



SLOVENSKI STANDARD

SIST EN 4009:2005

01-junij-2005

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SIST EN 4009:2004

Aerospace series - Bolts, double hexagon head, close tolerance shank, medium length thread, in heat resisting nickel base alloy NI-PH2601 (Inconel 718) - Classification: 1 550 MPa (at ambient temperature) / 650 °C

Aerospace series - Bolts, double hexagon head, close tolerance shank, medium length thread, in heat resisting nickel base alloy NI-PH2601 (Inconel 718) - Classification: 1 550 MPa (at ambient temperature) / 650 °C

Luft- und Raumfahrt - Zwölfkant-Passschrauben, mittlere Gewindelänge, aus hochwarmfester Nickelbasislegierung NI-PH2601 (Inconel 718) - Klasse: 1 550 MPa (bei Raumtemperatur)/650 °C

Série aérospatiale - Vis a tete bihexagonale, fut a tolérance serrée, filetage moyen, en alliage résistant a chaud a base de nickel NI-PH2601 (Inconel 718) - Classification : 1 550 MPa (a température ambiante) / 650 °C

Ta slovenski standard je istoveten z: EN 4009:2004

ICS:

49.030.20 Sorniki, vijaki, stebelni vijaki Bolts, screws, studs

SIST EN 4009:2005

en

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English version

Aerospace series - Bolts, double hexagon head, close tolerance shank, medium length thread, in heat resisting nickel base alloy NI-PH2601 (Inconel 718) - Classification: 1 550 MPa (at ambient temperature) / 650° C

Série aérospatiale - Vis à tête bihexagonale, fût à tolérance serrée, filetage moyen, en alliage résistant à chaud à base de nickel NI-PH2601 (Inconel 718) - Classification : 1 550 MPa (à température ambiante) / 650° C

Luft- und Raumfahrt - Zwölfkant-Paßschrauben, mittlere Gewindelänge, aus hochwarmfester Nickelbasislegierung NI-PH2601 (Inconel 718) - Klasse: 1 550 MPa (bei Raumtemperatur) / 650° C

This European Standard was approved by CEN on 11 September 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 4009:2004) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

This document supersedes EN 4009:2003.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EN 4009:2004 (E)**1 Scope**

This standard specifies the characteristics of double hexagon headed bolts, with close tolerance shank and medium length thread, in NI-PH2601, for aerospace applications.

Classification: 1 550 MPa ¹⁾ / 650 °C ²⁾

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3353-1, *Aerospace – Lead and runout threads – Part 1: Rolled external threads*

ISO 4095, *Aerospace – Bihexagonal drives – Wrenching configuration – Metric series*

ISO 5855-2, *Aerospace – MJ threads – Part 2: Limit dimensions for bolts and nuts*

EN 2424, *Aerospace series – Marking of aerospace products*

EN 2952, *Aerospace series – Heat resisting alloy NI-PH2601 – Solution treated and cold worked – Bar for forged fasteners – $D \leq 50 \text{ mm} - 1\ 270 \text{ MPa} \leq R_m \leq 1\ 550 \text{ MPa}$ ³⁾*

EN 3666, *Aerospace series – Heat resisting alloy NI-PH2601 – Solution treated and cold worked – Bar for forged fasteners – $D \leq 50 \text{ mm} - 1\ 550 \text{ MPa} \leq R_m \leq 1\ 830 \text{ MPa}$ ³⁾*

EN 3833, *Aerospace series – Bolts, MJ threads, in heat resisting nickel base alloy NI-PH2601 (Inconel 718), passivated – Classification: 1 550 MPa (at ambient temperature) / 650 °C – Technical specification*

3 Required characteristics**3.1 Configuration – Dimensions – Tolerances – Masses**

See Figure 1 and Tables 1 and 2.

Dimensions and tolerances are in millimetres.

