Scope and Field of Application

These delivery conditions have been developed by the members of the "Deutscher Schraubenverband e.V. (DSV)". They shall lead to a decrease of the total number of types of fastener steels used. For all steels listed in these delivery conditions enhanced requirements compared to the actual national and international standards are specified. These delivery conditions will be checked annually and, if necessary, updated by the corresponding working group of the "DSV".

Ordering sample:
Steel DSV-TL (05/12) - 22 GKZ **similar to** steel DIN EN 10263-4 - 1.5535 GKZ

	1	2	3	4	5	6	7
	Purpose / Material	Steels not intended for heat treatment	Case hardening steels	Steels for quenching and tempering	Steels for high temperature applications	Steels for low temperature applications	Stainless steels
1	C10E	X					
2	C15E	X	X				
11	C16E		X				
12	16MnCr5		X				
13	C22		X				
14	C22 + Mn		X	X			
20	20MnB4		X	X	X		
21	23MnB3		X	X	X		
22	23MnB4		X	X	X		
23	28B2			X			
24	32CrB4			X			
25	(35+38)B2			X	X		
26	36CrB4			X			
27	30CrMoB1			X			
31	(34+37)Cr4			X			
32	34CrMo4			X			
33	34CrNiMo6			X	X		
41	21CrMoV5-7				X		
42	40CrMoV4-6				X		
43	X21CrMoNiV12-1				X		
44	X6NiCrTiMoVB25-15-2				X		
51	X5CrNi18-10					X	X
52	X3CrNiCu18-9-4					X	X
53	X6CrNiTi18-10					X	X
54	X5CrNiMo17-12-2					X	X
55	X6CrNiMoTi17-12-2					X	X
56	X3CrNiCuMo17-11-3-2					X	X

Currently valid standards for chosen steels

	Standard	Title	Material																												
			1	2	11	12	13	14	20	21	22	23	24	25	26	27	31	32	33	41	42	43	44	51	52	53	54	55	56
1	EN 10263 – 1	Steels for cold heading and cold extrusion General																											
2	EN 10083 – 1	Quenched and temp. steels – General																											
3	EN 10263 – 2	Unalloyed steel not intended for heat treatment	X	X																									
4	EN 10084	Case hardening steels	X	X	X	X																							
5	EN 10263 – 3	Case hardening steels	X	X		X	X	X																					
6	EN 10083 – 2	Quenched and temp. steels – unalloyed quality steels					X	X																					
7	EN 10083 – 3	Quenched and temp. steels – boron steels															X	X	X										
8	EN 10263 – 4	Quenched and tempered steels							X	X [1)]	X	X	X	X	X	X	X	X											
9	EN 10269	Steel and nickel alloys for fasteners for use at elevated and / or low temperatures							X [2)]	X [2)]	X [2)]			X					X	X	X	X	X	X	X	X	X		
10	DIN 267 – 13	Parts for bolted connections with specific mechanical properties												X						X	X	X	X	X		X	X	X	
11	EN 1515-1	Flanges and their joints – bolting																		X	X		X	X	X	X	X	X	
12	ISO 3506	Corrosion and acid resistant stainless steel fasteners																						X	X	X	X	X	
13	EN 10088	Stainless steels																						X	X	X	X	X	X
14	EN 10263 – 5	Stainless steels																						X	X	X	X	X	

