



WHEELS & CASTORS



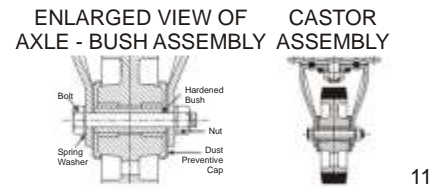
DIFFERENT TYPES OF WHEELS



DIFFERENT TYPES OF BEARINGS IN WHEELS



CASTOR ASSEMBLY



VARIOUS ATTACHMENTS TO CASTORS



LIGHT DUTY / LIGHT DUTY EXTRA STRENGTH PRESSED STEEL CASTORS / BRACKETS



MEDIUM DUTY PRESSED STEEL CASTORS / BRACKETS



HEAVY DUTY FORGED STEEL CASTORS / BRACKETS



HEAVY DUTY FORGED STEEL TWIN CASTORS



TRACK CASTORS





Dear Customer,

It gives me pleasure to present this catalogue to you. We are one of the leading manufacturers of a variety of wheels & castors fixed to various types of trolleys and equipments used in factories, warehouses, godowns & stores, hotels & canteens, hospitals, railway platforms, aerodromes etc. since year 1976 i.e. more than 30 years now.

Technical information & specifications for different types of wheels & castors has been given in the catalogue. However, in case you need any additional information or any clarifications, please ask for it.

Cost of replacement of wheel or castor is not just the cost of that wheel or castor. It also includes cost of inconvenience & downtime of the equipment, manpower lost etc. And these costs are much higher than the actual cost of wheel or castor. This point is foremost in our mind. Therefore our designs are robust for long lasting service of products. As a result, though initial purchase price of our product is slightly higher, the cost over a longer period is much less. Therefore, once the customer starts using our products, he never switches to any other brand. We are proud that 90 % of our orders are repeat orders from our satisfied customers. If you have not used our products till now, you may try once. I am sure that it will be a start of longer lasting relationship for mutual benefit of both.

Before deciding on a particular wheel or castor to be used, I request you to go through the "Selection Criteria for Wheels & Castors" given at the end of the catalogue. This will help you to select castor wheels which will need optimum pulling / pushing efforts and give longer working life at minimum operational cost.

A word of caution. Please be cautious of duplicate / spurious material. Always check for genuine "PIONEER" wheels, castors & spares.

Ajit Kotibhaskar

PRODUCTION FACILITIES

In order to have full fledged control over design & development, production, quality control, immediate deliveries and cost reduction, we have installed all the production facilities in-house.



PRESS SHOP : Fixed & swivel brackets, drums for SRT wheels and sheet metal components for accessories are manufactured in our full fledged press shop with mechanical & hydraulic presses. Shearing machine facility is also available for cutting of strips to be fed to the presses.



RUBBER SHOP : Life of rubber tyres depends very much on the rubber compound used and the curing time allowed. To have continuous check on these parameters, rubber tyres are manufactured in-house. We have full fledged rubber shop with rubber mixing mills and hydraulic rubber moulding presses.



UHMW-PE WHEELS MOULDING : UHMW-PE wheels are moulded on hydraulic compression moulding presses under strict temperature & pressure conditions and extended curing time for avoiding development of blow holes in the mass of the wheels.



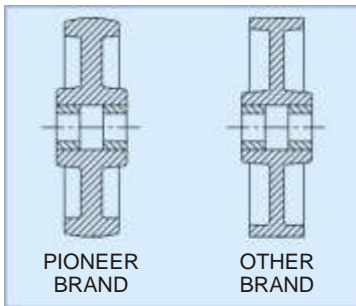
INJECTION MOULDING : All Polypropelene, Nylon & Polyurethane wheels are manufactured in-house on microprocessor controlled fully automatic injection moulding machines. Consistent quality of wheels is ensured as the temperature of material, pressure on the moulds, cooling time etc. are critically controlled by full automation. Raw materials of proper grade are selected for achieving required hardness & abrasion resistance.



TOOL ROOM : All dies & punches, moulds, jigs & fixtures for production & inspection are manufactured in-house in our own tool room having CNC wire cutting machine, vertical milling machine with D.R.O, radial drilling machine, surface grinder etc. The in-house tool room also ensures immediate maintenance of all the toolings and avoids delay in production.

WHY “ PIONEER “ WHEELS & CASTORS

There are ample reasons why large number of satisfied customers are using “PIONEER” wheels & castors. Some of them are :



Robust Designs; Longer Maintenance Free Life; Low overall cost :

Our designs of wheels & castors are robust yet attractive in look. Raw materials are selected giving due consideration to the strength of material. This reduces chances of failure of wheels or castors drastically, giving extended service life. This also reduces maintenance of castors & downtime of trolleys, reducing actual working cost of wheels & castors substantially. The extended working life & reduced maintenance cost offset the slightly higher initial purchase prices of our products.



Continuous Development & Improvements; Consistent Quality :

Our research & development team takes continuous efforts for developing new innovative products & improving the existing products. Rigorous procedures have been installed for inspection at all stages of the production. This ensures that only consistent superior quality products are produced and dispatched.

We also develop custom design wheels & castors, which are not in our existing range of products.



Large Variety :

Wheels are manufactured in nine different types from 40 mm dia x 20 mm width to 300 mm dia x 75 mm width having load carrying capacities ranging from 16 Kg. to 2000 Kg. per wheel. Fixed & swivel type brackets are manufactured in five different series for different load carrying capacities. The combination of wheels of different types and brackets of different series gives a customer hundreds of choices of castors for selection as per his requirement.



Immediate Availability; Large Responsive Dealer Network :

We maintain huge stocks of all our products in our store. In addition, large stocks of all running items are maintained by our Authorised Dealers for immediate deliveries. Our Authorised Dealers help the customer to identify & finalise his requirement, offer very reasonable prices, make efforts for prompt deliveries & render quick after sales service, if required at any time. In un-represented areas, the customer gets all these services directly from us.



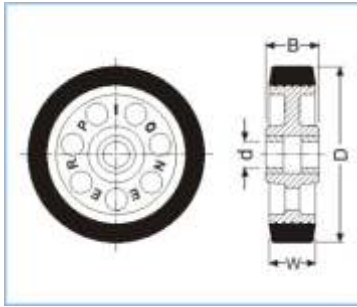
Customer Satisfaction :

We consider that it is our prime responsibility to offer excellent products to our customers at reasonable prices & within shortest delivery period. Although initial purchase price of our product is slightly higher, the cost over a longer period is much less. We are proud to say that 90 % of our orders are repeat orders from our satisfied customers. As a matter of fact, because of all the above mentioned points, once a customer starts using “ Pioneer “ wheels & castors, he never switches to any other brand.

DIFFERENT TYPES OF WHEELS

We manufacture wheels in nine different types. Properties, dimensional details and load carrying capacities of wheels of different types are given below.

For getting optimum performance of wheels, please go through 'Selection Criteria for Wheels and Castors' on page no. 20 before deciding on a particular wheel or castor.



The adjusting figure shows scheme of important dimensions of any type of wheel. Actual dimensions are given in the tables for each type of wheel.

- D** : Diameter of Wheel
- d** : Bore of Wheel
- W** : Width of Wheel
- B** : Boss Length of Wheel



SOLID RUBBER TYRE WHEELS (SRT)

(Range : 100 x 32 mm To 300x75 mm)

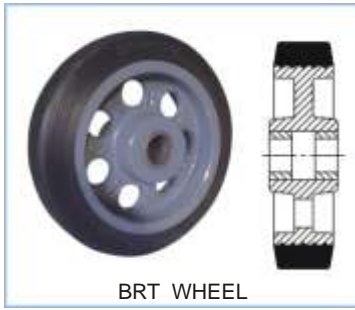
The wheel consists of Solid Rubber Tyre clamped between two pressed steel drums with bolts & nuts. Tyre is made from good quality rubber compound to ensure long life & good cushioning effect. The tyre, when worn out, can be replaced easily on sight.

- Hardness of rubber : (85 ± 5) on Shore 'A' scale.
- Maximum working temperature : 50°C

Size of wheel Dia x Width D mm x W mm	Width of boss of wheel B mm	Size of bore for wheels with					Ball bearing used (number)	Load Carrying Capacity Kg.
		PLB d mm	NYL d mm	SIB d mm	NRB d mm	BB d mm		
100 x 32	38 / 45	---	---	15.9	15.9	---	---	70
125 x 32	38 / 45	---	---	15.9	15.9	---	---	90
150 x 40	50	---	---	---	19.0	---	---	120
150 x 50	60	---	---	25.4	19.0 / 25.4	25.00	6005	125
200 x 50	60	---	---	25.4	19.0 / 25.4	25.00	6205	150
200 x 75	90	---	---	25.4	25.4	25.00	6205	225
250 x 50	60	---	---	25.4	25.4	25.00	6205	175
300 x 50	60	---	---	25.4	25.4	25.00	6205	200
300 x 75	90	---	---	25.4	25.4	25.00	6205	300

Note : In case of SRT wheel 100 x 32 & 125 x 32, width of boss of wheel is 38 mm for LD and LD-X series & 45 mm for MD series.

