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Category: 14

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Weld screws with weld ring

Observe list of approved suppliers

Schweißschrauben mit Schweißring

Foreword

This Standard specifies the characteristics of weld screws with weld ring.
This new weld screw with weld ring has been developed and released conforming to the latest state of the art as a further development of the previous weld screw standard MBN 75 for Mercedes Benz Cars.

Changes

In comparison with edition 2006-04, the following changes have been made:

- Section 3, DBL 8451 and DIN EN 10269 added
- Section 9, Table 9 updated
- Section 9.1, updated
- Annex A, Section A2, watertightness added

Contents

1 Scope

This Standard specifies the characteristics of weld screws with metric coarse pitch thread from M5 to M10 and metric fine pitch thread from M12x1,5 to M16x1,5 in product grade A. The special thread 7/16-20UNF is also covered. The weld screws shall be applied using the resistance welding process.

This new weld screw with weld ring has been developed and released conforming to the latest state of the art as a further development of the previous weld screw standard MBN 75 for Mercedes Benz Cars. In the event of any queries about the requirements with regard to the state of the art, please contact the person in charge of this Standard.

2 Approval of Suppliers

The company group ABC Umformtechnik, Altenloh Brinck & Co has been approved as development supplier and production supplier on behalf of the KTO working group under the leadership of the person in charge of this Standard.

Other manufacturers shall apply to the person in charge for approval. The approval shall be granted following coordination with the KTO working group in which members from the development, procurement, body-in-white, standards and KTO areas are represented. Care shall be taken to ensure that the products comply with the technical requirements. Product testing is required.

3 Normative References

MBN 10 346	Testing of weld nuts and weld screw fasteners
MBN 75	Weld screws
MBN 10 392	Insulating plastic coating Nycote

MBN 7085-5	Technical delivery conditions, Screws with MAThread thread, Mechanical and functional requirements
DIN ISO 261	ISO general purpose metric screw threads - General plan
DIN ISO 8992	Fasteners - General requirements for bolts, screws, studs and nuts
DIN ISO 965-1	ISO general purpose metric screw threads - Tolerances - Part 1: Principles and basic data
DIN EN ISO 898-1	Mechanical properties of fasteners made of carbon steel and alloy steel - Part 1: Bolts, screws and studs
DIN EN 26 157-3	Fasteners; surface discontinuities; bolts, screws and studs subject to special requirements (ISO 6157-3:1988); German version EN 26 157-3 : 1991
DIN EN ISO 3269	Fasteners - Acceptance inspection (ISO 3269:2000), German version EN ISO 3269:2000
MBN 36012	Hole tolerances
DIN EN ISO 4042	Fasteners - Electroplated coatings
DIN 267-2	Fasteners; technical delivery conditions; design and dimensional accuracy
DIN EN 10263-4	Steel rod, bars and wire for cold heading and cold extrusion - Part 4: Technical delivery conditions for steels for quenching and tempering
DIN EN ISO 4753	Fasteners - Ends of parts with external metric ISO thread
DIN 76-1	Thread run-outs and thread undercuts
DBL 8451	Supply Specification: Electrodeposited zinc or zinc alloy coatings for components manufactured from ferrous materials
DIN EN 10269	Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties

4 Abbreviations, Acronyms, Definitions & Symbols

KTO	Klein-Teile-Optimierung (small parts optimization – fastener technology)
KTO catalog	Binding small parts catalog for specialist departments
Nycote	Patented insulating plastic coating
MAThread	Patented thread type incl. pilot point

5 Regulated Substances and Recyclability

All materials, methods, processes, components and systems shall conform to the applicable statutory regulations with regard to controlled substances and recyclability.

6 Testing of Weld

Weld screws shall be tested in accordance with MBN 10 346 (Testing of weld nuts and weld screw fasteners) to ensure the quality of weld screws in the current process. The strength is monitored to check the welding parameters set and to verify the reliability of the process.
If the process includes other quality assurance measures intended to verify the reliability of the process, the continuous testing of the weld screws may be waived.

7 Dimensions, Designation

Unless other units are indicated, millimeters shall be used.

Weld screw with weld ring
with thread approx. to the head
(above _____ step line 2)

Weld screw with weld ring
with shank
(below _____ step line 2)

