

K-007 (2/7)

## TOYOTA ENGINEERING STANDARDS

## MILD STEEL WIRE RODS AND HARD STEEL WIRE RODS

軟鋼線材及び硬鋼線材

TS G3530G

CLASS		CONFIDENTIAL DO NOT REPRODUCE	The standards may be reproduced at the assigned section, provided the authorization has been given by the direct contractor on the subject.
C			
© TOYOTA MOTOR CORPORATION, 1994			
01 - 94	2	Revised (Added comparable standard JIS.(Table 1)) (Changed Applicable standards.)	
08 - 90	-	Issued	
DATE	SYM	REVISION RECORD	( An asterisk "*" in this standard denotes change from previous issue. )

Note: The new standards should be applied immediately to all engineering related activities. In the case of revision, the old standard which has been issued before this revision should be removed and destroyed in proper manner (such as shredding or burning) to avoid possible use of obsolete standards information.

Prepared and Written  
by

Metallic Material Dept.

Material Research & Development Div. I

TOYOTA MOTOR CORPORATION

*Memoru Mori*

Memoru Mori  
General Manager  
Engineering Information System  
Planning Dept.  
Engineering Administration Div.  
TOYOTA MOTOR CORPORATION  
1, Toyota, Toyota, Aichi, 471 JAPAN  
Facsimile Number: Japan-565-23-5767



CONFIDENTIAL · DO NOT REPRODUCE

K-003 (1/2)

## TOYOTA ENGINEERING STANDARDS

TS G3530G

## MILD STEEL WIRE RODS AND HARD STEEL WIRE RODS

## 1. Scope

This standard covers the mild steel wire rods and hard steel wire rods composing automobile components.

## 2. Classification and Material Codes

The classification and material codes of mild steel wire rods and hard steel wire rods shall conform to Table 1.

Table 1

Classification	Material code	Comparable standard (reference)	Example of use
		JIS	
Mild steel wire rod	SWRM 6	SWRM 6	Small screw, tapping screw, bolt, nut, split pin, steel wire
	SWRM 8	SWRM 8	
	SWRM 10	SWRM 10	
	SWRM 12	SWRM 12	
	SWRM 15	SWRM 15	
	SWRM 17	SWRM 17	
	SWRM 20	SWRM 20	
	SWRM 22	SWRM 22	
Hard steel wire rod	SWRH 27	SWRH 27	Small screw, bolt, spring washer, hard-drawn wire
	SWRH 32	SWRH 32	
	SWRH 37	SWRH 37	
	SWRH 42 A	SWRH 42 A	
	SWRH 42 B	SWRH 42 B	
	SWRH 47 A	SWRH 47 A	
	SWRH 47 B	SWRH 47 B	
	SWRH 52 A	SWRH 52 A	
	SWRH 52 B	SWRH 52 B	
	SWRH 57 A	SWRH 57 A	
	SWRH 57 B	SWRH 57 B	
	SWRH 62 A	SWRH 62 A	
	SWRH 62 B	SWRH 62 B	
	SWRH 67 A	SWRH 67 A	
	SWRH 67 B	SWRH 67 B	
	SWRH 72 A	SWRH 72 A	
	SWRH 72 B	SWRH 72 B	
	SWRH 77 A	SWRH 77 A	
SWRH 77 B	SWRH 77 B		
SWRH 82 A	SWRH 82 A		
SWRH 82 B	SWRH 82 B		

Printed in Japan

NOTE: The above standards and/or specifications are confidential and proprietary information of Toyota Motor Corporation. They should be used only for producing parts ordered by Toyota Motor Corporation or Toyota's affiliated car and parts manufacturers. They should not be reproduced in whole or in part, nor are they to be disclosed to a third party for any purpose other than part production.

CONFIDENTIAL · DO NOT REPRODUCE

K-4-003 (47)

## TOYOTA ENGINEERING STANDARDS

TS G3530G

Remark: In case of specifying the killed steel, K shall be attached to the code.  
Example: SWRM 10 K

## 3. Chemical Composition

The chemical compositions of mild steel wire rods and hard steel wire rods shall conform to Table 2 and Table 3.

