



TIRE GUIDE

For Commercial Vehicles

RUNNER, EURO, ATHLET, SNOW



SEMPERIT 



Publishers imprint

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General hints/Safety instructions

The extensive technical data and other information relating to tires and accessories on the following pages have been compiled to reflect as accurately and completely as possible the current state of development.

If this "Technical Data Book" is to be used as a basis for particularly important decisions, further data covering relevant standards such as **ETRTO**¹⁾, **DIN**²⁾ and **WdK**³⁾ can also be called upon. Special information can, of course, also be obtained from us at the following address:

Geschäftsbereich Semperit
Büttnerstraße 25
30165 Hannover
Postfach 169
30001 Hannover

All types are in compliance with **DOT**⁴⁾ regulations and are marked accordingly. Since 1982, all tires have been typed in accordance with **ECE**⁵⁾ directive 54 and thus also in accordance with the current **EU**⁶⁾ tire directives.

The data provided in this guide based on average operating conditions as normally encountered in central Europe.

Please contact us with respect to operating conditions differing from the above, e.g. for applications outside Central Europe.

This service brochure is of informative character. All liability is excluded, whether for damage or for other legal reasons. (See also page 2)

The tire sizes given in this guide are not always identical to the ones available in the size range.

Lower inflation pressure, greater loads or higher speeds than those recommended by the vehicle or tire manufacturer shorten the service life of the tire.

These instructions must be followed if vehicle safety – and that of those mounting tires – is to be guaranteed. This applies above all to instructions regarding inflation pressure.

Failure to comply with these instructions could result in tire damage that may even lead to tire blow-outs under certain circumstances. This, in turn, could cause traffic accidents involving damage to property and/or personal injury. (See also page 8)

1) ETRTO: The European Tire and Rim Technical Organisation, Brüssel

2) DIN: Deutsches Institut für Normung, Berlin

3) WdK: Wirtschaftsverband der deutschen Kautschuk-Industrie, Frankfurt/Main

4) DOT: U.S. Department of Transportation

5) ECE: Economic Commission for Europe (UN institution in Geneva)

6) EU: European Union, previously EEC

Tire sidewall information



Speed-Symbol

Symbol	F	G	J	K	L	M	N	P	Q	R	S
Speed km/h	80	90	100	110	120	130	140	150	160	170	180

Load-Index

Index	145	146	147	148	149	150	151	152	153	154	155	156
kg/tire	2900	3000	3075	3150	3250	3350	3450	3550	3650	3750	3875	4000

Example of tire sidewall markings:

315/70 R 22.5 152/148 L   0092542 tbls M 350

315: Tire width in mm

E12 0092542: Approval number

70: Aspect ratio (height is 70% of width)

tbls: Tubeless

R: Symbol for radial tire

M 350: Manufacturer's tread designation

22.5: Diameter code for 15° drop-center rim (in inch)

152: 3550 kg load capacity for single fitment (norm-related index)

Uncoded maximum load capacity and inflation pressure values in lbs (pounds – 1 lb = 0.4536 kg) and psi (pounds per square inch – 1 bar = 14.5 psi) may also be moulded into the tire. These markings form part of the identification code in accordance with U.S. Safety Regulation FMVSS 119** which covers all new pneumatic tires for light trucks, trucks, buses and trailers intended for use on public highways, as well as motorcycle tires. Canada and Israel also use this specification.

148: 3150 kg load capacity for dual fitment (norm-related index)

L: Speed 120 km/h (norm-related index)

154: 3750 kg load capacity (additional index)

150: 3350 kg load capacity (additional index)

K: Speed 110 km/h (additional index)

** FMVSS = Federal Motor Vehicle Safety Standard

Tire sidewall information

Units of measurement and definition (DIN 70020)

As a matter of principle the technical data in the tables always complies with the international standards as specified by ISO and the ETRTO. Further details such as other tire sizes or designs, plus the static radius and the rolling circumference comply with DIN/WdK Guidelines.

Lengths

are given in millimetres (mm).

Rim width

The linear distance between the flanges of the rim.

Section height

Half the difference between the overall diameter and the nominal rim diameter.

Tire width

The section width of an inflated tire mounted on its theoretical rim and indicated in the tire size designation.

Overall diameter

The diameter of an inflated tire at the outermost surface of the tread.

Nominal diameter

It is a size code figure for reference purposes only, as indicated in the tire and rim size designation.

Inflation pressure

tire inflation pressure is given in Bar based on cold tire.

Outer diameter New *

is a nominal size which refers to the tread center.

Max. outer diameter in service

is the maximum diameter permitted in the tread center as a result of permanent growth during tire use. Dynamic deformations are not included.

Cross-section width New *

is a nominal size which refers to the smooth tire wall.

Max. operational width

is the maximum permitted width. This includes scuff ribs, decorative ribs, lettering and permanent growth during use. Dynamic deformations are not included.

Static radius

is the distance from the tire center to the ground level. Measurements are checked on fitted tires inflated to the inflation pressure specified in DIN 70020 Part 5.

Rolling circumference

is the distance covered by each revolution of the tire.

Load capacities

are given in kgs (weight in the sense of mass)

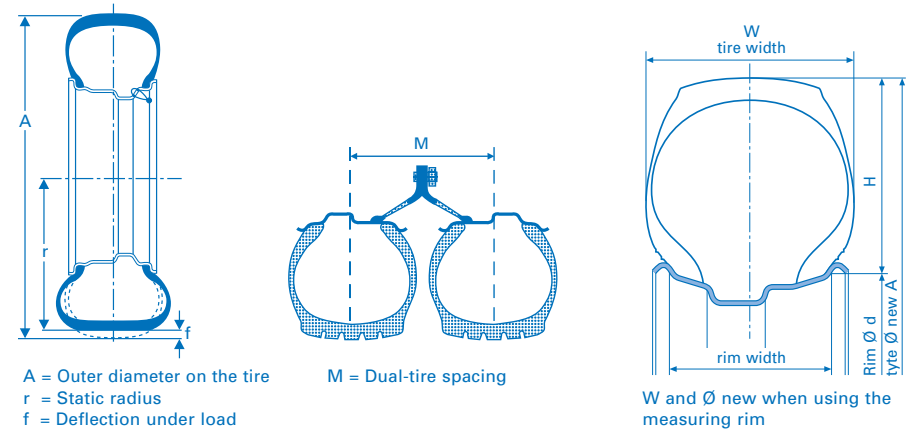
Dual-tire spacing

Maintaining the minimum spacing distance ensures that the two tires in a dual fitment arrangement function without any infringing the ETRTO standards providing the tires are not fitted with chains.

In the course of development, a variety of designations for tire dimensions have been introduced, some of which are used concurrently. The following combination is most frequently used: tire width in mm, then H : W (height : width) in % and finally the codes for the tire construction – for example R for “radial” and “-” for “crossply” – and the nominal rim diameter.

When planning vehicle wheel space, automotive designers must proceed on the basis of the maximum values for tire width and outer diameter, taking into account the tire's static and dynamic deformation. In this way they ensure that all standardly approved tires will fit in all cases. If this is not possible in exceptional cases, appropriate measures are to be taken to exclude any possible risk to safety.

Tire sidewall information



Vehicle tire group	Example of designation		Example comprises details of		
	Tire size ¹⁾	Service-description ²⁾	Tire width W	H:W %	Rim diameter
Light truck	185 R 14 C	102/100 N	185 mm	- 90	14 inch
	195/75 R 16 C	107/105 N	195 mm	75	16 inch
Truck	12 R 22.5	152/148 L	300 mm	- 90	22.5 inch
	315/80 R 22.5	156/150 L (154/150 M) ³⁾	315 mm	80	22.5 inch
	12.00 R 20	154/150 K	300 mm	100	20 inch
Trailer	365/80 R 20	160/ - K	365 mm	80	20 inch
	385/65 R 22.5	160/ - K	385 mm	65	22.5 inch
Bus	275/70 R 22.5	148/145 J	275 mm	70	22.5 inch
	295/80 R 22.5	152/148 M	295 mm	80	22.5 inch

1) „R” = radial design
„C” = Light-truck (Transporter) tires with LI for single fitment = 121 and smaller, see also page 10

2) Service description = load index for single/dual tires plus speed symbol (see also tables on following pages)

3) Supplementary service description

* Construction size

Operating instructions (DIN 7804/7805 and ECE-R 54)

Load capacity and speed

When determining the minimum tire size necessary for the axle of the vehicle, the authorized weight and the maximum design speed of the vehicle should always be used as a basis. Trailers first coming into service on or after January 1, 1990 must be equipped with tires suited for maximum speeds of at least 100 km/h, unless the trailer is clearly marked for a lower speed. The so-called "tolerance catalogue" must also be taken into consideration here. Nominal load capacity = 100% load, as also indicated by the load index (LI)*.

