# INTERNATIONAL STANDARD 

## Aerospace - Fluid systems and components - Pressure and temperature classifications

Aéronautique et espace - Systèmes de fluides et éléments constitutifs - Classification des températures et des pressions

# iTeh STANDARD PREVIEW (standards.iteh.ai) 

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41227490111
Fax + 41227490947
E-mail copyright@iso.org
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ISO 6771 was prepared by Technical Committee ISO/TC 20, Aircraft and space vehicles, Subcommittee SC 10, Aerospace fluid systems and components.

This third edition cancels and replaces the second edition (ISO 6771:1987), which has been technically revised. This third edition adds imperial unit equivalentst and the nominal temperatures and pressures for all classes have been revised.

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## Introduction

Aerospace fluid systems and components are generally designed and marked for a specific fluid pressure class and temperature type.

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# Aerospace - Fluid systems and components - Pressure and temperature classifications 

## 1 Scope

This International Standard specifies the pressure classes and temperature types for the basic systems and component systems that are commonly used in aerospace fluid systems. Classes and types in the lower ranges represent systems in common use. Those in the higher ranges represent systems that are in less common use or that are used in developmental systems.

## 2 Terms and definitions

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

## 2.1

## basic system

temperature types and pressure classes of the aircraff fluid systems, "'sually specified in the aircraft specification, with which the vehicle is designed to be operated
(Stand arrds. , iteh.ai)
NOTE 1 The basic system consists of several subsystems.
NOTE 2 The temperature type and pressure classes are tested and certified as an integral part of vehicle performance. https:/standards.iteh.ai/ catalogs standards/sist/b 19 ea78e-a161-4546-bd45-

## 2.2

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## component system

system whose temperature types and pressure classes are usually defined in the product specification
NOTE 1 The components are tested and qualified individually under each subsystem.
NOTE 2 The harmonization of temperature and pressure tolerances is accomplished in the component systems so that one product can be used in both systems, metric or imperial, and attain the same degree of performance of the subsystem.

## 3 Classification

### 3.1 Basic system

### 3.1.1 General

The pressure classes and temperature types for the basic systems are as specified in Tables 1 and 2 . No tolerance is permitted in the basic systems.

### 3.1.2 Pressure classes

Nominal system pressure classes for the basic systems shall be as specified in Table 1. The old pressure classes designated in Table 1 are the existing systems commonly used in the United States and Europe. The equivalent pressures as shown are mathematically converted from the basic systems for comparison only and should not be used in the basic systems.

Table 1 - Nominal system pressure classes for the basic systems

| Pressure classes | Metric system |  |  | Imperial system |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Old pressure classes | Pressu <br> $\mathrm{kPa}(\mathrm{bar})^{\mathrm{a}}$ basic | values <br> psi equivalent ${ }^{b}$ | Old pressure classes | psi basic | values <br> kPa equivalent ${ }^{\text {c }}$ |
| A | A | 4000 (40) | 580 | 600 | 600 | 4137 |
| B | B | 10500 (105) | 1522 | 1500 | 1500 | 10342 |
| $\mathrm{H}^{\text {d }}$ | - | $14000(140){ }^{\text {d }}$ | 2031 | 2000 | 2000 | 13790 |
| C | C | 16000 (160) | 2321 | - | $2500{ }^{\text {d }}$ | 17237 |
| D | D | 21000 (210) | 3046 | 3000 | 3000 | 20684 |
| E | E | 28000 (280) | 4061 | 4000 | 4000 | 27579 |
| $J^{\text {d }}$ | - | $35000(350){ }^{\text {d }}$ | 5076 | 5000 | 5000 | 34474 |
| F | F | 40000 (400) | 5802 | - | $6000{ }^{\text {d }}$ | 41368 |
| G | G | 50000 (500) | 7252 | - | $7000{ }^{\text {d }}$ | 48263 |
| $\mathrm{K}^{\text {d }}$ | - | $55000(550){ }^{\text {d }}$ | 7977 | 8000 | 8000 | 55158 |
| $1 \mathrm{bar}=100 \mathrm{kPa}$. <br> 1 kPa (kilopascal) $=0,1450381 \mathrm{psi}$ (pound-force per square inch). 1 psi (pound-force per square inch) $=6,89474 \mathrm{kPa}$ (kilopascal). <br> Additional pressure classes for future application. |  |  |  |  |  |  |

### 3.1.3 Temperature types

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Types of system operating temperature for the basic systems shall be as specified in Table 2. The old temperature types as shown in Table 2 are the existing systems commonly used by the United States and Europe. Some new temperature types are added in this revision for future application. The tolerances are not allowed in the basic systems.

