
**Aerospace — Fluid systems —
Vocabulary —**

**Part 2:
General terms and definitions
relating to flow**

iTeh STANDARD PREVIEW
*Aéronautique et espace — Systèmes de fluides — Vocabulaire —
Partie 2: Termes généraux et définitions relatifs à l'écoulement*
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ISO 8625-2:2018

<https://standards.iteh.ai/catalog/standards/sist/69946a94-a93b-4a4a-87c6-9db0c3c35882/iso-8625-2-2018>



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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 10, *Aerospace fluid systems and components*.

This second edition cancels and replaces the first edition (ISO 8625-2:1991), which has been technically revised.

The main changes compared to the previous edition are as follows:

- Clause 2 has been added, moving the “Terms and definitions” to Clause 3;
- Clause 3 has been technically revised and editorially reworked;
- the example for a definition at the beginning of Clause 3 has been deleted;
- the definitions in Clause 3 have been renumbered accordingly;
- the definitions for “laminar flow” and “turbulent flow” have been added as a sub-entry to the definition of “flow”;
- “flow factor” and “flow coefficient” have been combined under sub clause 3.4;
- “quiescent flow” and “seal leakage/seepage” have been moved as sub-entries to 3.7 (“leakage”);
- the definition for “Reynolds number” has been added to Clause 3 as sub-entry 3.10;
- the definition for “weepage” has been deleted; and
- the “Alphabetical Index” has been deleted.

A list of all parts in the ISO 8625 series can be found on the ISO website.

Aerospace — Fluid systems — Vocabulary —

Part 2:

General terms and definitions relating to flow

1 Scope

This document defines general terms relating to flow in fluid systems used in aerospace construction.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

cavitation

formation and collapse of cavities/implosion of bubbles, either gaseous or vapour, within a liquid stream, which occurs where the pressure is locally reduced below the saturated vapour pressure of the liquid and subsequently increased above the liquid's vapour pressure

Note 1 to entry: It may include gas coming out of solution in the liquid as pressure is reduced (soft cavitation).

Note 2 to entry: The cavitation tendency of a fluid is described by the cavitation number.

Note 3 to entry: The imploding or collapsing of these cavities/bubbles triggers an intense shock wave if occurring inside a pump. Cavitation can cause significant component and system damage if not quickly remedied.

3.2 Choked flow

3.2.1

choked flow of a compressible fluid

choked flow of a gas

limiting condition where the mass flow of a compressible fluid passing through a restriction will not increase with a further decrease in the downstream pressure while upstream pressure is fixed

Note 1 to entry: The limited parameter is fluid velocity, and thus mass flow can be increased with increased upstream pressure (increased fluid density).

3.2.2

choked flow of an incompressible fluid

choked flow of a liquid

limiting condition where the flow of a liquid flowing through a restriction is limited by the liquid pressure decreasing below the vapour pressure of the liquid downstream of the restriction

Note 1 to entry: This decrease in pressure leads to formation and implosion of bubbles (cavitation). The formation of the bubbles in the restriction limits the increase of the flow.

3.3

flow

movement of fluid generated by differential pressure and defined by either volumetric or mass flow rates, such as litres per second or kilograms per second

Note 1 to entry: Gas volume flow may be expressed at standard reference conditions of sea level, atmospheric pressure and ambient temperature (e.g. SCCM).

3.3.1

laminar flow

fluid flow characterized by the parallel movement of fluid layers (laminae) past one another in an orderly fashion

3.3.2

turbulent flow

fluid flow characterized by the random motion of fluid particles which overall, are still travelling in the direction of main or average flow

3.4 Flow factor/coefficient

3.4.1

flow factor

K_v

flow rate per unit of pressure drop characteristic of a pneumatic or hydraulic device, flow line, or connection usually expressed in metric units (cubic meters per hour per bar)

3.4.2

flow coefficient

C_v

flow rate per unit of pressure drop characteristic of a pneumatic or hydraulic device, flow line, or connection usually expressed in English units (gallons per minute per psi)

3.5

flow parameter of pneumatic devices

parameter which characterizes the relationship between the pressure and the flow in a compressible flow device

3.6

flow surge

temporary sudden increase and decrease in flow rate

Note 1 to entry: For example, due to changes in the system steady-state conditions, such as a change in valve position or pump ripple.

3.7 Leakage

3.7.1

external leakage

normally unwanted and unacceptable fluid flow from a component/device to the exterior of a closed hydraulic system

Note 1 to entry: The occurrence of external leakage is normally an indication of a failure in the device or in parts of a closed hydraulic system.

3.7.2

internal leakage

fluid flow between internal cavities of a device

3.7.3

quiescent flow

total internal leakage of a hydraulic system or a branch or component of hydraulic system while at rest

3.7.4

seepage

seal leakage

external leakage of an extremely small quantity of fluid at the surface of a component normally due to “breathing” of seals under cyclic pressure load

3.8

rated flow

specified flow at steady-state conditions for a component or system

3.9

relief flow

flow going through a relief valve due to the actuation of the valve to limit system or sub-system pressures due to failures or to limit the pressure due to failure effects

3.10

Reynolds number

dimensionless parameter to describe laminar or turbulent flow

Note 1 to entry: A low Reynolds number characterizes a laminar flow and high Reynolds number a turbulent flow. Typically the transition point between laminar and turbulent flow is at Reynolds numbers of around 4 000-5 000.

3.11

reverse flow

flow in the opposite direction to the normally prescribed system flow

Note 1 to entry: Can be due to the reversal of movement in a servo actuator for example.

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