LiftRunner Technical Data
Tugger Train Trailers

B-Frame

C-Frame

E-Frame

iGo systems

first in intralogistics

LiftRunner
Efficient production supply with tugger trains

Maximum delivery frequency for in-house goods and materials transportation as well as essential component of Lean Production

Different frames and trolleys can be combined

A specially developed removal system provides support when removing the trolleys

Guaranteed safety thanks to an automatic locking system

Outstanding driving properties, low-wear operation, high directional stability and low driving noise

In cutting-edge and Lean Production logistics, tugger trains are indispensable for efficient material flow. They supply the locations where they are needed, e. g. assembly points, with the right materials in different load carriers and in small batches. This allows the operator not only to reduce costly production logistics areas but also stock levels, energy consumption, as well as the risk of accidents thanks to less traffic. With the LiftRunner tugger train, STILL offers a complete tugger train system that is highly adaptable to individual operational requirements. The STILL LiftRunner tugger train system consists of a train truck (e. g. tow tractor from product lines LTX or LXT) and a flexible combination of different tugger train elements, like LiftRunner B-, C- and E-Frames (trailers) and trolleys (rollable load carriers). With the broad range of frames and trolleys, tugger trains can be assembled according to need, so that the various types of goods arrive in small batches quickly and efficiently at their particular place of handover. LiftRunner frames are therefore designed to transport trolleys of different types and dimensions, and are developed and constructed individually in accordance with customer requirements, as are the trolleys. Before the tugger train sets off, the trolleys are slotted into or onto the LiftRunner frames and are secured automatically. They can be loaded from the left or from the right (C- and E-Frames) or from both sides, depending on the direction of the coupling, so that no re-coupling of the frames is necessary (B-Frames). The trolleys are lifted automatically when the driver enters the towing truck or sits down. The lifting energy required for this is provided by hydraulics or electricity via the towing truck. The frames are lowered automatically when the driver leaves the towing truck and the trolleys can then be removed. A foot pedal activates a mechanism that eases the trolley in the direction of the operator. This initial thrust enables the trolley to be removed in an effortless manner that places no strain on the back.
By lifting the trolleys up during the journey, harder polyamide rollers can be used. This minimises rolling resistance, enabling higher loads to be moved more easily by hand. Moreover, it not only minimises running noise, but also wear-and-tear on the rollers.

LiftRunner
System Variants

Hydraulic

In a hydraulic lifting system, the power needed for lifting is provided by a hydraulic unit on the towing truck. The hydraulic line transmits the power to the individual LiftRunners. Lifting the LiftRunners attached to the towing truck occurs before the tugger train starts to move off.

Advantages

- High energy efficiency
- Smooth lifting and lowering
- Quiet operation

Electrical

In an electrical lifting system, the power needed for lifting is provided via an electrical connection to the towing truck. Individual LiftRunners are connected to one another via an electrical cable. Here again, the LiftRunners are lifted up before the journey begins.

Advantages

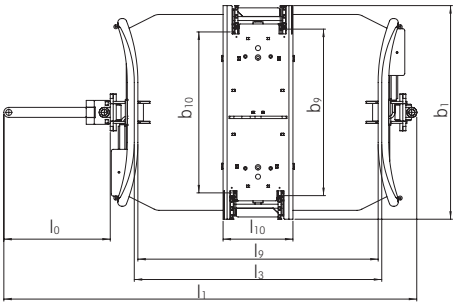
- Quiet operation
- Oil-free, suitable for the food and pharmaceutical industries due to its extremely clean operation
- High energy efficiency
- Smooth synchronised lifting and lowering

LiftRunner B-Frame
You know the load. We supply the frame.

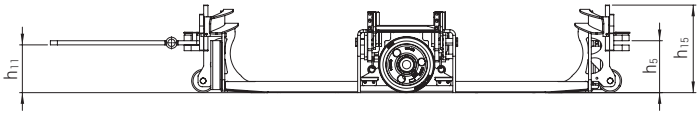
This specification sheet based on VDI standard 2198, only provides the technical values of the standard equipment. Different tyres, other lifting gear, additional equipment etc. may produce different figures.

