



NEX

From SAIL

The Future in Steel Design

PARALLEL FLANGE SECTIONS



स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड

STEEL AUTHORITY OF INDIA LIMITED

केन्द्रीय विपणन संगठन

CENTRAL MARKETING ORGANISATION

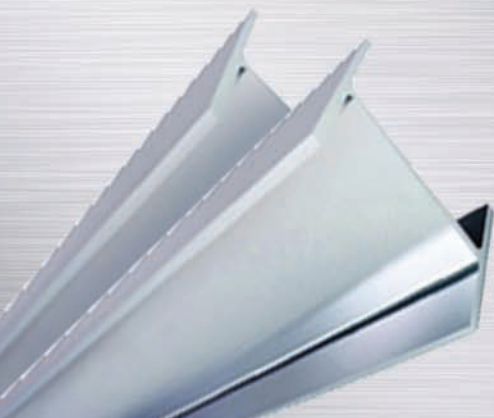
Government of India Enterprise

There's a little bit of SAIL in everybody's life

**SAIL is one of the largest
steel producers in India**



**SAIL contributes
immensely in developing
infrastructure for the country**



**SAIL is a one-stop-shop
for all steel products. Sells
50+ products in 500+
grades and 5000+
dimensions**

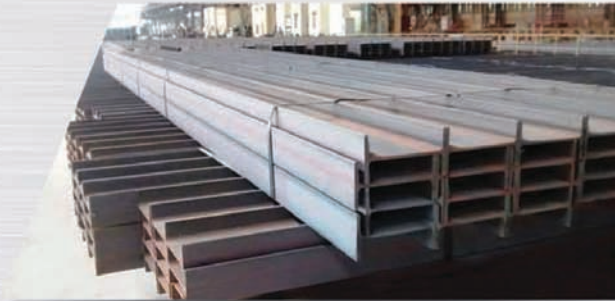
Our latest product is



Parallel Flange Sections

From SAIL's state-of-the-art mills

Parallel Flange Sections (IS 12778) are hot rolled steel structural sections, with parallel flanges having square toes and curves at the root of flange and web

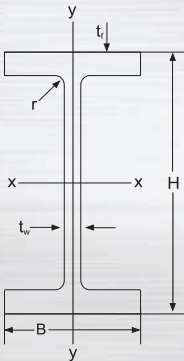


Parallel Flange Sections meet international standards of quality and stringent requirements of the infrastructure and construction industries

Parallel sections are preferred by today's structural engineers, architects and construction companies

Parallel Flange Sections have multiple advantages over conventional sections

Higher product flexibility - Wide range of width, flange thickness and web thickness combinations for any nominal depth



- H : Depth
- B : Width
- t_f : Flange thickness
- t_w : Web thickness
- r : Root radius
- x : X axis
- y : Y axis

Mechanically more efficient - Higher bending strength for beams and higher axial load carrying capacity for columns

Structurally more stable - Greater radius of gyration lowers slenderness ratio and allows withstanding of buckling to a greater extent

Lighter structures - Higher strength-to-weight ratio leads to lighter structures and foundations

Parallel Flange Sections have multiple advantages over conventional sections

Easier fabrication - Easier connection of joints by direct bolting on flanges without using tapered washes and easier butt welding of plate at edge of flange



Economical - Substantial saving in material weight when used as compression member (columns) or flexural member (beams)

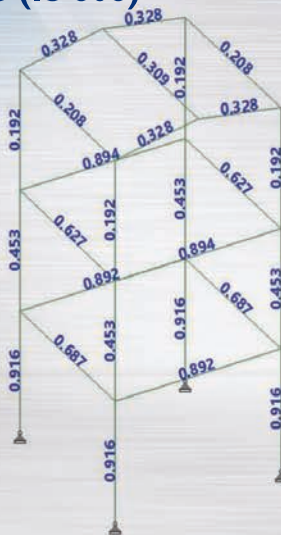
Type	Size	Weight Kg/m	Area (Sq. cm)	Radius of Gyration(cm)
ISMB	600x210	123	156	4.12
NPB	600x210	122.45	156	4.66
WPB	400x300	124.8	159	7.34

