

GB/T 1591-94

Chemical composition

Grade		Chemical composition, %										
		C ≤	Mn	Si ≤	P ≤	S ≤	V	Nb	Ti	Al ≥	Cr ≤	Ni ≤
Q295	A	0.16	0.80~1.50	0.55	0.045	0.045	0.02~0.15	0.015~0.060	0.02~0.20	—		
	B	0.16	0.80~1.50	0.55	0.040	0.040	0.02~0.15	0.015~0.060	0.02~0.20	—		
Q345	A	0.20	1.00~1.60	0.55	0.045	0.045	0.02~0.15	0.015~0.060	0.02~0.20	—		
	B	0.20	1.00~1.60	0.55	0.040	0.040	0.02~0.15	0.015~0.060	0.02~0.20	—		
	C	0.20	1.00~1.60	0.55	0.035	0.035	0.02~0.15	0.015~0.060	0.02~0.20	0.015		
	D	0.18	1.00~1.60	0.55	0.030	0.030	0.02~0.15	0.015~0.060	0.02~0.20	0.015		
	E	0.18	1.00~1.60	0.55	0.025	0.025	0.02~0.15	0.015~0.060	0.02~0.20	0.015		
Q390	A	0.20	1.00~1.60	0.55	0.045	0.045	0.02~0.20	0.015~0.060	0.02~0.20	—	0.30	0.70
	B	0.20	1.00~1.60	0.55	0.040	0.040	0.02~0.20	0.015~0.060	0.02~0.20	—	0.30	0.70
	C	0.20	1.00~1.60	0.55	0.035	0.035	0.02~0.20	0.015~0.060	0.02~0.20	0.015	0.30	0.70
	D	0.20	1.00~1.60	0.55	0.030	0.030	0.02~0.20	0.015~0.060	0.02~0.20	0.015	0.30	0.70
	E	0.20	1.00~1.60	0.55	0.025	0.025	0.02~0.20	0.015~0.060	0.02~0.20	0.015	0.30	0.70
Q420	A	0.20	1.00~1.70	0.55	0.045	0.045	0.02~0.20	0.015~0.060	0.02~0.20	—	0.40	0.70
	B	0.20	1.00~1.70	0.55	0.040	0.040	0.02~0.20	0.015~0.060	0.02~0.20	—	0.40	0.70
	C	0.20	1.00~1.70	0.55	0.035	0.035	0.02~0.20	0.015~0.060	0.02~0.20	0.015	0.40	0.70
	D	0.20	1.00~1.70	0.55	0.030	0.030	0.02~0.20	0.015~0.060	0.02~0.20	0.015	0.40	0.70
	E	0.20	1.00~1.70	0.55	0.025	0.025	0.02~0.20	0.015~0.060	0.02~0.20	0.015	0.40	0.70
Q460	C	0.20	1.00~1.70	0.55	0.035	0.035	0.02~0.20	0.015~0.060	0.02~0.20	0.015	0.70	0.70
	D	0.20	1.00~1.70	0.55	0.030	0.030	0.02~0.20	0.015~0.060	0.02~0.20	0.015	0.70	0.70
	E	0.20	1.00~1.70	0.55	0.025	0.025	0.02~0.20	0.015~0.060	0.02~0.20	0.015	0.70	0.70

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Mechanical properties

Grade		Yield Strength, Mpa				Tensile strength MPa	Elongation %	Impact Test (vertical)			
		Thickness, mm						+20C	0C	-20c	-40C
		<= 16	> 16~35	> 35~50	> 50~100		Not smaller than				
		Not smaller than					Not smaller than				
Q295	A	295	275	255	235	390~570	23				
	B	295	275	255	235	390~570	23	34			
Q345	A	345	325	295	275	470~630	21				
	B	345	325	295	275	470~630	21	34			
	C	345	325	295	275	470~630	22		34		
	D	345	325	295	275	470~630	22			34	
	E	345	325	295	275	470~630	22				27
Q390	A	390	370	350	330	490~650	19				
	B	390	370	350	330	490~650	19	34			
	C	390	370	350	330	490~650	20		34		
	D	390	370	350	330	490~650	20			34	
	E	390	370	350	330	490~650	20				27
Q420	A	420	400	380	360	520~680	18				
	B	420	400	380	360	520~680	18	34			
	C	420	400	380	360	520~680	19		34		
	D	420	400	380	360	520~680	19			34	
	E	420	400	380	360	520~680	19				27
Q460	C	460	440	420	400	550~720	17		34		
	D	460	440	420	400	550~720	17			34	
	E	460	440	420	400	550~720	17				27