SRT wheels of NRB type are provided with plastic cage NRB. Metal cage NRB can be fitted in these wheels on request.



BRT WHEEL

BONDED RUBBER TYRE WHEELS (BRT)

(Range : 77x32 mm To 300x75 mm)

A good quality rubber compound bonded (moulded) over a cast iron core forms a Bonded Rubber Tyre wheel. The load carrying capacity as well as life of BRT wheel is much more than that of SRT wheel. Casting can be returned back to us for rebonding of rubber when it is worn out.

Hardness of Rubber : (75 ± 5) on Shore 'A' scale.
 Grade of casting : FG200 as per IS-210
 Maximum working temperature : 50°C

Size of wheel Dia x Width D mm x W mm	Width of boss of wheel B mm	Size of bore for wheels with					Ball bearing used (number)	Load Carrying Capacity Kg.
		PLB d mm	NYL d mm	SIB d mm	NRB d mm	BB d mm		
77 x 32	45	---	---	15.9	---	---	---	80
100 x 32	45	---	---	15.9	19.0	20.00	6004	100
100 x 50	60	---	---	25.4	19.0 / 25.4	25.00	6205	150
125 x 32	45	---	---	15.9	19.0	20.00	6004	140
125 x 50	60	---	---	25.4	19.0 / 25.4	25.00	6205	175
150 x 50	60	---	---	25.4	19.0 / 25.4	25.00	6205	200
150 x 75	90	---	---	---	25.4	25.00	6205	300
200 x 50	60	---	---	25.4	19.0 / 25.4	25.00	6205	250
200 x 75	90	---	---	---	25.4	25.00	6205	375
250 x 50	60	---	---	25.4	25.4	25.00	6205	300
250 x 75	90	---	---	---	25.4	25.00	6205	450
300 x 50	60	---	---	25.4	25.4	25.00	6205	400
300 x 75	90	---	---	---	25.4	25.00	6205	600

Note : BRT wheels of NRB type are provided with plastic cage NRB. Metal cage NRB can be fitted in these wheels on request.



PU WHEEL

POLYURETHANE WHEELS (PU)

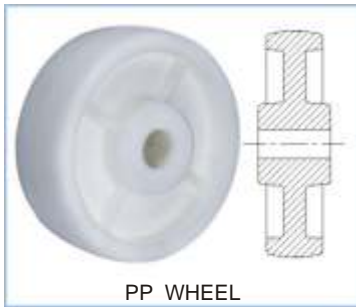
(Range : 77x32 mm To 200x50 mm)

Polyurethane with high abrasion resistance, mechanically locked over a polypropylene core, forms a Polyurethane wheel. The load carrying capacity as well as life of wheel is much more than that of SRT wheel. PU wheels have good shock absorption capacity & very low noise level.

Hardness of Polyurethane : (94 ± 2) on Shore 'A' scale.
 Maximum working temperature : 50°C

Size of wheel Dia x Width D mm x W mm	Width of boss of wheel B mm	Size of bore for wheels with					Ball bearing used (number)	Load Carrying Capacity Kg.
		PLB d mm	NYL d mm	SIB d mm	NRB d mm	BB d mm		
77 x 32	45	15.9	---	---	---	---	---	75
100 x 32	38 / 45	15.9	---	---	---	---	---	100
125 x 32	38 / 45	15.9	---	---	---	---	---	125
150 x 40	50	---	19.0	---	---	20.00	6004	150
150 x 50	60	---	19.0	---	---	20.00	6004	160
200 x 50	60	---	19.0	---	---	20.00	6004	175

Note : In case of PU wheel 100 x 32 & 125 x 32, width of boss of wheel is 38 mm for LD and LD-X series & 45 mm for MD series.



POLYPROPELENE WHEELS (PP)

(Range : 40x20 mm To 150x50 mm)

These wheels are manufactured from virgin Polypropelene Co-Polymer (PP-CP), white in colour, by injection moulding. The wheels are light in weight but have fair load carrying capacity. The acidic or alkaline chemicals have no effect on these wheels.

Hardness of Wheel : (80 ± 5) on Shore 'D' scale.

Maximum working temperature : 50°C

Size of wheel Dia x Width D mm x W mm	Width of boss of wheel B mm	Size of bore for wheels with					Ball bearing used (number)	Load Carrying Capacity Kg.
		PLB d mm	NYL d mm	SIB d mm	NRB d mm	BB d mm		
40 x 20	23	6.0	---	---	---	---	---	15
50 x 22	25	10.0	---	---	---	---	---	20
63 x 22	25	10.0	---	---	---	---	---	30
75 x 22	25	10.0	---	---	---	---	---	30
77 x 32	45	15.9	---	---	---	---	---	80
100 x 32	38 / 45	15.9	---	15.9	---	---	---	100
100 x 50	60	25.4	---	25.4	---	20.0	6004	175
125 x 32	38 / 45	15.9	---	15.9	---	---	---	150
125 x 50	60	25.4	---	25.4	---	20.0	6004	225
150 x 40	50	19.0	---	---	---	---	---	160
150 x 50	60	25.4	---	25.4	---	20.0	6004	300

Note : In case of PP wheel 100 x 32 & 125 x 32, width of boss of wheel is 38 mm for LD and LD-X series & 45 mm for MD series.



NYLON WHEELS (NYL)

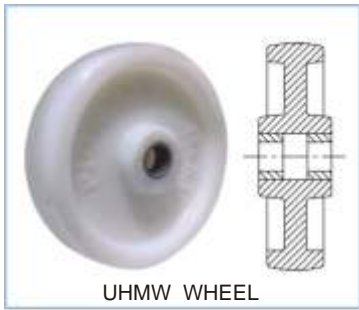
(Range : 50x25 mm To 150x50 mm)

These wheels are manufactured from virgin Nylon 6, white in colour, by injection moulding. These wheels are light in weight, but have high load carrying capacities. These wheels can be used upto 90°C temperature. The acidic or alkaline chemicals have no effect on these wheels.

Hardness of Wheel : (90 ± 5) on Shore 'D' scale.

Maximum working temperature : 90°C

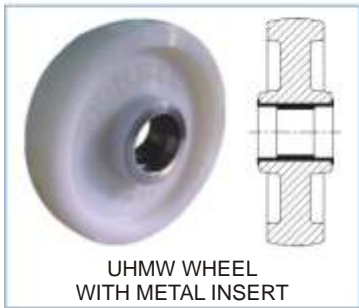
Size of wheel Dia x Width D mm x W mm	Width of boss of wheel B mm	Size of bore for wheels with					Ball bearing used (number)	Load Carrying Capacity Kg.
		PLB d mm	NYL d mm	SIB d mm	NRB d mm	BB d mm		
50 x 25	30	12.0	---	---	---	---	---	60
75 x 25	30	12.0	---	---	---	---	---	100
77 x 32	45	15.9	---	---	---	---	---	120
100 x 32	45	15.9	---	---	---	---	---	130
125 x 32	45	15.9	---	---	---	---	---	200
150 x 50	60	---	19.0	---	---	20.0	6004	350



UHMW-PE WHEELS & ROLLERS (UHMW)

(Range : 100x32 mm To 300x75 mm)

These are manufactured from virgin Ultra High Molecular Weight Polyethylene (UHME-PE) powder, white in colour. These wheels are light in weight but have very high load carrying capacity, higher wear resistance as well as high impact strength. Therefore the question of wheel cracking under load or impact load does not arise, as it may happen in case of polypropelene, nylon or fiber wheels. The material has got very low coefficient of friction. Therefore, pulling or pushing efforts required are considerably less. The material does not have any effect of chemicals or acids. Though the UHMW wheels can carry heavy loads, the material is not hard like cast iron. Therefore UHMW wheels do not damage the flooring.



UHMW-PE WHEELS WITH METAL INSERT FOR BALL BEARINGS

As the UHMW material has got very low coefficient of friction, ball bearing has tendency to rotate in the step bore. To avoid this, metal insert is pressed in the wheel. The metal insert has step bore suitable for ball bearing.

Please note that there are two types of UHMW wheels. MD type wheels having medium load carrying capacity suitable for MD series castors. HD type wheels having thicker section for higher load carrying capacity suitable for HD series castors. Please check for words MD & HD engraved on UHMW wheels and see that HD wheels are fitted in HD brackets.



UHMW ROLLERS

(Range : 82x70 mm To 82x100 mm)

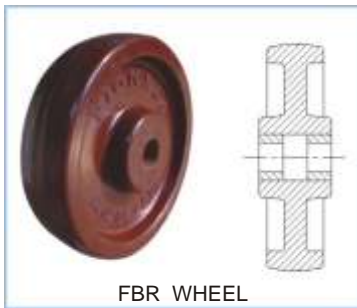
In view of light weight, high load carrying capacity and high impact strength UHMW-PE rollers are fitted to pallet trucks, stackers and similar equipments.