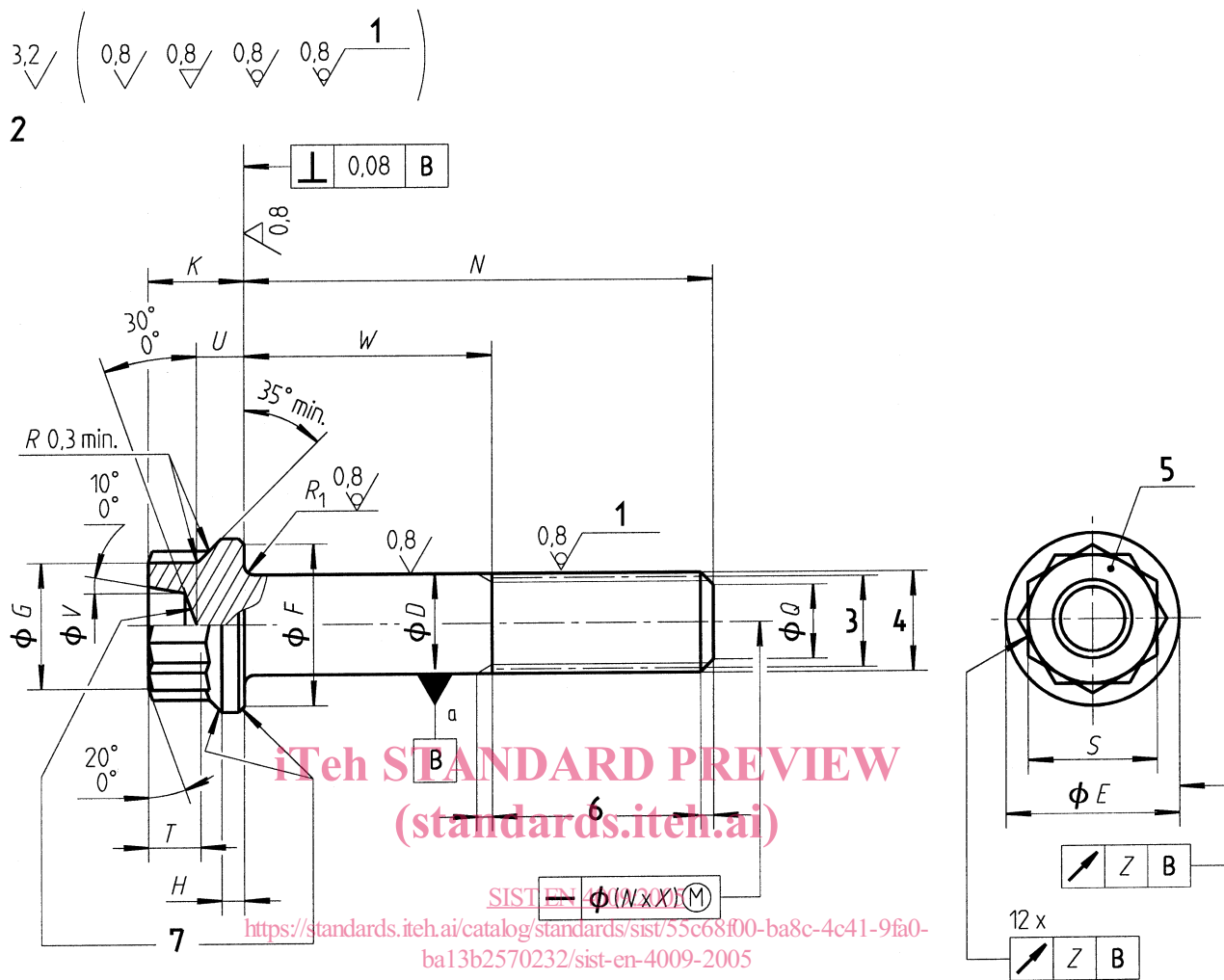
3.2 Materials

EN 3666 or EN 2952 with exception of final heat treatment which shall meet EN 3666 (reference heat treatment and relating mechanical properties).

1) Minimum tensile strength of the material at ambient temperature

2) Maximum test temperature of the parts

3) Published as AECMA Prestandard at the date of publication of this standard



Key

- 1 rolled
- 2 remove sharp edges 0,1 to 0,4.
- 3 pitch diameter
- 4 thread
- 5 marking
- 6 conforms to ISO 3353-1.
- 7 shape in this area at manufacturer's option

^a For bolts having a shank length less than one times the nominal value of the shank diameter *D*, the pitch diameter axis shall be used as the datum.

