



# SLOVENSKI STANDARD

## SIST EN 4321:2005

01-junij-2005

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SIST EN 4321:2004

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**Aerospace series - Bolts, double hexagon head with lockwire holes, relieved shank, long thread, in heat resisting nickel base alloy NI-PH2601 (Inconel 718), silver plated - Classification: 1 550 MPa (at ambient temperature) / 650 °C**

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Luft- und Raumfahrt - Zwölfkantschrauben, mit Löchern für Sicherungsdraht, Dünnschaft, langes Gewinde, aus hochwarmfester Nickelbasislegierung NI-PH2601 (Inconel 718), versilbert - Klasse: 1 550 MPa (bei Raumtemperatur)/650 °C

Série aérospatiale - Vis a tete bihexagonale avec trous de fil frein, fut dégagé, filetage long, en alliage résistant a chaud a base de nickel NI-PH2601 (Inconel 718), argentées - Classification : 1 550 MPa (a température ambiante) / 650 °C

**Ta slovenski standard je istoveten z: EN 4321:2004**

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**ICS:**

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

**SIST EN 4321:2005**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 4321**

November 2004

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Supersedes EN 4321:2003

English version

**Aerospace series - Bolts, double hexagon head with lockwire holes, relieved shank, long thread, in heat resisting nickel base alloy NI-PH2601 (Inconel 718), silver plated - Classification: 1 550 MPa (at ambient temperature) / 650° C**

Série aérospatiale - Vis à tête bihexagonale avec trous de fil frein, fût dégagé, filetage long, en alliage résistant à chaud à base de nickel NI-PH2601 (Inconel 718), argentées - Classification : 1 550 MPa (à température ambiante) / 650° C

Luft- und Raumfahrt - Zwölfkantschrauben mit Löcher für Sicherungsdraht, Dünnschaft, langes Gewinde, aus hochwarmfester Nickelbasislegierung NI-PH2601 (Inconel 718), versilbert - 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 4321:2004) 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 4321:2003.

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 the United Kingdom.

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**EN 4321:2004 (E)****1 Scope**

This standard specifies the characteristics of double hexagon headed bolts with lockwire holes, relieved shank and long thread, in NI-PH2601, silver plated, for aerospace applications.

Classification: 1 550 MPa <sup>1)</sup> / 650 °C <sup>2)</sup>

**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 2786, *Aerospace series – Electrolytic silver plating of fasteners* <sup>3)</sup>

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

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

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* <https://standards.iteh.ai/catalog/standards/sist/0e2f5d37-3cc0-4e17-a7ef-527cbacfb2f/sist-en-4321-2005>

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

See Figure 1 and Tables 1 and 2.

Dimensions and tolerances are in millimetres. They apply after silver plating.

