Wire thread inserts for ISO metric screw threads
Part 1: Dimensions and technical delivery conditions

DIN 8140-1

ICS 21.060.99

Supersedes
October 1988 edition.

Gewindeeinsätze aus Draht für Metrisches ISO-Gewinde –
Teil 1: Maße, Technische Lieferbedingungen

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Foreword

This standard has been prepared by Technical Committee *Gewindeeinsätze* of the *Normenausschuss Mechanische Verbindungselemente* (Fasteners Standards Committee).

Amendments

This standard differs from the October 1988 edition in that it has been editorially revised and the specifications for d_1 and the number of turns for sizes M14 and M16 have been harmonized with international standards.

Previous edition

DIN 8140-1: 1988-10.

All dimensions are in mm.

1 Scope

This standard specifies dimensions and technical delivery conditions for wire thread inserts ('thread inserts', for short) which serve to produce high-strength, wear-resistant internal screw threads in metallic and non-metallic components. They are also used to repair damaged threads and to replace threads worn in service. Thread inserts reduce the susceptibility of bolted connections to cold welding. They are resistant to the effects of high and low temperatures and to corrosion and ensure a constant coefficient of friction.

2 Normative references

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the titles of the publications are listed below. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

Continued on pages 2 to 13.

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original should be consulted as the authoritative text.

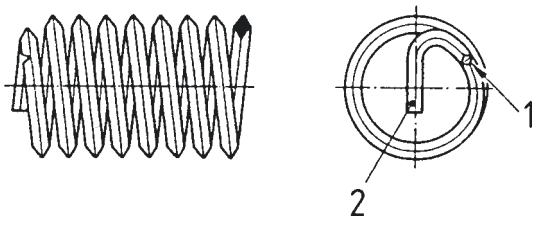
DIN 13-1	General purpose ISO metric screw threads – Part 1: Nominal sizes for 1 mm to 68 mm diameter coarse pitch threads
DIN 13-3	General purpose ISO metric screw threads – Part 3: Nominal sizes for 0,5 mm fine pitch threads with diameters from 3,5 mm to 90 mm
DIN 267-2	Fasteners – Technical delivery conditions – General requirements
DIN 962	Designation system for fasteners
DIN 8140-2	Wire thread inserts for ISO metric screw threads – Tapped holes for thread inserts and thread tolerances
DIN EN 28839	Mechanical properties of fasteners – Bolts, screws, studs and nuts made of non-ferrous metals (ISO 8839 : 1986)
DIN EN ISO 898-1	Mechanical properties of fasteners made of carbon steel and alloy steel – Part 1: Bolts, screws and studs (ISO/DIS 898-1 : 1996)*)
DIN EN ISO 2320	Prevailing torque type steel hexagon nuts – Mechanical and performance properties (ISO 2320 : 1997)
DIN EN ISO 3506-2	Mechanical properties of corrosion-resistant stainless steel fasteners – Part 2: Nuts (ISO 3506-2 : 1997)
DIN ISO 965-1	General purpose ISO metric screw threads – Tolerances – Part 1: Principles and basic data (ISO 965-1 : 1998)
ISO 6410-2 : 1993	Technical drawings – Screw threads and threaded parts – Part 2: Thread inserts
BS 4377 : 1991	Specification for tapping of holes to receive wire thread inserts (ISO metric threads)

3 Types and dimensions

Thread inserts shall be made from rhombic wire to form a spring-type helical coil. They are classified into type A inserts, for M2 to M39 and M8 × 1 to M39 × 3 screw threads (cf. figure 1), and type B inserts, with the internal cross section taking the form of a centric polygon and with a locking function, for M2,5 to M24 and M8 × 1 to M33 × 2 screw threads (cf. figure 2).

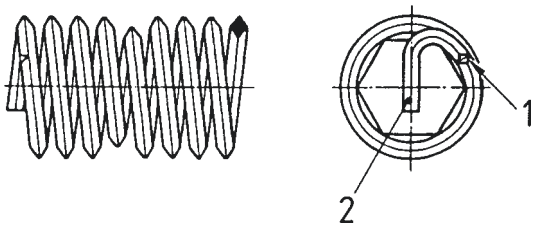
NOTE: Locking is achieved by an increased frictional contact in the thread, preventing the bolt in the connection from working loose, this resulting in an increased torque when screwing in the bolt.

Thread inserts shall be provided with a notch (as shown in figures 1 and 2) permitting removal of the tang after fitting.



1 Notch
2 Tang

Figure 1: Type A thread insert



1 Notch
2 Tang

Figure 2: Type B thread insert, with locking function

3.1 Nominal length

The recommended nominal length of a thread insert is a function of the workpiece material, and the property class of the bolt or the yield strength of the bolt material (cf. table 1).

*) At present at draft stage.