Features	1.1	Manufacturer				STILL	STILL	STILL	STILL
	1.2	Manufacturer's type designation				**LiftRunner B-Frame 1200 x 800 mm**	**LiftRunner B-Frame 1200 x 1000 mm**	**LiftRunner B-Frame triple feeding 800 x 600 mm**	**LiftRunner B-Frame triple feeding 1000 x 600 mm**
	1.2.1	Load dimensions (length x width)			mm	1210 x 810	1210 x 1010	1210 x 810 / 820 x 630	1210 x 1010 / 1010 x 630
	1.5	Load capacity [1]		Q	kg	1000	1000	1 trolley: 1000 2 trolleys: 2 x 500 3 trolleys: 3 x 300	1 trolley: 1000 2 trolleys: 2 x 500 3 trolleys: 3 x 300
Weight	2.1	Service weight			kg	204	237	408	490
Wheels/ chassis	3.1	Tyres				Polyurethane	Polyurethane	Polyurethane	Polyurethane
	3.2	Tyre size			mm	Ø 200	Ø 200	Ø 200	Ø 200
	3.5	Number of wheels				2 (mid axle)	2 (mid axle)	2 (mid axle)	2 (mid axle)
	3.6	Track width		b_{10}	mm	810	1010	810	1010
Basic dimensions	4.2.1	Total height	lowered/raised	h_{15}	mm	313/353	313/353	313/353	313/353
	4.4	Lift		h_3	mm	40	40	40	40
	4.12	Clutch height	lowered/raised	h_5	mm	185/225	185/225	185/225	185/225
	4.14	Tiller length		l_0	mm	533	683	533	683
	4.16	Loading surface length/max. trolley length [2]		l_3	mm	1240	1240	2030	2030
	4.18	Loading platform width		b_9	mm	834	1034	834	1034
	4.19	Total length		l_1	mm	2069	2219	2859	3009
	4.21	Total width		b_1	mm	1070	1270	1070	1270
	4.32	Ground clearance Centre of wheel base	lowered/raised	m_2	mm	0/40	0/40	0/40	0/40
	4.35	Turning radius	LTX 50/LTX 70	W_a	mm	1950/2100	2100/2250	3350/3450	3500/3600
	4.39	Frame opening length (inner frame dimension)		l_9	mm	1204	1204	1994	1994
	4.40	Centre plate length		l_{10}	mm	350	350	350	350
	4.41	Tiller height	lowered/raised	h_{11}	mm	170/210	170/210	170/210	170/210
Performance data	5.1	Max. speed [3]			km/h	15	15	15	15
Misc.	8.5	Coupling				Combination of rigid and flexible links		Combination of rigid and flexible links	

[1] With several trailers, the maximum towing capacity across the entire train is 4 t (depending on the max. towing capacity of the towing truck)
[2] Applies only when using STILL LiftRunner trolleys
[3] Depending on the towing truck and drawbar system



Top view B-Frame



Side view B-Frame

Maximum flexibility due to loading and unloading from both sides

Optimal handling thanks to high directional stability

Guaranteed high levels of safety thanks to automatic locking when connecting the trolleys in combination with ultra-easy removal

Low wear and quiet operation as trolleys are lifted up during transport

LiftRunner B-Frames are designed for different types of trolleys up to 1,000 kg. They offer maximum flexibility on different routes thanks to the option of loading and unloading from both sides without de-coupling the frame. To guarantee their directional stability even at higher speeds and during braking manoeuvres the two-wheeled frames are steered via a centre axle. The combination of rigid and flexible links keeps the entire train stable in all driving situations and also ensures safe ramp travel. Furthermore, trolleys lock when pushed into the B-Frame and are lifted up automatically when the driver enters the towing truck. When the operator exits the tractor, the frames are automatically lowered and the trolley is released via a foot pedal. By means of the removal mechanism's initial thrust, operators can then remove the trolley effortlessly without placing any strain on their back.

