

ICS 23.160  
CCS J 78



**NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**GB/T 3163-2024**

Replacing GB/T 3163-2007

---

**Vacuum technology - Vocabulary**  
**(English Translation)**

**Issued on: September 29, 2024**

**Implemented on: September 29, 2024**

---

**Issued by: State Administration for Market Regulation, China National  
Standardization Administration**

## Table of Contents

Preface

1 Scope

2 Normative references

3 Terms and Definitions

3.1 Basic terminology

3.2 Vacuum pump and related terms

3.3 Terminology of total and partial pressure vacuum gauges

3.4 Vacuum system and related terms

3.5 Leak detection and related terms

3.6 Vacuum coating technical terms

3.7 Vacuum Metallurgy Terminology

4 Symbol

Annex A (informative) This document is related to ISO 3529-1:2019, ISO 3529-2:2020 and ISO 3529-3:2014 structure numbering

Control case

Appendix B (Informative) Technical differences between this document and ISO 3529-1:2019, ISO 3529-2:2020 and ISO 3529-3:2014

And reasons

Appendix C (Informative) Vacuum Pump Classification Atlas

Appendix D (Informative) Total Pressure Vacuum Gauge Tree

Reference

Index

## Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document replaces GB/T 3163-2007 "Vacuum Technology Terminology". Compared with GB/T 3163-2007, except for structural adjustment and editing, in addition to the changes in performance, the main technical changes are as follows.

--- Changed the scope of application of this document (see Chapter 1, Chapter 1 of the 2007 edition);

- Added 70 terms such as "ultra-clean vacuum", "volume velocity" and "gas temperature" (see Chapter 3);
- Changed 28 terms such as "vacuum area", "pressure" and "unsaturated steam" (see Chapter 3, Chapter 2, Chapter 3, 2007 Edition) Chapters 4, 5 and 6);
- Deleted 21 terms such as "standard environmental conditions", "standard gas state" and "Pascal" (see Chapter 2 and Chapter 3 of the 2007 edition) Chapter 1, Chapter 4, Chapter 6 and Chapter 7);
- Deleted the terms related to vacuum drying and freeze drying (see Chapter 8 of the 2007 edition);
- Deleted the terms related to surface analysis technology (see Chapter 9 of the 2007 edition);
- Changed the "Symbol" (see Chapter 4, Appendix B of the 2007 edition);
- Deleted the appendix "Pressure units and conversion factors used before the adoption of the International System of Units (SI)" (see Appendix.2007 Edition).

Record A).

This document is modified to adopt ISO 3529-1:2019 "Vacuum technology vocabulary Part 1: Basic terms", ISO 3529-2:2020 "Vacuum ISO 3529-3:2014 "Vacuum technology vocabulary Part 3: Total pressure and partial pressure vacuum gauge".

Compared with ISO 3529-1:2019, ISO 3529-2:2020 and ISO 3529-3:2014, this document has many structural adjustments.

See Appendix A for a comparison of the structural number changes between the files.

This document has many technical differences compared with ISO 3529-1:2019, ISO 3529-2:2020 and ISO 3529-3:2014.

The outer margins of the clauses involved are marked with a single vertical line (|). A list of these technical differences and their reasons is given in Appendix B.

The following editorial changes were made to this document.

- In order to coordinate with the existing standards, the name of the standard is changed to "Vacuum Technology Terminology";
- In order to facilitate users to query the source of terms, the full text of GB/T 40344.1-2021 replaces ISO 21360-1:2012;
- Added Appendix A (informative) "This document is combined with ISO 3529-1:2019, ISO 3529-2:2020 and ISO 3529-3:2014 "Comparison of structure numbers";
- Added Appendix B (informative) "This document is consistent with ISO 3529-1:2019,

ISO 3529-2:2020 and ISO 3529-3:2014 Technical differences and reasons";

---Added index for easy reference.

## 1 Scope

This document defines the basic terms commonly used in the field of vacuum technology, vacuum pumps and related terms, total pressure and partial pressure vacuum gauge terms, vacuum system and related terms, leak detection and related terms, vacuum coating technology terms, vacuum metallurgy terms, and the definitions of the above terms.

This document is applicable to the field of vacuum technology and related teaching, scientific research, design, manufacturing, technical exchanges, as well as the preparation of relevant technical documents and Books and periodicals.

## 2 Normative references

This document has no normative references.

## 3 Terms and definitions

The following terms and definitions apply to this document.

### 3.1.1 General terms

#### 3.1.1.1

Vacuum

A rarefied gas state or environment based on a pressure or molecular density below that of the atmosphere.

#### 3.1.1.2

Vacuum area ranges of vacuum the division of vacuum areas according to a certain pressure range.

**Note 1:** The pressure range may vary slightly when selected. The widely recognized typical vacuum range is shown in Table 1.

**Note 2:** Ground pressure depends on weather conditions and altitude, ranging from 31kPa (the altitude and weather conditions of Mount Everest are the lowest point of air pressure) to 110kPa (the Dead Sea's altitude and weather conditions are the high point of air pressure).

Table 1 Typical vacuum area

Reasons for defining and dividing pressure ranges (typical situations)  $\geq 1 \times 10^2 \text{ Pa} \sim <$  atmospheric pressure (31kPa~110kPa) Low (rough) vacuum Pressure can be measured through simple materials (such as ordinary steel) and volume the gas is in a viscous flow

state.

$\geq 1 \times 10^{-1} \text{ Pa} \sim < 1 \times 10^2 \text{ Pa}$  Medium vacuum Pressure can be measured through precision materials (such as stainless steel) and volumetric Vacuum pump is obtained; gas is in transition flow state  $\geq 1 \times 10^{-6} \text{ Pa} \sim < 1 \times 10^{-1} \text{ Pa}$  High vacuum (HV) Pressure can pass through precision materials (such as stainless steel), elastomer seals Seal and high vacuum pump; gas is in molecular flow state