



1,200 - 2,000 kg

MSX Series

Pedestrian High Lift
Stacker With Operator
Platform

MS12-20X

SPEC SHEET

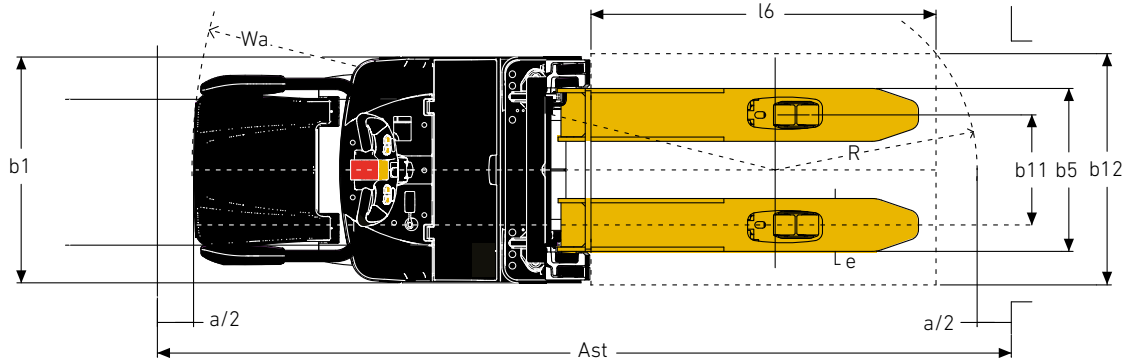
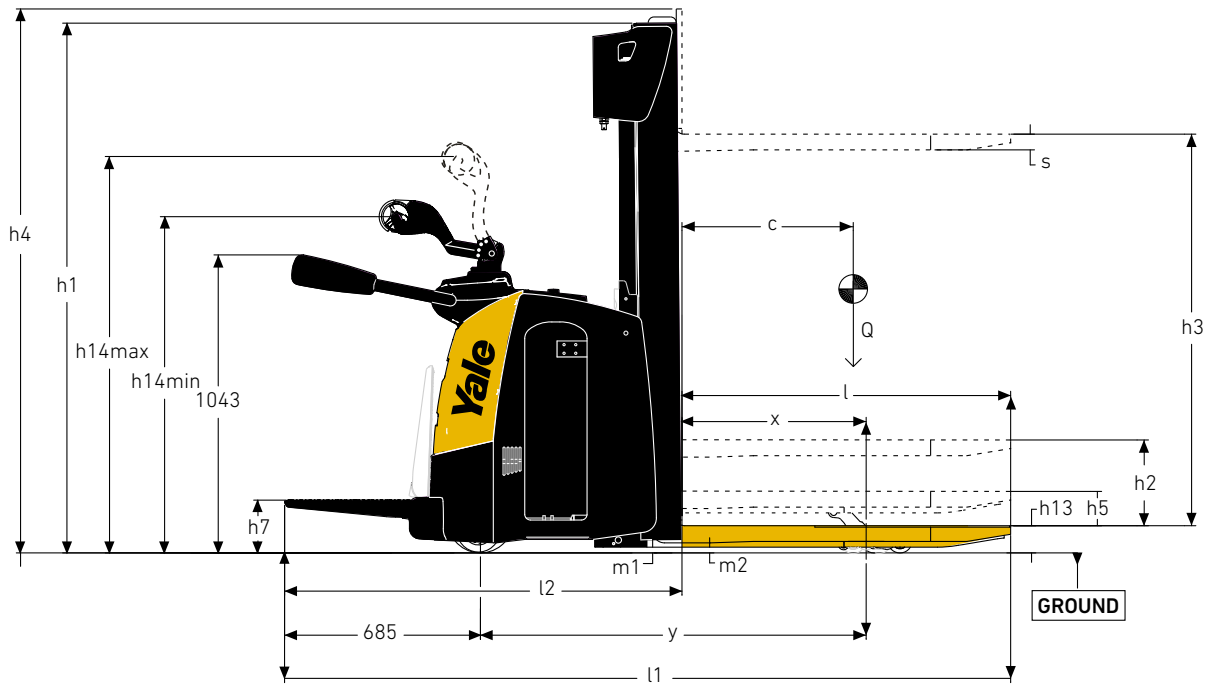
TRUCK DIMENSIONS – MSX SERIES