Reference speed

This is the speed assigned as per nominal load capacity of the tire.

The load capacity can be exceeded when the vehicle, due to its construction, has a lower maximum speed and vice versa (see the tables on page 10 and 11).

Inflation pressure

The inflation pressures indicated in the tables are minimum values given for reference purposes.

All inflation pressures apply to the "cold" tire, i.e. the state in which the tire is in after having stood outdoors for several hours, not exposed to intense sunlight.

M+S tires

May be mounted on commercial vehicles whose construction allows for a higher maximum speed than approved for the tire, provided the tire's lower approved speed is clearly posted in the vehicle in the driver's field of vision (e.g. sticker on the instrument panel).

Mixed fitment

(radial/crossply) Although it is permissible for a vehicle weighing more than 2.8 t to be fitted axlewise with tires of different construction, it is recommended that tires of the same construction be mounted on all wheel positions.

Rims

Only the specified rims may be mounted on new commercial vehicles series. Tapered bead seat rims with a diameter of 16" or less should be equipped with safety shoulders (e.g. round hump) if tubeless radial tires are fitted on them. The rim sizes printed in bold type in the tables from page 18 onwards, are optimal Semperit sizes with respect to service life, wear pattern and durability.

Wheels

The load capacity must be adequate in all cases.

Load capacities of tires in special cases (DIN 7804/7805)

Case	Type of service	Approved load capacity as % of the nominal load capacity in the tables
1	Special-service vehicles: Fire brigade vehicles with special superstructures, road flushers, road sweepers, garbage trucks, cherry-pickers, municipal service vehicles of a similar nature and other public utility vehicles.	110
2	Commercial vehicles: With special superstructures (concrete mixers, aircraft refuellers) used in local service with maximum service speeds not in excess of 60 km/h.	
3	Regular-service buses (M 3-Class II): In urban service, with maximum service-related speeds of up to 60 km/h.	
4	Regular-service buses (M 3-Class I): (see also DIN 7805) In urban and suburban service, if average speed does not exceed 40 km/h.	115
5	Tires on the front axle of trucks with facilities for snow removal (front-end snow plough/rotary snow plough and the like) at service-related speeds of 50 km/h 62 km/h	120 115
6	For internal use on aircraft refuellers at speeds of up to 30 km/h (inflation pressure + 15%, no reduction for dual fitment).	135
7	Caravans and other passenger-car trailers (only for C tires, see also WdK directive 195) for speeds of up to 100 km/h.	105

Please note: This chart is not applicable in conjunction with the charts on pages 10 or 11 in correspondence with the chart on page 12.

* see table on page 5

Load capacities for various maximum design speeds Tires for light commercial vehicles

Maximum speed in km/h (determined by vehicle design)	C-tires with load index 121 (1450 kg) or less as single fitments Approved load capacity as a percentage of the nominal load capacity ²⁾ equals the load index for reference speed				
	L 120	M* 130	N* 140	P* 150	Q-T 160-190
160	-	-	-	-	100
155	-	-	-	-	100
150	-	-	-	100	100
140	-	-	100	100	100
138	-	-	100	100	100
136	-	-	100	100	100
134	-	-	100	100	100
132	-	-	100	100	100
130	-	100	100	100	100
128	-	↑	100	100	100
126	-	↑	100	100	100
124	-	↑	100	100	100
122	-	↑	100	100	100
120	100	↑	100	100	100
118	↑	↑	100.5	↑	↑
116	↑	↑	101	↑	↑
114	↑	↑	101.5	↑	↑
112	↑	↑	102	↑	↑
110	↑	↑	102.5	↑	↑
108	↑	↑	103	↑	↑
106	↑	↑	103.5	↑	↑
104	↑	↑	104	↑	↑
102	↑	↑	104.5	↑	↑
100	↑	↑	105	↑	↑
95	↑	↑	106.5	↑	↑
90	↑	↑	107.5	↑	↑
85	↑	↑	108.5	↑	↑
80	see column N	see column N	110	see column N	see column N
75	↑	↑	111	↑	↑
70	↑	↑	112.5	↑	↑
65	↑	↑	113.5	↑	↑
60	↑	↑	115	↑	↑
55	↑	↑	117.5	↑	↑
50	↑	↑	120	↑	↑
45	↑	↑	122	↑	↑
40 ¹⁾	↑	↑	125	↑	↑
35 ¹⁾	↑	↑	129	↑	↑
30 ¹⁾	↑	↑	135	↑	↑
25 ¹⁾	↑	↑	142	↑	↑
20 ¹⁾	↑	↑	150	↑	↑
15 ¹⁾	↑	↑	160	↑	↑
Application restricted speed 10 ¹⁾	↑	↑	175	↑	↑
5 ¹⁾	↑	↑	190	↑	↑
Standstill ¹⁾	↑	↑	210	↑	↑

Load capacities for various maximum design speeds Tires for commercial vehicles

Maximum speed in km/h (determined by vehicle design)	Tires with load index 122 (1500 kg) or more as single fitments Approved load capacity as a percentage of the nominal load capacity ²⁾ equals the load index for reference speed						
	D 65	F 80	G 90	J 100	K 110	L 120	M 130
130	-	-	-	-	-	-	100
127.5	-	-	-	-	-	-	100
125	-	-	-	-	-	-	100
122.5	-	-	-	-	-	-	100
120	-	-	-	-	-	100	100
117.5	-	-	-	-	-	↑	100
115	-	-	-	-	-	↑	100
112.5	-	-	-	-	-	↑	100
110	-	-	-	-	100	↑	100
107.5	-	-	-	-	↑	↑	100
105	-	-	-	-	↑	↑	100
102.5	-	-	-	-	↑	↑	100
100	-	-	-	100	↑	↑	100
95	-	-	-	↑	↑	↑	101
90	-	-	100	↑	↑	↑	102
85	-	-	102	↑	↑	↑	103
80	-	100	↑	↑	↑	↑	104
75	-	102.5	↑	↑	↑	↑	105.5
70	-	105	↑	↑	↑	↑	107
65	100	107.5	↑	↑	↑	↑	108.5
60	100	↑	↑	↑	↑	↑	110
55	-	↑	↑	↑	↑	↑	111
50	102	↑	↑	↑	↑	↑	112
45	-	↑	↑	↑	↑	↑	113
40 ¹⁾	107	↑	↑	↑	↑	↑	115
35 ¹⁾	-	↑	↑	↑	↑	↑	119
30 ¹⁾	116	↑	↑	↑	↑	↑	125
25 ¹⁾	-	see column M	see column M	see column M	see column M	see column M	135
20 ¹⁾	140	↑	↑	↑	↑	↑	150
15 ¹⁾	150	↑	↑	↑	↑	↑	165
Application restricted speed 10 ^{1) 3)}	165	↑	↑	↑	↑	↑	180
5 ^{1) 3)}	190	↑	↑	↑	↑	↑	210
Standstill ^{1) 3)}	225	↑	↑	↑	↑	↑	250

1) Dual-tires = 2 x single load capacity

2) A sign indicating the max speed must be attached to trailers restricted to speeds below 100 km/h (62 mph)

3) Ask the tire manufacturer about these applications

* On M-, N- and P-tires can be interpolated in steps of 1.25 mph (2 km/h) from 87 mph (140 km/h) upwards
Tires with SI ratings P and Q under full load at speeds of over 140 km/h should be inflated an extra 0.1 bar for every excess 10 km/h. No excess loads are applicable over 65 km/h for tires on heavy trailers (with laden weight > 3.5 t). The load/speed variation given on this page do not apply to the additional service description (the so called Single Point). See operating instructions on page 8. This table is only applicable in conjunction with air pressure multiplier on page 12. If applied please check dual spacing (dual tire contact) and rim status.

