

ALLOY DATA SHEET



G18CrMo4

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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



G18CrMo4

Generality

Medium carbon steel chromium-molybdenum for high mechanical characteristics at treated condition. Good hardenability and medium weldability.

Market : this alloy can be used in all markets.



Chemical Composition

C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Mo (%)
0,15 – 0,21	< 0,4	0,6 – 0,9	< 0,025	< 0,035	0,9 – 1,2	0,15 – 0,25

Main characteristics

G18CrMo4

Family : High resistance

Weldability



Impact test values



Machining



Cost



Mechanical resistance



G18CrMo4

Mechanical characteristics & Heat treatment

Reference	Designation		Symbol	Heat Treatment		Thickness t mm	Mechanical properties				
	Name	Number		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	G17CrMo5-5	1.7357	+QT1	920 to 960	680 to 730	t ≤ 100	315	490 to 690	20	27	RT
Safe Metal other possibilities :											
Safe Metal	G18CrMo4		+N			t ≤ 30	240	450	18	6	-20
Safe Metal	G18CrMo4		+QT HR		High R _m	t ≤ 30	530 to 600	660 to 730	8	24	-20
Safe Metal	G18CrMo4		+QT M		Balanced R _m /Kv	t ≤ 30	470 to 530	600 to 660	15	50	-20
Safe Metal	G18CrMo4		+QT HD		High Kv	t ≤ 30	400 to 470	540 to 600	20	80	-20

RT : Room temperature
 QT : Liquid quenched and tempered
 HR : High resistance N : Normalized
 HD : High ductility

Microstructures

QUENCHING + TEMPERED AT 500 °C



QUENCHING + TEMPERED AT 600 °C



NORMALIZED



Machining

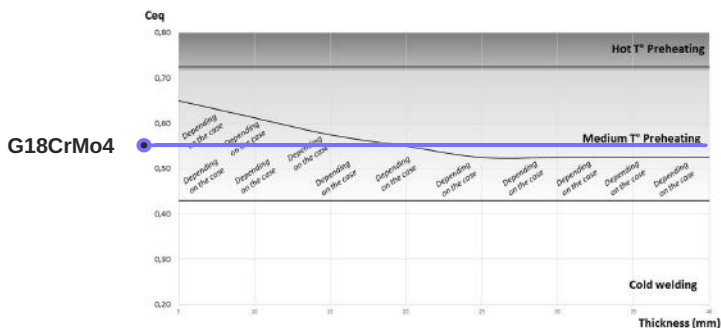
			HB*	Microstructure
EN 10293:2015	G17CrMo5-5	+QT1	140-210	Tempered Martensite
Safe Metal	G18CrMo4	+N	190	Ferrite + Pearlite + Bainite
Safe Metal	G18CrMo4	+QT HR	230	Tempered Martensite
Safe Metal	G18CrMo4	+QT M	200	Tempered Martensite
Safe Metal	G18CrMo4	+QT HD	170	Tempered Martensite

HB : Brinell hardness

G18CrMo4

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	
		E71T5	QT	150-200	550-650	
G20Mn5	1.2	E7006 M H4	SR/N	150-200	500-550	
		E7006 M H4	QT	160-220	540-580	
G24Mn6	3.1	ER110T5	SR	240-300	750-800	
		ER110T5	QT	260-340	780-860	
G28Mn6	3.1	ER80S02	SD			
G30MnV6	3.1	ER80S02	SD			
GE250	1.1	E71T5	SR/N	130-170	450-550	
		E71T5	QT	150-200	550-650	
GE280	1.2	E7006 M H4	SR/N	150-200	500-550	
		E7006 M H4	QT	160-220	540-580	
G20MnV6	3.1	ER110T5	SR	240-300	750-800	
		ER110T5	QT	260-340	780-860	
Cr-Mo						
G18CrMo4	5.1	E901B3	SR	160-250	620-660	111/135
		E901B3	QT	200-260	630-720	111/135
G25CrMo4	5.1	E1201B3	QT	300-350	850-1150	111
G30CrMo4	5.1	E1201B3	SR	280-350	800-1000	111
G21CrMoV5-11	6.2	E1201B3	SR	280-350	800-1000	111
Others						
G10MnMoV6	3.1	ER80 S-G	SR	200-280	620-660	
		ER80 S-G	QT	160-220	580-640	
G20MnCrMo4	4.2	ER120 S-G	SR	300-360	800-960	135
		ER120 S-G	QT	280-360	920-1020	