Hardness of Wheel / Roller : (75 ± 5) on Shore 'D' scale.
Maximum working temperature : 70°C

A word of caution : Wheels from UHME-PE material & PP material look alike. Both have white / off white shade. However, there is a vast difference in working life of the wheels. Life of UHMW wheel is at least three times the life of PP wheel of the same size, both being used under the same conditions.

Size of wheel Dia x Width D mm x W mm	Width of boss of wheel B mm	Size of bore for wheels with					Ball bearing used (number)	Load Carrying Capacity	
		PLB d mm	NYL d mm	SIB d mm	NRB d mm	BB d mm		MD Kg.	HD Kg.
100 x 32	38 / 45	15.9	---	15.9	19.0	20.0	6004	175	---
100 x 50	60	25.4	---	25.4	19.0 / 25.4	25.0	6205	300	300
125 x 32	38 / 45	15.9	---	15.9	19.0	20.0	6004	250	---
125 x 50	60	25.4	---	25.4	19.0 / 25.4	25.0	6205	250	400
150 x 40	50	19.0	---	19.0	---	20.0	6004	250	---
150 x 50	60	25.4	---	25.4	19.0 / 25.4	25.0	6205	350	550
150 x 75	90	25.4	---	25.4	25.4	25.0	6205	---	750
200 x 50	60	25.4	---	25.4	19.0 / 25.4	25.0	6205	500	750
200 x 75	90	25.4	---	25.4	25.4	25.0	6205	---	1000
250 x 50	60	25.4	---	25.4	25.4	25.0	6205	---	900
250 x 75	90	25.4	---	25.4	25.4	25.0	6205	---	1200
300 x 50	60	25.4	---	25.4	25.4	25.0	6205	---	1200
300 x 75	90	25.4	---	25.4	25.4	25.0	6205	---	1600
UHMW ROLLERS									
82 x 70	70	---	---	---	---	20.0 / 25.0	6204/6205	400	
82 x 85	85	---	---	---	---	20.0 / 25.0	6204/6205	450	
82 x 96	96	---	---	---	---	20.0 / 25.0	6204/6205	500	
82 x 100	100	---	---	---	---	20.0 / 25.0	6204/6205	500	

SPECIAL WHEELS IN UHMW-PE : UHMW-PE wheels in sizes 300 x 50 mm & 300 x 75 mm have 85 mm boss diameter. This boss diameter is suitable for fitting ball bearings upto size 6006 having OD 55 mm. However, in case higher size bearings is a necessity, we have wheels in size 300 x 50 mm with 110 mm boss dia and in size 300 x 75 mm with 125 mm boss dia.



FBR WHEEL

FIBRE WHEELS (FBR)

(Range : 100x32 mm To 150x50 mm)

These wheels are manufactured by compression moulding shredded cotton fabric, soaked in good quality phenolic resin. The hardness of fibre wheel is higher than the hardness of UHMW wheel. As a result, the chances of steel burr lying on the shop floor getting embedded in wheel surface are remote. The acidic or alkaline chemicals have little effect on these wheels.

Hardness of Wheels : (90 ± 5) on Shore 'D' scale.

Maximum working temperature : 170°C

Size of wheel Dia x Width D mm x W mm	Width of boss of wheel B mm	Size of bore for wheels with					Ball bearing used (number)	Load Carrying Capacity Kg.
		PLB d mm	NYL d mm	SIB d mm	NRB d mm	BB d mm		
100 x 32	45	15.9	---	15.9	19.0	20.0	6004	130
100 x 50	60	25.4	---	25.4	19.0 / 25.4	25.0	6205	225
150 x 50	60	25.4	---	25.4	19.0 / 25.4	25.0	6205	400



CI WHEEL

CAST IRON WHEELS (CI)

(Range : 50x25 mm To 300x75 mm)

These are bare cast iron wheels made from good quality graded castings, machinable & free from blow holes. These wheels have very high load carrying capacity & are suitable for high temperature applications like ovens, foundries etc. The only disadvantage of CI wheels is that they damage the costly floor surfaces.

Grade of Casting : FG 200 as per IS-210

Hardness of Casting : (175 ± 10) BHN.

Maximum working temperature : 250°C

Size of wheel Dia x Width D mm x W mm	Width of boss of wheel B mm	Size of bore for wheels with					Ball bearing used (number)	Load Carrying Capacity Kg.
		PLB d mm	NYL d mm	SIB d mm	NRB d mm	BB d mm		
50 x 25	30	---	---	12.0	---	---	---	100
75 x 25	30	---	---	12.0	---	---	---	150
77 x 32	45	---	---	15.9	19.0	20.0	6004	200
100 x 32	45	---	---	15.9	19.0	20.0	6004	300
100 x 50	60	---	---	25.4	19.0 / 25.4	25.0	6205	400
125 x 32	45	---	---	15.9	19.0	20.0	6004	400
125 x 50	60	---	---	25.4	19.0 / 25.4	25.0	6205	500
150 x 50	60	---	---	25.4	19.0 / 25.4	25.0	6205	700
150 x 75	90	---	---	---	25.4	25.0	6205	1050
200 x 50	60	---	---	25.4	19.0 / 25.4	25.0	6205	900
200 x 75	90	---	---	---	25.4	25.0	6205	1350
250 x 50	60	---	---	25.4	25.4	25.0	6205	1050
250 x 75	90	---	---	---	25.4	25.0	6205	1575
300 x 50	60	---	---	---	25.4	25.0	6205	1400
300 x 75	90	---	---	---	25.4	25.0	6205	2000

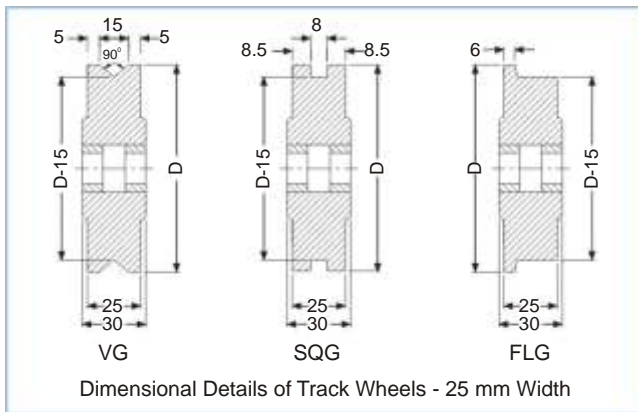


CAST IRON TRACK WHEELS (TRK)

(Range : 50x25 mm To 300x50 mm)

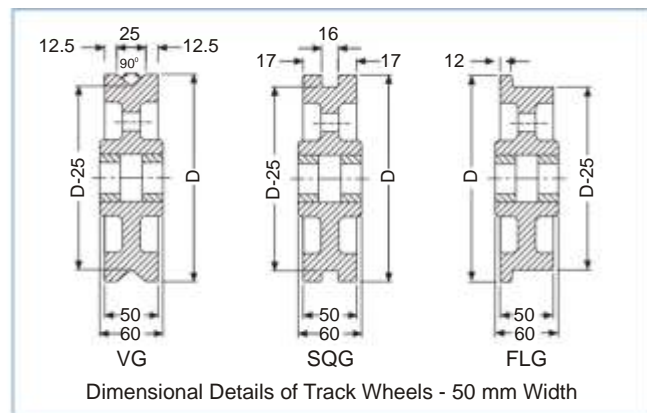
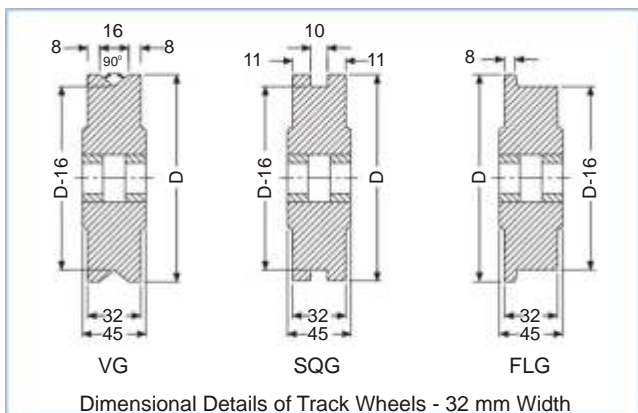
Cast iron wheels with either V-groove (VG), Square groove (SQG) or a Flange (FLG) are available depending upon the type of track over which the wheels have to move. Since the wheels roll over steel track, the pushing or pulling force required is much less. Floor surface also does not get damaged at any time.

Size of wheel Dia x Width D mm x W mm	Width of boss of wheel B mm	Size of bore for wheels with					Ball bearing used (number)	Load Carrying Capacity Kg.
		PLB d mm	NYL d mm	SIB d mm	NRB d mm	BB d mm		
50 x 25	30	---	---	12.0	---	---	---	100
75 x 25	30	---	---	12.0	---	---	---	150
77 x 32	45	---	---	15.9	19.0	20.0	6004	200
100 x 32	45	---	---	15.9	19.0	20.0	6004	300
100 x 50	60	---	---	25.4	19.0 / 25.4	25.0	6205	400
125 x 50	60	---	---	25.4	19.0 / 25.4	25.0	6205	500
150 x 50	60	---	---	25.4	19.0 / 25.4	25.0	6205	700
200 x 50	60	---	---	25.4	19.0 / 25.4	25.0	6205	900
250 x 50	60	---	---	25.4	25.4	25.0	6205	1050
300 x 50	60	---	---	25.4	25.4	25.0	6205	1400



Dimensional details of V-groove, Square groove and Flange for wheels having 25 mm width, 32 mm width and 50 mm width are as per drawings given.