Air pressure multiplier for increased load capacity due to maximum design speed

Maximum speed in km/h (determined by vehicle type)	Air pressure multiplier for reference speed (speed index) of tires	
	G, J, K, L, M 90 km/h - 130 km/h	N, P, Q, R, S 140 km/h - 180 km/h
140		1
135		1
130	1	1
125	1	1
120	1	1
115	1	1.01
110	1	1.02
105	1	1.06
100	1	1.06
95	1	1.08
90	1	1.09
85	1	1.10
80	1	1.12
75	1.01	1.14
70	1.02	1.15
65	1.04	1.15
60	1.06	1.18
55	1.07	1.22
50	1.08	1.25
45	1.09	1.28
40	1.10	1.30
35	1.11	1.30
30	1.13	1.30
25	1.17	1.30
20	1.21	1.30
15	1.25	1.30
10	1.30	1.35
5	1.40	1.35
0	1.40	1.40

The multipliers cited are to be used for an operating pressure of up to 10 bar.

Example: In the case of a K-rated tire (110 km/h) and nominal inflated pressure of 7.5 bar, the inflation pressure can be increased to 8.85 bar if the vehicle's maximum design speed is set at 40 km/h (1.1 x 7.5 bar) to utilize an increased load capacity of 115% of nominal load capacity.

Customer Segments



RUNNER F



RUNNER F2

315/70 R 22.5	156/150 L (154/150 M)
315/80 R 22.5	156/150 L

RUNNER D



RUNNER D2

315/70 R 22.5	154/150 L (152/148 M)
315/80 R 22.5	156/150 L

EURO-FRONT



M 249

245/70 R 19.5	136/134 M
265/70 R 19.5	140/138 M
285/70 R 19.5	144/142 M

EURO-FRONT

295/60 R 22.5	150/147 L
315/60 R 22.5	152/148 L

M 350

385/65 R 22.5 ¹⁾	158/- L (160/- K)
295/80 R 22.5	152/148 M



M 349

275/70 R 22.5	148/145 L
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M 434

11 R 22.5	148/145 L
12 R 22.5	152/148 L (150/148 M)
13 R 22.5	154/150 L (156/150 K)



M 434

205/75 R 17.5	124/122 M
215/75 R 17.5	126/124 M
225/75 R 17.5	129/127 M
235/75 R 17.5	132/130 L (130/128 M)



M 248

8.5 R 17.5	121/120 L
------------	-----------

EURO-DRIVE



M 470

205/75 R 17.5	124/122 M
215/75 R 17.5	126/124 M
225/75 R 17.5	129/127 M
235/75 R 17.5	132/130 L (130/128 M)
275/70 R 22.5	148/145 L
295/80 R 22.5	152/148 M
11 R 22.5	148/145 L
12 R 22.5	152/148 L

EURO-DRIVE

295/60 R 22.5	150/147 K
315/60 R 22.5	152/148 K



M 255

245/70 R 19.5	136/134 M
265/70 R 19.5	140/138 M
285/70 R 19.5	144/143 M

1) = Alternative tread pattern

EURO-TRAILER



M 223	
265/70 R 19.5	143/141 J
385/65 R 22.5	160/ - K

EURO-TRAILER	
385/55 R 22.5	160/- K (158/- L)



M 422	
7.50 R 15	135/133 G (134/132 J)
11 R 22.5	148/145 J



M 222	
8.25 R 15	142/141 G (141/140 J)
365/80 R 20	160/157 J



M 423	
215/75 R 17.5	135/133 J
235/75 R 17.5	143/141 J
245/70 R 17.5	143/141 K

ATHLET-FRONT



ATHLET-FRONT	
315/80 R 22.5	156/150 K



ATHLET-FRONT (Alternative tread pattern)	
12 R 22.5	152/148 K
13 R 22.5	154/150 K (156/150 G)



M 235	
14.00 R 20 TT	164/160 G

ATHLET-DRIVE



ATHLET-DRIVE	
315/80 R 22.5	156/150 K
12 R 22.5	152/148 K
13 R 22.5	154/150 K

ATHLET-TRAILER



M 277	
385/65 R 22.5	160/ - K

SNOW-FRONT



M 440	
295/80 R 22.5	152/148 M
315/80 R 22.5	154/150 M (156/150 L)

SNOW-DRIVE



M 431	
295/80 R 22.5	152/148 M
315/80 R 22.5	154/150 M (156/150 L)



M 529	
8.5 R 17.5	121/120 L

Specifications and load capacities

Tire size	Service description							EU tire label			Rim		Max. standard value	
	Pattern	LI / SI ¹⁾	Speed symbol and reference speed (km/h)	TT TL ²⁾	PR	M+S	3)	4)	5)	Rim width	Min. distance between rim centers	Width	External Ø	
												Width	External Ø	
245/70 R 17.5	TRAILER M 423	143/141 J	J 100	TL	16		D	C	◀ 70	6.75	270	250	803	
										7.50	279	258		
205/75 R 17.5	EURO-STEEL M 434	124/122 M	M 130	TL	14		E	C	◀ 70	5.25	222	205	765	
	TRANS-STEEL M 470	124/122 M	M 130	TL	14	M+S	F	C	◀ 76	6.00	231	213		
215/75 R 17.5	EURO-STEEL M 434	126/124 M	M 130	TL	12		E	C	◀ 70	6.00	239	220	779	
	TRANS-STEEL M 470	126/124 M	M 130	TL	12	M+S	E	C	◀ 76					
	TRAILER M 423	135/133 J	J 100	TL	16		D	C	◀ 70					
225/75 R 17.5	EURO-STEEL M 434	129/127 M	M 130	TL	12		E	C	◀ 70	6.00	246	228	797	
	TRANS-STEEL M 470	129/127 M	M 130	TL	12	M+S	E	C	◀ 76	6.75	254	235		
235/75 R 17.5	EURO-STEEL M 434	132/130 L (130/128 M)	L 120 (M 130)	TL	12		E	C	◀ 70	6.75	262	242	811	
	TRANS-STEEL M 470	132/130 L (130/128 M)	L 120 (M 130)	TL	12	M+S	E	C	◀ 76					
	TRAILER M 423	143/141 J	J 100	TL	16		D	C	◀ 70					
8.5 R 17.5	EXPRESS-STEEL M 248	121/120 L	L 120	TL	12		E	C	◀ 73	5.25	233	215	817	
	HI-GRIP M&S M 529	121/120 L	L 120	TL	12	M+S	F	C	◀ 73	6.00	242	224		
										6.75	251	232		

Footnotes, see page 28

Specifications and load capacities

Tire dimensions						Load capacity (kg) per axle at inflation pressure ⁶⁾ (bar) (psi)										
Design value		Stat. radius	Rolling circumference	L ¹⁾	Tire fitment		4.5 (65)	5.0 (73)	5.5 (80)	6.0 (87)	6.5 (94)	7.0 (102)	7.5 (109)	8.0 (116)	8.5 (123)	9.0 (131)
Width + 1%	External Ø ± 1%															
240	789	± 1.5%	± 2%	143	S	D	3405	3675	3940	4200	4455	4710	4955	5205	5450	10300
248																
197	753	± 1.5%	± 2%	124	S	D	2310	2495	2675	2850	3025	3200	3400	3600	3800	4000
205																
212	767	± 1.5%	± 2%	135	S	D	2720	2940	3150	3360	3565	3765	3965	4165	4360	8240
219																
219	783	± 1.5%	± 2%	129	S	D	2675	2885	3095	3295	3500	3700	3900	4100	4300	4500
226																
233	797	± 1.5%	± 2%	143	S	D	3405	3675	3940	4200	4455	4710	4955	5205	5450	10300
241																
207	803	± 1.5%	± 2%	121	S	D	2350	2535	2720	2900	3085	3270	3455	3640	3825	4010
215																
223																