111 : Electrode welding
135 : MAG

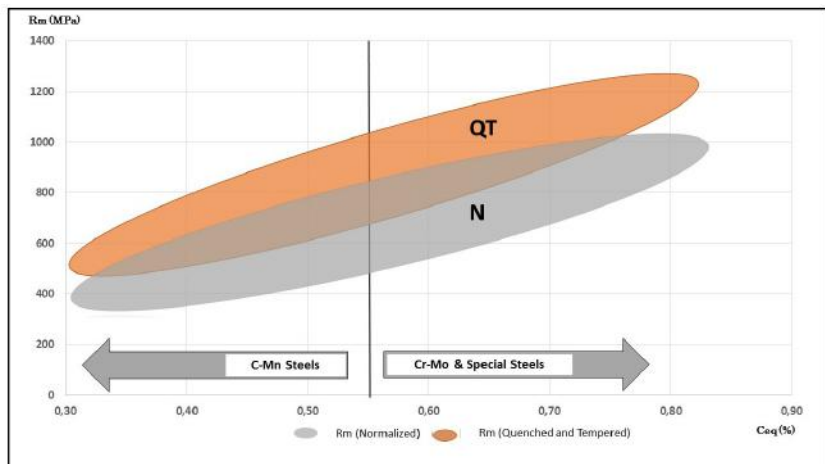
SR : Stress relieving
QT : Quenched and Tempered

N : Normalized

G18CrMo4

Comparative Table of Safe Metal grades

	Chemical composition								N			QT (Q220°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
GE240	0,23	0,9	0,5					0,4	480	25	12	520-600	25-30	oct-20
GE280	0,24	1,2	0,5	0,15				0,47	530	20	10	600-800	15-25	20-40
G20MnS (low)	0,2	1,1	0,4					0,38	470	28	40	500-550	20-22	38-46
G20MnS (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	850-940	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 (Q220°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	18	10	500-720	dec-22	30-80
G25CrMo4	0,23	0,8	0,4	1	0,2			0,62	660	11	12	600-920	oct-18	20-90
G30CrMo4	0,3	0,8	0,4	1	0,2			0,67	840	5	10	650-1020	oct-18	20-90
G21CrMoV5-11	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 (Q220°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	460	17	10	580-750	14-16	20-50
G20NiMoCr4	0,18	1	0,4	0,4	0,6		0,9	0,62	750	5	10	600-920	dec-20	35-100



C25

Family : Versatile



GE240

Family : Versatile



GE280

Family : Versatile



G20Mn5

Family : Versatile



G20MnV6

Family : Versatile



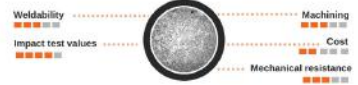
G24Mn6

Family : Versatile



G28Mn6

Family : Versatile



G30MnV6

Family : Versatile



G18CrMo4

Family : High resistance



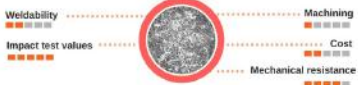
G25CrMo4

Family : High resistance



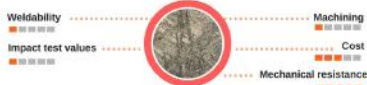
G30CrMo4

Family : High resistance



G21CrMoV5-11

Family : High resistance



G10MnMoV6

Family : Special



G20NiMoCr4

Family : Special



GS400-18 LT

Family : Cast iron