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Table 2 - Types of system operating temperature for basic systems

| Temperature type | Metric system |  | Imperial system |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Old temperature type | Temperature range ${ }^{\circ} \mathrm{C}$ | Old temperature type | Temperature range <br> ${ }^{\circ} \mathrm{F}$ |
| 07 | I | -55 to 71 | I | -65 to 160 |
| 09 | - | -55 to 95 | - | -65 to 200 |
| 13 | II | -55 to 135 | II | -65 to 275 |
| 20 | III | -55 to 200 | - | -65 to 400 |
| 23 | - | -55 to 235 | III | -65 to 460 |
| 32 | IV | -55 to 320 | - | -65 to 600 |
| 40 | V | -55 to 400 | - | -65 to 750 |
| 42 | - | -55 to 425 | - | -65 to 800 |
| 45 | - | -55 to 450 | - | -65 to 840 |
| 55 | - | -55 to 550 | - | -65 to 1020 |
| 65 | VI | -55 to 650 | - | -65 to 1200 |
| 73 | - | -55 to 730 | - | -65 to 1350 |
| 76 | - | -55 to 760 | - | -65 to 1400 |
| NOTE Formula used in temperature conversion: <br> $X{ }^{\circ} \mathrm{F}=32+9 / 5 \mathrm{Y}^{\circ} \mathrm{C}$ or $\mathrm{Y}^{\circ} \mathrm{C}=5 / 9\left(\mathrm{X}^{\circ} \mathrm{F}-32\right)$. |  |  |  |  |

### 3.2 Component system

### 3.2.1 Pressure classes

Nominal system pressure classes for the component systems shall be as specified in Table 3. The tolerance values as shown are to be used for conversion from one system to another. To qualify for both systems, the higher pressure shall be used.

Table 3 - Nominal system pressure classes for the component systems

| Pressure classes | Metric system |  |  | Imperial system |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Nominal pressure $\mathrm{kPa}(\mathrm{bar})^{\mathrm{a}, \mathrm{~b}}$ | Harmonize tolerance kPa | upper value/ lower value $\mathrm{kPa}$ | Nominal pressure $p s i^{c}$ | Harmonize tolerance psi | upper value/ lower value psi |
| A | 4000 (40) | +137 | $\begin{aligned} & 4137 \\ & 4000 \end{aligned}$ | 600 | -20 | $\begin{aligned} & 600 \\ & 580 \end{aligned}$ |
| B | 10500 (105) | -158 | $\begin{aligned} & 10500 \\ & 10342 \end{aligned}$ | 1500 | +23 | $\begin{aligned} & 1523 \\ & 1500 \end{aligned}$ |
| $\mathrm{H}^{\text {d }}$ | 14000 (140) | -211 | $\begin{aligned} & 14000 \\ & 13789 \end{aligned}$ | 2000 | +31 | $\begin{aligned} & 2031 \\ & 2000 \end{aligned}$ |
| C | $16000(160)$ | $+1237$ <br> (stan | $\begin{array}{\|c\|c\|} \hline \text { A. } 17237 \text { P } \\ \hline 16000 \end{array}$ | $2500$ | -179 | $\begin{aligned} & 2500 \\ & 2321 \end{aligned}$ |
| D | 21000 (210) | $-316$ | $\begin{array}{r} 21000 \\ 67720684 \end{array}$ | 3000 | +46 | $\begin{aligned} & 3046 \\ & 3000 \end{aligned}$ |
| E | 28000 (280) | $\begin{array}{r} \text { ds.iten.aitcatalog } \\ -427 \text { fla } \end{array}$ | andardsiso $0001-20$ 27579 | $4000$ | +61 | $\begin{aligned} & 4061 \\ & 4000 \end{aligned}$ |
| $J^{\text {d }}$ | 35000 (350) | -526 | $\begin{aligned} & 35000 \\ & 34474 \end{aligned}$ | 5000 | +76 | $\begin{aligned} & 5076 \\ & 5000 \end{aligned}$ |
| F | 40000 (400) | +1 368 | $\begin{aligned} & 41368 \\ & 40000 \end{aligned}$ | $6000^{\text {a }}$ | -198 | $\begin{aligned} & 6000 \\ & 5802 \end{aligned}$ |
| G | 50000 (500) | -1737 | $\begin{aligned} & 50000 \\ & 48263 \end{aligned}$ | $7000{ }^{\text {a }}$ | +252 | $\begin{aligned} & 7252 \\ & 7000 \end{aligned}$ |
| $\mathrm{K}^{\text {d }}$ | 55000 (550) | +158 | 55158 55000 | 8000 | -23 | $\begin{aligned} & 8000 \\ & 7977 \end{aligned}$ |
| a $\quad 1 \mathrm{bar}=100 \mathrm{kPa}$. <br> b $\quad 1 \mathrm{kPa}$ (kilopascal) $=0,1450381 \mathrm{psi}$ (pound-force per square inch). <br> c $\quad 1 \mathrm{psi}$ (pound-force per square inch) $=6,89474 \mathrm{kPa}$ (kilopascal). <br> d Additional pressure classes for future application. |  |  |  |  |  |  |

### 3.2.2 Temperature types

The old temperature types as used in Table 4 are from the existing systems commonly used in the United States and Europe. The new temperature types are additional temperatures added in this revision for future broader application. To qualify for both systems, the higher temperature range shall be used.