Specifications and load capacities

Tire size	Service description						EU tire label			Rim		Max. standard value	
	Pattern	LI / SI ¹⁾	Speed symbol and reference speed (km/h)	TT TL ²⁾	PR	M+S	3)	4)	5)	Rim width	Min. distance between rim centers	Width	External Ø
245/70 R 19.5	EURO-FRONT M 249	136/134 M	M 130	TL	16		D	C	70	6.75 7.50	270 279	250 258	853
	EURO-DRIVE M 255	136/134 M	M 130	TL	16	M+S	E	C	73				
265/70 R 19.5	EURO-FRONT M 249	140/138 M	M 130	TL	16		D	C	70	6.75 7.50 8.25	286 295 303	264 272 280	881
	EURO-DRIVE M 255	140/138 M	M 130	TL	16	M+S	E	C	73				
	TRAILER M 223	143/141 J	J 100	TL	16		D	C	70				
285/70 R 19.5	EURO-FRONT M 249	145/143 M	M 130	TL	16		D	C	70	7.50 8.25 9.00	311 318 327	287 294 303	911
	EURO-DRIVE M 255	145/143 M	M 130	TL	16	M+S	E	C	73				
385/55 R 22.5	EURO-TRAILER	160/- K (158/- L)	K 110 (L 120)	TL	20		C	C	70	11.75 12.25		396 401	1012
295/60 R 22.5	EURO-FRONT M 350	150/147 L	L 120	TL	18		C	C	70	9.00 9.75	329 338	304 312	940
	EURO-DRIVE	150/147 L	L 120	TL	18	M+S	E	C	76				
315/60 R 22.5	EURO-FRONT M 350	152/148 L	L 120	TL	20		C	C	70	9.00 9.75	344 352	318 326	966
	EURO-DRIVE	152/148 L	L 120	TL	20	M+S	D	C	76				

Footnotes, see page 28

Specifications and load capacities

Tire dimensions						Load capacity (kg) per axle at inflation pressure ⁶⁾ (bar) (psi)									
Design value		Stat. radius	Rolling circumference	L ¹⁾	Tire fitment	4.5 (65)	5.0 (73)	5.5 (80)	6.0 (87)	6.5 (94)	7.0 (102)	7.5 (109)	8.0 (116)	8.5 (123)	9.0 (131)
Width +1%	External Ø ±1%														
240 248	839	389	2559	136 134	S D	2690 5095	2930 5545	3160 5985	3390 6415	3610 6840	3835 7260	4050 7670	4265 8075	4480 8480	
254 262 269	867	401	2644	143 140 141 138	S S D D	3155 5955	3560 6480	3845 6995	4120 7495	4395 7995	4665 8480	4930 8960	5190 9440	5450 10300	
276 283 291	895	413	2730	145 143	S D	3485 6550	3790 7125	4090 7690	4385 8245	4675 8790	4965 9330	5245 9860	5525 10380	5800 10900	
381 386	996	464	3018	160 158	S S	5165 5110	5620 5555	6065 6000	6505 6430	6935 6855	7360 7275	7775 7690	8190 8095	8595 8500	9000
292 300	926	435	2806	150 147	S D	3845 7060	4185 7685	4515 8290	4840 8890	5160 9480	5475 10055	5790 10630	6095 11190	6400 11750	6700 12300
306 313	950	445	2879	152 148	S D	4075 7235	4435 7870	4785 8495	5130 9105	5470 9710	5805 10305	6135 10885	6460 11465	6780 12035	7100 12600

Specifications and load capacities

Tire size	Service description							EU tire label			Rim		Max. standard value	
	Pattern	LI / SI ¹⁾	Speed symbol and reference speed (km/h)	TT TL ²⁾	PR	M+S	3)	4)	5)	Rim width	Min. distance between rim centers	Width	External Ø	
385/65 R 22.5	EURO-FRONT M 350	158/ - L (160/ - K)	L 120 (K 110)	TL	18		C	C	70	11.75 12.25		405 410	1092	
	TRAILER M 223	160/ - K	K 110	TL	20		C	C	70					
	TRAILER-STEEL M 277	160/ - K	K 110	TL	14	M+S	C	C	76					
275/70 R 22.5	EURO-STEEL M 349	148/145 L	L 120	TL	16		D	C	70	7.50 8.25	303 311	280 287	974	
	TRANS-STEEL M 470	148/145 L	L 120	TL	16	M+S	E	C	76					
315/70 R 22.5	RUNNER F2	156/150 L (154/150 M)	L 120 (M 130)	TL	20	M+S	**	**	**	9.00 9.75	351 360	318 326	1032	
	RUNNER D2	154/150 L (152/148 M)	L 120 (M 130)	TL	20	M+S	**	**	**					

Footnotes, see page 28

Specifications and load capacities

Tire dimensions				L ¹⁾	Tire fitment	Load capacity (kg) per axle at inflation pressure ⁶⁾ (bar) (psi)									
Design value		Stat. radius	Rolling circumference			4.5 (65)	5.0 (73)	5.5 (80)	6.0 (87)	6.5 (94)	7.0 (102)	7.5 (109)	8.0 (116)	8.5 (123)	9.0 (131)
Width + 1%	External Ø ± 1%														
389 394	1072	496	3248	160 158	S S	5165 5110	5620 5555	6065 6000	6505 6430	6935 6855	7360 7275	7775 7690	8190 8095	8595 8500	9000
269 276	958	445	2922	148 145	S D	3615 6660	3935 7245	4245 7820	4550 8385	4855 8940	5150 9485	5440 10025	5730 10555	6015 11080	6300 11600
312 320	1014	468	3093	156 154 152 150 148	S S S D D	4590 4305 4265 7695 7575	4995 4685 4640 8370 8240	5390 5055 5010 9035 8890	5780 5420 5370 9685 9535	6165 5780 5725 10325 10165	6540 6130 6075 10955 10785	6910 6480 6420 11580 11395	7280 6825 6760 12195 12000	7640 7160 7100 12800 12600	8000 7500

Specifications and load capacities

Tire size	Service description						EU tire label			Rim		Max. standard value	
	Pattern	LI / SI ¹⁾	Speed symbol and reference speed (km/h)	TT TL ²⁾	PR	M+S	3)	4)	5)	Rim width	Min. distance between rim centers	Width	External Ø
295/80 R 22.5	EURO-FRONT M 350	152/148 M	M 130	TL	16		D	C	◀) 70	8.25 9.00	326 335	302 310	1062
	TRANS-STEEL M 470	152/148 M	M 130	TL	16	M+S	E	C	◀) 70				
	SNOW-FRONT M 440	152/148 M	M 130	TL	16	M+S	D	C	◀) 73				
	SNOW-DRIVE M 431	152/148 M	M 130	TL	16	M+S	E	D	◀) 76				
315/80 R 22.5	RUNNER F2	156/150 L (154/150 M)	L 120 (M 130)	TL	20	M+S	C	B	◀) 69	9.00 9.75	351 360	318 326	1096
	RUNNER D2	156/150 L (154/150 M)	L 120 (M 130)	TL	20	M+S	D	C	◀) 73				
	ATHLET-FRONT	156/150 K	K 110	TL	16	M+S	D	C	◀) 73				
	ATHLET-DRIVE	156/150 K	K 110	TL	20	M+S	D	C	◀) 74				
	SNOW-FRONT M 440	154/150 M (156/150 L)	M 130 (L 120)	TL	18	M+S	D	C	◀) 73				
	SNOW-DRIVE M 431	154/150 M (156/150 L)	M 130 (L 120)	TL	18	M+S	E	D	◀) 76				

Specifications and load capacities

Tire dimensions				L ¹⁾	Tire fitment	Load capacity (kg) per axle at inflation pressure ⁶⁾ (bar) (psi)									
Design value		Stat. radius	Rolling circumference			4.5 (65)	5.0 (73)	5.5 (80)	6.0 (87)	6.5 (94)	7.0 (102)	7.5 (109)	8.0 (116)	8.5 (123)	9.0 (131)
Width + 1%	External Ø ± 1%														
290 298	1044	487	3184	152 148	S D	4265 7575	4640 8240	5010 8890	5370 9535	5725 10165	6075 10785	6420 11395	6760 12000	7100 12600	
312 320	1076	500	3282	156 154 150	S S D	4590 4505 8055	4995 4905 8760	5390 5290 9455	5780 5675 10140	6165 6050 10810	6540 6420 11470	6910 6785 12120	7280 7140 12765	7640 7500 13400	8000