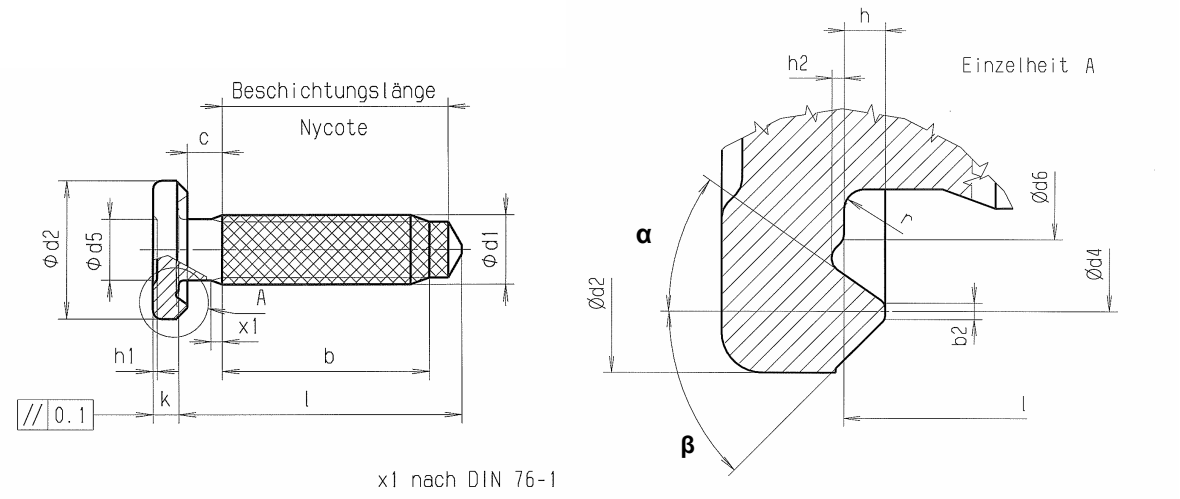


Fig. 7:
Weld screw with weld ring, MAThread thread and pilot point in accordance with MBN 7085-5 with Nycote in accordance with MBN 10 392.

Effective thread length: EL= l – MAT (see MBN 7085-5)

7.1 Insulating Plastic Coatings (Nycote) on the Thread

In the assembly process, clean threads are required for a proper and accurate threaded connection. The ease of running following the cataphoretic dip coating and painting process is ensured by means of a Nycote coating in accordance with MBN 10 392 on the thread. Weld spatter is also prevented from sticking. The version according to this Standard provides for the use of Nycote. The coating length includes the thread length and the pilot point. The inclusion of the pilot point with truncated cone in the coating for process-related reasons is permitted. General application for M5 to M12 incl. 7/16-UNF.

7.2 MAThread Thread as Assembly Aid

From diameter M5 to 7/16-20UNF in accordance with MBN 7085-5, weld screws shall generally be designed with MAThread thread type and pilot point.
The bolts and screws with the MAThread thread can be connected directly with the nuts without manual application, by attaching them to the screwdriver. The effective thread length (thread with load-bearing capacity) shall be taken into account in accordance with MBN 7085-5 Table 2. The pilot point assists the assembly process.
Weld screws from M12 to M16 incl. shall not be provided with MAThread thread, but with the thread run-out in accordance with DIN EN ISO 4753 “Pilot point with truncated cone (PC)“

7.3 Strength Specifications

For the designation of styles and finishes with additional ordering information refer to DIN 962.
In general, for weld screws M5 to M6 incl., property class 8.8 shall apply.
Property class 10.9 shall apply from M8 to M16.

7.4 Dimensions

		Thread design with MAThread					without MAThread		
Thread d_1		**M5**	**M6**	**M8**	**M10**	**7/16-20 UNF**	**M12x1,5**	**M14x1,5**	**M16x1,5**
P[a]		0,8	1	1,25	1,5		1,5	1,5	1,5
c [b]	max.	2,4	2,9	3,7	4,3	3,5	4.4	4,6	4,8
b[c]		16	18	22	26	26	30	34	38
d_2	js16	10	12	16	20	22	24	28	32
h	+-0,07	0,7	0,9	1,0	1,1	1,1	1,2	1,3	1,4
k	js15	2	2,5	3	4	4	4,8	5,6	6,4
r	max.	0,3	0,4	0,5	0,6	0,6	1	1	1
α	+- 2°	35°	35°	35°	35°	40°	40°	40°	45°
ß	+- 2°	35°	40°	45°	45°	45°	45°	45°	45°
b_2	±0,1	0,2	0,3	0,4	0,4	0,4	0,4	0,4	0,4
d_4	min.	7,5	9,75	12,5	16,5	17	19	21	25
d_5	+-0,3	4,5	5	7	9	10	11	12,5	14
h_1	+-0,2	0,3	0,4	0,5	0,5	0,6	0,7	0,7	0,8
h_2	+-0,1	0,2	0,25	0,3	0,3	0,4	0,5	0,6	0,6
d6	+-0,25	5,9	6,7	9,1	12,5	13,3	14,2	16,9	19,8
Strength		8.8	8.8	10.9	10.9	10.9	10.9	10.9	10.9
l Nom. dim.	**Toler-ance**								
10	±0,29								
12	±0,35								
16						**Step line 1**			
18									
20	± 0,42								
22									
25									
30									
35	± 0,50								
40						**Step line 2**			
45									
50									
55	± 0,60								
60									
65									
70									
75									
7/16-20UNF Thread tolerance **2A**									

P [a] Thread pitch

c [b] Valid for thread to head, i.e. stud lengths l above step line 2

b[c] Valid for thread below step line 2

Lengths above the continuous step line 1 are not covered by this standard for reasons associated with the application technology.