Grade of Casting : FG 200 as per IS-210
 Hardness of Casting : (175 ± 10) BHN.
 Maximum working temperature : 250°C

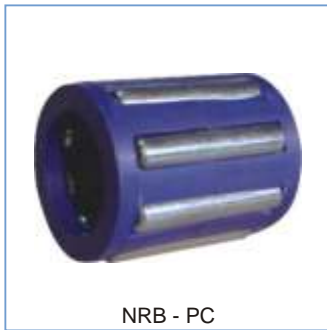


Note : Cast Iron & Cast Iron Track wheels are provided with metal cage NRB. Plastic cage NRB not available in these wheels.

DIFFERENT TYPES OF BEARINGS IN WHEELS



- NYL : Nylon Bushing
- SIB : Sintered Iron Bush
- NRB - PC : Needle Roller Bearing - Plastic Cage
- NRB - MC : Needle Roller Bearing - Metal Cage
- BB : Ball Bearing



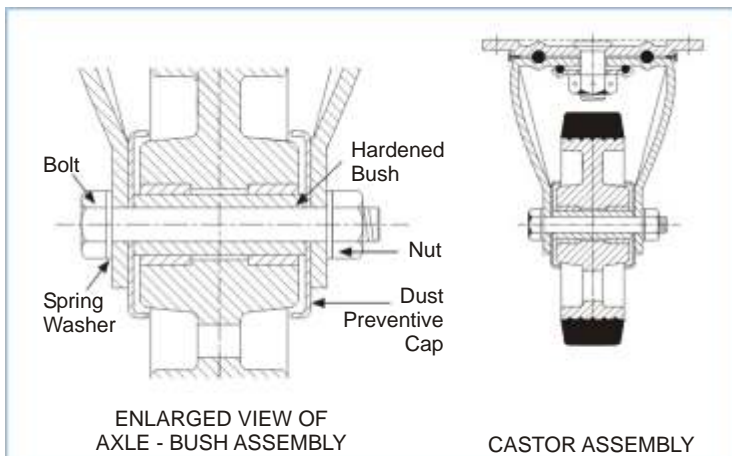
SIZES IN NEEDLE ROLLER BEARING	
Plastic Cage (ID x OD x Length)	Metal Cage (ID x OD x Length)
15.9 x 26.0 x 30	----
19.0 x 34.5 x 35	19.0 x 34.5 x 35
19.0 x 34.5 x 40	19.0 x 34.5 x 50
19.0 x 34.5 x 50	25.4 x 41.0 x 50
25.4 x 41.0 x 50	25.4 x 41.0 x 80



SPECIFICATIONS OF BALL BEARINGS							
Bearing No.	I.D.	O.D.	Width	Bearing No.	I.D.	O.D.	Width
6203	17	40	12	6305	25	62	17
6004	20	42	12	6006	30	55	13
6204	20	47	14	6206	30	62	16
6304	20	52	15	6007	35	62	14
6205	25	52	15	6207	35	72	17

The wheel may have either plain bore (PLB) or may be fitted with either two nylon bushes (NYL) or two self lubricating sintered iron bushes (SIB) or one needle roller bearing (NRB) or two ball bearings (BB). Needle roller bearing may have two varieties - either with plastic cage (NRB-PC) or with metal cage (NRB-MC). Plain bore is available only in case of PP, PU, NYL, UHMW & FBR wheels where the material of wheel itself has bearing properties.

DETAILS OF CASTOR ASSEMBLY



Half thread bolt is manufactured specifically to suit castor assembly. The central bush on which a wheel rotates is hardened (25 to 30 RC) and accurately ground (± 0.02 mm) for longer life of castor assembly. Dust preventive caps or full thread guards are provided to prevent dust & foreign particles entering the bearing area. This gives smooth running of wheels over longer period. Spring washers are provided on either side of bolt to prevent loosening of nut due to shocks in running conditions. Nylock nut or castle nut & cotter pin can also be provided as an extra precaution.

VARIOUS ATTACHMENTS TO CASTORS



We can provide castors with either wheel lock (WHL) or with wheel brake (WHB) and / or swivel lock (SWL). It is essential that the attachment, if required, is specified at the time of ordering itself. It is difficult to fix these attachments afterwards at the customer's premises.

Please note that these attachments are not available for castors of every size of every series. Given below are the sizes of castors for which these attachments are available in every series.

Attachment	LD Series	LD-X Series	MD Series	HD Series
Wheel Lock	---	---	All sizes except 50 x 25 , 75 x 25	All sizes
Wheel Brake	100 x 32 , 125 x 32 150 x 40	100 x 32 , 125 x 32 150 x 40	All sizes except 50 x 25 75 x 25 77 x 32	All sizes
Swivel Lock	---	---	---	All sizes

DUST PREVENTIVE CAPS



Dust preventive caps are provided to cover the bearing of wheel. These cover the boss of the wheel to prevent outside dirt getting into the bearing easily. As a result, the rotation of wheel is smooth for longer period.

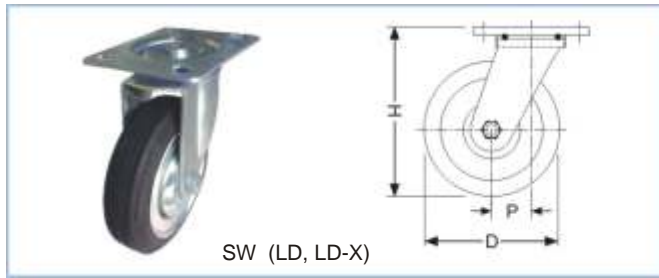
FULL THREAD GUARDS



In textile industries, the fibres get clustered around the rotating wheel & the bearing and the wheel gets jammed. To avoid this, full thread guards are provided on both sides of the wheel. The gap between wheel & thread guard is so small that outside fibres & dirt cannot reach easily to the bearing. As a result, the rotation of wheel is smooth for a longer period as compared to wheels provided with ordinary dust preventive caps.

LIGHT DUTY PRESSED STEEL CASTORS (LD SERIES)

LIGHT DUTY EXTRA STRENGTH PRESSED STEEL CASTORS (LD-X SERIES)



SW (LD, LD-X)



FX (LD, LD-X)

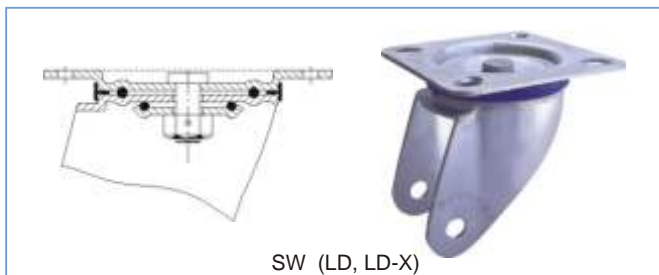
Light duty castors are suitable for hospital furniture, house hold furniture & equipments, laboratory equipments, food serving trolleys in hotels & canteens etc. where weight of material to be carried is less. Light duty extra strength castors are particularly suitable where LD castors fail too frequently & where loads are moderate. Both LD & LD-X castors look alike and have same dimensions. The only difference is, LD-X castors are manufactured from thicker plates.

SRT, PU, PP, UHMW wheels are assembled in LD & LD-X castors.



SW (LD - PG, LD - X - PG)

CONSTRUCTION OF LD & LD-X BRACKETS



SW (LD, LD-X)



SW (LD - PG, LD-X-PG)



FX (LD, LD-X)

Light Duty Swivel Brackets [SW(LD)] & Light Duty Swivel Brackets with peg (i.e. stud or pin) for inserting in a pipe [SW(LD-PG)] are manufactured from tested M. S. plates (IS : D-1079). Both base plate & revolving top are first blanked on a mechanical press & then formed on hydraulic press. The components are first buffed & then zinc plated for elegant look. Steel balls are accommodated in grooves formed on base plate & revolving top. The base & revolving top are assembled together with a king pin. Steel balls are provided between revolving top & washer below the king pin nut for smooth rotation of revolving top. Plastic ring is provided around the steel balls in order that outside dirt does not reach steel balls easily.

Construction of peg type swivel bracket is similar to the plate type swivel bracket except that instead of a base plate, a cup is used to accommodate steel balls & the king pin is an integral part of the peg.

Matching Light Duty Fixed Brackets [FX(LD)] are also manufactured from tested sheets [IS : D-1079] by blanking on mechanical press & forming on hydraulic press. Sides of bracket are embossed for additional strength as well as for elegant look.

