भारतीय मानक
Indian Standard

IS 19057 : 2024
ISO 7721-2 : 1990

काउंटरसंक समतल शीर्ष पेंच — क्रॉस रिसेस्ड की पेनिट्रेशन गहराई

Countersunk Flat Head Screws — Penetration Depth of Cross Recesses

ICS 21.060.01

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General Engineering and Fasteners Standards Sectional Committee, PGD 37

NATIONAL FOREWORD

This Indian Standard which is identical to ISO 7721-2 : 1990 ‘Countersunk flat head screws — Part 2: Penetration depth of cross recesses’ issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the General Engineering and Fasteners Standards Sectional Committee and approval of the Production and General Engineering Division Council.

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’; and

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 225 : 1983 Fasteners — Bolts, screws, studs and nuts — Symbols and designations of dimensions	IS 8536 : 2021/ISO 225 : 2010 Fasteners — Bolts, screws, studs and nuts — Symbols and descriptions of dimensions (*second revision*)	Identical
ISO 4757 : 1983 Cross recesses for screws	IS 7478 : 2011/ISO 4757 : 1983 Cross recesses for screws (*second revision*)	Identical
ISO 7721 : 1983 Countersunk head screws — Head configuration and gauging	IS 11362 : 1985/ISO 7721 : 1983 Head configuration and gauging of countersunk head screws	Identical

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2020 ‘Rules for rounding off numerical values (*second revision).*’ The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Introduction

The penetration depth of cross recesses for countersunk flat head screws has to satisfy two requirements which act in opposite directions for a given head dimension.

First, there is the requirement for sufficient head strength to attain the proof and breaking loads of the respective property class. A shallow cross recess increases the head strength. On the other hand, the wrenchability of the screw should be satisfactory; this can only be achieved by a sufficiently deep cross recess.

ISO 7721-2 was developed in order to find a compromise which, as far as possible, would meet both requirements.

This part of ISO 7721 specifies deep cross recesses for countersunk head screws of low strength: a good wrenchability is achieved and the head strength is still sufficient. This execution will be used in ISO 7046-1 (see annex A).

For screws of higher strength, sufficient head strength can only be attained by a shallower penetration depth of the cross recesses. If such screws also require good wrenchability, then, under the conditions of the common head style, a shoulder has to be provided under the head, in addition to the larger penetration depth, in order to guarantee sufficient head strength.

This compromise, which unfortunately results in different but interchangeable types of cross recessed flat countersunk head screws, is at the moment the only way of reaching an agreement at the international level.

Indian Standard

COUNTERSUNK FLAT HEAD SCREWS — PENETRATION DEPTH OF CROSS RECESSES

1 Scope

This part of ISO 7721 specifies the penetration depth of cross recesses of countersunk flat head screws for the two series 1 and 2 (deep and shallow, respectively).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7721. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7721 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 225:1983, *Fasteners — Bolts, screws, studs and nuts — Symbols and designations of dimensions.*

ISO 4757:1983, *Cross recesses for screws.*

ISO 7721:1983, *Countersunk head screws — Head configuration and gauging.*

3 Dimensions

For application of the penetration depths of cross recesses specified in table 1, different underhead configurations are provided in order to attain sufficient head strength (see figure 1 and figure 2). Both types satisfy the conditions of the common head style as specified in ISO 7721[1)].

NOTE 1 Symbols and designations of dimensions are specified in ISO 225.