$$Ast = Wa + R + a$$

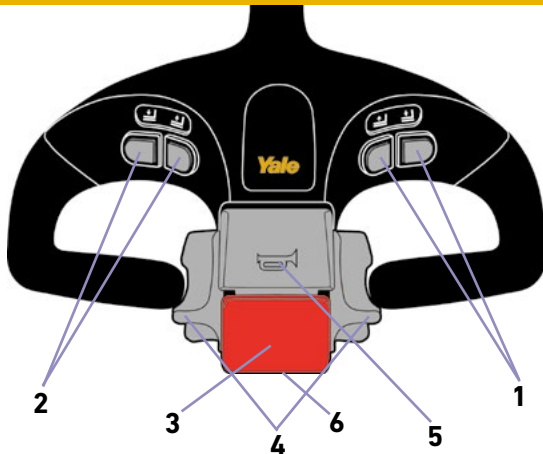
$$R = \sqrt{(l_6 + x)^2 + \left(\frac{b_{12}}{2}\right)^2}$$

a = 200mm

l₆ = Load length



TILLER HEAD – MSX SERIES



1. Proportional lift / lower buttons
2. On / off for low speed or initial lift (option)
3. Travel direction inverter button
4. Butterfly control buttons for direction and speed
5. Horn
6. Creep speed (opposite side)

MAST DIMENSIONS – MS12X, MS14X, MS16X

h ₃ (mm)	h ₂ (mm)	h ₃ ⁽¹⁾ (mm)	h ₄ ⁽²⁾ (mm)	Weight ⁽³⁾ (kg)
2-Stage No Free-Lift (NFL) Mast				
2800	100	1900 ⁽⁴⁾	3328	329
3000	100	2000 ⁽⁴⁾	3528	343
3200	100	2100	3728	356
3400	100	2200	3928	369
3600	100	2300	4128	382
3800	100	2400	4328	395
4000	100	2500	4528	409
4200	100	2600	4728	422

(1) With free lift of 100mm for NFL mast

(2) With load backrest (h=1000) for carriage h₄ + 562mm (2 stage mast), + 524mm (3 stage mast), + 518mm (2 ton. mast)

(3) All weights are: mast structures (weldment, cylinders, chain, pulley) + oil.
EXCLUDED: forks, accessories

(4) Not available with vertical extraction

MAST DIMENSIONS – MS12X, MS14X, MS16X

h ₃ (mm)	h ₂ (mm)	h ₃ ⁽¹⁾ (mm)	h ₄ ⁽²⁾ (mm)	Weight ⁽³⁾ (kg)
2-Stage No Free-Lift (NFL) Mast				
2740	1418	1850 ⁽⁴⁾	3268	341
2940	1518	1950 ⁽⁴⁾	3468	354
3140	1618	2050	3668	367
3340	1718	2150	3868	380
3540	1818	2250	4068	393
3740	1918	2350	4268	406
3940	2018	2450	4468	419
4140	2118	2550	4668	432

(1) With free lift of 100mm for NFL mast

(2) With load backrest (h=1000) for carriage h₄ + 562mm (2 stage mast), + 524mm (3 stage mast), + 518mm (2 ton. mast)

(3) All weights are: mast structures (weldment, cylinders, chain, pulley) + oil.
EXCLUDED: forks, accessories

