FREE-CUTTING STEELS

Roda Specialty Steel

Rodacciai®

SINCE 1959 ALL OVER THE WORLD

FREE-CUTTING STEELS

Free-cutting steels have an improved capacity to cut chips for use on CNC and Screw machines with high productivity, typically of mass produced parts for the automotive and appliance industry.
The improved machinability is achieved by the addition of **Sulfur** (which guarantees the breakage of the chip) and other particular alloying elements such as **Lead** (which reduces the friction between the tool and the chip), **Tellurium** and **Bismuth** (which further accentuate these characteristics).

	Condition	Profile	Range (mm)	Finishing	Tolerances
Bars	Hot rolled	Round	0.75÷4.00	As rolled, rough peeled	For all Imperial sizes - cold drawn & smooth turned, or cold drawn wire - tolerances: Per ASTM A484, straightness of 1/32" per 5ft, out of roundness - ½ the dia tolerance
	Cold-drawn	Round Hexagonal Square Special	0.79÷3.00 0.16÷3.00 0.16÷2.75	Bright	
	Smooth-turned	Round	0.75÷4.00	Bright	
	Ground	Round	0.12÷4.00	Bright	
Wire	Cold-drawn	Round Hexagonal Square Special	0.79÷0.88 0.12÷0.75 0.16÷0.75	Bright, coated	

For our RPM.Bar like to 1215 - 12L14 - cold drawn & smooth turned: J9 tolerance which is half of the tolerance listed in ASTM A108

FREE-CUTTING STEELS NOT INTENDED FOR HEAT TREATMENT

They are by far the most common among free-cutting steels, which have low carbon content and are designed for maximum machinability. **These steels should be used without any further heat-treatment.**

NOTE: Machined pieces can be hardened on the surface by thermo-chemical heat-treatments.

	EN ISO 683-4:2018 EN 10277:2018	N°	ASTM A29	C	Si (max)	Mn	P (Max)	S	Pb	Other elements
11SMN30	11SMn30	1.0715	(1215)	≤ 0,14	0,05	0,90÷1,30	0,11	0,27÷0,33	-	-
1215	-	-	1215	≤ 0,09	-	0,75÷1,05	0,04÷0,09	0,26÷0,35	-	-
AVZ	11SMn37	1.0736	-	≤ 0,14	0,05	1,00÷1,50	0,11	0,34÷0,40	-	-
LED108	11SMnPb30	1.0718	(12L14)	≤ 0,14	0,05	0,90÷1,30	0,11	0,27÷0,33	0,20÷0,35	-
12L14	(11SMnPb30)	(1.0718)	12L14	≤ 0,15	-	0,85÷1,15	0,04÷0,09	0,26÷0,35	0,15÷0,35	-
PS113	11SMnPb37	1.0737	-	≤ 0,14	0,05	1,00÷1,50	0,11	0,34÷0,40	0,20÷0,35	-
TELYX	(11SMnPb37 +Te)	(1.0737)	-	≤ 0,14	0,05	1,00÷1,50	0,11	0,34÷0,40	0,20÷0,35	Te=0,005÷0,030
TELBY	(11SMnPb30 +Te +Bi)	(1.0718)	(12L14+Te+Bi)	≤ 0,14	0,05	0,90÷1,30	0,11	0,27÷0,33	0,20÷0,35	Te=0,010÷0,050 Bi=0,06÷0,09
TELBYPLUS	(11SMnPb37 +Te +Bi)	(1.0737)	-	≤ 0,14	0,05	1,00÷1,50	0,11	0,34÷0,40	0,20÷0,35	Te=0,010÷0,050 Bi=0,06÷0,09
PR60	-	-	-	0,25÷0,30	0,30	1,10÷1,60	0,10	0,24÷0,32	0,15÷0,30	-

FREE-CUTTING STEELS FOR CASE-HARDENING

Free-cutting steels for case-hardening are low carbon steels that maintain a good machinability and can undergo case hardening treatments of the pieces after being machined.

	EN ISO 683-4:2018 EN 10277:2018	N°	ASTM A29	C	Si (max)	Mn	P (Max)	S	Pb	Other elements
10SPB20	10SPb20	1.0722	-	0,07÷0,13	0,40	0,70÷1,10	0,06	0,15÷0,25	0,20÷0,35	-
1117	15SMn13	1.0725	1117	0,12÷0,18	0,40	0,90÷1,30	0,06	0,08÷0,18	-	-

FREE-CUTTING STEELS FOR QUENCHING AND TEMPERING

With a higher carbon content these free-cutting steels can be quenched and tempered, but still maintain a **good machinability** even with lower sulfur percentages.
The bars can be supplied in **heat treated condition**, in order to avoid heat-treating the pieces after machining.
When quenched and tempered, these steels have **elevated mechanical characteristics** and should be used for **parts that require** greater mechanical properties.

	EN ISO 683-4:2018 EN 10277:2018	N°	ASTM A29	C	Si (max)	Mn	P (Max)	S	Pb	Other elements
35S20	35S20	1.0726	-	0,32÷0,39	0,40	0,70÷1,10	0,06	0,15÷0,25	-	-
45S20	46S20	1.0727	-	0,42÷0,50	0,40	0,70÷1,10	0,06	0,15÷0,25	-	-
45S20PB	46SPb20	1.0757	-	0,42÷0,50	0,40	0,70÷1,10	0,06	0,15÷0,25	0,15÷0,35	-
44SMN28	44SMn28	1.0762	(1144)	0,40÷0,48	0,40	1,30÷1,70	0,06	0,24÷0,33	-	-
1144	-	-	1144	0,40÷0,48	-	1,35÷1,65	0,40	0,24÷0,33		
SAE1144PB	44SMnPb28	1.0763	(11L44)	0,40÷0,48	0,40	1,30÷1,70	0,06	0,24÷0,33	0,15÷0,35	-
PR40	(38SMn28 +Se)	(1.0760)	-	0,35÷0,40	0,40	1,20÷1,50	0,06	0,24÷0,33	-	Se=0,010÷0,020
PR80 SAE1137PB	36MnPb14	1.0765	(11L37)	0,32÷0,39	0,40	1,30÷1,70	0,06	0,10÷0,18	0,15÷0,35	-

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