[1)] Intended for EN 10263-4
[2)] Intended for EN 10269

Restricted chemical analysis of steels specified in EN 10263 and EN 10269

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DSV No.	Material / Analysis / Identification	C	Si	Mn	P	S	Cr	Mo	Ni	V	Ti	Al	Cu	B	N
		%	%	%	%	%	%	%	%	%	%	%	%	ppm	%
1	1.1122 C10E	0,08 0,12	- 0,10	0,30 0,60	- 0,025	- 0,025						0,02 -	- 0,25		
2	1.1132 C15E	0,13 0,17	- 0,10	0,35 0,60	- 0,015	- 0,015						0,02 -	- 0,25		
11	1.1148 C16E	0,14 0,18	- 0,15	0,70 0,90	- 0,015	- 0,015							- 0,25		
12	1.7131 16MnCr5	0,15 0,19	- 0,15	1,10 1,30	- 0,015	- 0,015	0,95 1,10						- 0,25		
13	1.1152 C22	0,20 0,24	- 0,15	0,40 0,60	- 0,015	- 0,015							- 0,25		
14	(1.1152) C22 + Mn	0,20 0,24	- 0,15	0,80 1,00	- 0,015	- 0,015							- 0,25		
20	1.5525 20MnB4	0,18 0,23	- 0,15	0,90 1,10	- 0,015	- 0,015	- 0,10		- 0,10		- 0,06	0,02 0,06	- 0,25	8 50[b]	- 0,008
21	1.5507 23MnB3	0,21 0,25	- 0,15	0,80 1,00	- 0,015	- 0,015	0,25 0,35[c]				- 0,06	0,02 0,06	- 0,25	8 50[b]	
22	1.5535 23MnB4	0,21 0,25	- 0,15	1,00 1,20	- 0,015	- 0,015	0,20 0,30				- 0,06	0,02 0,06	- 0,25	8 50[b]	
23	1.5510 28B2	0,25 0,29	- 0,15	0,70 0,90	- 0,02[a]	- 0,015	0,15 0,30				- 0,06	0,02 0,06	- 0,25	8 50[b]	
24	1.7076 32CrB4	0,30 0,34	- 0,15	0,70 0,90	- 0,02[a]	- 0,015	1,05 1,20				- 0,06	0,02 0,06	- 0,25	8 50[b]	
25	1.5511 (35+38)B2	0,35 0,39	- 0,15	0,70 0,90	- 0,02[a]	- 0,015	0,15 0,30				- 0,06	0,02 0,06	- 0,25	8 50[b]	
26	1.7077 36CrB4	0,34 0,38	- 0,15	0,70 0,90	- 0,02[a]	- 0,015	1,05 1,20				- 0,06	0,02 0,06	- 0,25	8 50[b]	
27	--- 30CrMoB1	0,28 0,32	- 0,15	0,80 1,10	- 0,015*	- 0,015	0,15 0,30	0,08 0,15			- 0,06	0,02 0,06	- 0,25	8 50[b]	
31	1.7033 / 1.7034 (34+37)Cr4	0,34 0,37	- 0,15	0,70 0,90	- 0,02[a]	- 0,015	1,05 1,20				- 0,02		- 0,25		
32	1.7220 34CrMo4	0,34 0,37	- 0,15	0,70 0,90	- 0,015	- 0,015	1,05 1,20	0,20 0,30			- 0,02		- 0,25		
33	1.6582 34CrNiMo6	0,34 0,38	- 0,15	0,50 0,70	- 0,02[a]	- 0,015	1,55 1,70	0,15 0,30	1,40 1,70		- 0,02		- 0,25		
41	1.7709 21CrMoV5-7	0,21 0,25	0,15 0,35	0,60 0,80	- 0,025	- 0,015	1,35 1,50	0,65 0,80		0,25 0,35		- 0,03			
42	1.7711 40CrMoV4-7	0,40 0,44	0,15 0,35	0,60 0,80	- 0,025	- 0,015	1,05 1,20	0,60 0,75		0,25 0,35		- 0,015			
43	1.4923 X21CrMoV12-1	0,20 0,24	0,10 0,50	0,60 0,80	- 0,025	- 0,015	11,0 12,5	0,80 1,20	0,30 0,80	0,25 0,35					
44	1.4980 X6NiCrTiMoVB25-15-2	0,04 0,08	- 1,0	1,0 2,0	- 0,025	- 0,015	13,5 16,0	1,0 1,5	24,0 27,0	0,10 0,50	1,9 2,3	- 0,35		30 100	
51	A2 1.4301 X5CrNi18-10	- 0,07	- 1,0	- 2,0	- 0,045	- 0,030	17,0 19,0		8,0 11,0						- 0,11
52	A2 1.4567 X3CrNiCu18-9-4	- 0,04	- 1,0	- 2,0	- 0,045	- 0,030	17,0 19,0		8,0 10,0				3,0 4,0		- 0,11
53	A3 1.4541 X6CrNiTi18-10	- 0,08	- 1,0	- 2,0	- 0,045	- 0,030	17,0 19,0		9,0 12,0		5xC 0,80				
54	A4 1.4401 X5CrNiMo17-12-2	- 0,07	- 1,0	- 2,0	- 0,045	- 0,030	16,5 18,5	2,0 2,5	10,5 13,5						- 0,11
55	A5 1.4571 X6CrNiMoTi17-12-2	- 0,08	- 1,0	- 2,0	- 0,045	- 0,030	16,5 18,5	2,0 2,5	10,5 13,5		5xC 0,80				
56	A4 1.4578 X3CrNiCuMo17-11-3-2	- 0,04	- 1,0	- 2,0	- 0,045	- 0,015	16,5 17,5	2,0 2,5	10,0 11,0				3,0 3,5		- 0,11

a) In case of steels with DSV No. 23, 24, 25, 26, 31 or 33 a content of P ≤ 0,015% may be specified if necessary

b) The content of boron may reach 0,005% provided that the not effective boron is controlled by additives of titanium and/or aluminium.