(4) Not available with vertical extraction

MAST DIMENSIONS – MS12X, MS14X, MS16X

MODEL	h ₃ (mm)	h ₂ (mm)	h ₃ ⁽¹⁾ (mm)	h ₄ ⁽²⁾ (mm)	Weight ⁽³⁾ (kg)			
3-Stage Full Free-Lift (FFL) Mast								
MS16X	MS14X	MS12X	4040	1318	1850 ⁽⁴⁾	4606	462	
			4340	1418	1950 ⁽⁴⁾	4906	481	
			4620	1518	2050	5186	499	
			4900	1618	2150	5466	518	
				5180	1718	2250	5746	537
				5460	1818	2350	6026	556
				5740	1918	2450	6306	575
				6020	2018	2550	6586	594

(1) With free lift of 100mm for NFL mast

(2) With load backrest (h=1000) for carriage h₄ + 562mm (2 stage mast), + 524mm (3 stage mast), + 518mm (2 ton. mast)

(3) All weights are: mast structures (weldment, cylinders, chain, pulley) + oil.
EXCLUDED: forks, accessories

(4) Not available with vertical extraction

MAST DIMENSIONS – MS20X

h ₃ (mm)	h ₂ (mm)	h ₃ ⁽¹⁾ (mm)	h ₄ ⁽²⁾ (mm)	Weight ⁽³⁾ (kg)
2-Stage No Free-Lift (NFL) Mast				
2600	100	1900 ⁽⁴⁾	3172	327
2800	100	2000 ⁽⁴⁾	3372	340
3000	100	2100	3572	353
3200	100	2200	3772	366
3400	100	2300	3972	379
3600	100	2400	4172	393
3800	100	2500	4372	406
4000	100	2600	4572	419

(1) With free lift of 100mm for NFL mast

(2) With load backrest (h=1000) for carriage h₄ + 562mm (2 stage mast), + 524mm (3 stage mast), + 518mm (2 ton. mast)

(3) All weights are: mast structures (weldment, cylinders, chain, pulley) + oil.
EXCLUDED: forks, accessories

(4) Not available with vertical extraction

All values are nominal values and they are subject to tolerances.

