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Aerospace — Fluid systems and components — Pressure and temperature classifications

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

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

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 equivalents, and the nominal temperatures and pressures for all classes have been revised.

ISO 6771:2007(E)

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 aircraft fluid systems, usually specified in the aircraft specification, with which the vehicle is designed to be operated

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.

2.2 387f4a904032/iso-6771-2007

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 values		Old	Pressure values		
	pressure classes	kPa (bar) ^a basic	psi equivalent ^b	pressure classes	psi basic	kPa equivalent ^c	
Α	Α	4 000 (40)	580	600	600	4 137	
В	В	10 500 (105)	1 522	1 500	1 500	10 342	
Ηd	_	14 000 (140) ^d	2 031	2 000	2 000	13 790	
С	С	16 000 (160)	2 321	_	2 500 ^d	17 237	
D	D	21 000 (210)	3 046	3 000	3 000	20 684	
E	E	28 000 (280)	4 061	4 000	4 000	27 579	
Ĵq	_	35 000 (350) ^d	5 076	5 000	5 000	34 474	
F	F	40 000 (400)	5 802	_	6 000 ^d	41 368	
G	G	50 000 (500)	7 252	_	7 000 ^d	48 263	
Κ ^d	_	55 000 (550) ^d	7 977	8 000	8 000	55 158	

¹ bar = 100 kPa.

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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. 387f4a904032/iso-6771-2007

Table 2 — Types of system operating temperature for basic systems

	Metric	system	Imperial system		
Temperature type	Old temperature type	Temperature range	Old temperature type	Temperature range	
		°C		°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 1 020	
65	VI	-55 to 650	_	-65 to 1 200	
73	_	-55 to 730	_	-65 to 1 350	
76	_	-55 to 760	_	-65 to 1 400	

 $X ^{\circ}F = 32 + 9/5 Y ^{\circ}C \text{ or } Y ^{\circ}C = 5/9 (X ^{\circ}F - 32).$

¹ kPa (kilopascal) = 0,145 038 1 psi (pound-force per square inch).

¹ psi (pound-force per square inch) = 6,894 74 kPa (kilopascal).

Additional pressure classes for future application.

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

		Metric system		Imperial system			
Pressure classes	Nominal pressure	Harmonize tolerance	upper value/ lower value	Nominal pressure	Harmonize tolerance	upper value/ lower value	
	kPa (bar) ^{a, b}	kPa	kPa	psi ^c	psi	psi	
А	4 000 (40)	+137	4 137	600	-20	600	
A	4 000 (40)	+137	4 000	000	-20	580	
В	10 500 (105)	-158	10 500	1 500	+23	1 523	
Ь	10 300 (103)	-130	10 342	1 300	+23	1 500	
Hď	14 000 (140)	-211	14 000	2 000	+31	2 031	
П	14 000 (140)	-211	13 789	2 000	+31	2 000	
С	16 000 (160)	STAND (standa	A 17 237 P R	E V E W	-179	2 500	
			16 000eh	ai)	-179	2 321	
D	21 000 (210)	-316	21 000	3 000	+46	3 046	
В	, ,	<u>ISC</u>				3 000	
Е	https://standa 28 000 (280)	rds.iteh.ai/catalog/s 287 f4a904	andards/sist/bf9ea 28 000 032/iso-6 / / 1-200	8e-a161-4546-bd 7 4 000	45 - +61	4 061	
	28 000 (280)	-42 I 1 1 0 1	27 579	4 000	+01	4 000	
Jd	35 000 (350)	-526	35 000	5 000	+76	5 076	
3	33 000 (330)	-320	34 474	3 000	170	5 000	
F	40 000 (400)	+1 368	41 368	6 000 ^a	− 198	6 000	
,			40 000			5 802	
G	50 000 (500)	-1 737	50 000	7 000 ^a	+252	7 252	
G			48 263	7 000	∓ 202	7 000	
K ^d	55 000 (550)	+158	55 158	8 000	-23	8 000	
IV.			55 000	0 000	-23	7 977	

a 1 bar = 100 kPa.

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.

¹ kPa (kilopascal) = 0,145 038 1 psi (pound-force per square inch).

c 1 psi (pound-force per square inch) = 6,894 74 kPa (kilopascal).

Additional pressure classes for future application.

Table 4 — Types of system operating temperature for component systems

	Metric System				Imperial System				
Temperature type	Old temperature type	Temperature range	Lower temperature Field of tolerance	Upper temperature Field of tolerance	Old temperature type	Temperature range	Lower temperature Field of tolerance	Upper temperature Field of tolerance	
07	I	–55 to 71	–55 –54	71 70	I	–65 to 160	–67 –65	160 158	
09	_	-55 to 95	–55 –54	95 93	_	-65 to 200	–67 –65	203 200	
13	II	-55 to 135	–55 –54	135 135	II	-65 to 275	–67 –65	275 275	
20	III	-55 to 200	–55 –54	204 200	_	-65 to 400	–67 –65	400 392	
23	_	-55 to 235	–55 –54	238 235	III	-65 to 460	−67 −65	460 455	
32	IV	-55 to 320	h \$\frac{-55}{\$^4 T} A	320 N316AF	RD P RI	-65 to 600	–67 –65	608 600	
40	V	-55 to 400	- 55ta -54	n c 400	s.it <u>e</u> h.a	65 to 750	–67 –65	752 750	
42	_	-55tto-425	dards.iteh.ai/c -54 387	<u>ISO 677)</u> 427 atalog/standar 7f4a9 425 32/is	<u>:2007</u> ls/sist/ <u>bf</u> 9ea78e o-6771-2007	-a <u>1</u> 65 to 800bo	-67 -65	800 797	
45	_	-55 to 450	–55 –54	450 449	_	-65 to 840	–67 –65	842 840	
55	_	-55 to 550	–55 –54	550 549	_	-65 to 1 020	–67 –65	1 022 1 020	
65	VI	-55 to 650	–55 –54	650 649	_	-65 to 1 200	–67 –65	1 202 1 200	
73	_	-55 to 730	–55 –54	732 730	_	-65 to 1 350	–67 –65	1 350 1 346	
76	_	-55 to 760	–55 –54	760 760	_	-65 to 1 400	–67 –65	1 400 1 400	

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