Footnotes, see page 28

Specifications and load capacities

Tire size	Service description							EU tire label			Rim		Max. standard value	
	Pattern	LI / SI ¹⁾	Speed symbol and reference speed (km/h)	TT TL ²⁾	PR	M+S	3)	4)	5)	Rim width	Min. distance between rim centers	Width	External Ø	
												Width	External Ø	
11 R 22.5	EURO-STEEL M 434	148/145 L	L 120	TL	16		C	C	70	7.50	306	283	1070	
	TRANS-STEEL M 470	148/145 L	L 120	TL	16	M+S	E	C	76	8.25	314	290		
	TRAILER-STEEL M 422	148/145 J	J 100	TL	16		D	C	70					
12 R 22.5	EURO-STEEL M 434	152/148 L (150/148 M)	L 120 (M 130)	TL	16		C	C	70	8.25	329	304	1104	
	TRANS-STEEL M 470	152/148 L	L 120	TL	16	M+S	E	C	76	9.00	338	312		
	ATHLET-FRONT	152/148 K	K 110	TL	16	M+S	E	C	73					
	ATHLET-DRIVE	152/148 K	K 110	TL	16	M+S	E	C	74					
13 R 22.5	EURO-STEEL M 434	154/150 L (156/150 K)	L 120 (K 110)	TL	18		C	C	70	9.00	352	319	1146	
	ATHLET-FRONT	154/150 K (156/150 G)	K 110 (G 90)	TL	16	M+S	E	C	73	9.75	360	326		
	ATHLET-DRIVE	154/150 K	K 110	TL	18	M+S	E	C	74					

Footnotes, see page 28

Specifications and load capacities

Tire dimensions						Load capacity (kg) per axle at inflation pressure ⁶⁾ (bar) (psi)										
Design value		Stat. radius	Rolling circumference	L1 ¹⁾	Tire fitment	4.5 (65)	5.0 (73)	5.5 (80)	6.0 (87)	6.5 (94)	7.0 (102)	7.5 (109)	8.0 (116)	8.5 (123)	9.0 (131)	
Width +1%	External Ø ±1%															
272	1050	±1.5%	±2%	148	S	3785	4120	4445	4765	5080	5390	5695	6000	6300		
279						6970	7585	8185	8775	9355	9930	10490	11050	11600		
292 300	1084	±1.5%	±2%	152	S	4265	4640	5010	5370	5725	6075	6420	6760	7100		
						150	4225	4600	4960	5320	5670	6020	6360	6700		
						148	7575	8240	8890	9535	10165	10785	11395	12000		12600
313 320	1124	±1.5%	±2%	156	S	4590	4995	5390	5780	6165	6540	6910	7280	7640	8000	
						154	4505	4905	5290	5675	6050	6420	6785	7140		7500
						150	8055	8760	9455	10140	10810	11470	12120	12765		13400

Specifications and load capacities

Tire size	Service description						EU tire label			Rim		Max. standard value	
	Pattern	LI / SI ¹⁾	Speed symbol and reference speed (km/h)	TT TL ²⁾	PR	M+S	3)	4)	5)	Rim width	Min. distance between rim centers	Width	External Ø
7.50 R 15	TRAILER-STEEL M 422	135/133 G (134/132 J)	G 90 (J 100)	TT	16		D	C	70	5.00	232	212	784
										5.50	238	217	
										6.00	244	223	
										6.50	250	228	
8.25 R 15	TRAILER-STEEL M 222	142/141 G (141/140 J)	G 90 (J 100)	TT	18		D	C	70	5.50	258	235	848
										6.00	263	240	
										6.50	269	246	
										7.00	276	252	
365/80 R 20	TRAILER-STEEL M 222	160/157 J	J 100	TL	20		D	C	70	10.00		379	1116
14.00 R 20	GIGANT-STEEL M 235	164/160 G	G 90	TT	22	M+S	E	C	73	9.00	414	367	1268
										10.00	426	377	

Specifications and load capacities

Tire dimensions				L ¹⁾	Tire fitment	Load capacity (kg) per axle at inflation pressure ⁶⁾ (bar) (psi)									
Design value		Stat. radius	Rolling circumference			4.5 (65)	5.0 (73)	5.5 (80)	6.0 (87)	6.5 (94)	7.0 (102)	7.5 (109)	8.0 (116)	8.5 (123)	9.0 (131)
Width + 1%	External Ø ± 1%														
202				135	S	2850	3075	3295	3515	3730	3940	4150	4360		
207				134	S	2770	2990	3205	3420	3630	3835	4035	4240		
212	773	357	2342	133	D	5385	5815	6235	6645	7050	7450	7845	8240		
217				132	D	5230	5645	6050	6450	6845	7235	7620	8000		
224				142	S	3465	3740	4010	4275	4535	4795	5045	5300		
229				141	S	3365	3635	3895	4155	4405	4655	4905	5150		
234	835	383	2530	141	D	6735	7270	7795	8310	8815	9315	9810	10300		
240				140	D	6540	7055	7565	8065	8560	9045	9525	10000		
364	1092	502	3331	160	S	5620	6065	6505	6935	7360	7775	8190	8595	9000	
				157	D	10310	11125	11925	12715	13490	14260	15015	15760	16500	
360				164	S	6865	7405	7940	8465	8985	9495	10000			
370	1238	564	3776	160	D	12355	13335	14295	15245	16175	17090	18000			

Explanation of footnotes

Data acc. to DIN 7805/4, WdK-Guidelines 134/2, 142/2, 143/14, 143/25

1) Load index single/dual wheel fitment and speed symbol

2) TT = Tube Type, TL = Tubeless

3) Fuel efficiency

4) Wet grip

5) External rolling noise (db)

6) For inflation pressure of 8.0 bar (116 psi) and over use valve slit cover plate

** Label values in preparation

Valves, tubes and flaps

TL Tires 16" – 19.5"		
Tire size	Rim	Valve
205/75 R 16 C	5 1/2 J	43 GS 11.5
	6 J	43 GS 11.5
	6 1/2 J	43 GS 11.5
215/75 R 16 C	5 1/2 J	43 GS 11.5
	6 J	43 GS 11.5
	6 1/2 J	43 GS 11.5
225/75 R 16 C	6 1/2 J	43 GS 11.5
	6 J	43 GS 11.5
	7 J	43 GS 11.5
6.00 R 16 C	4 1/2 J,K	43 GS 16
	4.50 E	43 GS 16
	4.50 E SDC	43 GS 16
	5 1/2 J,K	43 GS 16
	5 K	43 GS 16
	5.00 E SDC	43 GS 16
6.50 R 16 C	4 1/2 J,K	43 GS 16
	4.50 E SDC	43 GS 16
	4.50 F	43 GS 16
	5 1/2 K	43 GS 16
	5 K	43 GS 16
	5.00 E SDC 5.50 F SDC	43 GS 16 43 GS 16
10 R 17.5	6.75	MS
	7.50	MS
205/75 R 17.5	5.25	MS
	6.00	MS
	6.75	MS
215/75 R 17.5	6.00	MS
	6.75	MS
225/75 R 17.5	6.00	MS
	6.75	MS
235/75 R 17.5	6.75	MS
	7.50	MS
8.5 R 17.5	5.25	MS
	6.00	MS
	6.75	MS
8 R 17.5 C	5.25	MS
	6.00	MS
	6.75	MS
245/70 R 19.5	6.75	MS
	7.50	MS
265/70 R 19.5	6.75	MS
	7.50	MS
	8.25	MS
285/70 R 19.5	7.50	MS
	8.25	MS
	9.00	MS