VDI 2198 – GENERAL SPECIFICATIONS – MSX SERIES

GENERAL			Yale			
			MS12X	MS14X	MS16X	MS20X
1.1	Manufacturer					
1.2	Model designation					
1.3	Drive		Electric (battery)			
1.4	Operator type		Pedestrian/Standing			
1.5	Rated capacity/Rated load	Q (t)	1.2	1.4	1.6	2.0
1.6	Load centre distance	c (mm)	600			
1.8	Load distance, centre of drive axle to fork ⁽¹⁾	x (mm)	709			
1.9	Wheelbase	y (mm)	1319			
WEIGHT	2.1	Service weight	1100	1130	1240	1243
	2.2	Axle loading with load, front/rear ⁽¹⁷⁾	797 / 1503	830 / 1700	897 / 1943	938 / 2305
	2.3	Axle loading without load, front/rear ⁽¹⁷⁾	749 / 351	774 / 356	837 / 403	836 / 407
TYRES	3.1	Tyres front/rear	NDIIThane			
	3.2	Tyre size, front ⁽¹⁷⁾	230 x 80			
	3.3	Tyre size, rear ⁽¹⁷⁾	85 x 100	85 x 70		
	3.4	Additional wheels (dimensions)	150 x 54			
	3.5	Wheels, number front/rear (x = driven wheels) ⁽¹⁷⁾	1x + 1 / 2	1x + 1 / 4		
	3.6	Tread, front ⁽¹⁷⁾	b ₁₀ (mm)	510		
	3.7	Tread, rear ⁽¹⁷⁾	b ₁₁ (mm)	396		
DIMENSIONS	4.2	Height, mast lowered	h ₁ (mm) 2100			
	4.3	Free lift	h ₂ (mm) 100			
	4.4	Lift	h ₃ (mm) 3200			
	4.5	Height, mast extended	h ₄ (mm) 3728			
	4.6	Initial lift	h ₅ (mm) -			
	4.8	Seat height/stand height	h ₁₄ (mm) 185			
	4.9	Height drawbar in driving position min./max.	h ₈ (mm) 1147 / 1382			
	4.15	Height, lowered	h ₁₃ (mm) 90			
	4.19.1	Overall length (pedestrian) ⁽³⁾	l ₁ (mm) 2009		2081	
	4.19.2	Overall length (standing) ⁽³⁾	l ₁ (mm) 2445		2517	
	4.20.1	Length to face of forks (pedestrian) ⁽³⁾	l ₂ (mm) 859		931	
	4.20.2	Length to face of forks (standing) ⁽³⁾	l ₂ (mm) 1295		1367	
	4.21	Overall width	b ₁ / b ₂ (mm) 790			
	4.22	Fork dimensions	s/e/l (mm) 55 / 185 / 1150			65 / 185 / 1150
	4.24	Fork-carriage width	b ₃ (mm) -			
	4.25	Distance between fork-arms	b ₅ (mm) 570 ⁽¹⁸⁾			
	4.26	Width between load arms	b ₄ (mm) m ₁ -			
	4.31	Ground clearance, laden, below mast	(mm) 42			
	4.32	Ground clearance, center of wheelbase	m ₂ (mm) 32			
	4.33	Load dimension b ₁₂ x l ₆ crossways	b ₁₂ x l ₆ (mm) 1000 x 1200			
4.34	Aisle width for pallets 1000mm x 1200mm crossways (pedestrian)	A _{st2} (mm) 2463	2534			
4.34.1	Aisle width for pallets 1000mm x 1200mm crossways (standing)	A _{st1} (mm) 2870	2942			
4.34.2	Aisle width for pallets 800mm x 1200mm lengthwise (pedestrian)	A _{st2} (mm) 2429	2500			
4.34.3	Aisle width for pallets 800mm x 1200mm lengthwise (standing)	A _{st1} (mm) 2836	2908			
4.35	Turning radius (pedestrian) ⁽²⁾	W _{a2} (mm) 1596				
4.35.1	Turning radius (standing) ⁽²⁾	W _{a1} (mm) 2003				
PERFORMANCE	5.1	Travel speed, laden/unladen (pedestrian)	km/h 6			
	5.1.1	Travel speed, laden/unladen (standing) ^{(19) (20)}	7.5 ⁽¹⁰⁾	8.5	7	
	5.1.2	Travel speed, laden/unladen, backwards (pedestrian)	km/h 6			
	5.1.3	Travel speed, laden/unladen, backwards (standing) ^{(19) (20)}	7.5 ⁽¹⁰⁾	8.5	7	
	5.2	Lift speed, laden/unladen	0.15 / 0.26		0.13 / 0.26	
	5.3	Lowering speed, laden/unladen	0.4 / 0.3		0.24 / 0.17	
	5.7	Gradeability, laden/unladen	- ⁽¹⁶⁾		- ⁽¹⁷⁾	
	5.8	Max. gradeability, laden/unladen	7.0 / 16.8 ⁽¹²⁾	6.2 / 16.3 ⁽¹³⁾	8.1 / 20.0	6.8 / 20
	5.10	Service brake	Electromagnetic			
	ELECTRIC	6.1	Drive motor, S2 60 min rating	1.8 ⁽¹¹⁾		2.5
6.2		Lift motor S3 15% rating	kW 3 ⁽¹⁴⁾			
6.3		Battery according to DIN 43531 / 35 / 36 A,B,C, no	B			
6.4		Battery voltage/nominal capacity K5	24V / 250Ah ⁽⁵⁾	24V / 250Ah ⁽⁶⁾	24V / 375Ah ⁽⁷⁾	24V / 375Ah ⁽⁷⁾
6.5		Battery weight ⁽⁴⁾	212		288	
6.6		Energy consumption acc. to VDI cycle	1	1.1	1.25	1.3
8.1	Type of drive unit	AC-Controller				
8.4	Average noise level at the operator's ear according to EN 12053	dB (A) 65.4				

(1) With 3 stage mast - 43mm

(2) IL: load section lowered +72mm

(3) With 3 stage mast +43mm, with 3 stage mast with load backrest +43mm, with 2 stage mast with load backrest +27mm

