II of the overall International Standard.

1 SCOPE AND FIELD OF APPLICATION

1.1 This part of the International Standard specifies a method of measuring the critical backing pressure of vapour vacuum pumps.

The critical backing pressure is that backing pressure above which the operating conditions of the pump are affected in such a manner that its performance ceases to be satisfactory.

The dependence of the performance of a vapour pump on the backing pressure can only be completely described by means of a curve relating the inlet and backing pressures over the range of operation.

In many cases it is adequate to specify the critical backing pressure by a single parameter which is defined in 2.1. In some cases, however, especially where ultra-high vacuum performance is of interest, or where gases such as hydrogen and helium are concerned, the complete curve may be required.

1.2 The pumps considered comprise the following three classes of oil and mercury vapour pumps :

- vapour jet vacuum pump;
- diffusion pumps;
- diffusion-ejector pumps.

2 DEFINITIONS

For the purpose of this International Standard the following definitions apply :

2.1 critical backing pressure :

2.1.1 General case — For a stated throughput, the lowest value of the backing pressure at which a small percentage increment in the backing pressure causes a specified percentage rise in the inlet pressure.

NOTE — For the purpose of this International Standard, the minimum value of this specified increment is 10 %.

2.1.2 "no-load" critical backing pressure : The value of the critical backing pressure corresponding to zero admitted throughput.

2.1.3 "full-load" critical backing pressure : The value of the critical backing pressure corresponding to the maximum throughput for stable operation of the pump.

2.2 test dome; test header : A chamber of specific form and dimensions attached to the inlet of the pump through which a measured flow of gas may be admitted to the pump, and which is equipped with means of pressure measurement.

2.3 ultimate pressure : The limiting pressure approached asymptotically in the dome, with the gas inlet valve closed and the pump in normal operation.

NOTE — In practice the limiting pressure is considered as having been reached after pumping for sufficient time to establish that further reduction in pressure will be negligible.

3 APPARATUS

3.1 Test dome, as shown in figure 1 and described in ISO 1608/I.