UDC 621.882.2.082.1 : 621.882.42 December 1990

Screw and washer assemblies

Coarse threaded screws with captive plain washer

DIN 6900 Part 1

Kombi-Schrauben mit Regelgewinde mit flacher Scheibe

This standard, together with DIN 6900 Parts 2 to 5, December 1990 editions, supersedes DIN 6900, December 1972 edition.

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.

Dimensions in mm

1 Scope and field of application

This standard specifies requirements for screw and washer assemblies consisting of an M 2,5 to M 12 screw with flat bearing face, assigned to property class 10.9 or less, and a captive plain washer.

Socket or cross recessed head screws the critical cross section of which is not located in threaded portion of the shank but in the head are not suitable for screw and washer assemblies. For further restrictions in the use of such screws, see the relevant product standards.

2 Concept

A screw and washer assembly is a preassembled unit of a screw and washer, the washer being fitted before the thread is rolled. After rolling, the washer is captive but free to rotate.

3 Dimensions

Only screws with a shank diameter approximately equal to the pitch diameter or threaded up to the head may be used for assemblies as specified here.

Examples of screw and washer assemblies

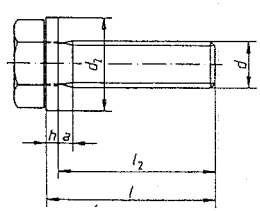

Figure 1. Assembly with screw threaded up to the head

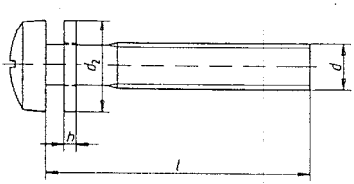

Figure 2. Assembly with screw with unthreaded portion of shank

Table 1. **Dimensions**

Thread size (d)	a	l_2 [1]	Washer dimensions DIN 6902 washer Type C (0)		Type A (1)		Type B (2)	
	max	min	h	d_2	h	d_2	h	d_2
M2,5	0,9	4	0,6	5	0,6	6	0,8	8
M3	1	4	0,6	6	0,6	7	0,8	9
(M3,5)	1,2	6	0,8	7	0,8	8	0,8	11
M4	1,4	6	0,8	8	0,8	9	1	12
M5	1,6	6	1	9	1	10	1,6	15
M6	2	8	1,6	11	1,6	12	1,6	18
M8	2,5	10	2	15	2	16	2	24
M10	3	12	2,5	18	2,5	20	2,5	30
M12	3,5	14	3	20	3	24	3	37

Use of the size given in brackets should be avoided where possible.

[1] $l_{2\,min}$ is the smallest effective screw length manufacturable.

See relevant product standards for specifications for l.

Continued on pages 2 and 3

As a deviation from the relevant product standards, the underhead fillet shall comply with the following specifications.

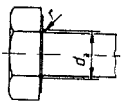

Table 2. **Underhead fillet dimensions**

Thread size	M2,5	M3	(M3,5)	M4	M5	M6	M8	M10	M12
r min	-	-	-	-	-	-	0,1	0,1	0,1
d_a max.	2,3	2,8	3,3	3,8	4,7	5,6	7,5	9,4	11,2

4 Technical delivery conditions

Screws and washers used to make assemblies shall comply with the relevant technical delivery conditions except for the following.

4.1 Assemblies with steel screw

Steel screws for assemblies as specified here are to be produced to property class 10.9 or less. As a deviation from ISO 898 Part 1, tensile strength and strength under wedge loading are to be tested on the assembly, not on its components.

If screws are to comply with specifications other than those given in this standard (e.g. regarding material), these shall be agreed between manufacturer and customer.

4.2 Assemblies with stainless steel or non-ferrous metal screw

If the screw of an assembly is to be of stainless steel or non-ferrous metal, the corrosion behaviour of the washer material shall be equivalent to that of the screw.

5 Designation

The designation of a screw and washer assembly is to include the name of the screw, letter Z to denote that the screw is fitted with a captive washer and the code number (0, 1 or 2; cf. table 1) denoting the type of plain washer.

Examples of designation

Designation of a DIN 933 – M 10 × 35 – 8.8 hexagon head screw[1]) with DIN 6902 – A 9,3 captive washer (Z 1):

Hexagon head screw DIN 933 – M 10 × 35 – Z 1 – 8.8

Note. As screw and washer assemblies have not yet been assigned an ISO designation, a screw which is to be supplied fitted with a captive washer and is to be produced to an ISO Standard shall be designated as follows.

Designation of an ISO 4017 – M 10 × 35 – 8.8 hexagon head screw with DIN 6902 – A 9,3 captive washer (Z 1):

Hexagon head screw ISO 4017 – M 10 × 35 – 8.8,
Z 1 type as in DIN 6900 Part 1

[1]) Cf. note on the limited period of validity in DIN 933, September 1987 edition.

Appendix A

Additional thread size (M 7) for replacement and maintenance purposes

Thread size M 7 is not included in the international range of threads for screws and nuts and its further use is deprecated. However, with regard to existing documentation and for meeting replacement and maintenance requirements, they may still be ordered on the basis of DIN 931 Part 1 and DIN 933, September 1987 editions. The dimensions of the corresponding screw and washer assemblies shall be as specified in the table below.

Table A.1.

Thread size (d)	a	l_2 [1]	d_a	r	Washer dimensions DIN 6902 washer Type A (1)		Type B (2)	
	max.	min.	max.	min.	h	d_2	h	d_2
M7	2	14	6,6	-	1,6	14	2	21

[1] Shorter screw lengths are subject to agreement on ordering.

Standards referred to

DIN 931 Part 1	M 1,6 to M 39 hexagon head bolts; product grades A and B
DIN 933	M 1,6 to M 52 hexagon head screws threaded up to the head; product grades A and B
DIN 6902	Plain washers for screw and washer assemblies
ISO 898-1 : 1988	Mechanical properties of fasteners; bolts, screws and studs
ISO 4017 : 1988	Hexagon head screws; product grades A and B

Previous editions

DIN 6900 : 09.66, 12.72.

Amendments

The following amendments have been made to the December 1972 edition of DIN 6900.

a) DIN 6900 has been split up into five Parts.
b) The 'Scope and field of application' clause has been included.
c) Dimension a for thread size M 12 has been amended.
d) The assembly dimensions for size M 7 which is not included in the international range of screw threads have been specified in an appendix.
e) The l_2 values have been amended.
f) The minimum length of screws with an unthreaded portion of shank, l_3, is no longer specified.
g) Specifications for assemblies with countersunk head screws are no longer included.
h) Technical delivery conditions have been included.
i) An example of designation has been included that relates to assemblies with screw produced to an ISO Standard.

International Patent Classification

F 16 B 35/00
F 16 B 43/00