LiftRunner C-Frame
You know the load. We supply the frame.

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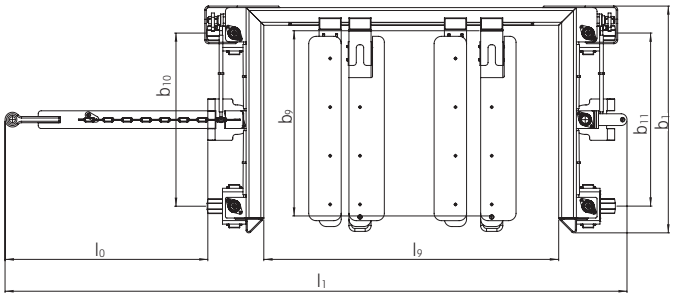
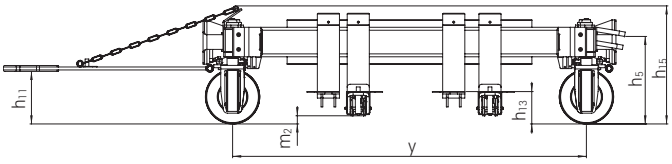
Features	1.1	Manufacturer				STILL
	1.2	Manufacturer's type designation				**LiftRunner C-Frame 2000 x 1200 mm**
	1.2.1	Load dimensions (length x width)			mm	1210 x 810
	1.5	Load capacity		Q	kg	2 trolleys: 2 x 800
	1.9	Wheel base		y	mm	2400
Weight	2.1	Service weight			kg	960
Wheels/ chassis	3.1	Tyres				Super Elastic
	3.2	Tyre size	front/back		mm	Ø 374/374
	3.5	Number of wheels				2/2
	3.6	Track width	front/back	b_{10}/b_{11}	mm	1174/1174
Basic dimensions	4.2.1	Total height	lowered/raised	h_{15}	mm	800/830
	4.4	Lift		h_3	mm	80
	4.12	Clutch height	lowered/raised	h_5	mm	593/673
	4.14	Tiller length		l_0	mm	1375
	4.15	Height lowered (underclearance)		h_{13}	mm	220
	4.16	Loading surface length/max. trolley length		l_3	mm	2000
	4.18	Loading platform width		b_9	mm	1255
	4.19	Total length		l_1	mm	4218
	4.21	Total width		b_1	mm	1540
	4.32	Ground clearance centre of wheel base	lowered/raised	m_2	mm	55/135
	4.35	Turning radius	LTX 70/LXT	W_a	mm	3100/3750
	4.39	Frame opening length (inner frame dimension)		l_9	mm	2000
	4.41	Tiller height	lowered/raised	h_{11}	mm	356/436
Performance data	5.1	Max. speed [1]			km/h	15
Misc.	8.5	Coupling				C-Frame tiller

[1] Depending on the towing truck



Top view C-Frame



Side view C-Frame

Optimal handling characteristics and directional stability guarantee high levels of safety, even when handling large and heavy loads

Quiet and low-wear operation as the trolleys are lifted up during transport

High load capacity and safe transport thanks to automatic locking when attaching the trolleys

LiftRunner C-Frames are designed for different types and dimensions of trolleys and can carry up to 1,600 kg. Their superelastic tyres excellently compensate for any unevenness of the ground. The steering movement of the tiller is transferred to all wheels, thus providing high directional stability even at high speeds. At the same time, the frame also remains stable even during braking manoeuvres, sharp steering manoeuvres and when traversing ramps. An optional overrun brake, which converts the kinetic energy into braking force during braking, provides additional safety.

