

# Seamless Steel Tube to EN10305-4 For Hydraulic Applications

Table 1 - Chemical composition (cast analysis)<sup>a</sup>

Steel grade		% by mass					
Steel name	Steel number	C max.	Si max.	Mn max.	P max.	S max.	Al tot min.
E215	1.0212	0,10	0,05	0,70	0,025	0,015	0,025
E235	1.0308	0,17	0,35	1,20	0,025	0,015	-
E355 <sup>b</sup>	1.0580	0,22	0,55	1,60	0,025,	0,015	-

a) Elements not included in this table (but see footnote b) shall not be intentionally added to the steel without the agreement of the purchaser, except for elements which may be added for finishing the cast. All appropriate measures shall be taken to prevent the addition of undesirable elements from scrap or other materials used in the steel making process.

b) Additions of Nb, Ti and V are permitted at the discretion of the manufacturer. The content of these elements shall be reported.

Table 2 - Permissible deviations of the product analysis from the specified limits given in Table 1

Element	Specified limit of the cast analysis % by mass	Permissible deviation of the product analysis % by mass
C	≤0,22	+ 0,02
Si	≤0,55	+ 0,05
Mn	≤1,60	+ 0,10
P	≤0,025	+ 0,005
S	≤0,015	+ 0,003
Al	≤0,025	- 0,005

Table 3 - Mechanical properties at room temperature

Steel grade		Tensile strength	Yield strength <sup>a</sup>	Elongation
Steel name	Steel number	R <sub>m</sub> min. MPa	R <sub>eH</sub> min. MPa	A min. %
E215	1.0212	290 to 430	215	30
E235	1.0308	340 to 480	235	25
E355	1.0580	490 to 630	355	22

a) For tubes with outside diameter ≤ 30mm and wall thickness ≤ 3mm, the R<sub>eH</sub> minimum values are 10MPa lower than the values given in this table.  
NOTE The steel grades defined in this part of EN10305 have an intrinsic minimum transverse impact energy of 27 J at 0°C.