



## NON-ALLOY SPECIAL STEELS:

Steels with high carbon content.

### CHEMICAL ANALYSIS FOR NON-ALLOY SPECIAL STEELS

Steel grade	CHEMICAL ELEMENTS (% on mass)							
	C		Si		Mn		P	S
	Min.	Max.	Min.	Max.	Min.	Max.	Max.	Max.
<b>C22E</b>	0.17	0.24	-	0.40	0.40	0.70	0.035	0.035
<b>C35E</b>	0.32	0.39	-	0.40	0.50	0.80	0.035	0.035
<b>C45E</b>	0.42	0.50	-	0.40	0.50	0.80	0.035	0.035
<b>C60E</b>	0.57	0.65	-	0.40	0.60	0.90	0.035	0.035
<b>38Mn6</b>	0.34	0.42	0.15	0.35	1.40	1.65	0.035	0.035

For all the a.m. steelgrades: Cr ≤ 0.40%; Mo ≤ 0.10%; Ni ≤ 0.40 %; Cr + Mo + Ni ≤ 0.63%.

### MECHANICAL PROPERTIES FOR NON-ALLOY SPECIAL STEELS

Steel grade	Delivery condition	Yield strength min. (ReH) (N/mm <sup>2</sup> =Mpa)				Tensile strength min. (Rm) (N/mm <sup>2</sup> =Mpa)				Longitudinal elongation min. %				Longitudinal impact value		
		For nominal w.t. in mm												Temp. (°C)	W.T.(mm)	Min Value (J min.)
		≤ 16	> 16 ≤ 40	> 40 ≤ 80	//	≤ 16	> 16 ≤ 40	> 40 ≤ 80	//	≤ 16	> 16 ≤ 40	≤ 40 > 80	//			
<b>C22E</b>	<b>+N</b>	240	210	210	-	430	410	410	-	24	25	25	-	Impact test is foreseen only for quenched and tempered material (+QT)		
<b>C35E</b>	<b>+N</b>	300	270	270	-	550	520	520	-	18	19	19	-			
<b>C45E</b>	<b>+N</b>	340	305	305	-	620	580	580	-	14	16	16	-			
<b>C60E</b>	<b>+N</b>	390	350	340	-	710	670	670	-	10	11	11	-			
<b>38Mn6</b>	<b>+N</b>	400	380	360	-	670	620	570	-	14	15	16	-			
		For nominal w.t. in mm														
		≤ 8	> 8 ≤ 20	> 20 ≤ 50	> 50 ≤ 80	≤ 8	> 8 ≤ 20	> 20 ≤ 50	> 50 ≤ 80	≤ 8	> 8 ≤ 20	> 20 ≤ 50	> 50 ≤ 80			
<b>C22E</b>	<b>+QT</b>	340	290	270	260	500	470	440	420	20	22	22	22	+20	≤ 8	50
															> 8 ≤ 20	50
															> 20 ≤ 60	40
															> 60 ≤ 100	40
<b>C35E</b>	<b>+QT</b>	430	380	320	290	630	600	550	500	17	19	20	20	+20	≤ 8	35
															> 8 ≤ 20	
															> 20 ≤ 60	
															> 60 ≤ 100	
<b>C45E</b>	<b>+QT</b>	490	430	370	340	700	650	630	600	14	16	17	17	+20	≤ 8	25
															> 8 ≤ 20	
															> 20 ≤ 60	
															> 60 ≤ 100	
<b>C60E</b>	<b>+QT</b>	580	520	450	420	850	800	750	710	11	13	14	14	-	-	-
<b>38Mn6</b>	<b>+QT</b>	620	570	470	400	850	750	650	550	13	14	15	16	+20	≤ 8	36
															> 8 ≤ 20	40
															> 20 ≤ 60	40
															> 60 ≤ 100	-

Note: the impact test is optional according to the norm, in case of need it has to be explicitly required.