Table 2

Material code	C	Mn	Unit: %	
			P	S
SWRM 8	0.08 max.	0.30 to 0.60	0.045 max.	0.045 max.
SWRM 8	0.10 max.			
SWRM 10	0.08 to 0.13			
SWRM 12	0.10 to 0.15			
SWRM 15	0.13 to 0.18			
SWRM 17	0.15 to 0.20			
SWRM 20	0.18 to 0.23			
SWRM 22	0.20 to 0.25			

Table 3

Material code	C	Si	Mn	Unit: %		
				P	S	
SWRH 27	0.24 to 0.31	0.15 to 0.35	0.30 to 0.60	0.040 max.	0.040 max.	
SWRH 32	0.28 to 0.36					
SWRH 37	0.34 to 0.41					
SWRH 42 A	0.39 to 0.46					0.60 to 0.90
SWRH 42 B						0.30 to 0.60
SWRH 47 A						0.60 to 0.90
SWRH 47 B	0.44 to 0.51					0.30 to 0.60
SWRH 52 A	0.49 to 0.56					0.60 to 0.90
SWRH 52 B						0.30 to 0.60
SWRH 57 A	0.54 to 0.61					0.60 to 0.90
SWRH 57 B			0.30 to 0.60			
SWRH 62 A	0.59 to 0.66		0.60 to 0.90			
SWRH 62 B			0.30 to 0.60			
SWRH 67 A	0.64 to 0.71		0.60 to 0.90			
SWRH 67 B			0.30 to 0.60			
SWRH 72 A	0.69 to 0.76		0.60 to 0.90			
SWRH 72 B			0.30 to 0.60			
SWRH 77 A	0.74 to 0.81		0.60 to 0.90			
SWRH 77 B			0.30 to 0.60			
SWRH 82 A	0.79 to 0.86		0.60 to 0.90			
SWRH 82 B		0.30 to 0.60				

Printed in Japan

NOTE: The above standards and/or specifications are confidential and proprietary information of Toyota Motor Corporation. They should be used only for producing parts ordered by Toyota Motor Corporation or Toyota's affiliated car and parts manufacturers. They should not be reproduced in whole or in part, nor be they to be disclosed to a third party for any purpose other than part production.

CONFIDENTIAL · DO NOT REPRODUCE

Ka-003 (5/7)

TOYOTA ENGINEERING STANDARDS

TS G3530G

**4. Quality**

The mild steel wire rods and hard steel wire rods shall be free from harmful defects in practical use.

**5. Standard Diameter and Dimensional Tolerance**

5.1 Standard diameter for mild steel wire rods and hard steel wire rods shall conform to Table 4.

Table 4

													Unit: mm	
3.5	6	7	8	9	9.5	10	11	12	13	14	15	16	17	19

5.2 The dimensional tolerance and out-of-round (the difference between the max. and min. values of diameter at the same cross section of the wire rod) of mild steel wire rods shall conform to Table 5.

Table 5

		Unit: mm
Tolerance	Deviation between diameters	
±0.5	0.6 max.	

5.3 The dimensional tolerance and out-of-round (the difference between the max. and min. values of diameter at the same cross section of the wire rod) of mild steel wire rods shall conform to Table 6.

Table 6

		Unit: mm
Tolerance	Deviation between diameters	
±0.50	0.50 max.	

**6. Test****6.1 Chemical Composition**

Chemical composition shall conform to TSG1000G and TSG2902G.

**6.2 General Quality**

General quality shall conform to the Section 13 of TSG3000G.

Printed in Japan

NOTE: The above standards and/or specifications are confidential and proprietary information of Toyota Motor Corporation. They should be used only for producing parts ordered by Toyota Motor Corporation or Toyota's affiliated car and parts manufacturers. They should not be reproduced in whole or in part, nor are they to be disclosed to a third party for any purpose other than part production.

CONFIDENTIAL - DO NOT REPRODUCE

64-003 (S)

**TOYOTA ENGINEERING STANDARDS** **TS G3530G**

**Applicable Standards**

- TSG1000G General Rule for Chemical Analysis of Steel Materials
- \* TSG2902G Method of Spark Test for Steels
- TSG3000G General Quality of Steels for Machine Structural Use

Printed in Japan

NOTE: The above standards and/or specifications are confidential and proprietary information of Toyota Motor Corporation. They should be used only for producing parts ordered by Toyota Motor Corporation or Toyota's affiliated car and parts manufacturers. They should not be reproduced in whole or in part, nor are they to be disclosed to a third party for any purpose other than part production.