Section	Mass (Kg/m)	Section Modulus about major axis(cm ³)
MB 400	61.6	1022.9
NPB 400x180x57.38	57.38	1022.3

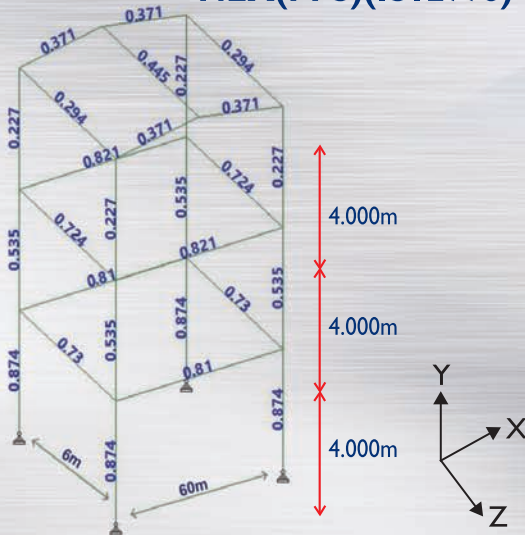
NEX Parallel Flange Sections are more efficient and provide more economic designs.

e.g. UTILISATION RATIO of sections

TFS (IS 808)



NEX(PFS)(ISI2778)



Max utilisation ratio of the Conventional sections used:

Top Beams: MB250 – 0.328

Mid Beams: MB350 – 0.894

Lower Beams: MB450 – 0.892

Columns: MB600 – 0.916

Max utilisation ratio of the Parallel Flange Sections used:

Top Beams: NPB250x30.11 – 0.371

Mid Beams: NPB300x49.32 – 0.821

Lower Beams: NPB400x66.31 – 0.81

Columns: WPB240x83.2 – 0.874

The ratio of calculated design load on any structural member to its load-carrying capacity is known as UTILISATION RATIO which should normally be less than one

Loading conditions

- ☐ Dead Load of 400 kg/m on floor beams & 100 kg/m on roof beams.
- ☐ Live Load of 1000 kg/m² on lower level floor beams & 600 kg/m² on mid level floor and 200 kg/m² on roof beams.
- ☐ Wind Load of 300 kg/m on each column in both X & Z direction.

□ Comparison of the weight of structure, for the above example, is given below:

Conventional Section	Weight in Tons	Parallel Flange Section	Weight in Tons
MB 600 x 123.0	5.79	WFPB 240 x 83.20	3.985
MB 450 x 72.4	1.735	NPB 400 x 66.31	1.588
MB 350 x 52.4	1.254	NPB 300 x 49.32	1.181
MB 250 x 37.3	1.125	NPB 250 x 30.11	0.906
Total	9.904	Total	7.661

23% saving in weight is realised by using NEX Parallel Flange Sections instead of conventional sections for the example shown.

□ Greater efficiency of the Parallel Flange Sections is primarily due to better distribution of material across the section. This leads to greater moment of inertia, section modulus and radius of gyration. Consequently PFS has more load carrying capacity.

ADVANTAGES OF USING HIGHTENSILE SECTIONS

- Lighter super structure
- Upfront savings in cost due to lesser weight of steel
- Reduced depth of beams
- Greater load carrying capacity for same depth of columns used in mild steel
- Lower transportation, handling and erection costs due to lower weight of structure

NEX AS ELECTRIC POLE (WPB I 60)

			Dimensions (mm)						
Sections	Mass (Kg/m)	Sectional Area (cm ²)	D (Depth)	B (Width)	t (Web thick)	T (Flange thick)	Flange slope, a deg	R ₁ (Root Radius)	R ₂
WPB I 60	30.44	38.78	152	160	6	9	-	15	-
WPB I 60	23.84	30.37	148	160	4.5	7	-	15	-