Table 4 - Types of system operating temperature for component systems

| Temperature type | Metric System |  |  |  | Imperial System |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Old temperature type | Temperature range <br> ${ }^{\circ} \mathrm{C}$ | Lower temperature <br> Field of tolerance | Upper temperature <br> Field of tolerance | Old temperature type | Temperature range <br> ${ }^{\circ} \mathrm{F}$ | Lower temperature <br> Field of tolerance | Upper temperature <br> Field of tolerance |
| 07 | 1 | -55 to 71 | $\begin{aligned} & -55 \\ & -54 \end{aligned}$ | $\begin{aligned} & 71 \\ & 70 \end{aligned}$ | 1 | -65 to 160 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 160 \\ & 158 \end{aligned}$ |
| 09 | - | -55 to 95 | $\begin{aligned} & -55 \\ & -54 \end{aligned}$ | $\begin{aligned} & 95 \\ & 93 \end{aligned}$ | - | -65 to 200 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 203 \\ & 200 \end{aligned}$ |
| 13 | II | -55 to 135 | $\begin{aligned} & -55 \\ & -54 \end{aligned}$ | $\begin{aligned} & 135 \\ & 135 \end{aligned}$ | II | -65 to 275 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 275 \\ & 275 \end{aligned}$ |
| 20 | III | -55 to 200 | $\begin{aligned} & -55 \\ & -54 \end{aligned}$ | $\begin{aligned} & 204 \\ & 200 \end{aligned}$ | - | -65 to 400 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 400 \\ & 392 \end{aligned}$ |
| 23 | - | -55 to 235 | $\begin{aligned} & -55 \\ & -54 \end{aligned}$ | $\begin{aligned} & 238 \\ & 235 \end{aligned}$ | III | -65 to 460 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 460 \\ & 455 \end{aligned}$ |
| 32 | IV | -55 to 320 | $\ln _{-54}^{-55}$ | $\mathrm{N}_{316}^{320}$ | DD PR | C-65 to 600 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 608 \\ & 600 \end{aligned}$ |
| 40 | V | -55 to 400 | $\begin{aligned} & \hline-55 t 2 \\ & -54 \end{aligned}$ | $\begin{gathered} 1 \mathrm{Cl} 400^{\circ} \mathrm{d} \\ 399 \end{gathered}$ | s.iteh.a | $-65 \text { to } 750$ | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 752 \\ & 750 \end{aligned}$ |
| 42 | - | -55 to 425 | $\begin{array}{\|r} \text { dards. } 55 \\ -54 \quad 38 \end{array}$ | $\begin{aligned} & \text { atalog } 427 \\ & \text { f4a } 42532 / 1 \end{aligned}$ | $\begin{array}{\|l\|} 2007 \\ \text { Is/sist/byea78 } \\ \text {-6771-2007 } \end{array}$ | -a 65 to $800{ }^{\text {b }}$ | $\text { 45- } \begin{array}{r} -67 \\ -65 \end{array}$ | $\begin{aligned} & 800 \\ & 797 \end{aligned}$ |
| 45 | - | -55 to 450 | $\begin{aligned} & -55 \\ & -54 \end{aligned}$ | $\begin{aligned} & 450 \\ & 449 \end{aligned}$ | - | -65 to 840 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 842 \\ & 840 \end{aligned}$ |
| 55 | - | -55 to 550 | $\begin{aligned} & -55 \\ & -54 \end{aligned}$ | $\begin{aligned} & 550 \\ & 549 \end{aligned}$ | - | -65 to 1020 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 1022 \\ & 1020 \end{aligned}$ |
| 65 | VI | -55 to 650 | $\begin{aligned} & -55 \\ & -54 \end{aligned}$ | $\begin{aligned} & 650 \\ & 649 \end{aligned}$ | - | -65 to 1200 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 1202 \\ & 1200 \end{aligned}$ |
| 73 | - | -55 to 730 | $\begin{aligned} & -55 \\ & -54 \end{aligned}$ | $\begin{aligned} & 732 \\ & 730 \end{aligned}$ | - | -65 to 1350 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 1350 \\ & 1346 \end{aligned}$ |
| 76 | - | -55 to 760 | $\begin{aligned} & -55 \\ & -54 \end{aligned}$ | $\begin{aligned} & 760 \\ & 760 \end{aligned}$ | - | -65 to 1400 | $\begin{aligned} & -67 \\ & -65 \end{aligned}$ | $\begin{aligned} & 1400 \\ & 1400 \end{aligned}$ |
| NOTE | Formula used in temperature conversion:$X^{\circ} \mathrm{F}=32+9 / 5 \mathrm{Y}^{\circ} \mathrm{C} \text { or } \mathrm{Y}{ }^{\circ} \mathrm{C}=5 / 9\left(\mathrm{X}^{\circ} \mathrm{F}-32\right) .$ |  |  |  |  |  |  |  |

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