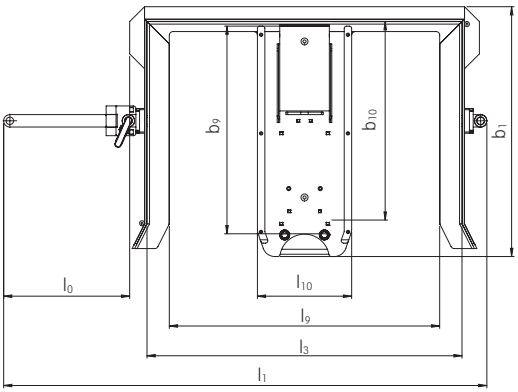
Equipped with flexible prongs, C-Frames can easily be adjusted to any trolley size and adapted to customer-specific carriers. When pushed into the C-Frame, trolleys are also locked automatically and lifted up hydraulically when the driver enters the towing truck; they are also then lowered again when the driver exits. By means of the removal system's initial thrust, operators can remove the trolley effortlessly without placing any strain on their back.

LiftRunner E-Frame
You know the load. We supply the frame.

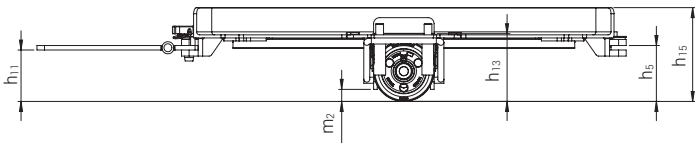
This specification sheet based on VDI standard 2198, only provides the technical values of the standard equipment. Different tyres, other lifting gear, additional equipment etc. may produce different figures.

Features	1.1	Manufacturer				STILL		STILL		STILL	STILL
	1.2	Manufacturer's type designation				**LiftRunner E-Frame 1200 x 800 mm**		**LiftRunner E-Frame 1200 x 1000 mm**		**LiftRunner E-Frame double feeding 800 x 600 mm**	**LiftRunner E-Frame double feeding 1000 x 600 mm**
	1.2.1	Load dimensions (length x width)			mm	1210 x 810		1210 x 1010		1210 x 810 / 820 x 630	1210 x 1010 / 1010 x 630
	1.5	Load capacity [1]		Q	kg	600	1000	600	1000	1 trolley: 1000 2 trolleys: 2 x 500	1 trolley: 1000 2 trolleys: 2 x 500
Weight	2.1	Service weight			kg	158	170	188	200	254	285
Wheels/ chassis	3.1	Tyres				Polyurethane		Polyurethane		Polyurethane	Polyurethane
	3.2	Tyre size			mm	Ø 200		Ø 200		Ø 200	Ø 200
	3.5	Number of wheels				2 (mid axle)		2 (mid axle)		2 (mid axle)	2 (mid axle)
	3.6	Track width		b_{10}	mm	800		1000		845	1045
Basic dimensions	4.2.1	Total height	lowered/raised	h_{15}	mm	310/350		310/350		310/350	310/350
	4.4	Lift		h_3	mm	40		40		40	40
	4.12	Clutch height	lowered/raised	h_5	mm	185/225		185/225		185/225	185/225
	4.14	Tiller length		l_0	mm	533		683		683	833
	4.15	Height lowered (underclearance)		h_{13}	mm	228		228		228	228
	4.16	Loading surface length/max. trolley length [2]		l_3	mm	1270		1270		1786	1786
	4.18	Loading platform width		b_9	mm	837		1037		834	1034
	4.19	Total length		l_1	mm	1953		2095		2568	2718
	4.21	Total width		b_1	mm	1007		1207		1062	1262
	4.32	Ground clearance centre of wheel base	lowered/raised	m_2	mm	25/65		25/65		40/80	40/80
	4.35	Turning radius	LTX 50/LTX 70	W_a	mm	1950/2100		2100/2250		3100/3200	3250/3350
	4.39	Frame opening length (inner frame dimension)		l_9	mm	1090		1090		1610	1610
	4.40	Centre plate length		l_{10}	mm	380		380		536	536
	4.41	Tiller height	lowered/raised	h_{11}	mm	170/210		170/210		170/210	170/210
Performance data	5.1	Max. speed [3]			km/h	15		15		15	15
Misc.	8.5	Coupling				Basic tiller/combination of rigid and flexible links				Combination of rigid and flexible links	