Construction of Light Duty Extra Strength swivel bracket [SW(LD-X)] & fixed bracket [FX(LD-X)] is same as that of Light Duty brackets. The only difference is Light Duty Extra Strength brackets are manufactured from thicker plates for carrying higher loads than LD brackets.

STAINLESS STEEL BRACKETS

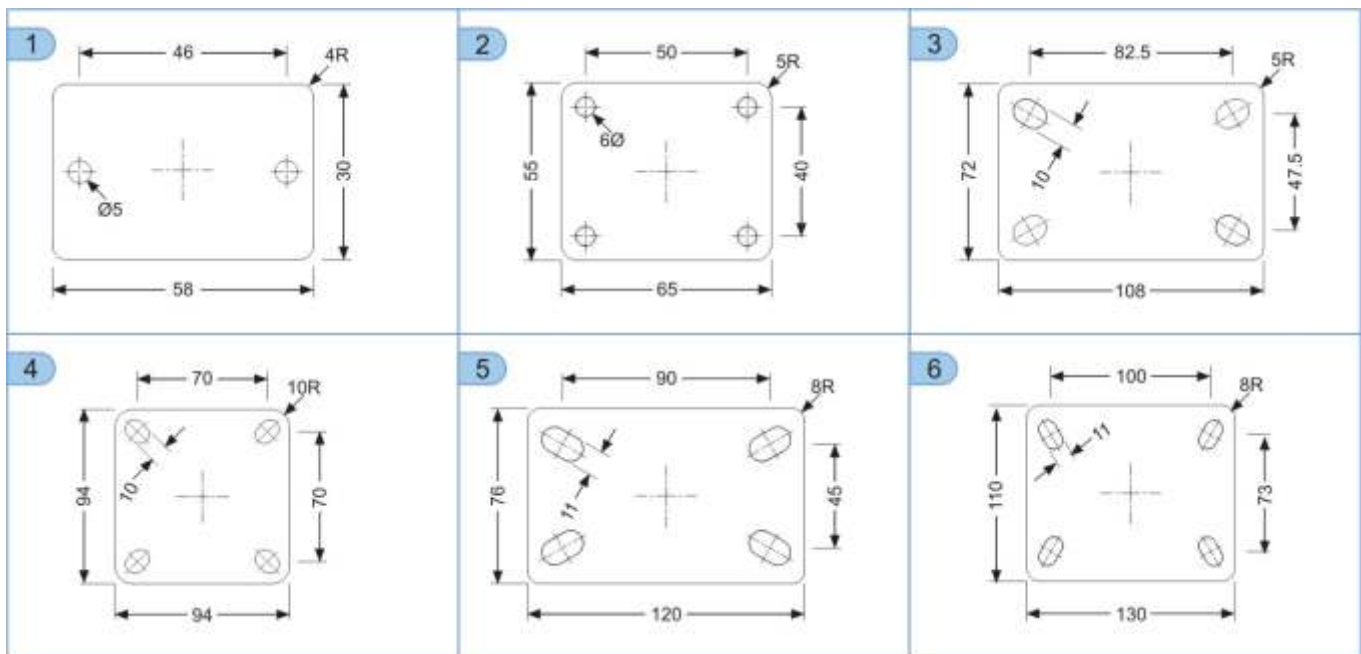
Light Duty Stainless Steel brackets are manufactured from stainless steel sheets (SS-304). All other components of bracket such as kingpin, nut, D.P.cap, spring washer, bolt etc are also of stainless steel. As stainless steel is a non ferrous metal, the chances of corrosion are completely avoided. Also, stainless steel has got excellent resistance to chemicals & hence S.S. brackets are widely used in chemical industries, food industries, fisheries, pharmaceutical industries etc. The brackets are buffed (polished) for mirror finish shining. Please note that these brackets are available in SW (LD) type only.

DIMENSIONAL DETAILS & LOAD CARRYING CAPACITIES

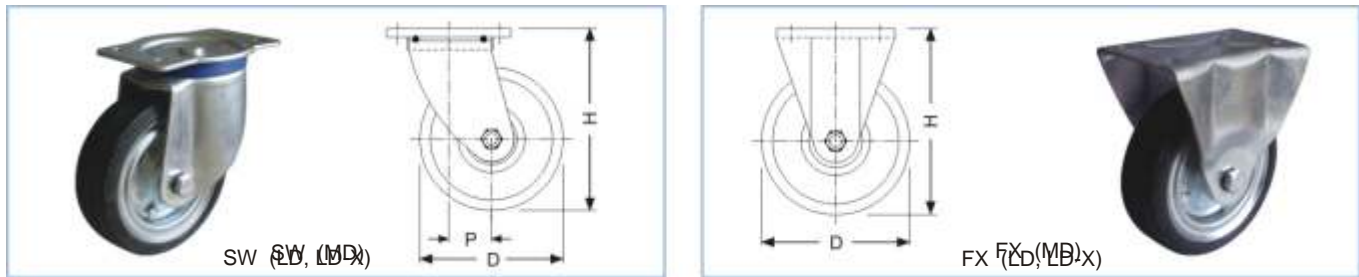
FIXED & SWIVEL CASTORS - LD									
Size of wheel Dia x Width	Overall height	Offset in case of SW Castors	Mounting Plate Number		Standard size of Peg Dia X Length (In case of peg type castors)	Load carrying capacity			
			FX Castor	SW Castor		SRT type Kg.	PU type Kg.	PP type Kg.	UHMW type Kg.
D mm X W mm	H mm	P mm							
40 x 20	50	---	01	---	---	---	---	15	---
50 x 22	70	26	---	02	Ø 16 x 38 L	---	---	20	---
63 x 22	80	26	---	02	Ø 16 x 38 L	---	---	30	---
75 x 22	95	26	---	02	Ø 16 x 38 L	---	---	30	---
100 x 32	125	38	03	04	Ø 22 x 38 L	70	75	75	75
125 x 32	155	38	03	04	Ø 22 x 38 L	90	115	115	115
150 x 40	185	45	05	06	Ø 22 x 38 L	120	150	150	150

FIXED & SWIVEL CASTORS - LD - X									
Size of wheel Dia x Width	Overall height	Offset in case of SW Castors	Mounting Plate Number		Standard size of Peg Dia X Length (In case of peg type castors)	Load carrying capacity			
			FX Castor	SW Castor		SRT type Kg.	PU type Kg.	PP type Kg.	UHMW type Kg.
D mm X W mm	H mm	P mm							
100 x 32	125	38	03	04	Ø 22 x 38 L	70	100	100	100
125 x 32	155	38	03	04	Ø 22 x 38 L	90	125	125	125
150 x 40	185	45	05	06	Ø 22 x 38 L	120	150	160	175

DIMENSIONS OF MOUNTING PLATES FOR FIXED & SWIVEL CASTORS



MEDIUM DUTY PRESSED STEEL CASTORS (MD SERIES)



Medium Duty castors are designed to carry moderate loads i.e. more than LD or LD-X castors, and are suitable for various types of trolleys and equipments used in industries, warehouses, godowns, stores, railway platform and so on. These castors are also suitable for hospital furniture, laboratory equipments or food serving trolleys where load carrying capacity required is higher & the light duty castors need frequent replacement.

SRT, BRT, PU, PP, NYL, UHMW, FBR, CI, CI Track wheels are assembled in Medium Duty brackets.

CONSTRUCTION OF MD BRACKETS



Medium Duty swivel brackets [SW(MD)] are manufactured from tested M. S. plates [IS : D-1079]. Both fixed & swivel brackets are of one piece construction. In case of swivel brackets, both base & revolving top are blanked on mechanical press & then formed on hydraulic press. Steel balls are accommodated in grooves formed on base plate & revolving top. The base & revolving top are assembled together with a specially manufactured round head bolt which acts as a king pin. Steel balls are provided between the revolving top & washer below the king pin nut for smooth rotation of revolving top. Plastic ring is provided around the steel balls so that outside dirt does not reach steel balls easily. The swiveling action is like a thrust bearing. Since the grooves for steel balls are formed on hydraulic press, the consistency of dimensions & finish of grooves are assured for smooth swiveling action. [Some other manufacturers of brackets cut the grooves for steel balls on lathe. As a result, the thickness of plate below the grooves reduces & the bracket becomes weak].

Construction of peg type swivel bracket is similar to the plate type swivel bracket except that instead of a base plate, a cup is used to accommodate steel balls & the king pin is an integral part of the peg. Peg type brackets are available in sizes from 50x25 to 125x32 only. Standard size of Peg - $\varnothing 22 \times 38$ L

Medium Duty fixed brackets [FX(MD)] are manufactured from tested M. S. plates [IS:D-1079] by blanking on a mechanical press & then forming on hydraulic press. Sides of brackets are embossed for additional strength as well as for elegant look.

Both fixed & swivel brackets are first buffed & then zinc plated. Brackets with Nickel Chrome plating can be provided on request. Now a days lot of industries are using standard MD brackets with Nickel Chrome plating as a substitute for Stainless Steel brackets.

