

***COLD FORGING
QUALITY STEELS***



Clean Steel

State of the Art Process Technology

COLD FORGING QUALITY STEELS



Material quality requirements for cold heading steels.

- Excellent surface quality ensuring zero defect situation so that forged components have no defects
- Good control over ovality to ensure smooth forging process.
- Good control over mechanical properties such as tensile strength and reduction are to ensure proper cold forgeability and productivity
- Completely descaled surface to avoid forging defects such as scale pits and resultant surface roughness.
- Suitable metallurgical structure to ensure proper machinability level.
- Good and uniform response to heat treatment since the components are always treated in bulk.

Category	SAE/AISI	DIN	IS	EN
Low Carbon & Medium Carbon Grades	1006	-	-	-
	1008	-	-	-
	1010	CK-10	C10	-
	1012	CK-10	C10	EN2A
	1015	CK-15	-	EN32B
	1018	-	C-15Mn75	EN2C
	1020	C-20	C-25Mn75	EN3A
	1025	-	-	-
	1040	-	-	-
	1045	-	-	-
Carbon Manganese	1541	36Mn7	37C15	EN15
Boron Grades	10B21	-	21C10BT	-
	15B25	-	26C10BT	-
	15B41	-	-	-
Chrome-Moly	4135	-	-	-
	4140	-	40CR ₁ MO ₃	EN-19

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Dimensional Specifications (As rolled)*

Diameter Range	Ovality	Permissible Tolerance
5.5-9.0 mm	0.2 mm max	± 0.15 mm
10-25 mm	0.3 mm max	± 0.20 mm
26-36 mm	0.4 mm max	± 0.30 mm

* In specific cases stricter specifications can be met.

Particulars	Block Route (5.5 mm to 11 mm dia)	Garret Route (12 mm to 36 mm dia)
Coil Weight	1500 kgs max	1500 kgs max
Coil Inner Diameter	800 mm	800 mm
Coil Outer Diameter	1200 mm	1500 mm
Coil Height	900 mm	1100 mm
Coiling Direction	Clockwise	Clockwise
Binding	Strap	Strap

Wire Rods Rolled Sizes :

Sizes (mm)
5.5, 6.0, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10, 11, 12, 13, 14, 15, 16, 16.3, 17.3, 18.5, 20, 21, 22, 23, 24, 25.4, 26, 27.5, 28, 30, 32, 33, 34, 36, 38 mm dia.



CHEMICAL COMPOSITIONS OF TYPICAL COLD FORGING QUALITY GRADES :

CARBON STEELS

Sr.	Grade	C%	Si%	Mn%	S% Max	P% Max	Cr%	B%	Mo%	Pb%	Ni%	Others
1	AISI 1006	0.06 Max	0.10 max	0.25- 0.40	0.050	0.040						
2	AISI 1008	0.10 max	0.10 max	0.30- 0.50	0.050	0.040						
3	AISI 1010	0.08- 0.13	0.10 max	0.30 0.60	0.050	0.040						
4	VS 14250	0.10- 0.14	0.13 max	0.21- 0.45	0.040	0.030						
5	VS 13111	0.07- 0.11	0.07 max	0.20- 0.40	0.040	0.030						
6	AISI 1015	0.13- 0.18	0.15 max	0.30- 0.60	0.050	0.040						
7	AISI 1018	0.15- 0.20	0.05- 0.10	0.60- 0.90	0.050	0.040						
8	EN1APb	0.08- 0.15	0.10 max	0.85- 1.15	0.26- 0.35	0.040 0.090				0.15- 0.35		
9	EN1A	0.07- 0.15	0.10 max	0.80- 1.20	0.20- 0.30	0.060 max						

BORON STEELS

Sr.	Grade	C%	Si%	Mn%	S% Max	P% Max	Cr%	B%	Mo%	Pb%	Ni%	Others
1	SAE/AISI 10B21	0.18- 0.23	0.30 max	0.80- 1.10	0.030	0.030	0.10- 0.20	0.0005- 0.003				
2	AISI 15B25	0.23- 0.28	0.30 max	0.90- 1.30	0.030	0.030	0.10- 0.20	0.0005- 0.003				
3	19MnB4M	0.20- 0.25	0.15- 0.30	0.80- 1.10	0.030	0.030	0.30- 0.40	0.0008- 0.003				
4	SAE/AISI 15B41	0.36- 0.44	0.15- 0.30	1.35- 1.65	0.030	0.030	0.10- 0.20	0.0005- 0.003				
5	AISI 10B36M	0.34- 0.39	0.15- 0.30	0.80- 1.10	0.030	0.030	0.20- 0.40	0.0006- 0.003				
6	DIN 36CrB4	0.34- 0.38	0.10 max	0.60- 0.90	0.015	0.015	0.90- 1.20	0.0015- 0.005				
7	51B37	0.35- 0.40	0.20- 0.35	0.35- 0.45	0.025	0.025	0.95- 1.15	0.0005- 0.003	0.040 max		0.10 max	

ALLOY STEELS

Sr.	Grade	C%	Si%	Mn%	S% Max	P% Max	Cr%	B%	Mo%	Pb%	Ni%	Others
1	SCM 415 H	0.12- 0.18	0.15- 0.35	0.55- 0.90	0.03	0.03	0.85- 1.25		0.15- 0.35		0.25 max	
2	SCM 435	0.32- 0.39	0.15- 0.30	0.55- 0.90	0.03	0.03	0.80- 1.25		0.15- 0.35		0.25 max	
3	AISI 4135	0.33- 0.38	0.15- 0.30	0.70- 0.90	0.04	0.035	0.80- 1.10		0.15- 0.25		0.25 max	
4	AISI 4140	0.38- 0.43	0.15- 0.30	0.75- 1.00	0.04	0.035	0.80- 1.10		0.15- 0.25			
5	AISI 5140	0.38- 0.43	0.15- 0.30	0.70- 0.90	0.04	0.035	0.70- 0.90					
6	AISI 1541	0.36- 0.44	0.15- 0.30	1.35- 1.65	0.05	0.04						



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AD 2000 Merkblatt WO /PED Certified by TUV Nord

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