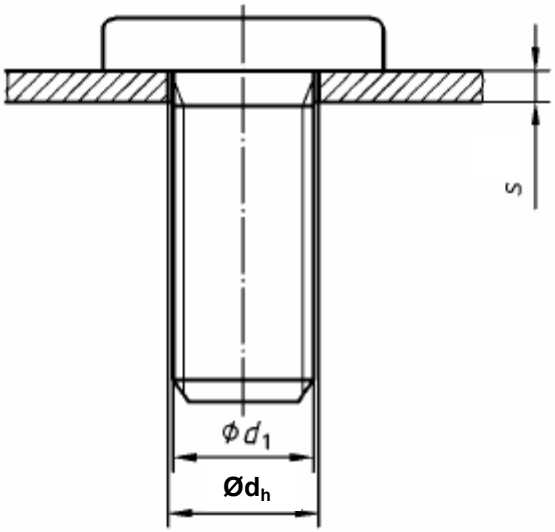
Table 7.4: Dimensions

7.5 Designation

The designation of a weld screw describes the style, dimensions with thread type (MAThread from M5 to 7/16-UNF), nominal length, strength, screw end PC in accordance with DIN EN ISO 4753 from M12 incl., thread coating Nycote from M5 to M12 and finish.

Examples: **Weld screw MBN 10391 – M6 MAT x 25 - 8.8 - NYC – FE/Zn4**
Weld screw MBN 10391 – M8 MAT x 25 - 10.9 - NYC – FE/Zn4
Weld screw MBN 10391 – M12 x 25 – PC - 10.9 - NYC – FE/Zn4
Weld screw MBN 10391 – M14 x 25 – PC - 10.9 – NYC - FE/Zn4
Weld screw MBN 10391 – M14 x 25 - 10.9 - FE/Zn4

8 Installation Situation



Thread d_1		M5	M6	M8	M10	7/16-20 UNF	M12x1,5	M14x1,5	M16x1,5
d_h	+0,2 / -0,1	5,3	6,4	8,4	10,5	12	13	15	17
s		0,8 – 1,5	0,8 – 1,75	1,2 – 2,5	1,5 – 3,0	2,0 – 4,0	2,0 – 4,0	2,0 – 4,0	2,0 – 4,0

s sheet thickness
d_h clearance hole sheet (tolerances for holes in accordance with MBN 36012)

Table 8.1: Installation situation

9 Technical Delivery Conditions

Material	Designation	23MnB3
	Standard designation	1.5507
General requirements	Standard	DIN ISO 8992
Thread	Tolerance	6e
	Standard	DIN ISO 965-1
Mechanical properties	Property class	M5 and M6 FK: 8.8, ≥M8 FK: 10.9, but with the following deviation: tensile strength Rm 1040-1140 MPa.
	Standard	DIN EN ISO 898-1
Limit deviations and geometrical tolerances	Product grade	A
	Standard	DIN EN ISO 4759-1
Finish		Surface roughness is covered in DIN 267-2: Limits for surface discontinuities are covered in DIN EN 26 157-3 Surface protection: standard version **Fe/Zn4** in acc. with DIN EN ISO 4042. Chromium(VI)-free in acc. with DBL 8585, without passivation, without seal, max. layer thickness 10µm. Weld screws with FK:10.9 shall be tempered following application of finish Fe/Zn 4 in acc. with DBL 8451.
Acceptability		For acceptance procedure, DIN ISO 3269 applies.
Delivery		100% machine checked parts according to criteria head diameter, pilot point yes/no, thread yes/no, foreign bodies.
Packaging		Delivery in mini-load containers (KLTs) in sealed bags or as agreed with the ordering department. Quantity per packaging unit to be determined following consultation with the responsible DC department.
General		Compliance with DC Special Terms.

Table 9: Technical delivery conditions

9.1 Marking

The manufacturer's marking with the value of the property class shall be attached in the cup at the end face of the screw head.
The marking shall not protrude beyond the upper side of the head.

9.2 Matrix of Characteristics

For weld screws in accordance with this standard, matrix of characteristics MBN 4000-160-6 applies.
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End of main document
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Anhang A

General

A.1 Notes on further specifications / literature

KTO catalog:	Internal: http://kto.app.corpintra.net External: https://engineering.supplier.daimler.com
ISO 4753	Fasteners - Ends of parts with external metric ISO thread
DIN 962	Bolts, screws, studs and nuts - Designation, types and finishes
ISO 965-2	ISO general purpose metric screw threads - Tolerances - Part 2: Limits of sizes for general purpose external and internal screw threads; medium quality
DIN EN ISO 4759-1	Tolerances for fasteners - Part 1 : Bolts, screws, studs and nuts; Product grades A, B and C
German Fastener Association edition 06-03	Technische Lieferbedingung für Schraubenstähle mit erhöhten Anforderungen (Technical delivery conditions for screw steels with increased requirements)
Stahl-Eisen-Liste (Steel Iron List)	Daimler Corporate Standardization

A.2 Watertightness

The weld does not cover 100%. If required, testing of the application in accordance with MBN 10355 is recommended. The welding zone should be tested following the cataphoretic dip coating bath. Additional measures are required for the tightness in the thread (e.g. screw with DBL 9460.42).

End of Annex A
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