Figure 1

Table 1

Code	Thread ^a Designation	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>K</i>	<i>Q</i>	<i>R</i> ₁		<i>S</i> ^b	<i>T</i>	<i>U</i>		<i>V</i>		<i>X</i>	<i>Z</i>	
		f7	max.	min.	min.	min.	h15	± 0,5	max.	min.		min.	max.	min.	max.	min.			
050	MJ5×0,8-4h6h	5	9,1	8,3	6,8	1	5,5	3,4	0,5	0,3	7	2	2,9	2,5	3,7	3,2	0,020	0,13	
060	MJ6×1-4h6h	6	10,6	9,8	7,8	1,2	6	4,2	0,7	0,5	8	2,3	3,2	2,8	4,6	4,1		0,15	
070	MJ7×1-4h6h	7	12,1	11,3	8,8	1,4	6,5	5,2			0,6	0,6	9	2,6	3,7	3,3	5,4	4,9	0,026
080	MJ8×1-4h6h	8	13,6	12,8	9,8	1,6	7	6,2	0,6	0,6			10	2,8	4,1	3,7	5,7	5,2	
100	MJ10×1,25-4h6h	10	16,7	15,7	11,8	2	8	7,9			0,8	0,6	0,6	12	3,1	5,1	4,7	7,2	6,7
120	MJ12×1,25-4h6h	12	19,9	18,8	13,7	2,4	9,2	9,8	0,9	0,6	0,6			14	3,5	6	5,6	8,5	8

^a In accordance with ISO 5855-2. The thread major diameter "d" shall be:

*d*_{max.} = *D*_{min.} - 0,025;

*D*_{min.}: see ISO 5855-2.

^b Bihexagonal wrenching configuration in conformity with ISO 4095 over length *T* min.

Table 2

Length code	W ±0,2	Thread code											
		050		060		070		080		100		120	
		N ±0,3	Mass ^a	N ±0,3	Mass ^a	N ±0,3	Mass ^a	N ±0,3	Mass ^a	N ±0,3	Mass ^a	N ±0,3	Mass ^a
003	3	15	4,08	17	6,21	–	–	–	–	–	–	–	–
004	4	16	4,24	18	6,44	19	9,13	20,5	13,00	–	–	–	–
005	5	17	4,41	19	6,68	20	9,45	21,5	13,41	25,5	23,91	–	–
006	6	18	4,57	20	6,91	21	9,76	22,5	13,82	26,5	24,56	28,5	39,22
007	7	19	4,73	21	7,14	22	10,08	23,5	14,24	27,5	25,21	29,5	40,15
008	8	20	4,89	22	7,37	23	10,40	24,5	14,65	28,5	25,85	30,5	41,08
009	9	21	5,05	23	7,61	24	10,72	25,5	15,07	29,5	26,50	31,5	42,02
010	10	22	5,21	24	7,84	25	11,04	26,5	15,48	30,5	27,15	32,5	42,95
011	11	23	5,38	25	8,07	26	11,35	27,5	15,90	31,5	27,80	33,5	43,88
012	12	24	5,54	26	8,31	27	11,67	28,5	16,31	32,5	28,44	34,5	44,81
013	13	25	5,70	27	8,54	28	11,99	29,5	16,73	33,5	29,09	35,5	45,75
014	14	26	5,86	28	8,77	29	12,30	30,5	17,16	34,5	29,73	36,5	46,68
015	15	27	6,03	29	9,01	30	12,62	31,5	17,55	35,5	30,39	37,5	47,61
016	16	28	6,19	30	9,24	31	12,94	32,5	17,97	36,5	31,03	38,5	48,54
017	17	29	6,35	31	9,47	32	13,26	33,5	18,38	37,5	31,68	39,5	49,48
018	18	30	6,51	32	9,71	33	13,57	34,5	18,80	38,5	32,33	40,5	50,41
019	19	31	6,67	33	9,94	34	13,89	35,5	19,21	39,5	32,98	41,5	51,34
020	20	32	6,84	34	10,17	35	14,21	36,5	19,63	40,5	33,62	42,5	52,27
021	21	33	7,00	35	10,41	36	14,52	37,5	20,04	41,5	34,27	43,5	53,21
022	22	34	7,16	36	10,64	37	14,84	38,5	20,46	42,5	34,92	44,5	54,14
023	23	35	7,32	37	10,87	38	15,16	39,5	20,87	43,5	35,57	45,5	55,07
024	24	36	7,48	38	11,11	39	15,48	40,5	21,28	44,5	36,21	46,5	56,00
025	25	37	7,65	39	11,34	40	15,79	41,5	21,70	45,5	36,86	47,5	56,94
026	26	38	7,81	40	11,57	41	16,11	42,5	22,11	46,5	37,51	48,5	57,87
027	27	39	7,97	41	11,80	42	16,43	43,5	22,53	47,5	38,16	49,5	58,80
028	28	40	8,13	42	12,04	43	16,75	44,5	22,94	48,5	38,80	50,5	59,73
029	29	41	8,29	43	12,27	44	17,06	45,5	23,36	49,5	39,45	51,5	60,67
030	30	42	8,46	44	12,50	45	17,38	46,5	23,77	50,5	40,10	52,5	61,60
032	32	44	8,78	46	12,97	47	18,02	48,5	24,57	52,5	41,40	54,5	63,46
034	34	46	9,10	48	13,44	49	18,65	50,5	25,43	54,5	42,69	56,5	65,33
036	36	48	9,43	50	13,90	51	19,29	52,5	26,26	56,5	43,99	58,5	67,19
038	38	50	9,75	52	14,37	53	19,92	54,5	27,09	58,5	45,28	60,5	69,06

continued

Table 2 (concluded)