[1] With several trailers, the maximum towing capacity across the entire train is 4 t (depending on the max. towing capacity of the towing truck)
[2] Applies only when using STILL LiftRunner trolleys
[3] Depending on the towing truck and drawbar system



Top view E-Frame



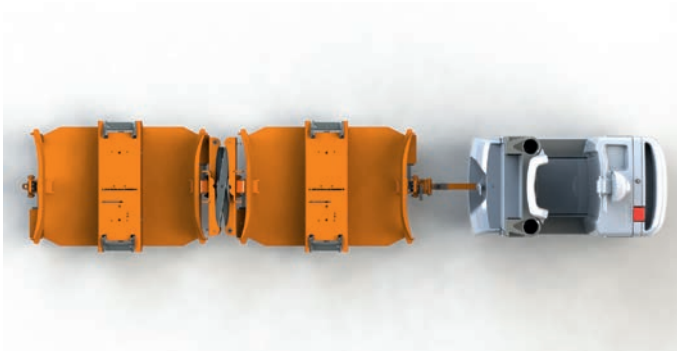
Side view E-Frame

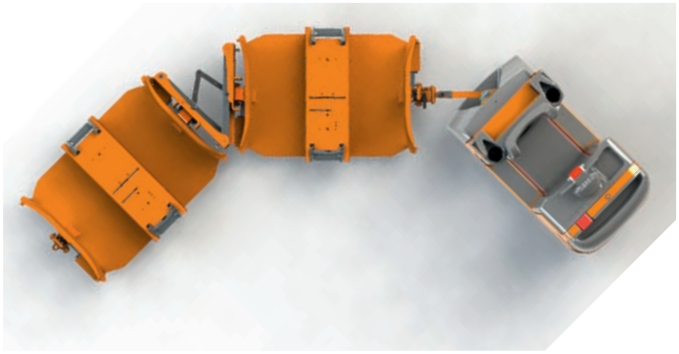
Excellent driving characteristics and loadability provide flexibility and a high level of safety

Quiet operation and low wear-and-tear, as trolleys are raised up during the journey

Easy handling and high ease of operation thanks to automatic locking and easy removal system

The manoeuvrable, two-wheel LiftRunner E-Frames are designed for trolleys of various types and dimensions. They can carry up to 1,000 kg and are steered via a centre axle. This also ensures high directional stability at higher speeds and during braking manoeuvres. The proven combination of rigid and flexible links minimises jolting movements when starting off or braking and also ensures safe driving on ramps. The trolleys can be easily pushed into the lowered E-Frame on level ground and are secured by an automatic mechanism. When the driver enters the towing truck, the trolleys are lifted up automatically, while the frames are lowered automatically when the driver exits, allowing the trolleys to be removed easily. By means of the removal mechanism's initial thrust, operators can then remove the trolley effortlessly without placing any strain on their back. The E-Frames can be combined with B- or C-Frames in one train.





The folding tiller enables drivers to manoeuvre through corners and shelving aisles with flexibility

Multiple uses of C-Frames in indoor and outdoor areas

B-Frames for single and triple loading

Different kinds of load carriers can be transported by the B-Frame

LiftRunner B-Frame
Working Aisle Widths

B-Frame 90° curve minimum aisle width	Number of B-Frames	Tow length in mm without towing truck	d (chamfered edge) in mm (without oncoming traffic) with LTX 50/LTX 70	e (aisle width without chamfered edge) in mm (without oncoming traffic) with LTX 50/LTX 70	f (aisle width with chamfered edge) in mm (without oncoming traffic) with LTX 50/LTX 70
LiftRunner B-Frame 1200 x 800 mm	2	4089	0/0	2070/2070	2070/2070
	4	8128	500/500	2320/2320	2070/2070
LiftRunner B-Frame 1200 x 1000 mm	2	4389	0/0	2270/2270	2270/2270
	4	8728	500/500	2520/2770	2270/2270
LiftRunner B-Frame triple feeding 800 x 600 mm	2	5669	1000/1000	2570/2570	2070/2070
	4	11288	2000/2000	3070/3070	2070/2070
LiftRunner B-Frame triple feeding 1000 x 600 mm	2	5969	1000/1000	2770/2770	2270/2270
	4	11888	2000/2000	3270/3270	2270/2270