Table 1: Nominal length (guideline values)

Tensile strength of workpiece material, R_m, in N/mm²	Nominal length, l_1, for a bolt property class/yield strength, in N/mm², of bolt material, of			
	5.8/400	8.8/640	10.9/900	12.9/1 080
Up to 150	2 d	2,5 d	2,5 d	2,5 d
Over 150 up to 200	1,5 d	2 d	2 d	2,5 d
Over 200 up to 250	1,5 d	1,5 d	2 d	2,5 d
Over 250 up to 300	1 d	1,5 d	1,5 d	2 d
Over 300 up to 400	1 d	1 d	1,5 d	1,5 d
Over 400	1 d	1 d	1,5 d	1,5 d

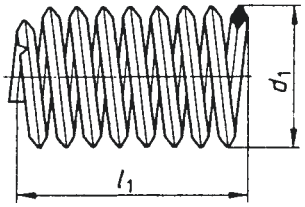
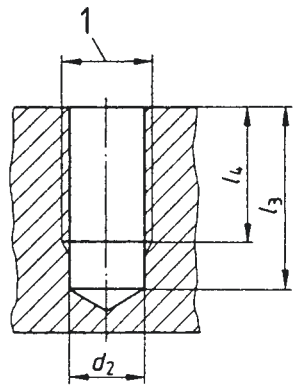


Figure 3: Thread insert



1 Thread to DIN 8140-2

Figure 4: Tapped hole

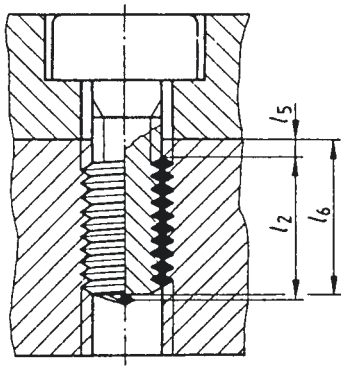


Figure 5: Assembly

Key to symbols:

d thread size (nominal diameter)
d_1 major diameter of thread insert before assembly
d_2 minor diameter of tapped hole (guideline value)
l_1 nominal length of thread insert (design value)
l_2 length of thread insert when fitted ($l_1 - P$)
l_3 minimum depth of core hole
l_4 minimum length of tapped hole for blind holes and clearance holes ($l_1 = l_2 + P$)
l_5 distance of thread insert from workpiece surface (0,25 P to 0,75 P)
l_6 maximum length of engagement with tang not removed
P pitch

3.2 Coarse pitch threads

Table 2: Dimensions for inserts, core holes and tapped holes
(with recommended thread sizes)

Thread insert							Core hole		Tapped hole to DIN 8140-2	Assembled lengths			
Thread size, d	P	l_1 [2]		Number of turns [1]	d_1 Min.	d_1 Max.	d_2 [3]	l_3 Min.	Thread size	l_4	l_2	l_6	l_5
M2	0,4	1 d	2	2,9	2,6	2,8	2,1	4,3	EG M2	2	1,6	1,4	0,1 to 0,3
		1,5 d	3	4,9				5,3		3	2,6	2,4	
		2 d	4	6,9				6,3		4	3,6	3,4	
		2,5 d	5	8,9				7,3		5	4,6	4,4	
M2,5	0,45	1 d	2,5	3,5	3,3	3,5	2,6	5,1	EG M2,5	2,5	2,05	1,8	0,1 to 0,3
		1,5 d	3,75	5,9				6,35		3,75	3,3	3,1	
		2 d	5	8,1				7,6		5	4,55	4,3	
		2,5 d	6,25	10,5				8,85		6,25	5,8	5,6	
M3	0,5	1 d	3	3,9	3,8	4,0	3,2	5,8	EG M3	3	2,5	2,3	0,1 to 0,4
		1,5 d	4,5	6,3				7,3		4,5	4	3,8	
		2 d	6	8,7				8,8		6	5,5	5,3	
		2,5 d	7,5	11,1				10,3		7,5	7	6,8	
M4	0,7	1 d	4	3,7	5,15	5,35	4,2	7,8	EG M4	4	3,3	3	0,2 to 0,5
		1,5 d	6	6,1				9,8		6	5,3	5	
		2d	8	8,4				11,8		8	7,3	7	
		2,5 d	10	10,9				13,8		10	9,3	9	
M5	0,8	1 d	5	4,3	6,35	6,6	5,2	9,2	EG M5	5	4,2	3,8	0,2 to 0,6
		1,5 d	7,5	6,9				11,7		7,5	6,7	6,3	
		2 d	10	9,7				14,2		10	9,2	8,8	
		2,5 d	12,5	12,3				16,7		12,5	11,7	11,3	
M6	1	1 d	6	4,2	7,6	7,85	6,3	11,1	EG M6	6	5	4,5	0,3 to 0,8
		1,5 d	9	6,9				14,1		9	8	7,5	
		2 d	12	9,6				17,1		12	11	10,5	
		2,5 d	15	12,3				20,1		15	14	13,5	

See page 6 for [1]), [2]) and [3]).

(continued)