

## SPRING STEEL- FLATS AND ROUNDS

### INTRODUCTION:

- NIPHA caters to the demands of various core sectors of the economy like Automobiles, Railways, Agricultural Machinery, Mining and the Engineering Sector as a whole.
- Our facilities are ISO 9001:2000 Accredited specially for the manufacture of Hot Rolled Steel Products.

### PRODUCT APPLICATION:

- SPRING STEEL FLATS & ROUNDS are used for manufacturing various types of springs & components for suspension mechanism in Automobiles and Railways. Springs are in the form of:  
I. LEAF SPRING      II. COIL SPRING  
III. STABILISER BARS      IV. TORSION BARS

### GENERAL FEATURES:

- A very high degree of quality, reliability and service life is expected in springs which are vital for any automobile or the railways.
- The spring's capacity to take on static and dynamic load over an extended period of time depends upon the steel that goes into its making.

### SPECIFIC FEATURES:

- A. **Condition of Supply:** Hot Rolled
- B. **Shapes & Sizes:**
  - **FLATS:** 38 X 6 mm – 120 X 28 mm
  - **ROUNDS:** 18 mm – 50 mm
- C. **Straightness:** Bars would have a straightness of 3mm/m (max.)
- D. **Surface Quality:** On visual inspection, surface would be free from harmful defects- cracks, lap, fold, scratch, roll-pass marks, pits etc.
- E. **As Rolled Hardness:** 310 BHN
- F. **Edge Radius:** Flats can be supplied with an edge radius "R" which is equal to either "T" or "T/2", where "T" is equal to the thickness.

### DIMENSIONAL TOLERANCES FOR ROUNDS

DIAMETER RANGE (MM)	TOLERANCE (MM)	
	TOLERANCE +/- (DIA)	TOLERANCE (OUT OF ROUND)
18-22	0.20	0.30
22-25	0.24	0.35
25-28	0.25	0.40
28-31	0.28	0.45
31-34	0.30	0.50
34-38	0.36	0.60
38-50	0.40	0.60

### DIMENSIONAL TOLERANCES FOR FLATS

WIDTH RANGE (MM)	WIDTH	TOLERANCE +/- (MM)			
		THICKNESS		CONCAVITY	
		<= 10	> 10	T <= 10	T > 10
38-50	0.30	0.15	-	0.15	0.15
51-75	0.50	0.15	0.20	0.15	0.20
76-100	0.70	0.20	0.25	0.20	0.20
101-125	0.90	0.25	0.40	0.30	0.40

# CHEMICAL COMPOSITION OF TYPICAL SPRING STEEL IN VARIOUS INTERNATIONAL STANDARDS

	C	Si	Mn	P (Max.)	S (Max.)	Cr	V	B (Min.)
<b>SAE</b>								
50B50	0.48-0.53	0.15-0.30	0.75-1.00	0.035	0.040	0.40-0.60	-	0.0005
5060	0.56-0.64	0.15-0.30	0.75-1.00	0.035	0.040	0.40-0.60	-	-
50B60	0.56-0.64	0.15-0.30	0.75-1.00	0.035	0.040	0.40-0.60	-	0.0005
5150	0.48-0.53	0.15-0.30	0.70-0.90	0.035	0.040	0.70-0.90	-	-
5155	0.51-0.59	0.15-0.30	0.70-0.90	0.035	0.040	0.70-0.90	-	-
5160	0.56-0.64	0.15-0.30	0.75-1.00	0.035	0.040	0.70-0.90	-	-
51B60	0.56-0.64	0.15-0.30	0.75-1.00	0.035	0.040	0.70-0.90	-	0.0005
6150	0.48-0.53	0.15-0.30	0.70-0.90	0.035	0.040	0.80-1.10	0.15MIN	-
9254	0.51-0.59	1.20-1.60	0.60-0.80	0.035	0.040	0.60-0.80	-	-
9260	0.56-0.64	1.80-2.20	0.75-1.00	0.035	0.040	-	-	-
<b>JIS G 4801</b>								
SUP 3	0.75-0.90	0.15-0.35	0.30-0.60	0.035	0.035	-	-	-
SUP 4	0.90-1.10	0.15-0.35	0.30-0.60	0.035	0.035	-	-	-
SUP 6	0.55-0.65	1.50-1.80	0.70-1.00	0.035	0.035	-	-	-
SUP 7	0.55-0.65	1.80-2.20	0.70-1.00	0.035	0.035	-	-	-
SUP 9	0.50-0.60	0.15-0.35	0.65-0.95	0.035	0.035	0.65-0.95	-	-
SUP 9A	0.55-0.65	0.15-0.35	0.70-1.00	0.035	0.035	0.70-1.00	-	-
SUP 10	0.45-0.55	0.15-0.35	0.65-0.95	0.035	0.035	0.80-1.10	0.15-0.20	-
SUP 11A	0.55-0.65	0.15-0.35	0.70-1.00	0.035	0.035	0.70-1.10	-	0.0005
<b>BS 970 EN</b>								
42	0.70-0.85	0.10-0.40	0.55-0.75	0.050	0.050	-	-	-
43	0.45-0.60	0.10-0.40	0.60-0.80	0.050	0.050	-	-	-
45	0.50-0.60	1.50-2.00	0.70-1.00	0.050	0.050	-	-	-
45A	0.55-0.65	1.70-2.00	0.70-1.00	0.050	0.050	-	-	-
47	0.45-0.55	0.50MAX	0.50-0.80	0.050	0.050	0.80-1.20	0.15MIN	-
48	0.45-0.55	0.10-0.50	0.50-0.80	0.050	0.050	1.00-1.40	-	-
48A	0.50-0.60	1.35-1.65	0.60-0.90	0.050	0.050	0.55-0.85	-	-
<b>DIN</b>								
38Si7	0.35-0.42	1.50-1.80	0.50-0.80	0.045	0.045	-	-	-
51Si7	0.47-0.55	1.50-1.80	0.50-0.80	0.045	0.045	-	-	-
60Si7	0.55-0.65	1.50-2.00	0.80-1.00	0.035	0.035	-	-	-
60SiCr7	0.55-0.65	1.50-1.80	0.70-1.00	0.045	0.045	0.20-0.40	-	-
55Cr3	0.52-0.59	0.15-0.40	0.70-1.00	0.035	0.035	0.60-0.90	-	-
50CrV4	0.47-0.55	0.15-0.40	0.70-1.00	0.035	0.035	0.90-1.20	0.10-0.20	-
51CrMoV4	0.48-0.56	0.15-0.40	0.70-1.00	0.035	0.035	0.90-1.20	0.07-0.12	0.15-0.25
55CrNiV22	0.51-0.55	0.15-0.30	0.80-1.00	0.025	0.020	0.30-0.50	0.20-0.30	NI- 0.80-1.20