STAINLESS STEEL BRACKETS

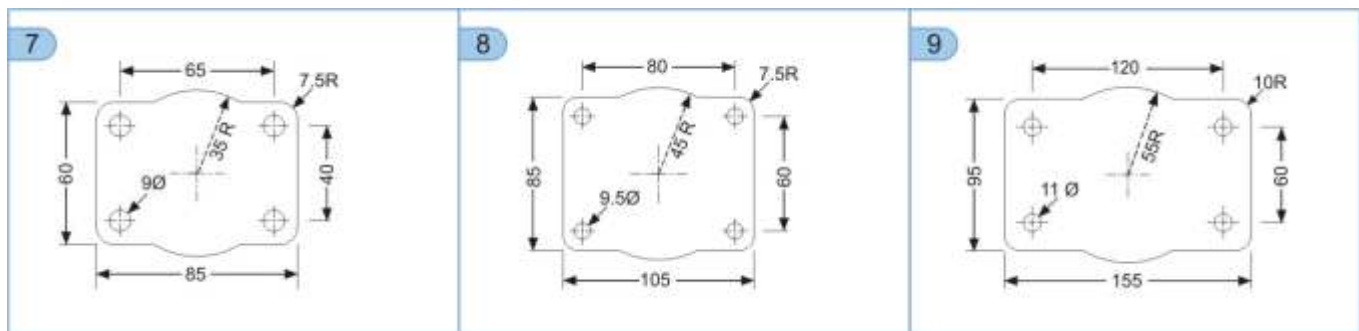
Medium Duty Stainless Steel brackets are manufactured from stainless steel sheets (SS-304). All other components of bracket such as king pin, nut, D.P.cap, spring washer, bolt etc are also of stainless steel. As stainless steel is a non ferrous metal, the chances of corrosion are completely avoided. Also, stainless steel has got excellent resistance to chemicals & hence widely used in chemical industries, food industries, fisheries, pharmaceutical industries etc. The brackets are buffed (polished) for mirror finish shining. These brackets are available in fixed as well as in swivel type upto size 100x32.

DIMENSIONAL DETAILS & LOAD CARRYING CAPACITIES

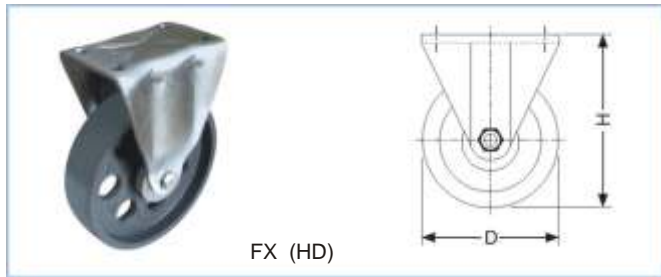
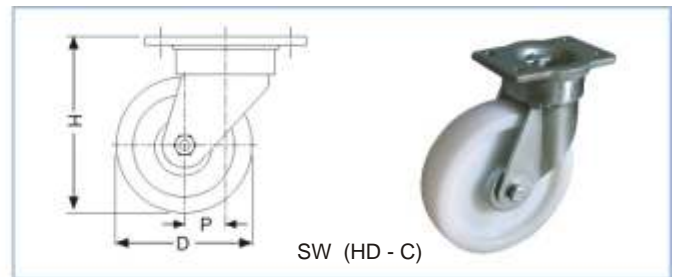
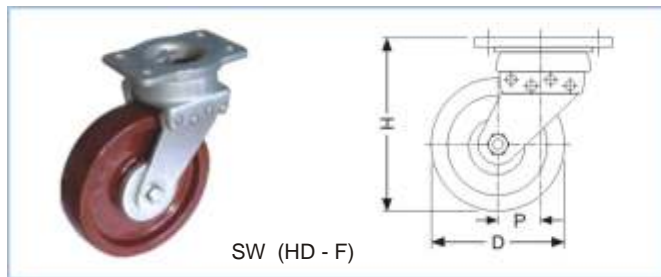
FIXED CASTORS - MD											
Size of wheel Dia x Width D mm X W mm	Overall height H mm	Mounting Plate Number	Load Carrying Capacity								
			SRT Type Kg.	BRT Type Kg.	PU Type Kg.	PP Type Kg.	NYL Type Kg.	UHMW Type Kg.	FBR Type Kg.	CI Type Kg.	
50 x 25	75	7	---	---	---	---	---	60	---	---	100
75 x 25	100	7	---	---	---	---	---	100	---	---	150
77 x 32	105	8	---	80	75	80	120	---	---	---	200
100 x 32	130	8	70	100	100	100	130	175	130	---	300
100 x 50	140	9	---	150	---	---	175	---	300	225	400
125 x 32	155	8	90	140	125	150	200	250	---	---	400
125 x 50	165	9	---	175	---	---	225	---	250	---	500
150 x 50	185	9	125	200	160	300	350	350	400	---	700
200 x 50	235	9	150	250	175	---	---	500	---	---	900

SWIVEL CASTORS - MD												
Size of wheel Dia x Width D mm X W mm	Overall height H mm	Offset P mm	Mounting Plate Number	Load Carrying Capacity								
				SRT Type Kg.	BRT Type Kg.	PU Type Kg.	PP Type Kg.	NYL Type Kg.	UHMW Type Kg.	FBR Type Kg.	CI Type Kg.	
50 x 25	75	35	7	---	---	---	---	50	---	---	50	
75 x 25	100	35	7	---	---	---	---	75	---	---	75	
77 x 32	105	40	8	---	80	75	80	100	---	---	100	
100 x 32	130	40	8	70	100	100	100	130	150	130	150	
100 x 50	140	50	9	---	150	---	---	175	---	200	200	
125 x 32	155	40	8	90	140	125	150	200	200	---	200	
125 x 50	165	50	9	---	175	---	---	225	---	250	250	
150 x 50	185	50	9	125	200	160	300	350	350	350	350	
200 x 50	235	50	9	150	250	175	---	---	450	---	450	

DIMENSIONS OF MOUNTING PLATES FOR FIXED & SWIVEL CASTORS



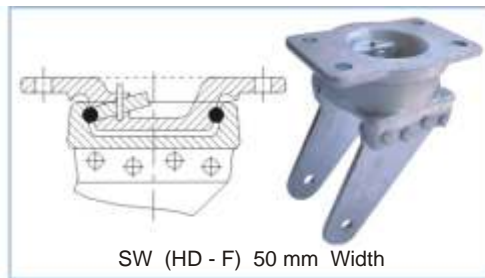
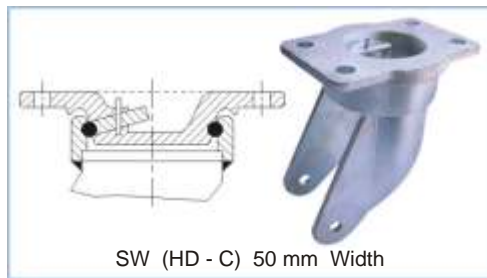
HEAVY DUTY FORGED STEEL CASTORS (HD SERIES)



Heavy Duty castors are recommended for higher loads as well as where floor conditions are not good & MD castors need frequent replacement. These castors can withstand occasional shock loads & higher speeds. Heavy Duty swivel castors are of two types. i.e. HD-F & HD-C. However, important dimensions such as mounting holes, overall height etc. are exactly same for both types of castors. **Therefore, matching fixed castor [FX(HD)] is same for both HD-C & HD-F swivel castors.**

SRT, BRT, PU, PP, NYL, UHMW, FBR, CI, CI Track wheels are assembled in heavy duty brackets.

CONSTRUCTION OF HD BRACKETS



Swivel brackets with king pin have design limitations. They are good for light and medium loads. However, under heavy loads and continuous duty, some play gets developed in the king pin assembly and the balls run out of the ball race. To overcome this limitation, swivel brackets in HD-C & HD-F design have been developed. In both these types, steel balls are accommodated in ball races machined on OD of base and ID of revolving part. The base and revolving part are interlocked with steel balls like ball bearing. The ball race performs multiple functions. It serves like a thrust bearing as well as load bearing. Since there is no king pin, the failure of bracket due to steel balls running out of ball race because of play developed in king pin assembly is eliminated.

In case of Swivel Bracket (HD-C), the base is EN-9 steel forging. The revolving part is M.S. Ring. The side arms are pressed in half round shape & welded to the ring.

In case of Swivel Bracket (HD-F), both the base & revolving top are EN-9 steel forgings. The side arms are riveted to the revolving forging for castors suitable for wheel of 50 mm width. The side arms are welded to the revolving forging for castors suitable for wheel of 75 mm width.



Heavy duty fixed brackets FX (HD) suitable for wheels having 50 mm width have one piece construction like FX(MD) brackets. However, brackets suitable for wheels having 75 mm width have welded construction. Two side arms, blanked and embossed for additional strength as well as elegant look, are welded to the base plate.

