

## STEELS TABLE

### NON-ALLOY STEELS WITH SPECIFIED IMPACT PROPERTIES

Standard steels with low carbon content and low temperature impact properties.

#### CHEMICAL ANALYSIS FOR NON-ALLOY STEELS WITH SPECIFIED IMPACT PROPERTIES

Steel grade	CHEMICAL ELEMENTS (% on mass)																			
	C		Si		Mn		P	S	Cr	Mo		Ni		Al	Cu	N	Nb	Ti	V	
	Min.	Max.	Min.	Max.	Min.	Max.	Max.	Max.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Max.	Max.	Max.	Min.	Max.
<b>E275K2</b>	-	0.20	-	0.40	0.50	1.40	0.030	0.030	0.30	-	0.10	-	0.30	0.020	0.35	0.015	0.05	0.03	-	0.05
<b>*E355K2</b>	-	0.20	-	0.50	0.90	1.65	0.030	0.030	0.30	-	0.10	-	0.50	0.020	0.35	0.015	0.05	0.05	-	0.12
<b>*P355N<sup>2</sup></b> <b>(EN 10216-3)</b>	-	0.20	-	0.50	0.90	1.70	0.025	0.020	0.30	-	0.08	-	0.50	0.020	0.30	0.020	0.05	0.040	-	0.10
<b>*P355NL1<sup>2</sup></b> <b>(EN 10216-3)</b>	-	0.18	-	0.50	0.90	1.70	0.025	0.015	0.30	-	0.08	-	0.50	0.020	0.30	0.020	0.05	0.040	-	0.10
<b>*E420J2<sup>1</sup></b>	0.16	0.22	0.10	0.50	1.30	1.70	0.030	0.035	0.30	-	0.08	-	0.40	0.010	0.30	0.020	0.07	0.05	0.08	0.15
<b>*E460K2<sup>1</sup></b>	-	0.20	-	0.60	1.00	1.70	0.030	0.030	0.30	-	0.10	-	0.80	0.020	0.70	0.025	0.05	0.05	-	0.20
<b>*E590K2<sup>1</sup></b>	0.16	0.22	0.10	0.50	1.30	1.70	0.030	0.035	0.30	-	0.08	-	0.40	0.010	0.30	0.020	0.07	0.05	0.08	0.15
<b>E730K2</b>	-	0.20	-	0.50	1.40	1.70	0.025	0.025	0.30	0.30	0.45	0.30	0.70	0.020	0.20	0.020	0.05	0.05	-	0.12

<sup>1</sup> Nb + V ≤ 0.20%

<sup>2</sup> Al/N ≥ 2; Cr + Cu + Mo ≤ 0.45 %; Nb + Ti + V ≤ 0.12 %

#### MECHANICAL PROPERTIES FOR NON-ALLOY STEELS WITH SPECIFIED IMPACT PROPERTIES

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 properties at -40°C (J min.)
		For nominal w.t. in mm											
		≤ 20	> 20 ≤ 40	> 40 ≤ 50	> 50 ≤ 65	> 65 ≤ 80	> 80 ≤ 100	≤ 20	> 20 ≤ 40	> 40 ≤ 65	> 65 ≤ 100		
<b>*P355N</b> <b>(EN 10216-3)</b>	+N	355	345	335	325	315	305	from 490 to 650	from 490 to 630	from 490 to 630	from 450 to 590	22	34
<b>*P355NL1</b> <b>(EN 10216-3)</b>	+N	355	345	335	325	315	305	from 490 to 650	from 490 to 630	from 490 to 630	from 450 to 590	22	34
		For nominal w.t. in mm										Longitudinal elongation min. %	Longitudinal impact properties at -40°C (J min.)
		≤ 16	> 16 ≤ 40	> 40 ≤ 65	> 65 ≤ 80	> 80 ≤ 100	> 100 ≤ 120	≤ 16	> 16 ≤ 40	> 40 ≤ 65	> 65 ≤ 100		
<b>E275K2</b>	+N	275	265	255	245	235	-	410	410	410	380	22	40
<b>*E355K2</b>	+N	355	345	335	315	295	-	490	490	470	470	20	40
<b>*E420J2</b>	+N	420	400	390	370	360	-	600	560	530	500	19	27
<b>*E460K2</b>	+N	460	440	430	410	390	-	550	550	550	520	19	40
<b>*E590K2</b>	+QT	590	540	480	455	420	-	700	650	570	520	16	40
<b>E730K2</b>	+QT	730	670	620	580	540	-	790	750	700	680	15	40

\*Standard stock

☐ Tubes in steel grade E355K2, available as standard stock, are supplied with double marking E355K2/P355N or E355K2/P355NL1. In both cases the product undergoes to an impact test at a -40°C with minimum average result of 34 Joule.