**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).

**3.3 Surface treatment**

EN 2786

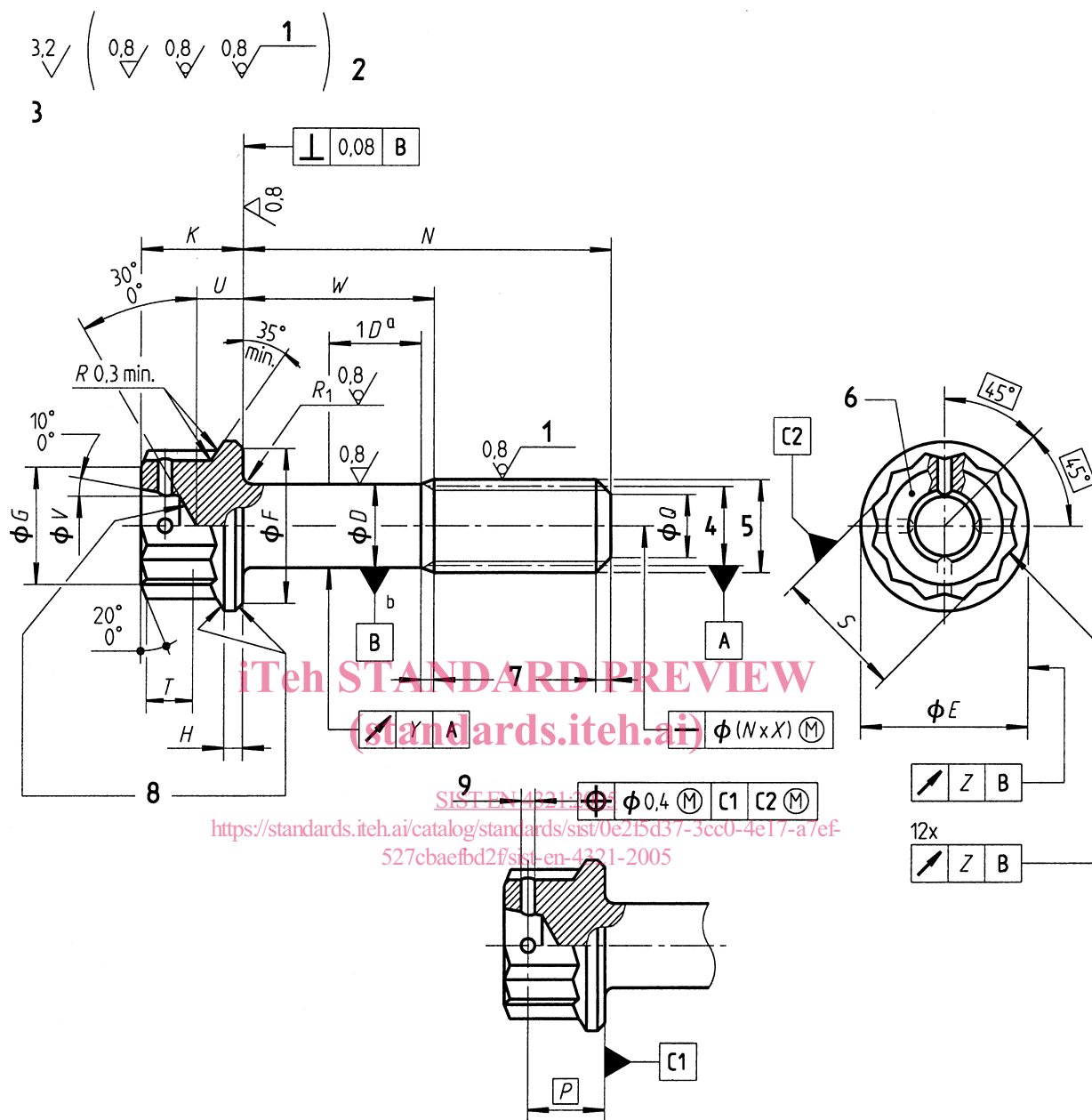
Thickness:

- thread 3 µm to 6 µm, shall be measured at the pitch diameter;
- other areas may show complete coverage, without thickness requirement.

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 values apply before silver plating.
- 3 remove sharp edges 0,1 to 0,4.
- 4 pitch diameter

- 5 thread
- 6 marking
- 7 conforms to ISO 3353-1
- 8 shape in this area at manufacturer's option
- 9 four holes *M* deburred

<sup>a</sup> When the length of the shank is less than one times the nominal value of the shank diameter *D*, the run-out is measured at a distance equal to half the actual shank length.

<sup>b</sup> For bolts having a shank length less than one times the nominal value of the shank diameter *D*, and for those threaded to head, the pitch diameter axis shall be used as the datum.