B-Frame 180° curve minimum aisle width	Number of B-Frames	Tow length in mm without towing truck	a (aisle width) in mm (without oncoming traffic) with LTX 50/LTX 70	b (aisle width) in mm (without oncoming traffic) with LTX 50/LTX 70	c (distance between the aisles) in mm (without oncoming traffic) with LTX 50/LTX 70	Aisle width in mm in loading and unloading zones with LTX 50/LTX 70
LiftRunner B-Frame 1200 x 800 mm	2	4089	2000/2000	2200/2400	2000/2000	2900/2900
	4	8128	2000/2000	3000/3200	2000/2000	2900/2900
LiftRunner B-Frame 1200 x 1000 mm	2	4389	2000/2000	2500/2700	2000/2000	3300/3300
	4	8728	2000/2000	3300/3500	2000/2000	3300/3300
LiftRunner B-Frame triple feeding 800 x 600 mm	2	5669	2700/2700	2700/2800	2000/2000	2900/2900
	4	11288	2700/2700	3700/3800	2000/2000	2900/2900
LiftRunner B-Frame triple feeding 1000 x 600 mm	2	5969	3200/3200	2700/2800	2000/2000	3300/3300
	4	11888	3200/3200	3700/3800	2000/2000	3300/3300

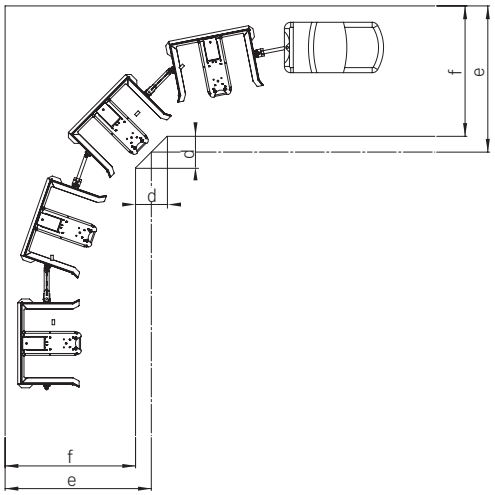
LiftRunner C-Frame
Working Aisle Widths

C-Frame 90° curve minimum aisle width	Number of C-Frames	Tow length in mm without towing truck	d (chamfered edge) in mm (without oncoming traffic) with LTX 70/LXT	e (aisle width without chamfered edge) in mm (without oncoming traffic) with LTX 70/LXT	f (aisle width with chamfered edge) in mm (without oncoming traffic) with LTX 70/LXT
LiftRunner C-Frame 2000 x 1200 mm	1	4140	0/1000	2540/3040	2540
	2	8280	500/1500	2790/3290	2540
	3	12420	1000/1500	3040/3290	2540
	4	16560	1500/2000	3290/3540	2540

C-Frame 180° curve minimum aisle width	Number of C-Frames	Tow length in mm without towing truck	a (aisle width) in mm (without oncoming traffic) with LTX 70/LXT	b (aisle width) in mm (without oncoming traffic) with LTX 70/LXT	c (distance between the aisles) in mm (without oncoming traffic) with LTX 70/LXT	Aisle width in mm in loading and unloading zones with LTX 70/LXT
LiftRunner C-Frame 2000 x 1200 mm	1	4140	2550/3100	2550/3100	800	3900
	2	8280	2800/3200	2800/3200	800	3900
	3	12420	3050/3400	3050/3400	800	3900
	4	16560	3300/3600	3300/3600	800	3900