c) Exceptions possible

Additional properties of steel rods, bars and wires

1. Diameter and concentricity	Wire rod			Bar
Further treatment	calibrated		to be drawn	--
Specified in	DIN EN 10108		DIN EN 10017	DIN EN 10060
Acceptable deviation of the diameter	B	A	--	--
Acceptable out-of-roundness of the cross section related to the permissible deviation of the diameter	80 %	80 %	80 %	80 %

2. Surface Discontinuities

The surface properties of the wire shall meet the requirements of grade E as specified in EN 10221 and shall be free of discontinuities, which would cause the wire to burst if cold headed or heat treated. This is to be proofed by cold heading tests. A cold heading relation of 4:1 ($h_0/d_0 = 2$) shall be used for annealed wires and a relation of 3:1 ($h_0/d_0 = 1{,}5$) for unannealed wires.

3. Surface carbon condition	Four point decarburization measurement method, proceeding from the point of deepest decarburization range of decarburization	
	maximum value	average value
∅ ≤ 10 mm	0.1 mm	0.075 mm
∅ > 10 mm	1.00 % · d	0.75 % · d

For case hardened steels and quenched and tempered steels (including boron steels and steels for high temperature applications, excluding C10 and austenitic steels) a carburization or total decarburization is not acceptable, a partial decarburization up to the limits specified above. In case of dispute the evaluation of decarburization depth shall be done by checking the hardness HV0,3 according to DIN EN ISO 6507-1. In EN 10263-1:02-2002 the decarburization depth is defined, as the distance between the surface and the nearest point on the hardness-curve, which represents the 80% hardness of the not decarburized area.
According to DIN EN ISO 6507-1 the minimum distance between the surface and the hardness-impression are 2.5-times the impression-diagonal; however the measuring points should be as close as possible to the surface. In case the distance defined above is to short, the geometric impression and the ratio of the length of the two diagonals shall be checked in order to avoid measuring mistakes. The result is not valid if the difference of the length of the two diagonals, related to the shorter diagonal, exceeds 5 %.

4. Inclusions	Other steels	Austenitic steels
Total-sumparameter according to DIN 50 602	K3 < 20	K4 = 0

Additional properties of steel rods, bars and wires

5. Grain size	Steels not intended for heat treatment and case hardened steels	Quenched and tempered steels	Austenitic steels
Grain size according to DIN 50601, ISO 643	5 and finer	5 and finer	not specified

6. Maximum amount of trace elements not specified in standards*
(Agreement between VDEh and VDA)

Cr	Mo	Ni	V	Ti	Nb	Al	N	Cu	B	As	Sn	Pb**	O**
%	%	%	%	%	%	%	%	%	ppm	%	%	%	%
- 0,30	- 0,08	- 0,30	- 0,05	- 0,01	- 0,03	- 0,060	- 0,015	- 0,25	- 8	- 0,04	- 0,02	- 0,04	- 0,004

* Does not apply for austenitic steels.
** Pb and O values for guidance only.

Former revision

01/99, 4/00, 8/00, 12/00, 11/03, 03/06

Updates

In comparison to revision 03/06, following changes have been made.

- All pages updated to the latest revision 05/12.
- On page 1 the ordering example was changed into Steel DSV-TL (05/12) - 22 GKZ **similar to** steel DIN EN 10263-4 - 1.5535 GKZ and updated onto the latest revision of TL.
- On page 2 DSV No. 20 has been added; for DSV No. 20-22 footnotes [1) and 2)] were added.
- On page 3 the DSV No. 20 has been added.
- On page 3 the material (19 +23)MnB4-1.5523 (DSV No. 22) has been deleted and has been replaced by material 23MnB4-1.5535.
- On page 3 the max. Al-content of all boron steels were reduced from 0.08% to 0.06%.
- On page 3 the chromium content of DSV No. 021 has been defined as 0.25-0.35 and footnote [C)] has been added.
- On page 4 the references to the withdrawn standards DIN 59115, DIN 59110 and DIN 59130 were replaced by the references to the current standards DIN EN 10108, DIN EN 10017 and DIN EN 10060.
- On page 4 the standard EN 10263-1:2001 has been changed into EN 10263-1:02-2002.
- The note on page 5 has been deleted.