TL Tires 20" – 22.5"		
Tire size	Rim	Valve
14.00 R 20	10.0	120MSF
	10.00V	120MSF
365/80 R 20	10.00V	120MSF
10 R 22.5	6.75	MS
	7.50	MS
11 R 22.5	7.50	MS
	8.25	MS
12 R 22.5	8.25	MS
	9.00	MS
13 R 22.5	9.00	MS
	9.75	MS
275/70 R 22.5	7.50	MS
	8.25	MS
295/80 R 22.5	8.25	MS
	9.00	MS
315/70 R 22.5	9.00	MS
315/80 R 22.5	9.00	MS
385/65 R 22.5	11.75	MS
	12.25	MS

TT Tires				
Tire size	Rim	Tube	Valve	Flap
7.50 R 15	6.0	7.50-15	75 D-74	170-15
	6.5	7.50-15	75 D-74	170-15
8.25 R 15	6.5	8.25-15	75D-74	170-15
	7.0	8.25-15	75D-74	170-15
7.00 R 16	6.00 G SDC	7.00/7.50-16	105 D-Z	160-16
7.50 R 16	6.00 G SDC	7.00/7.50-16	105 D-Z	160-16
10.00 R 20	7.50	10.00 - 20	127 D-Z	200-20
11.00 R 20	8.00	11.00 - 20	127 D-Z	200-20
12.00 R 20	8.50	12.00 - 20	127 D-Z	200-20
14.00 R 20	10.0	14.00 - 20	140 D-Z	280-20
	10.00 V	14.00 - 20	140 D-Z	280-20
9.00 R 20	7.00	9.00 - 20	115 D-Z	180-20
12.00 R 24	8.50	12.00 - 24	127 D-74	220-24

Special load capacities for buses

Tire size	Load Index LI	Single/ Dual fitment	Max. permitted axle weight (kg) for inflation pressure (bar/psi) including + 10% extra as per German Transport Association 15% extra as per German Transport Association (DIN 78 05)									
			4.5/65	5.0/73	5.5/80	6.0/87	6.5/94	7.0/102	7.5/109	8.0/116	8.5/123	9.0/131
275/70 R 22.5	148	S	4160	4525	4885	5235	5580	5925	6260	6590	6920	7245
	145	D	7660	8335	8995	9640	10280	10910	11525	12140	12740	13340

Recommended inflation pressure for tires on town and country buses dependent on axle loads

Regrooving guidelines

All Semperit tires which can be regrooved have, on both sidewalls, in accordance with ECE regulation 54, the word **REGROOVABLE**

The additional tread depth of up to 4 mm gained by regrooving means a significant increase in performance.

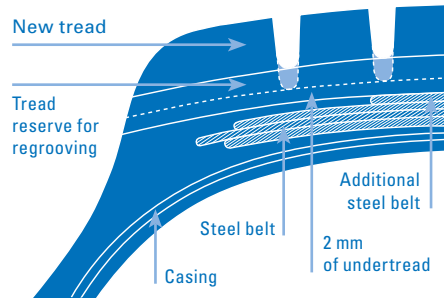
As part of their design all-steel truck tires have a so-called tread stock between the upper edge of the belt and the tread grooves. This tread stock is intended to prevent stones etc. penetrating the steel belts and casing.

Provided it is marked "REGROOVABLE", a commercial vehicle tire may be regrooved down to a residual undertread thickness of 2 mm above the breaker or belt.

All additional regulations of the respective country have to be met.

Although tires can be remoulded after reaching the legal wear limit, regrooving is not advisable in every case. The tread stock thickness is reduced and stones etc. can more easily penetrate and damage the steel belts, leading to rust formation. This has a decidedly negative effect on the tire's suitability for retreading.

The best time for remoulding is when the tread is worn down to about 3 mm. The tire must then be checked to make sure the wear is even all round. Attention should be paid to local or uneven wear patches.



Example:

Tire size	315/80 R 22.5 M 430
Original depth of the new tire	20.0 mm
Additional tread as a result of regrooving	4.0 mm

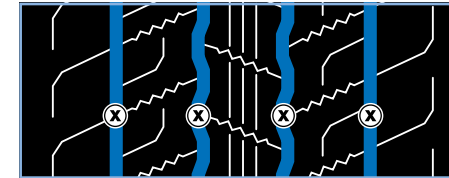
Regrooving may only be carried out by a qualified expert, in order to avoid premature failure as well as any reduction in the tire's suitability for remoulding.

In some countries (e.g. Germany for KOM-100 coaches and Austria for coaches) regrooving of front axle tires for coaches is prohibited. In general regrooving on front axle coach tires is not recommended.

All Semperit tires on which regrooving is permitted are marked "Regroovable".

RUNNER F

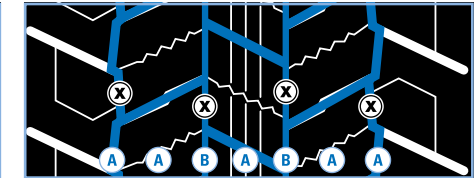
Runner F2



Tire size	Depth (mm)	Width (mm)
315/70 R 22.5	2.0	10
315/80 R 22.5	3.0	10

RUNNER D

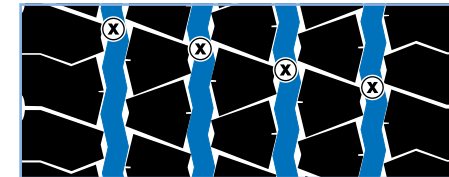
Runner D2



Tire size	Depth (mm)	Width (mm)
315/70 R 22.5	2.0	A: 7, B: 5
315/80 R 22.5	3.0	A: 7, B: 5

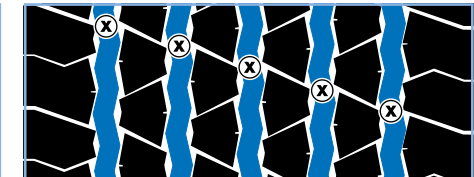
EURO-FRONT

M 350



Tire size	Depth (mm)	Width (mm)
295/80 R 22.5	3.0	10-12
315/80 R 22.5	3.0	10-12

M 350

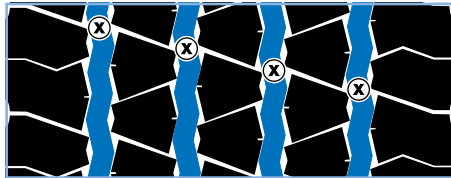


Tire size	Depth (mm)	Width (mm)
315/70 R 22.5	3.0	11-12
385/65 R 22.5	3.5	11-12

⊗ = Measuring point

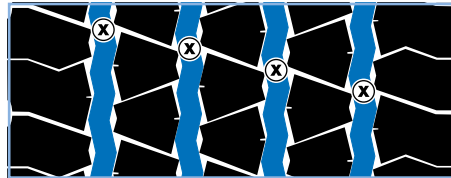
EURO-FRONT

M 249



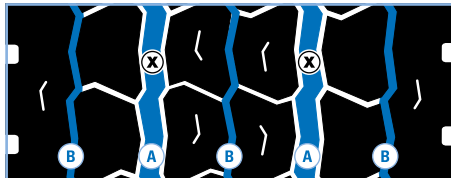
Tire size	Depth (mm)	Width (mm)
245/70 R 19.5	3.0	9-11
265/70 R 19.5	2.5	9-11
285/70 R 19.5	3.0	9-11

EURO-FRONT



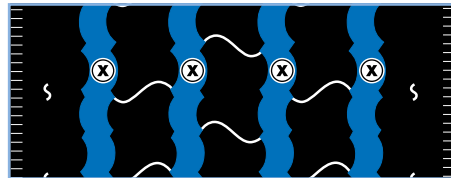
Tire size	Depth (mm)	Width (mm)
295/60 R 22.5	3.5	10-12
315/60 R 22.5	3.5	10-12

M 434



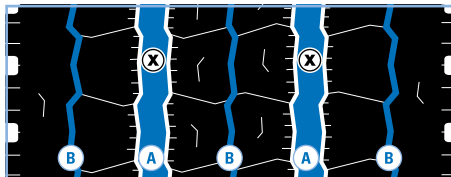
Tire size	Depth (mm)	Width (mm)
11 R 22.5	3.5	A: 8-10, B: 4-5
12 R 22.5	3.5	A: 8-10, B: 4-5
13 R 22.5	3.5	A: 8-10, B: 4-5

