

STANDARD REFERENCE:  
 FIAT 52503 Specification

### RODACCIAI REFERENCES AND COMPARABLE STANDARDS

EUROPE		ITALY	GERMANY	FRANCE	UK	USA	
EU 86 - 70		FIAT 52503	(DIN 17212-72)	(NF A 35-563-83)	(BS 970 pt.3-96)	ASTM A 29	
Grade	N°		Werkstoff	N°			
(C36)	-	C33	(CF 35)	(1.1183)	XC32	060A35	1035

### CHEMICAL COMPOSITION (CAST ANALYSIS) (%)

FIAT	C	Si	Mn	P / max	S	Cr / max	Ni / max	Cu / max	Al
C33	0,30±0,36	0,15±0,40	0,60±0,90	0,035	0,020±0,035	0,25	0,25	0,30	0,020±0,050

### MECHANICAL PROPERTIES - AS ROLLED CONDITION

Delivering condition	Size mm	Rp 0,2 (MPa) min	Rm (MPa)	A5 (%) min	KCU (J) min	KV (J) min	HB core	HB surface
UNTREATED	all	-	-	-	-	-	-	≤ 240
SOFT ANNEALED	all	295	540÷690	19	25	-	160÷210	160÷210
NORMALIZED (+N)	>10 ≤30	295	540÷690	19	25	-	160÷210	160÷210
	>30 ≤100	250	480÷650	21	25	-	140÷210	140÷210
QUENCHED AND TEMPERED (+QT)	>16 ≤40	350	550÷700	20	-	40	160÷210	160÷210
	>40 ≤100	300	500÷650	21	-	40	140÷210	140÷210

### MECHANICAL PROPERTIES - BRIGHT PRODUCT CONDITION\* \*\*

Size (mm)	as Rolled + as Rolled + Turned (+SH)		Quenched + Tempered + Turned (+QT +SH)***			Quenched + Tempered + Cold Drawn (+QT +C)			Cold Drawn (+C)		
	Hardness HB	Rm (MPa)	Rp 0,2 (MPa) min	Rm (MPa)	A5 (%) min	Rp 0,2 (MPa) min	Rm (MPa)	A5 (%) min	Rp 0,2 (MPa) min	Rm (MPa)	A5 (%) min
≥5 ≤10	-	-	-	-	-	610	750÷900	9	480	620÷950	6
>10 ≤16	-	-	-	-	-	535	680÷850	9	400	575÷900	7
>16 ≤40	147±195	495±655	350	550÷700	20	460	640÷800	10	300	560÷850	8
>40 ≤63	147±195	495±655	300	500÷650	21	390	550÷690	11	275	525÷800	9
>63 ≤100	147±195	495±655	300	500÷650	21	310	500÷650	12	240	470÷780	9

\*For reference only \*\*For size <5 mm the mechanical properties may be agreed at the time of enquiry and order  
 \*\*\*This values are valid also for Cold drawn + Quenched + Tempered condition (+C +QT)

### WORKING TEMPERATURES RECOMMENDED

Operation	Hot forgings deformation	Normalizing	Soft annealing	Quenching in water	Tempering
°C	850±1100	870±910	650÷700	840÷860	550÷650

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**SURFACE HARDENING STEELS**  
 NOT ALLOYED

**R33S**