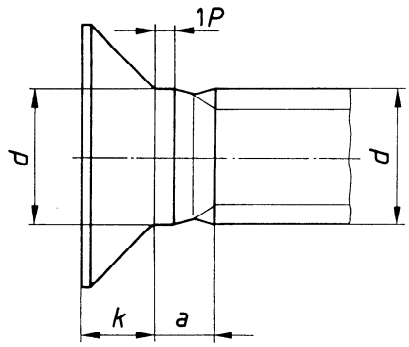


Figure 1 — Screw with underhead shoulder

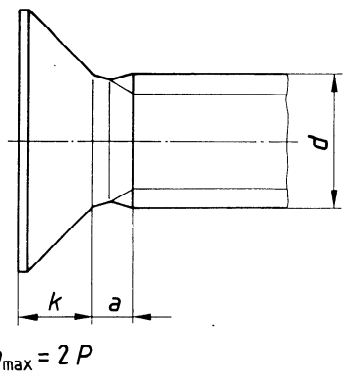
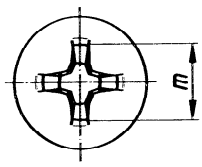
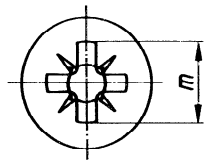
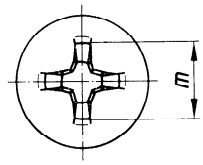
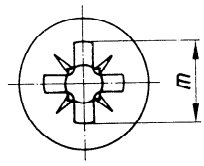


Figure 2 — Screw without underhead shoulder

1) Will be revised and published under number ISO 7721-1

Table 1 — Dimensions

Dimensions in millimetres

Thread (d)		Recess No. [1]	Cross recesses											
			Series 1 (deep)						Series 2 (shallow)					
														
			Type H			Type Z			Type H			Type Z		
			Penetration depth [2]		m	Penetration depth [2]		m	Penetration depth [2]		m	Penetration depth [2]		m
Metric	Other		min.	max.	ref.	min.	max.	ref.	min.	max.	ref.	min.	max.	ref.
M1,6	—	0	0,6	0,9	1,6	0,70	0,95	1,6	—	—	—	—	—	—
M2	—	0	0,9	1,2	1,9	0,95	1,20	1,9	0,9	1,2	1,9	0,95	1,20	1,9
—	**ST2,2**	0	0,9	1,2	1,9	0,95	1,20	2	—	—	—	—	—	—
M2,5	—	1	1,4	1,8	2,9	1,48	1,73	2,8	1,25	1,55	2,7	1,22	1,47	2,5
M3	**ST2,9**	1	1,7	2,1	3,2	1,76	2,01	3	1,4	1,8	2,9	1,48	1,73	2,8
M3,5	**ST3,5**	2	1,9	2,4	4,4	1,75	2,20	4,1	1,6	2,1	4,1	1,61	2,05	4
M4	**ST4,2**	2	2,1	2,6	4,6	2,06	2,51	4,4	2,1	2,6	4,6	2,06	2,51	4,4
M5	**ST4,8**	2	2,7	3,2	5,2	2,60	3,05	4,9	2,3	2,8	4,8	2,27	2,72	4,6
—	**ST5,5**	3	2,8	3,3	6,6	2,73	3,18	6,3	—	—	—	—	—	—
M6	**ST6,3**	3	3,0	3,5	6,8	3,00	3,45	6,6	2,8	3,3	6,6	2,73	3,18	6,3
M8	**ST8**	4	4,0	4,6	8,9	4,15	4,60	8,8	3,9	4,4	8,7	3,87	4,32	8,5
M10	**ST9,5**	4	5,1	5,7	10	5,19	5,64	9,8	4,8	5,3	9,6	4,78	5,23	9,4
Application [3]			**Screws without underhead shoulder** Self-tapping screws Wood screws Screws of property class 4.8 **Screws with underhead shoulder** Screws of property classes 8.8 and 9.8 Thread cutting screws Thread forming screws						**Screws without underhead shoulder** Screws of property class 8.8, Thread forming screws, Thread cutting screws } entirely heat treated					

1) Cross recesses in accordance with ISO 4757.

2) Penetration depth measured in accordance with ISO 4757.

3) Specified for steel screws, application for other materials at manufacturer's option.

Annex A
(informative)

Bibliography

[1] ISO 7046:1983, *Cross recessed countersunk flat head screws (common head style) — Product grade A and property class 4.8 only.*[2)]

[2] ISO 7046-2:1990, *Cross recessed countersunk flat head screws (common head style) — Grade A — Part 2: Steel of property class 8.8, stainless steel and non-ferrous metals.*

2) Will be revised and published under number ISO 7046-1.

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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