



## SPECIFIC STEELGRADES AVAILABLE FOR SEAMLESS HOLLOW SECTIONS

Besides all the steelgrades codified by the norm EN 10210 (see steeltable p. 7-8), the seamless hollow sections can be supplied, upon request, in other steelgrades with high yield strength values, codified by the manufacturers' specifications. These particular steelgrades can have high impact values and mechanical features, that can lead to a size reduction and a weight saving.

Seamless hollow sections in this kind of steelgrades can be supplied upon request.

### CHEMICAL ANALYSIS

Steelgrade	Chemical elements (% on mass)																			
	C		Si		Mn		P	S	V + Nb	Cr	Mo	Ni	Cu	N	Al		V		Nb	Ti
	min.	max.	min.	max.	min.	max.	max.	max.	max.	max.	max.	max.	max.	max.	min.	max.	min.	max.	max.	max.
Forterior® 370 ImpactFIT 20	-	0.20	0.10	0.45	1.15	1.70	0.030	0.025	0.16	-	-	-	-	-	-	-	-	-	-	-
Forterior® 400	-	0.20	0.10	0.45	1.15	1.70	0.030	0.025	0.16	-	-	-	-	-	-	-	-	-	-	-
Forterior® 430 ImpactFIT 20	-	0.22	0.10	0.50	1.20	1.70	0.030	0.025	0.17	-	-	-	-	-	-	-	-	-	-	-
Forterior® 450	-	0.22	0.10	0.50	1.20	1.70	0.030	0.025	0.17	-	-	-	-	-	-	-	-	-	-	-
Forterior® 450 ImpactFIT 20	0.16	0.22	0.10	0.50	1.30	1.70	0.030	0.035	-	0.30	0.08	0.40	0.25	0.020	0.010	0.060	0.08	0.15	0.05	0.03
Forterior® 450 ImpactFIT 30	0.16	0.22	0.10	0.50	1.30	1.70	0.030	0.035	-	0.30	0.08	0.40	0.25	0.020	0.010	0.060	0.08	0.15	0.05	0.03
Forterior® 460 ImpactFIT 20 <sup>1</sup>	-	0.22	0.10	0.50	1.30	1.70	0.030	0.025	0.21	-	-	-	-	-	-	-	-	-	-	-
Forterior® 470	0.16	0.22	0.10	0.50	1.30	1.70	0.030	0.035	-	0.30	0.08	0.40	0.25	0.020	0.010	0.060	0.08	0.15	0.05	0.03
Forterior® 490	0.16	0.22	0.10	0.50	1.30	1.70	0.030	0.035	-	0.30	0.08	0.40	0.25	0.020	0.010	0.060	0.08	0.15	0.05	0.03
Forterior® 500 <sup>1</sup>	-	0.22	0.10	0.50	1.30	1.70	0.030	0.025	0.21	-	-	-	-	-	-	-	-	-	-	-
Forterior® 590 ImpactFIT 40	0.16	0.22	0.10	0.50	1.30	1.70	0.030	0.035	-	0.30	0.08	0.40	0.25	0.020	0.010	0.060	0.08	0.15	0.05	0.03
Forterior® 630 ImpactFIT 40 <sup>1</sup>	0.16	0.22	0.10	0.50	1.30	1.70	0.030	0.035	-	0.30	0.08	0.40	0.25	0.020	0.010	0.060	0.08	0.15	0.05	0.03

<sup>1</sup> For w.t. > 12 mm the maximum carbon value is 0.23%

### MECHANICAL PROPERTIES

Steelgrade	Delivery condition	Yield strength min. (ReH) (N/mm <sup>2</sup> =Mpa)		Tensile strength (Rm) (N/mm <sup>2</sup> =Mpa)		Longitudinal elongation min. %	Longitudinal impact value (J min.)			Equivalent steelgrades <sup>^</sup>
		For nominal w.t. in mm		min.	max.		Temperature °C			
		≤12	>12 ≤25				-20	-30	-40	
Forterior® 370 ImpactFIT 20	Normalized	370	350	510	-	20	27	-	-	SG40+N
Forterior® 400	Untreated	400	380	510	-	19	-	-	-	SG40
Forterior® 430 ImpactFIT 20	Normalized	430	410	560	-	19	27	-	-	SG45+N
Forterior® 450	Untreated	450	430	560	-	18	-	-	-	SG45
Forterior® 450 ImpactFIT 20	Normalized	450	440	600	750	19	27	-	-	MW450+N 20MnV6+N
Forterior® 450 ImpactFIT 30	Normalized	450	440	600	750	19	-	27	-	20MnV6+N
Forterior® 460 ImpactFIT 20	Normalized	460	450	610	-	19	27	-	-	SG50+N
Forterior® 470	Untreated	470	470	650	800	17	-	-	-	20MnV6 E470
Forterior® 470 ImpactFIT 20	Normalized	470	450	620	770	19	27	-	-	MW500+N 21MnV6+N
Forterior® 490	Untreated	490	490	670	820	17	-	-	-	MW500 21MnV6+N
Forterior® 500	Untreated	500	480	610	-	17	-	-	-	SG50
Forterior® 590 ImpactFIT 40	Quenched and tempered	590	570	700	850	16	-	-	30	20MnV6+QT E590K2
Forterior® 630 ImpactFIT 40	Quenched and tempered	630	610	740	930	16	-	-	27	MW500+QT 21MnV6+QT

<sup>^</sup> This comparison has been effected with manufacturers' specifications no longer in use or with current codifications according to the European regulations.