

ALLOY DATA SHEET



G10MnMoV6

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WHO ARE WE ?

Safe Metal is the world leader in steel components made by green sand casting. Our teams operate as part of an international network that stretches across Europe, America and Asia, and partner their sales and project management skills with those of their customers.

MAKING WORLD CLASS

Thanks to the expert skills of our R&D department, we are able to improve our industry knowledge and hence our products, our production process and metalworking by choosing the most appropriate methods for the product



G10MnMoV6

Generality

Manganese-molybdenum-vanadium steel, low carbon for high mechanical characteristics at treated condition.



Market : this alloy is often used in the construction equipment market and on the railway market.



Chemical Composition

C (%)	Si (%)	Mn (%)	P (%)	S (%)	Mo (%)
< 0,12	< 0,6	1,2 – 1,8	< 0,025	< 0,02	0,2 – 0,4

Main characteristics

G10MnMoV6

Family : Special

Weldability



Impact test values



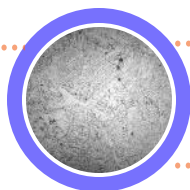
Machining



Cost



Mechanical resistance



G10MnMoV6

Mechanical characteristics & Heat treatment

Designation			Heat Treatment			Thickness t mm	Mechanical properties				
Reference	Name	Number	Symbol	Normalizing or austenitizing °C	Tempering °C		Tensile test at room temperature			Impact test	
						R _{p0.2} MPa min.	R _m Mpa min.	A% min.	KV J min.	Temp. °C	
Safe Metal possibilities according to norms :											
EN 10293:2015	G10MnMoV6-3	1.5410	+QT2	950 to 980	640 to 660	t ≤ 50	500	600 to 750	18	27	-20
										60	RT
			+QT3	950 to 980	600 to 650	t ≤ 100	400	520 to 650	22	27	-20
									60	RT	
Safe Metal other possibilities :											
Safe Metal	G10MnMoV6		+N			t ≤ 30	275	460	17	<10	-20
Safe Metal	G10MnMoV6		+QT HR		High R _m	t ≤ 30	600-650	700-750	12	30	-20
Safe Metal	G10MnMoV6		+QT HD		High K _v	t ≤ 30	500-600	600-700	18	60	-20

RT : Room temperature

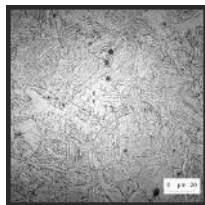
HR : High resistance N : Normalized

QT : Liquid quenched and tempered

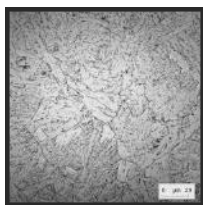
HD : High ductility

Microstructures

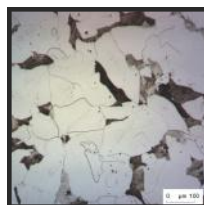
QUENCHING + TEMPERED AT 500 °C



QUENCHING + TEMPERED AT 600 °C



NORMALIZED



Machining

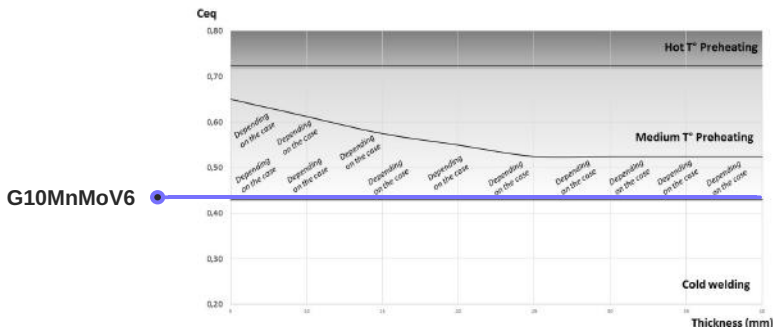
			HB mini*	Microstructure
EN 10293:2015	G10MnMoV6-3	+QT2	180 - 230	Tempered Martensite
EN 10293:2015	G10MnMoV6-3	+QT3	150-200	Tempered Martensite + Bainite
Safe Metal	G10MnMoV6	+N	190	Ferrite + Pearlite
Safe Metal	G10MnMoV6	+QT HR	230	Tempered Martensite + Bainite
Safe Metal	G10MnMoV6	+QT HD	190	Tempered Martensite + Bainite

HB : Brinell hardness

G10MnMoV6

Welding

Preheating conditions according to thickness and equivalent carbon. A specific zone is defined where preheating is not absolutely necessary and depends on the case.



