



Acero resistente a las altas temperaturas y presiones

	Grade / material	Grade / material	Grade / material	Grade / material
Standard	DIN 17175	EN 10216-2	DIN 17175	EN 10216-2
Steel grade	15 Mo 3 grade III with US-test	16 Mo 3 TC2 with US-test	13 CrMo 44 grade III with US-test	13 CrMo 4-5 TC2 with US-test
Steel grade-No.	1.5415	1.5415	1.7335	1.7335
Colour code	yellow ring, red ring	no colour code	yellow ring, silver ring	no colour code
Marking	mill stamp, grade inspectors sign, heat number, tube number	mill stamp, grade EN-standard heat number, inspectors sign, ID-number	mill stamp, grade inspectors sign, heat number, tube number	mill stamp, grade EN-standard heat number, inspectors sign, ID-number
Certificates	MTC 3.1 B/3.1 optional 3.1 A, 3.1 C/3.2 acc. to EN 10204	MTC 3.1 B/3.1 optional 3.1 A, 3.1 C/3.2 acc. to EN 10204	MTC 3.1 B/3.1 optional 3.1 A, 3.1 C/3.2 acc. to EN 10204	MTC 3.1 B/3.1 optional 3.1 A, 3.1 C/3.2 acc. to EN 10204
Tensile strength	450-600 N/mm ²	450-600 N/mm ²	440-590 N/mm ²	440-590 N/mm ²
Yield strength				
below 16 mm WTH	270	280	290	290
below 40 mm WTH	270	270	290	290
below 60 mm WTH	260	260	280	280
larger than 60 mm WTH	to be agreed	to be agreed	to be agreed	to be agreed
Elongation longitudinal	22%	22%	22%	22%
transversal min.	20%	20%	20%	20%
Min. impact energy at room temperature (Joule)	48 (longitudinal) 34 (transversal)	40 (longitudinal) 27 (transversal)	48 (longitudinal) 34 (transversal)	40 (longitudinal) 27 (transversal)
Applicable operating pressure at 450° C Outsader diameter				
OD < 63,5 mm	bellow 80 bar	no details	bellow 80 bar	no details
OD < 63,5 mm	below 32 bar	no details	below 32 bar	no details

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	Grade / material	Grade / material	Grade / material	Grade / material
Standard	DIN 17175	EN 10216-2	DIN 17175	EN 10216-2
Steel grade	St 35.8 grade I without US-test	P 235 GH TC1 without US-test	St. 35.8 grade III with US-test	P 235 GH TC2 with US-test
Steel grade-No.	1.0305	1.0345	1.0305	1.0345
Colour code	white ring	no colour code	white ring	no colour code
Marking	mill stamp, grade S for seamless, inspectors sign	mill stamp, grade EN-standard test class, inspectors sign, ID number, heat number	mill stamp, grade S for seamless, inspectors sign	mill stamp, grade EN-standard test class, inspectors sign, ID number, heat number
Certificates	MTC 3.1 B/3.1 optional 3.1 A, 3.1 C/3.2 acc. to EN 10204	MTC 3.1 B/3.1 optional 3.1 A, 3.1 C/3.2 acc. to EN 10204	MTC 3.1 B/3.1 optional 3.1 A, 3.1 C/3.2 acc. to EN 10204	MTC 3.1 B/3.1 optional 3.1 A, 3.1 C/3.2 acc. to EN 10204
Tensile strength	360-480 N/mm ²	360-500 N/mm ²	360-480 N/mm ²	360-500 N/mm ²
Yield strength				
below 16 mm WTH	235	235	235	235
below 40 mm WTH	225	225	225	225
below 60 mm WTH	215	215	215	215
larger than 60 mm WTH	to be agreed	to be agreed	to be agreed	to be agreed
Elongation longitudinal	25%	25%	25%	25%
transversal min.	23%	23%	23%	23%
Min. impact energy at room temperature (Joule)	48 (longitudinal) 34 (transversal)	40 (longitudinal) 27 (transversal)	48 (longitudinal) 34 (transversal)	40 (longitudinal) 27 (transversal)
Applicable operating pressure at 450° C Outsader diameter				
OD < 63,5 mm	bellow 80 bar	no details	bellow 80 bar	no details
OD < 63,5 mm	below 32 bar	no details	below 32 bar	no details