**Figure 1**

Table 1

Code	Thread <sup>a</sup> Designation	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>K</i>		<i>M</i> H13	<i>P</i>	<i>Q</i> ± 0,5	<i>R</i> <sub>1</sub>		<i>S</i> <sup>b</sup>	<i>T</i> min.	<i>U</i>		<i>V</i>		<i>X</i>	<i>Y</i>	<i>Z</i>
		± 0,13	max.	min.	min.	min.	max.	min.				max.	min.			max.	min.	max.	min.			
050	MJ5×0,8-4h6h	4,48	9,1	8,3	6,8	1	5,65	5,35	1,2	4,2	3,4	0,5	0,3	7	2	2,9	2,5	3,7	3,2	0,003	0,12	0,13
060	MJ6×1-4h6h	5,35	10,6	9,8	7,8	1,2	6,15	5,85		4,6	4,2	0,7	0,5	8	2,3	3,2	2,8	4,6	4,1			0,15
070	MJ7×1-4h6h	6,35	12,1	11,3	8,8	1,4	6,65	6,35		5,1	5,2			9	2,6	3,7	3,3	5,4	4,9		0,18	
080	MJ8×1-4h6h	7,35	13,6	12,8	9,8	1,6	7,15	6,85		5,5	6,2	0,6	0,6	10	2,8	4,1	3,7	5,7	5,2	0,0025	0,15	0,2
100	MJ10×1,25-4h6h	9,19	16,7	15,7	11,8	2	8,15	7,85		6,4	7,9			0,8	12	3,1	5,1	4,7	7,2			6,7
120	MJ12×1,25-4h6h	11,19	19,9	18,8	13,7	2,4	9,35	9,05		7,4	9,8	0,9	14	3,5	6	5,6	8,5	8	0,18	0,3		

<sup>a</sup> In accordance with ISO 5855-2

<sup>b</sup> Bihexagonal wrenching configuration in conformity with ISO 4095 over length 7 min.

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Table 2

Length code	N ± 0,3	Thread code																	
		050			060			070			080			100			120		
		max.	W min.	Mass <sup>a</sup>	max.	W min.	Mass <sup>a</sup>	max.	W min.	Mass <sup>a</sup>	max.	W min.	Mass <sup>a</sup>	max.	W min.	Mass <sup>a</sup>	max.	W min.	Mass <sup>a</sup>
008	8			3,26	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
010	10			3,52			5,11			7,19			9,62	–	–	–	–	–	–
012	12			3,78			5,48			7,71			10,32	–	–	–	–	–	–
014	14			4,04			5,85			8,23			11,02			18,01	–	–	–
016	16			4,29			6,22			8,75			11,71			19,10			29,41
018	18			4,55			6,59			9,27			12,41			20,19			31,03
020	20			4,81			6,95			9,79			13,11			21,28			32,64
022	22			5,07			7,32			10,31			13,81			22,37			34,25
024	24			5,33			7,69			10,83			14,51			23,45			35,87
026	26			5,59			8,06			11,36			15,20			24,54			37,48
028	28			5,85			8,43			11,88			15,90			25,63			39,10
030	30			6,11			8,80			12,40			16,60			26,72			40,71
032	32			6,37			9,17			12,92			17,30			27,81			42,32
034	34			6,63			9,54			13,44			17,99			28,90			43,94
036	36			6,89			9,91			13,96			18,69			29,98			45,55
038	38			7,15			10,28			14,48			19,39			31,07			47,17
040	40			7,40			10,65			15,00			20,09			32,16			48,78
042	42			7,66			11,02			15,52			20,78			33,25			50,40
044	44			7,92			11,39			16,04			21,48			34,34			52,01
046	46			8,18			11,76			16,56			22,18			35,43			53,62
048	48			8,44			12,13			17,08			22,88			36,51			55,24
050	50			8,70			12,50			17,60			23,57			37,60			56,85
052	52			8,96			12,87			18,12			24,27			38,69			58,47
054	54			9,22			13,24			18,65			24,97			39,78			60,08
056	56			9,48			13,61			19,17			25,67			40,87			61,69
058	58			9,74			13,98			19,69			26,36			41,96			63,31
060	60			10,00			14,35			20,21			27,06			43,04			64,92
062	62			10,26			14,72			20,73			27,76			44,13			66,54
064	64			10,51			15,09			21,25			28,46			45,22			68,15
066	66			10,77			15,46			21,77			29,16			46,31			69,76
068	68			11,03			15,83			22,29			29,85			47,40			71,38

continued