Welding comparative table

Grade	Group (ISO TR 15608)	Filler Metal	Post-Welding HT	Hardness of melted area (HV10)	Rm (MPa)	Process (acc. NFEN ISO 15614)
C steel						
C25	1.2	E71T5	SR/N	130-170	450-550	111/135
		E71T5	QT	150-200	550-620	
G20Mn5	1.2	E70C6 M H4	SR/N	150-200	500-550	
		E70C6 M H4	QT	160-220	540-600	
G24Mn6	3.1	ER110T5	SR	240-300	750-800	
		ER110T5	QT	280-340	780-860	
G28Mn6	3.1	ER80SD2	SD			
G30MnV6	3.1	ER80SL2	SD			
GE230	1.1	E71T5	SR/N	130-170	450-550	
		E71T5	QT	150-200	550-650	
GE280	1.2	E70C6 M H4	SR/N	150-200	500-550	
		E70C6 M H4	QT	160-220	540-580	
G20MnV6	3.1	ER110T5	SR	240-300	750-800	
		ER110T5	QT	280-340	780-860	
Cr-Mn						
G18CrMo4	5.1	E9018B3	SR	180-250	620-680	111/135
G25CrMo4	5.1	E9018G	QT	200-260	630-720	111/135
G30CrMo4	5.1	E12018G	QT	300-350	850-1150	111
G21CrMoV5-11	6.2	E15018G	SR	280-350	800-1000	111
Others						
G10MnMoV6	3.1	ER90 S-G	SR	200-280	620-660	135
		ER90 S-G	QT	160-220	580-640	
G20NiCrMo4	4.2	ER120 S-G	SR	300-350	900-960	
		ER120 S-G	QT	280-360	920-1020	

111 : Electrode welding
135 : MAG

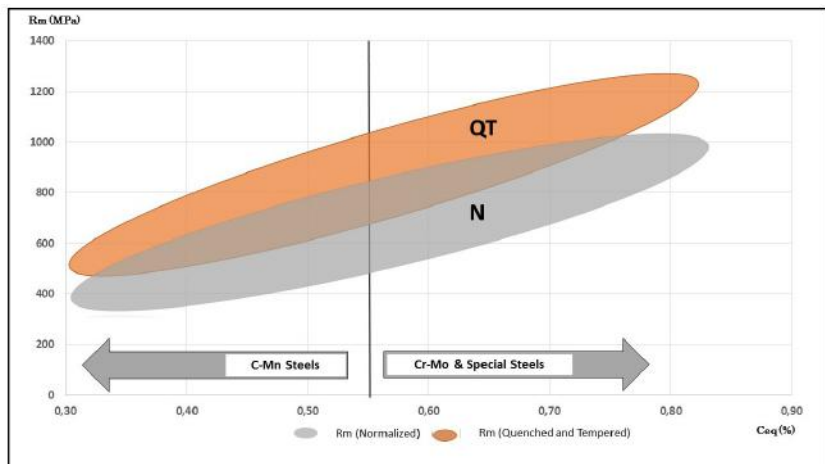
SR : Stress relieving
QT : Quenched and Tempered

N : Normalized

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Comparative Table of Safe Metal grades

Chemical composition										N			QT (2020°C)		
C-Mn	C (%)	Mn (%)	Si (%)	Cr (%)	Mo (%)	V (%)	Ni (%)	Coq (%)	Rm	AN	Kv (-20°C)	Rm	AN	Kv (20°C)	
C25	0,2	0,7	0,45					0,32	440	25	22	420-520	20-25	40-50	
GE340	0,23	0,9	0,5					0,4	480	25	12	520-800	25-30	oct-20	
GE380	0,24	1,2	0,5	0,15				0,47	530	20	10	600-800	15-25	20-40	
G20Mn5 (low)	0,2	1,1	0,4					0,38	470	28	40	500-590	20-22	38-46	
G20Mn5 (high)	0,23	1,4	0,5					0,5				600-880	dec-25	25-30	
G20MnV6	0,23	1,55	0,5			0,05		0,54	580	25	10				
G24Mn6 (low)	0,23	1,65	0,5					0,52	590	18	10	550-670	20-25	40-75	
G24Mn6 (high)	0,25	1,8	0,5					0,6	630	32	10	620-900	oct-25	15-35	
G28Mn6	0,3	1,4	0,5					0,53	650	17	10	600-840	oct-15	30-60	
G30MnV6	0,3	1,4	0,5			0,1		0,55	650	12	30	700-950	08-dec	30-45	
Chemical composition										N			QT (2020°C)		
Cr-Mo	C (%)	Mn (%)	Si (%)	Cr (%)	Mo (%)	V (%)	Ni (%)	Coq (%)	Rm	AN	Kv (-20°C)	Rm	AN	Kv (20°C)	
G18CrMo4	0,18	0,8	0,4	1	0,2			0,55	450	16	10	540-720	dec-22	30-80	
G25CrMo4	0,25	0,8	0,4	1	0,2			0,62	600	11	12	600-920	oct-18	20-90	
G30CrMo4	0,3	0,8	0,4	1	0,2			0,67	840	5	10	650-1050	oct-18	20-90	
G210MoV5-11	0,2	0,7	0,5	1,15	1	0,3		0,82	980	5	5	900-1200	05-oct	5	
Chemical composition										N			QT (2020°C)		
Others	C (%)	Mn (%)	Si (%)	Cr (%)	Mo (%)	V (%)	Ni (%)	Coq (%)	Rm	AN	Kv (-20°C)	Rm	AN	Kv (20°C)	
G10MnMoV6	0,12	1,35	0,5		0,3	0,08		0,42	480	17	10	580-790	14-16	20-50	
G20MnCr4	0,18	1	0,4	0,4	0,6		0,9	0,62	790	5	10	600-950	dec-20	35-100	





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