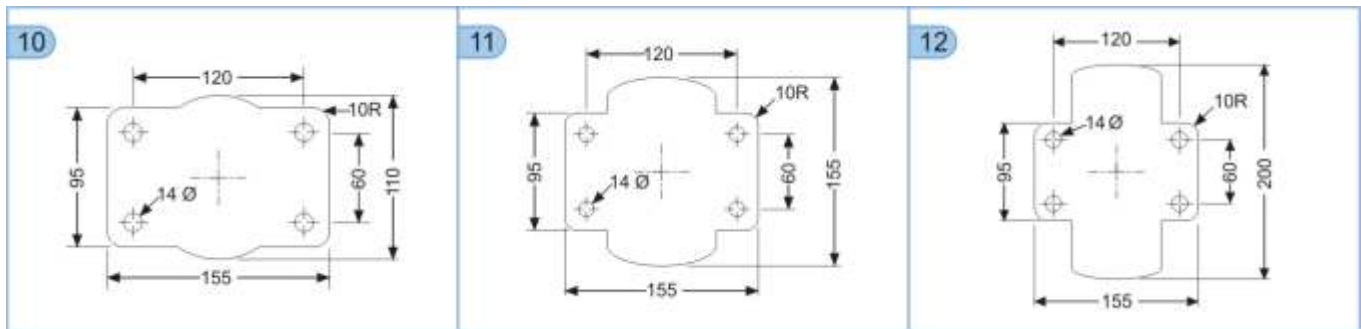


DIMENSIONAL DETAILS & LOAD CARRYING CAPACITIES

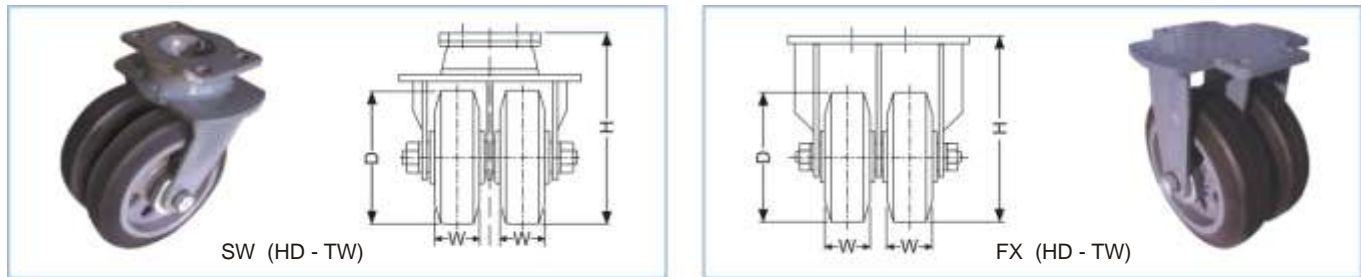
FIXED CASTORS HD & SWIVEL CASTORS HD-F												
Size of wheel Dia x Width	Overall height	Offset in case of SW Castors P mm	Mounting Plate Number		Load Carrying Capacity							
			FX	SW	SRT Type	BRT Type	PU Type	PP Type	NYL Type	UHMW Type	FBR Type	CI Type
					Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	
100 x 50	155	40	10	10	---	150	---	175	---	300	225	400
125 x 50	180	45	10	10	---	175	---	225	---	400	---	500
150 x 50	205	50	10	10	125	200	160	300	350	550	400	700
150 x 75	205	50	11	10	---	300	---	---	---	750	---	1050
200 x 50	255	60	10	10	150	250	175	---	---	750	---	900
200 x 75	255	60	11	10	225	375	---	---	---	1000	---	1350
250 x 50	305	70	10	10	175	300	---	---	---	900	---	1050
250 x 75	305	70	11	10	---	450	---	---	---	1200	---	1575
300 x 50	355	80	10	10	200	400	---	---	---	1200	---	1400
300 x 75	355	80	11	10	300	600	---	---	---	1600	---	1800

SWIVEL CASTORS HD-C												
Size of wheel Dia x Width	Overall height	Offset	Mounting Plate Number	Load Carrying Capacity								
				SRT Type	BRT Type	PU Type	PP Type	NYL Type	UHMW Type	FBR Type	CI Type	
				Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	
100 x 50	155	40	10	---	150	---	175	---	300	225	400	
125 x 50	180	45	10	---	175	---	225	---	400	---	500	
150 x 50	205	50	10	125	200	160	300	350	550	400	700	
200 x 50	255	60	10	150	250	175	---	---	750	---	900	
250 x 50	305	70	10	175	300	---	---	---	900	---	1050	
300 x 50	355	80	10	200	400	---	---	---	1200	---	1200	

DIMENSIONS OF MOUNTING PLATES FOR FIXED & SWIVEL CASTORS



HEAVY DUTY FORGED STEEL CASTORS TWIN (HD - TW SERIES)



Twin castors have the advantage of greater load carrying capacity for the same castor height. The load is distributed over a wide floor area. But because of the differential movement of two wheels, the scrubbing action that arises on turning from the use of wide tread single wheel is avoided. The use of twin castor is, therefore, advantageous than use of single wheel castor with wider tread width of the wheel. Attachments such as wheel lock, wheel brake & swivel lock can be provided on these castors.

DIMENSIONAL DETAILS & LOAD CARRYING CAPACITIES

Size of wheel Dia x Width D mm X W mm	Overall height of FX/SW Castors H mm	Offset in case of Swivel Castors P mm	Mounting Plate Number		Load Carrying Capacity							
					SRT Type	BRT Type	PU Type	PP Type	NYL Type	UHMW Type	FBR Type	CI Type
			FX	SW	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.	Kg.
100 x 50	155	40	12	10	---	300	---	350	---	600	450	800
125 x 50	180	45	12	10	---	350	---	450	---	800	---	1000
150 x 50	205	50	12	10	250	400	320	600	700	1100	800	1400
200 x 50	255	60	12	10	300	500	350	---	---	1500	---	1800
250 x 50	305	70	12	10	350	600	---	---	---	1800	---	1800
300 x 50	355	80	12	10	400	800	---	---	---	1800	---	1800

TRACK CASTORS (MD & HD SERIES)



The track castors are designed for use over inverted angle iron tracks or over square section or over rails. Cast iron wheels with either V-groove or square groove or a flange are available depending upon the type of track over which the castors have to move.

Since the wheels rolls on steel track, the pushing or pulling force required is much less. This reduces labour fatigue. Floor surface also does not get damaged at any time. The track wheels can be fitted in fixed & swivel brackets of MD or HD series.

Other details like load carrying capacity, offset, mounting plate dimensions etc. will depend on the type of bracket in which the wheel is fitted & may be seen in the table for that type of bracket.

NOTE : The overall height of castor is calculated considering outside diameter of wheel. Depth of V groove or square groove or height of flange is not considered.

SELECTION CRITERIA FOR WHEELS & CASTORS

A) Load carrying capacity

It is normally observed that 80% of the castor failures are due to improper selection of castor wheels. Generally, the designer / user selects a castor wheel looking to the load carrying capacity of the castor as specified in the catalogue. But these capacities are given on the basis of the ideal conditions - trolley running on horizontal, level, smooth, hard and non-deformable surface at a speed below 6 km/hr. and in ambient temperature of $20 \pm 10^{\circ}\text{C}$ (IS : 7369 - 1983). However, on the shop floor, many abnormal conditions exist and additional safety factor must be considered while selecting the castor. Given below are such conditions.

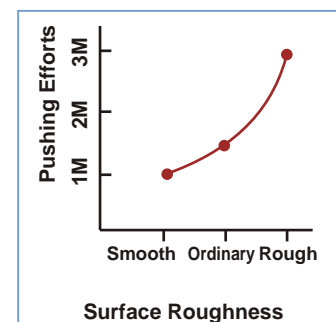
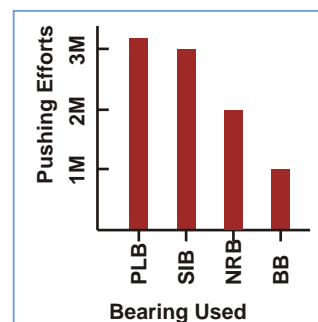
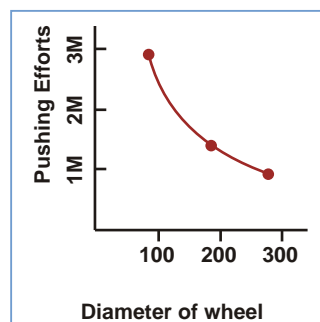
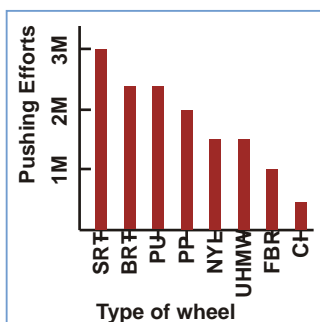
- **Uneven loading of castors** : The operator may place heavier boxes on one side of the platform trolley. As a result, one or two castors may be subjected to higher load as compared to other castors. One must consider what is the maximum load any one castor will be subjected to.
- **Unevenness of flooring** : On uneven flooring, only three wheels out of four wheels fitted to a trolley touch the ground and take the load. One of the wheels just idles. Thus each wheel gets overloaded by 33%. This overload is generally never considered.
- **Shock loads** : Even if the flooring is good, generally, there are number of joints. While rolling over the joint, there is a jerk which creates shock load. Many a times a trolley is lifted by a mechanical means, carried to some other destination and then placed on the floor. While placing the trolley on floor, there is always a jerk, small or big depending upon the carefulness of the operator. This creates a shock load. Further, all the four castors do not touch the ground at one time. Naturally, the castor which touches the ground first gets overloaded. A severe shock load is considered twice the actual load on the castor.
- **Speed of the trolley** : The castors are designed to work for manually pushed or pulled trolleys having speed below 6 km/hr. However, on sloppy floor, the operator pushes the trolley and leaves it. The trolley runs above 6 km/hr and bumps against other object. The load carrying capacity reduces in proportion of the speed. In such cases, higher speed and shock load due to bumping of the trolley has to be considered.