M 349



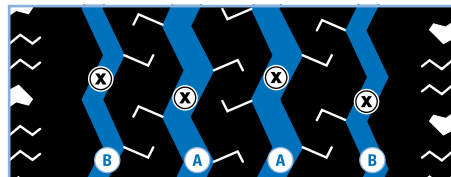
Tire size	Depth (mm)	Width (mm)
275/70 R 22.5	2.5	10-12

M 434



Tire size	Depth (mm)	Width (mm)
205/75 R 17.5	2.5	A: 7-8, B: 3-4
215/75 R 17.5	2.0	A: 7-8, B: 3-4
225/75 R 17.5	2.5	A: 7-8, B: 3-4
235/75 R 17.5	2.5	A: 7-8, B: 3-4

M 248



Tire size	Depth (mm)	Width (mm)
7.00 R 16	1.5	A: 9-10, B: 5-6
7.50 R 16	1.5	A: 9-10, B: 5-6
8 R 17.5 C	2.0	A: 9-10, B: 5-6
8.5 R 17.5	2.0	A: 9-10, B: 5-6
10 R 17.5	2.5	A: 9-10, B: 5-6

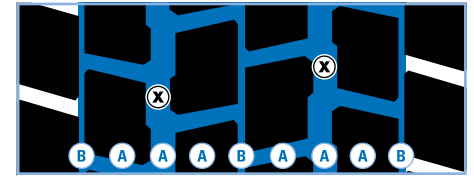
EURO-DRIVE

EURO-DRIVE



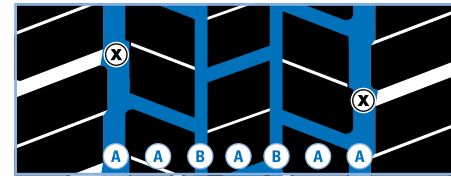
Tire size	Depth (mm)	Width (mm)
295/60 R 22.5	2.5	A: 8-10, B: 3-4
315/60 R 22.5	3.5	A: 8-10, B: 3-4

M 255



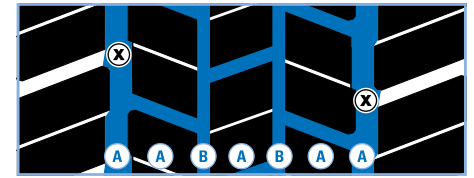
Tire size	Depth (mm)	Width (mm)
245/70 R 19.5	3.0	A: 11, B: 5
265/70 R 19.5	2.5	A: 11, B: 5
285/70 R 19.5	3.0	A: 11, B: 5

M 470



Tire size	Depth (mm)	Width (mm)
275/70 R 22.5	3.0	A: 8-10, B: 3-4
315/70 R 22.5	4.0	A: 8-10, B: 3-4
295/80 R 22.5	4.0	A: 8-10, B: 3-4
315/80 R 22.5	3.0	A: 8-10, B: 3-4
11 R 22.5	3.5	A: 8-10, B: 3-4
12 R 22.5	4.0	A: 8-10, B: 3-4

M 470

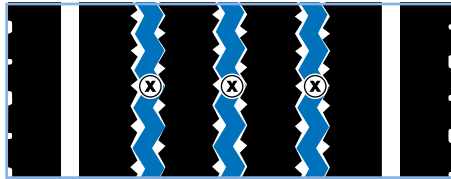


Tire size	Depth (mm)	Width (mm)
205/75 R 17.5	2.5	A: 6-7, B: 3-4
215/75 R 17.5	2.5	A: 6-7, B: 3-4
225/75 R 17.5	2.5	A: 6-7, B: 3-4
235/75 R 17.5	2.5	A: 6-7, B: 3-4

⊗ = Measuring point

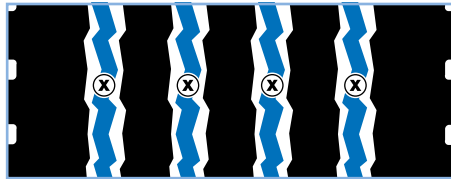
EURO-TRAILER

EURO-TRAILER



Tire size	Depth (mm)	Width (mm)
385/55 R 22.5	3.5	12

M 422



Tire size	Depth (mm)	Width (mm)
11 R 22.5	3.5	8-10

M 223



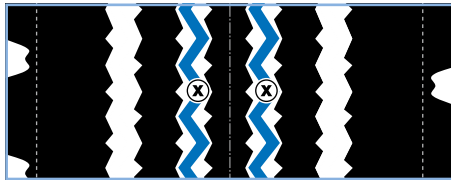
Tire size	Depth (mm)	Width (mm)
265/70 R 19.5	3.0	8

M 222



Tire size	Depth (mm)	Width (mm)
365/80 R 20	3.5	8-10

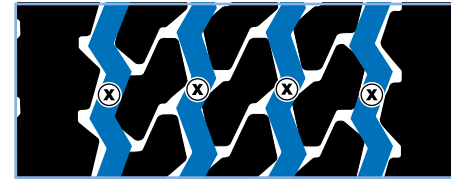
M 423



Tire size	Depth (mm)	Width (mm)
215/75 R 17.5	2.5	10-11
235/75 R 17.5	1.5	10-11
245/70 R 17.5	1.5	10-11

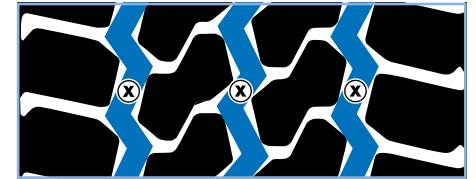
ATHLET-FRONT

ATHLET-FRONT



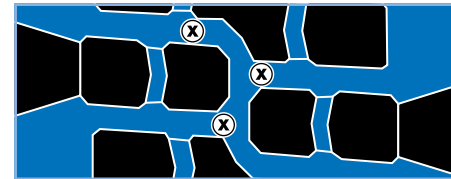
Tire size	Depth (mm)	Width (mm)
315/80 R 22.5	3.0	12

ATHLET-FRONT



Tire size	Depth (mm)	Width (mm)
12 R 22.5	3.5	12
13 R 22.5	3.5	12

M 235



Tire size	Depth (mm)	Width (mm)
12.00 R 20	4.0	8-10
14.00 R 20 TT	4.0	8-10
14.00 R 20 TL	4.0	8-10

⊗ = Measuring point

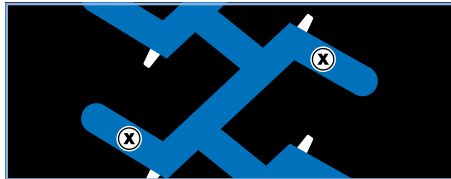
ATHLET-DRIVE

ATHLET-TRAILER

SNOW-FRONT

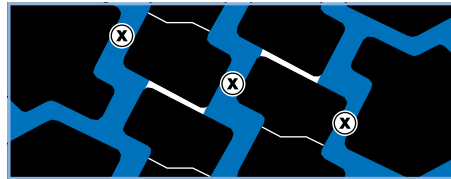
SNOW-DRIVE

ATHLET-DRIVE



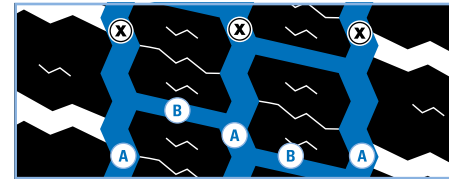
Tire size	Depth (mm)	Width (mm)
315/80 R 22.5	3.5	12-14

M 277



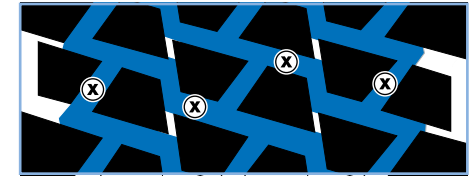
Tire size	Depth (mm)	Width (mm)
385/65 R 22.5	3.5	10-12

M 440



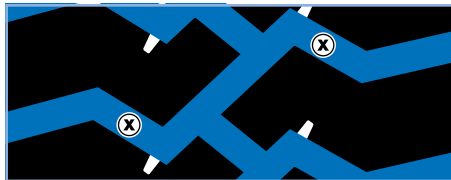
Tire size	Depth (mm)	Width (mm)
295/80 R 22.5	3.5	A: 11-13, B: 10
315/80 R 22.5	3.0	A: 11-13, B: 10

M 431



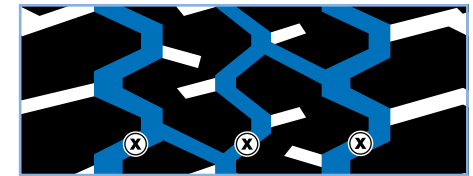
Tire size	Depth (mm)	Width (mm)
295/80 R 22.5	4.0	10
315/80 R 22.5	3.5	10
12 R 22.5	4.0	10

ATHLET-DRIVE



Tire size	Depth (mm)	Width (mm)
12 R 22.5	3.5	12-14
13 R 22.5	3.5	12-14

M 529



Tire size	Depth (mm)	Width (mm)
8.5 R 17.5	2.0	5-7

⊗ = Measuring point

Maintenance and care

The pre-condition for successful maintenance and care is the correct choice of tire, following the recommendations of the tire manufacturer.