LiftRunner E-Frame
Working Aisle Widths

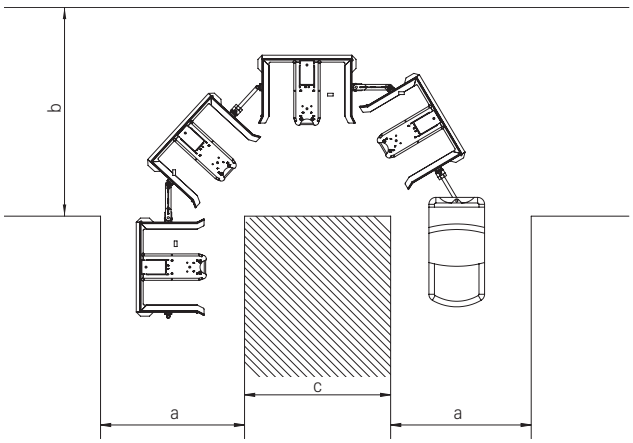
E-Frame 90° curve minimum aisle width	Number of E-Frames	Tow length in mm without towing truck	d (chamfered edge) in mm (without oncoming traffic) with LTX 50/LTX 70	e (aisle width in mm without oncoming traffic with LTX 50/LTX 70)	f (aisle width with chamfered edge) in mm (without oncoming traffic) with LTX 50/LTX 70
LiftRunner E-Frame 1200 x 800 mm	2	3846	0/0	2010/2010	2010/2010
	4	7642	500/500	2260/2260	2010/2010
LiftRunner E-Frame 1200 x 1000 mm	2	4146	0/0	2210/2210	2210/2210
	4	8242	500/1000	2460/2710	2210/2210
LiftRunner E-Frame double feeding 800 x 600 mm	2	5388	500/500	2320/2320	2070/2070
	4	10726	1500/1500	2820/2820	2070/2070
LiftRunner E-Frame double feeding 1000 x 600 mm	2	5688	500/500	2510/2510	2260/2260
	4	11326	1500/1500	3010/3010	2260/2260



d = chamfered edge (45°)
e = aisle width without chamfered edge
f = aisle width with chamfered edge

E-Frame 90° track curve

E-Frame 180° curve minimum aisle width	Number of E-Frames	Tow length in mm without towing truck	a (aisle width in mm without oncoming traffic with LTX 50/LTX 70)	b (aisle width in mm without oncoming traffic with LTX 50/LTX 70)	c (distance in mm between the aisles)	Aisle width in mm in loading and unloading zones with LTX 50/LTX 70
LiftRunner E-Frame 1200 x 800 mm	2	3846	2000/2000	2200/2400	2000/2000	2900/2900
	4	7642	2000/2000	3000/3200	2000/2000	2900/2900
LiftRunner E-Frame 1200 x 1000 mm	2	4146	2300/2300	2500/2700	2000/2000	3300/3300
	4	8242	2300/2300	3300/3500	2000/2000	3300/3300
LiftRunner E-Frame double feeding 800 x 600 mm	2	5388	2500/2500	2500/2600	2000/2000	2955/2955
	4	10726	2500/2500	3500/3600	2000/2000	2955/2955
LiftRunner E-Frame double feeding 1000 x 600 mm	2	5688	3000/3000	2500/2600	2000/2000	3355/3355
	4	11326	3000/3000	3500/3600	2000/2000	3355/3355



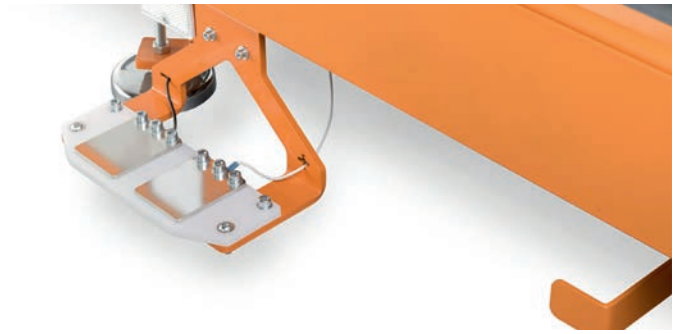
a = aisle width
b = aisle width
c = distance between the aisles