(4) These values may vary of +/-5%

(5) Available battery 24V / 210Ah (212 kg) ; 24V / 250Ah Polypropylene case version (180 kg + ballast 32kg) ; 24V / 200Ah Li-Ion (211kg)

(6) Available battery 24V / 210Ah (212kg) ; 24V / 315Ah (288kg) ; 24V / 375Ah (288kg) ; 24V / 250Ah Polypropylene case version (180kg + ballast 32kg) ; 24V / 200Ah Li-Ion (211 kg) ; 24V / 300Ah Li-Ion (277kg) ; with 315 / 375Ah the wheelbase is increased y = +72mm

(7) Available battery 24V / 315Ah (288kg) ; 24V / 300Ah Li-Ion (277kg)

(8) Available battery 24V / 210Ah (212kg) ; 24V / 200Ah Li-Ion (211kg)

(9) Available battery 24V / 210Ah (212kg) ; 24V / 315Ah (288kg) ; 24V / 375Ah (288kg) ; 24V / 200Ah Li-Ion (211kg) ; 24V / 300Ah Li-Ion (277kg) ; with 315 / 375Ah the wheelbase is increased y = +72mm

(10) Available 8.5km/h with 2.5kW S2 = 60min motor

VDI 2198 – GENERAL SPECIFICATIONS – MSX SERIES

		Yale						
		MS12X IL	MS14X IL	MS16X IL	MS16X SL			
GENERAL	1.1	Manufacturer	Yale					
	1.2	Model designation	Electric (battery)					
	1.3	Drive	Pedestrian/Standing					
	1.4	Operator type	Pedestrian/Standing					
	1.5	Rated capacity/Rated load	Q (t)	1.2	1.4	1.6	1.6	
	1.6	Load centre distance	c (mm)	600				
	1.8	Load distance, centre of drive axle to fork ⁽¹⁾	x (mm)	644				
	1.9	Wheelbase	y (mm)	1350	1422	1408		
	WEIGHT	2.1	Service weight	1191				
2.2		Axle loading with load, front/rear ⁽¹⁷⁾	kg	912 / 1479	840 / 1751	1000 / 1867	1042 / 2081	
2.3		Axle loading without load, front/rear ⁽¹⁷⁾	kg	815 / 376	795 / 396	870 / 397	985 / 538	
TYRES	3.1	Tyres front/rear	NDIIThane					
	3.2	Tyre size, front ⁽¹⁷⁾	230 x 80					
	3.3	Tyre size, rear ⁽¹⁷⁾	85 x 95	85 x 75		85 x 70		
	3.4	Additional wheels (dimensions)	150 x 54				125 x 60	
	3.5	Wheels, number front/rear (x = driven wheels) ⁽¹⁷⁾	1x + 1 / 2	1x + 1 / 4				
	3.6	Tread, front ⁽¹⁷⁾	b ₁₀ (mm)	510			522	
	3.7	Tread, rear ⁽¹⁷⁾	b ₁₁ (mm)	385			968 - 1168 - 1368	
DIMENSIONS	4.2	Height, mast lowered	h ₁ (mm)	1900			2100	
	4.3	Free lift	h ₂ (mm)	100				
	4.4	Lift	h ₃ (mm)	2800			3200	
	4.5	Height, mast extended	h ₄ (mm)	3328			3728	
	4.6	Initial lift	h ₅ (mm)	120			-	
	4.8	Seat height/stand height	h ₁₄ (mm)	185				
	4.9	Height drawbar in driving position min./max.	h ₈ (mm)	1147 / 1382				
	4.15	Height, lowered	h ₁₃ (mm)	90			55	
	4.19.1	Overall length (pedestrian) ⁽³⁾	l ₁ (mm)	2105	2177		2161	