Storage

Unused tires should be stored in cool, dry, dark and lightly ventilated rooms. Tires which are not fitted on rims should be stored standing up. Avoid contact with fuel, lubricants, solvents and chemicals. Should tires, tubes and bead flaps need to be stored temporarily, they may age more quickly and develop cracks if they are exposed to intense sunlight or extreme heat. Effective air circulation accelerates this process. Inner tubes may be particularly affected if their packaging is damaged.

Fitting the tire

Before demounting a tire, unscrew and remove the valve insert; then wait until all the air has been allowed to escape. If a tube-type tire is fitted with an angled valve to DIN 7786-80 GD 80, unscrew the valve stem and wait until the escaping air ceases to make a noise before removing the tire. Particular care should be taken when fitting the tire. Only rust-free rims of the right size should be used. These should not be damaged or show any signs of wear and tear. The loose flange side should be examined with great care. Always use new rubber tubeless valves or new inner tubes and flaps on new tires or new seals for tubeless metal valves.

Take special care after tire repairs: inner tubes stretch in use and may form dangerous folds when re-fitted. If in doubt, always fit new inner tubes in order to avoid tube failure.

It is particularly important with large tires that these should already fit on the rim flange with as little inflation pressure as possible. See also WdK-Guideline 104, where detailed fitting recommendations are given.

As a guide:

When fitting, do not exceed 150% of the maximum standard inflation pressure. Under no circumstances must 10 bar be exceeded. Use only recommended fitting tools and equipment.

Should the tire bead be jammed on the rim and the pressure be high, the bead may be damaged or even destroyed.

With tube type tires, check that valves still move freely after the filler nozzle has been removed. This is important for later inflation pressure checks under difficult conditions.

Fast-running wheels should be balanced statically and dynamically to ensure smooth running.

Maintenance and care

Fitting the wheel onto the vehicle

Vehicle axle data such as toe-in, king pin inclination and castor as well as axle alignment must be checked and if necessary adjusted to within tolerances.

Only then should the wheel be fitted.

When fitting make sure that the axle hub is perfectly centered. Extra care is necessary with large, heavy tires which do not have special centering.

If necessary re-balance the wheel when it is fitted on the vehicle.

Always remember to check that the valves move freely and are easily accessible. Valve extensions are necessary for dual tires.

Checking the inflation pressure requires the free movement and easy access of the valves, even when they have become dirty in operation.

Valve caps, preferably high pressure type, must be fitted.

On rolling road testers where the vehicle performance is examined, restrictive testing regulations must be observed: depending on the roller diameter only short tests may be carried out and these always below maximum speed.

If a vehicle has the same type of tires on all round e.g. radial tires, this will guarantee optimum driving characteristics and maximum driving stability.

The use of different tire designs on each axle should be a rare exception. Where vehicles are being used on the highway, minimum tread depths as specified in the latest national regulations must be observed. For motor vehicles, trailers or semitrailers it is essential that tires of the same construction are fitted to the same axle.

Tire Tread Depth

The legal minimum tread depth is 1.6 mm and must cover the complete width and circumference of the tread. The depth should be measured in the tread groove with the tread wear indicator (the area with the indicator should not be taken).

Vehicle in operation

The inflation pressure must be correct. Otherwise poor vehicle handling and pronounced, irregular tread wear are inevitable.

If pressure is insufficient, the rolling resistance will increase and with it the fuel consumption. Hidden defects in the tire may also occur which later lead to tire failure.

Maintenance and care

Tire inflation pressures specified by vehicle and tire manufacturers are contained in the vehicle manual and, for instance, on the vehicle mud guard. These may vary with different loads and service conditions, and must be adjusted before commencing a journey. Specified inflation pressures always apply to cold tires. It is quite normal for the pressure to increase as the tires warm up during driving. Do not reduce pressure when the tires are hot.

Never use different inflation pressures for the same axle.

The spare wheel should be inflated to at least the maximum inflation pressure given in the vehicle manual. Remember to always include the spare wheel when checking inflation pressures.

A balanced, even style of driving reduces the strain on the tires. Every hasty reaction on the accelerator, brakes or steering shortens the life of the tires.

The same also applies of course to all other forms of peak strain such as severe scuffing of the tire along the curb or driving over obstacles that may be in the road. These can all result in damage to the tire construction.

Excessive strain on the tire should be avoided. This has the same effect as insufficient pressure.

Do not exceed the tire's permitted maximum speed, otherwise tire damage is inevitable.

Maintenance and care of the vehicle's tires

The high quality standard of the tires and vehicle, which is achieved by the measures and recommendations stated above, can only be ensured by **regularly checking all factors**.

For example, pressure checks and external inspections of the tires (including the sidewalls to the inside of the vehicle and between dual tires).

Pressure checking devices and small replacement parts such as valve inserts, caps and extensions should always be close at hand.

Tires age as a result of physical and chemical processes and this may impair their performance.

Tires which are fitted to mainly stationary vehicles or those which are not used regularly, are particularly prone to premature ageing.

Maintenance and care

Unfavorable weather conditions also accelerate the ageing process as well as the storage conditions covered in the previous section.

An expert should always be called in to make a qualified judgement on the tires. Regrooving of the tread pattern – usually when there are 2 or 3 millimetres of tread depth left – should be carried out only by qualified experts when the word “REGROOVABLE” is displayed on the tire sidewall.

Tire repairs

Tire damage may initially be just a question of damage to the outer rubber: however, this apparently superficial damage can eventually extend down to, or into, the tire's reinforcing materials (casing/belt). Therefore no time should be lost in taking the tire to a specialist for assessment as soon as any external damage is detected.

Damage to the reinforcing materials, for instance due to a nail puncture or a deep cut, is particularly dangerous because dirt and moisture may penetrate between the damage occurring and when it was detected. This may even result in more serious damage to the reinforcing materials. Damage to the inside of a tire can also cause a slow puncture. The tire is then driven underinflated and consequently subjected to excessive strain. All these factors can make a tire irreparable by the time the damage is finally discovered. If the tire is repaired regardless, even if it is repaired by a reputable tire specialist, it is possible that tire failure can still occur as a result of an overstrained area, other than that originally damaged.

This is why each tire must be carefully inspected by a tire expert before it is repaired. Only a specially trained person can decide whether it is possible to repair the tire and whether the tire will be capable of delivering safe performance after the repair. Repairs must be carried out by an authorized workshop, which is then responsible for inspecting the tire and for doing the job properly.

Repairs to the wheels are forbidden.

Overview of tread patterns



RUNNER / EURO

RUNNER

RUNNER F2
RUNNER D2



ATHLET



SNOW

EURO-FRONT

M 350/M 249
EURO-FRONT
M 349
M 434
M 248

ATHLET-FRONT

ATHLET-FRONT
M 235

SNOW-FRONT

M 440

EURO-DRIVE

M 470
EURO-DRIVE
M 255

ATHLET-DRIVE

ATHLET-DRIVE

SNOW-DRIVE

M 431
M 529

EURO-TRAILER

M 223
M 422
M 222
M 423

ATHLET-TRAILER

M 277



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