To take care of overloads for above mentioned reasons, a thumb rule is to consider the load carrying capacity of a castor at 50% to 60% of the nominal capacity.

B) Pushing / Pulling Efforts

Floor conditions remaining exactly the same pushing / pulling efforts required to move a trolley depend on three factors. Labour fatigue must be avoided.

- **Diameter of a wheel** : As the diameter of wheel increases, the pushing / pulling efforts are reduced proportionately. Try to use higher diameter wheel as far as possible.
- **Type of Wheel** : Floor conditions & bearing in the wheel remaining the same, pushing / pulling efforts depend very much on the material of wheel. Rubber being soft, rubber wheels get compressed under load and due to higher coefficient of friction need more pushing / pulling efforts for the same load. As against this, cast-iron being very hard, cast iron wheels do not get compressed at all under the loads. It has very low coefficient of friction with the flooring. Therefore, cast iron wheels need the minimum pushing / pulling efforts for the same load. Pushing / pulling efforts for PP, Nylon, PU & UHMW wheels will range in between the minimum & maximum.
- **Type of bearing used in wheel** : If we consider the pushing / pulling efforts required are moderate for wheels with PLB & SIB, pushing / pulling efforts are less for wheels with NRB & minimum for wheels with BB. However, periodic cleaning & greasing of bearings must be ensured.



C) Floor Surface :

Pushing / pulling efforts, noise level and life of wheel depend upon roughness of the surface on which wheels roll. Rubber, PU wheels & light duty castors may be avoided on rough surface if slightly higher noise level is permitted. It is advisable to use UHMW-PE or CI wheels & medium duty or heavy duty castors depending upon load. Rubber, PU or PP wheels and light duty castors may be used on smooth surface and light loads.

D) Noise Level :

Rubber and PU Wheels are soft and have low noise level. PP,NYL & UHMW-PE wheels have comparatively higher noise level. CI wheels have very high noise level. If very low noise level is absolutely essential, you may check for rubber or PU wheels with higher diameters.

E) Working Temperature :

Load carrying capacity of wheel reduces as the working temperature goes up. As a matter of fact, beyond safe working temperatures, the Rubber, PU, PP, NYL and UHMW PE wheels start softening and loose their shape under load. Check safe working temperature for all materials of wheels given below in the chart while selecting the wheel.

In case of higher temperature, one must always use special greases which withstand desired higher temperature in all rotating parts of wheels & brackets.

F) Damage To Floor :

Rubber, PU, PP, NYL, FBR and UHMW- PE wheels do not damage the floor. However, CI wheels damage the floor. Therefor, CI wheels may be selected only for higher load capacities.

G) Atmospheric Conditions :

In chemical and pharmaceutical industries, castor wheels are subjected to use in highly corrosive atmosphere. In food industries, the atmosphere is highly humid. In such industries, polymer wheels with stainless steel brackets are suggested to use. In order to reduce cost of the castor, today many industries are using mild steel brackets with hard nickel chrome plating as a substitute for stainless steel brackets.

H) Pushing / Pulling By Power Driven Vehicle :

All wheels and castors are designed for manual pulling or pushing at a speed not exceeding 6 km/hr. Therefore, pushing / pulling of trolleys or trolley mounted equipments by power driven vehicle must be avoided as it subjects wheels & castors to extreme severity in respect of shock loads. The driver does not get any feel even if the wheel or bracket gets jammed. As a result, a jammed wheel or castor is dragged over the road and gets completely damaged. Therefore, life of wheel or castor cannot be predicted in such a situation.

However, if pushing / pulling of trolleys or trolley mounted equipment by power driven vehicle is unavoidable, UHMW- PE or CI wheels with heavy duty brackets are suggested. Much higher factor of safety must be considered.

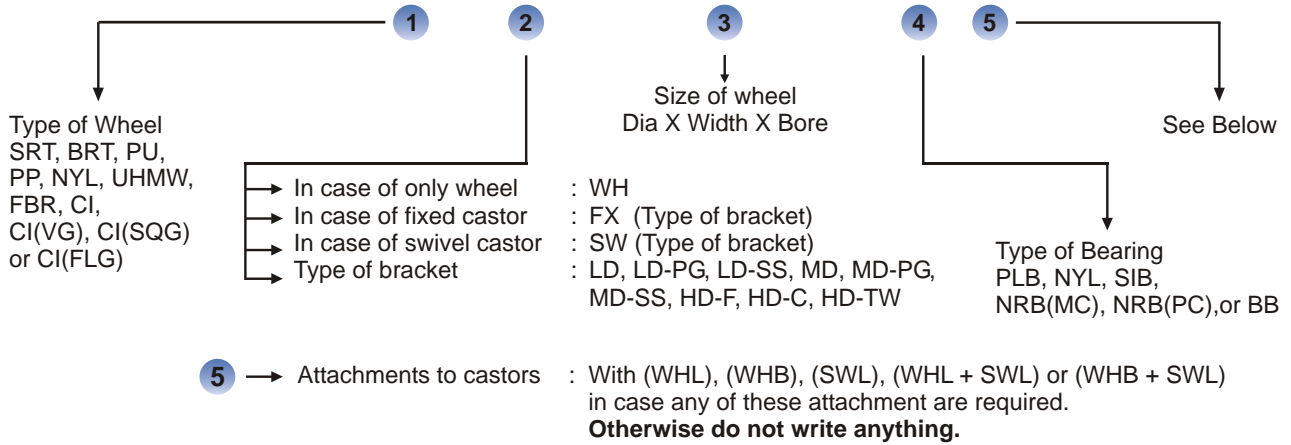
Finally, we may say, selection of a castor wheel is a compromise depending upon a number of working conditions and expectations.

COMPARISON OF WHEELS AND THEIR PROPERTIES

Type of Wheel	Load Bearing Capacity	Resistance to Wear	Shock Absorption Capacity	Road Grip	Resistance To Chemicals	Noise Level	Comparative Life	Safe Working Temperature
Solid Rubber Tyre (SRT)	Fair	Fair	Good	Good	Poor	Low	1 P	50°C
Bonded Rubber (BRT)	Good	Good	Excellent	Excellent	Poor	Low	3 P	50°C
Polyurethane (PU)	Good	Better	Excellent	Excellent	Better	Low	3 P	50°C
Polypropelene (PP)	Good	Fair	Fair	Fair	Excellent	Medium	3 P	50°C
Nylon (NYL)	Better	Better	Fair	Fair	Excellent	Medium	8 P	90°C
UHMW - PE (UHMW)	Better	Better	Fair	Fair	Excellent	Medium	10 P	70°C
Fibre (FBR)	Better	Good	Fair	Fair	Better	Medium	8 P	170°C
Cast Iron (CI)	Excellent	Excellent	Nil	Fair	Poor	High	20 P	250°C

ORDERING FORMAT

SRT / SW (MD) / 150 X 50 X 25.4 / SIB



GUIDE TO CODE WORDS

SRT - Solid Rubber Tyre	SS - Stainless Steel	PLB - Plain Bore
BRT - Bonded Rubber Tyre	WH - Wheel only	NYL - Nylon Bush
PU - Polyurethane	FX - Fixed castor	SIB - Sintered Iron Bush
PP - Polypropelene	SW - Swivel castor	NRB - Needle Roller Bearing
NYL - Nylon	LD - Light Duty	MC - Metal Cage
UHMW - Ultra High Molecular Weight Polyethylene	LD-X - Light Duty Extra Strength	PC - Plastic Cage
FBR - Fiber, Resin Impregnated	MD - Medium Duty	BB - Ball Bearing
CI - Cast Iron	HD - Heavy Duty	SWL - Swivel Lock
VG - V-Grooved	HD-C - Heavy Duty Cup Type	WHL - Wheel Lock
SQG - Square Grooved	HD-F - Heavy Duty Forged Steel Revetted Type	WHB - Wheel Brake
FLG - Flanged	PG - Peg	
	TW - Twin	

The Manufacturer

PIONEER ENGINEERING INDUSTRIES

Plot No. A - 42, H - Block, M. I. D. C. Industrial Area,
Pimpri, Pune - 411 018. (INDIA)

Tel. : (020) 27475071, 27463467 Fax : (020) 27461181

Email : pioneer_eng@dataone.in , sales@pioneercastors.net