		Sectional Properties							
		Moment of Inertia		Radius of Gyration		Section Modulus		Plastic Section Modulus	
Sections	Mass (Kg/m)	I _x (cm ⁴)	I _y (cm ⁴)	R _x (cm)	R _y (cm)	Z _x (cm ³)	Z _y (cm ³)	Z _{px} (cm ³)	Z _{py} (cm ³)
WPB 160x30.44	30.44	1672.97	615.57	6.57	3.98	220.13	76.95	245.17	117.64
WPB 160x23.84	23.84	1282.88	478.73	6.50	3.97	173.36	59.84	190.43	91.37

Advantages of using NEX (WPB I 60) as electric pole

1. Comparatively lighter steel member with higher section modulus
2. Saving in cost due to lower weight of steel member
3. Easier connection due to parallel flanges
4. Lower transportation, handling and erection cost owing to lighter members
5. Superior finish from state-of the-art mills
6. Supply in specific lengths as per requirement
7. Alternative of existing sections viz., HBI 50*34.6kg/m, SCI 50*37.1kg/m, JI 16*23kg/m etc with cost saving.

Steel conforming to IS: 2062-2011, Hot Rolled Section as per I 2778:2004 & tolerances as per ISI 2779:1989 (1995)

WPB I 60 is available in 4 sections of 23.84kg/m, 30.44kg/m, 42.59kg/m and 76.19kg/m in Grade E250BR and above. WPB I 60 in 23.84 kg/m & 30.44 kg/m have been adopted as Electric Poles by some of the State Government discoms for implementation of their DDUGJY, SAUBHAGYA & IPDS schemes.

Application of NEX

Flyovers

Stadiums

Metro Rails/Indian Railways

Foot Over Bridges

Multi-level Car Parks

Industrial Buildings

Raw Material Handling Plants

Residential Complexes

Commercial Complexes

Power Plants

Ports/Offshore Structures

Oil Refineries/Petrochemical Plants

Electric Poles (Masts)

Trailer and Truck Bed Frames

Some of our valued customers using NEX Parallel Flange Sections



Some of our valued customers using NEX Parallel Flange Sections



NEX PFS available with SAIL

Narrow Flange Parallel Beams

NPB 100 X 55 X 8.10
NPB 200 X 100 X 22.36
NPB 200 X 100 X 25.09
NPB 250 X 125 X 30.11
NPB 300 X 150 X 36.52
NPB 300 X 150 X 42.24
NPB 300 X 150 X 49.32
NPB 400 X 180 X 57.38
NPB 400 X 180 X 66.3
NPB 400 X 180 X 75.66
IPE 400R [400X 180 X 84.00]
NPB 450 X 190 X 67.15
NPB 450 X 190 X 77.57
NPB 450 X 190 X 92.36
IPE 450R [450 X 190 X 95.20]
IPE 450V [450 X 190 X 104.00]
NPB 500 X 200 X 79.36
NPB 500 X 200 X 90.68

Narrow Flange Parallel Beams

NPB 600 X 220 X 122.45
NPB 600 X 220 X 154.46
IPE 600V[600 X 220 X 184.00]
NPB 750 X 270 X 174.54
NPB 750 X 270 X 202.48
IPE 750 [750 X 270 X 173.00]
IPE 750 [750 X 270 X 185.00]
IPE 750 [750 X 270 X 196.00]

Wide Flange Parallel Beams

WPB 160 X 160 X 23.84
WPB 160 X 160 X 30.44
WPB 160 X 160 X 42.59
WPB 160 X 160 X 76.19
WPB 240 X 240 X 47.39
WPB 240 X 240 X 60.32
WPB 240 X 240 X 83.20
WPB 240 X 240 X 156.67
WPB 300 X 300 X 117.04

As per IS 2062:2011 grades readily available -
E250, E300, E350, E410, E450

Contact Details for Commercial Enquiry

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