Length code	W ± 0,2	Thread code											
		050		060		070		080		100		120	
		N ± 0,3	Mass ^a	N ± 0,3	Mass ^a	N ± 0,3	Mass ^a	N ± 0,3	Mass ^a	N ± 0,3	Mass ^a	N ± 0,3	Mass ^a
040	40	52	10,07	54	14,84	55	20,55	56,5	27,92	60,5	46,58	62,5	70,93
042	42	54	10,40	56	15,30	57	21,19	58,5	28,75	62,5	47,87	64,5	72,79
044	44	56	10,72	58	15,77	59	21,82	60,5	29,57	64,5	49,17	66,5	74,66
046	46	58	11,05	60	16,24	61	22,46	62,5	30,40	66,5	50,46	68,5	76,52
048	48	60	11,37	62	16,70	63	23,09	64,5	31,23	68,5	51,76	70,5	78,39
050	50	62	11,69	64	17,17	65	23,73	66,5	32,06	70,5	53,05	72,5	80,25
052	52	–	–	66	17,63	67	24,36	68,5	32,89	72,5	54,35	74,5	82,12
054	54	–	–	68	18,10	69	25,00	70,5	33,72	74,5	55,64	76,5	83,98
056	56	–	–	70	18,57	71	25,63	72,5	34,55	76,5	56,94	78,5	85,85
058	58	–	–	72	19,03	73	26,27	74,5	35,38	78,5	58,23	80,5	87,71
060	60	–	–	74	19,50	75	26,90	76,5	36,21	80,5	59,53	82,5	89,58
062	62	–	–	–	–	77	27,54	78,5	37,04	82,5	60,82	84,5	91,44
064	64	–	–	–	–	79	28,17	80,5	37,86	84,5	62,12	86,5	93,31
066	66	–	–	–	–	81	28,80	82,5	38,69	86,5	63,41	88,5	95,17
068	68	–	–	–	–	83	29,44	84,5	39,52	88,5	64,71	90,5	97,04
070	70	–	–	–	–	85	30,07	86,5	40,35	90,5	66,00	92,5	98,90
072	72	–	–	–	–	–	–	88,5	41,18	92,5	67,30	94,5	100,77
074	74	–	–	–	–	–	–	90,5	42,01	94,5	68,59	96,5	102,63
076	76	–	–	–	–	–	–	92,5	42,84	96,5	69,89	98,5	104,50
078	78	–	–	–	–	–	–	94,5	43,67	98,5	71,18	100,5	106,36
080	80	–	–	–	–	–	–	96,5	44,49	100,5	72,48	102,5	108,23
082	82	–	–	–	–	–	–	–	–	102,5	73,77	104,5	110,09
084	84	–	–	–	–	–	–	–	–	104,5	75,07	106,5	111,96
086	86	–	–	–	–	–	–	–	–	106,5	76,36	108,5	113,82
088	88	–	–	–	–	–	–	–	–	108,5	77,66	110,5	115,69
090	90	–	–	–	–	–	–	–	–	110,5	78,95	112,5	117,55
092	92	–	–	–	–	–	–	–	–	112,5	80,25	114,5	119,42
094	94	–	–	–	–	–	–	–	–	114,5	81,54	116,5	121,28
096	96	–	–	–	–	–	–	–	–	116,5	82,84	118,5	123,15
098	98	–	–	–	–	–	–	–	–	118,5	84,13	120,5	125,01
100	100	–	–	–	–	–	–	–	–	120,5	85,43	122,5	126,88
104	104	–	–	–	–	–	–	–	–	–	–	126,5	130,61
108	108	–	–	–	–	–	–	–	–	–	–	130,5	134,34
112	112	–	–	–	–	–	–	–	–	–	–	134,5	138,07
116	116	–	–	–	–	–	–	–	–	–	–	138,5	141,80
120	120	–	–	–	–	–	–	–	–	–	–	142,5	145,53

^a Mass ≈ quoted in kg/1 000 parts