	4.19.2	Overall length (standing) ⁽³⁾	l ₁ (mm)	2540	2612		2597	
	4.20.1	Length to face of forks (pedestrian) ⁽³⁾	l ₂ (mm)	955	1027		1011	
	4.20.2	Length to face of forks (standing) ⁽³⁾	l ₂ (mm)	1390	1462		1447	
	4.21	Overall width	b ₁ / b ₂ (mm)	790			794 / 1095 -1295 -1495	
	4.22	Fork dimensions	s/e/l (mm)	55 / 185 / 1150			35 / 120 / 1150	
	4.24	Fork-carriage width	b ₃ (mm)	-			800 / 1000 / 1200	
	4.25	Distance between fork-arms	b ₅ (mm)	570 ⁽¹⁸⁾			max 716 / 944 / 1096 ⁽²¹⁾	
	4.26	Width between load arms	b ₄ (mm) m ₁	-			841-1041-1241	
	4.31	Ground clearance, laden, below mast	(mm)	44			42	
	4.32	Ground clearance, center of wheelbase	m ₂ (mm)	20			26	
	4.33	Load dimension b ₁₂ x l ₆ crossways	b ₁₂ x l ₆ (mm)	1000 x 1200				
4.34.1	Aisle width for pallets 1000mm x 1200mm crossways (pedestrian)	Ast ₂ (mm)	2524	2595		2619		
4.34.1	Aisle width for pallets 1000mm x 1200mm crossways (standing)	Ast ₁ (mm)	2932	3002		3034		
4.34.2	Aisle width for pallets 800mm x 1200mm lengthwise (pedestrian)	Ast ₂ (mm)	2511	2582		2605		
4.34.2	Aisle width for pallets 800mm x 1200mm lengthwise (standing)	Ast ₁ (mm)	2919	2990		3020		
4.35.1	Turning radius (pedestrian) ⁽²⁾	W _{a2} (mm)	1626	1697		1722		
4.35.1	Turning radius (standing) ⁽²⁾	W _{a1} (mm)	2034	2105		2137		
PERFORMANCE	5.1	Travel speed, laden/unladen (pedestrian)	km/h	6				
	5.1	Travel speed, laden/unladen (standing) ^{(19) (20)}	km/h	7.5 ⁽¹⁰⁾	8.5		7	
	5.1.1	Travel speed, laden/unladen, backwards (pedestrian)	km/h	6				
	5.1.1	Travel speed, laden/unladen, backwards (standing) ^{(19) (20)}	km/h	7.5 ⁽¹⁰⁾	8.5		7	
	5.2	Lift speed, laden/unladen	m/s	0.15 / 0.26				
	5.3	Lowering speed, laden/unladen	m/s	0.4 / 0.3				
	5.7	Gradeability, laden/unladen	%	- ⁽¹⁸⁾	- ⁽¹⁹⁾	1.0 / 4.8		0.8 / 3.7
5.8	Max. gradeability, laden/unladen	%	6.6 / 15.3 ⁽¹⁴⁾	6.0 / 15.3 ⁽¹⁵⁾		8.0 / 20.0	7.2 / 16.8	
5.10	Service brake	Electromagnetic						
ELECTRIC	6.1	Drive motor, S2 60 min rating	kW	1.8 ⁽¹¹⁾			2.5	
	6.2	Lift motor S3 15% rating	kW	3 ⁽¹⁶⁾				
	6.3	Battery according to DIN 43531 / 35 / 36 A,B,C, no	B					
	6.4	Battery voltage/nominal capacity K5	V/Ah	24V / 250Ah ⁽⁸⁾	24V / 250Ah ⁽⁹⁾	24V / 375Ah ⁽⁷⁾	24V / 375Ah ⁽⁷⁾	
	6.5	Battery weight ⁽⁴⁾	kg	212			288	
	6.6	Energy consumption acc. to VDI cycle	kWh/h	1	1.1		1.25	1.3
8.1	Type of drive unit	AC-Controller						
8.4	Average noise level at the operator's ear according to EN 12053	dB (A)	65.4					

(11) Available 2.5kW S2=60min motor

(12) Available 10.4 / 20.0 with 2.5kW S2 = 60min motor

(13) Available 9.3 / 20.0 with 2.5kW S2 = 60min motor

(14) Available 10.0 / 20.0 with 2.5kW S2 = 60min motor

(15) Available 9.0 / 20.0 with 2.5kW S2 = 60min motor

(16) Value referred to S3 12%

(17) Pedestrian version. For Standing version, front / rear are inverted

(18) Available b₅ 680mm: with b₅ 680mm and 2 stage mast, x -43 mm, l₁ and l₂ +43mm

(19) With lateral protections not in guarding position: 6km/h

(20) Without lateral protections (optional): 6km/h MS16X SL

(21) With forks 35 / 120 / 1150, effective dimension may change depending on forks position and on forks dimensions

All values are nominal values and they are subject to tolerances.

REAR TYRE SIZE – MSX SERIES

			b₄ 1050mm	b₄ 1250mm
3.7	Tread, rear (tyre size, rear = ø 85 x 70mm) ⁽¹⁾	b ₁₁ (mm)	1178	1378
3.7	Tread, rear (tyre size, rear = ø 125 x 50mm) ⁽¹⁾	b ₁₁ (mm)	1132	1332
4.21	Overall width (tyre size, rear = ø 85 x 70mm)	b ₁ / b ₂ (mm)	860 / 1305	860 / 1505
4.21	Overall width (tyre size, rear = ø 125 x 50mm)	b ₁ / b ₂ (mm)	860 / 1214	860 / 1414
4.26	Distance between wheel arms / loading surfaces	b ₄ (mm)	1050	1250
4.34	Aisle width for pallets 1000mm x 1200mm crossways (standing) (tyre size, rear = ø 85 x 70mm)	Ast ₁ (mm)	2989 ⁽²⁾	3040 ⁽²⁾
4.34.1	Aisle width for pallets 1000mm x 1200mm crossways (pedestrian) (tyre size, rear = ø 85 x 70mm)	Ast ₂ (mm)	2540 ⁽²⁾	2591 ⁽²⁾
4.34.2	Aisle width for pallets 1000mm x 1200mm crossways (standing) (tyre size, rear = ø 125 x 50mm)	Ast ₁ (mm)	3003 ⁽²⁾	3031 ⁽²⁾
4.34.3	Aisle width for pallets 1000mm x 1200mm crossways (pedestrian) (tyre size, rear = ø 125 x 50mm)	Ast ₂ (mm)	2554 ⁽²⁾	2582 ⁽²⁾
4.34.4	Aisle width for pallets 800mm x 1200mm lengthwise (standing) (tyre size, rear = ø 85 x 70mm)	Ast ₁ (mm)	2978 ⁽²⁾	3042 ⁽²⁾
4.34.5	Aisle width for pallets 800mm x 1200mm lengthwise (pedestrian) (tyre size, rear = ø 85 x 70mm)	Ast ₂ (mm)	2529 ⁽²⁾	2593 ⁽²⁾
4.34.6	Aisle width for pallets 800mm x 1200mm lengthwise (standing) (tyre size, rear = ø 125 x 50mm)	Ast ₁ (mm)	2984 ⁽²⁾	3032 ⁽²⁾
4.34.7	Aisle width for pallets 800mm x 1200mm lengthwise (pedestrian) (tyre size, rear = ø 125 x 50 mm)	Ast ₂ (mm)	2535 ⁽²⁾	2583 ⁽²⁾

(1) Pedestrian version. For Stand-on version, front/rear are inverted

(2) With 3 stage mast +12mm

All values are nominal values and they are subject to tolerances.





About Yale®

Yale Materials Handling Corporation is one of the oldest manufacturers of lift trucks in the world. We've been in the business of lifting since 1875 and we apply that experience to help customers solve materials handling challenges. Our full line of lift trucks range in capacity from 1 to 16 tonne and are powered by internal combustion engines or electric options. Yale also offers robotic solutions, telemetry, fleet management, parts, financing and training. From traditional lift truck equipment to emerging technologies, our goal, every day, is to work with our nationwide dealer network to continually improve and provide the solutions you need, when and how you need them.

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