E-Frame 180° track curve

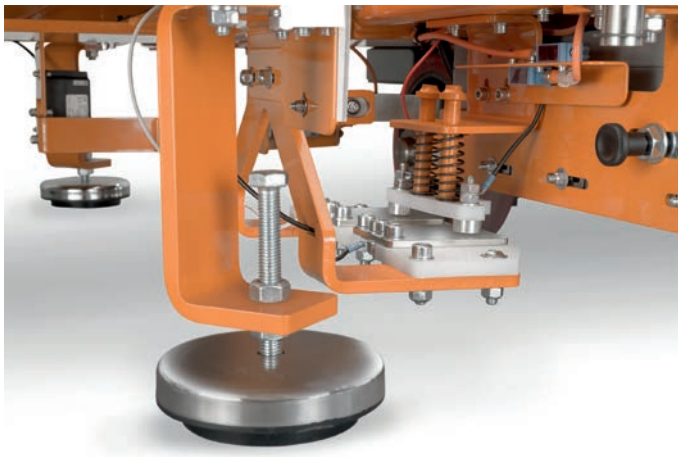
With the LiftRoller iGo systems, STILL created an integrated rolling platform for the STILL LiftRunner frame, which is designed both for heavy loads and automated load handling alike. The LiftRoller can be used with our manual LTX 50 or combined with our automated LTX 50 iGo systems to form a fully automated tugger train.
With the help of modern sensors and precision laser scanning technology, the frame of the fully automated tugger train is safely navigated to a compatible transfer station for load transfer, where it is positioned with centimetre precision. Thanks to intelligent safety functions, injuries, and damage to trucks, warehouse facilities and goods are a thing of the past.

The just-in-time or just-in-sequence principle ensures accurate supply to the transfer stations. The entire loading/unloading process is then carried out automatically. Routes can be adapted, expanded and combined with other solutions without a great deal of time and effort. This combination of automated load transfer and driving reduces your logistics traffic, while simultaneously increasing the efficiency of your processes. An ideal solution for supplying your production lines or feeding your machines.

LiftRoller station iGo systems transfer station



Power supply and control signal transferred via the contact plate



Maximum flexibility thanks to mobile transfer stations, which require no power supply or installation

LiftRoller station iGo systems transfer station

The LTX 50 iGo systems combine automated travel with automated load handling

LiftRunner Tugger Train Trailers
The 'Simply Efficient' factors: Performance attributes as a measure of economic efficiency

Simply easy

- Easy attaching and detaching of the trolleys to the frames
- Easy removal of trolleys without strain on the back
- Low noise and wear as the trolleys have no contact with the ground during travel

Simply powerful

- Strong as a team: Pulling up to four B- or E-Frames with a towing capacity of max. 4,000 kg
- Bundled transports enable high delivery and goods turnover rates
- Reduces the storage and logistics space required
- Small turning circle for space-saving use

Simply safe

- High directional stability even when travelling at high speeds, executing braking manoeuvres and turning corners
- Bundled transports and less truck traffic ensure high levels of safety
- Minimised risk of damage: Trolleys lock automatically when attached
- Combination of rigid and flexible links minimises pitching during acceleration and braking on ramps

Simply flexible

- Fast supply and removal for small batch sizes with various carriers in different supply areas
- Maximum flexibility: Depending on the frame type, the LiftRunners can either be loaded from the left, from the right or from both sides
- The frame can be adjusted flexibly in a train thanks to the straightforward coupling/tiller system
- Frame types can be freely combined for the provision of small batch sizes in line with demand
- Simultaneous loading and unloading of material for a more efficient logistics system

LiftRunner Tugger Train Trailers
Equipment Variants

	LiftRunner B-Frame	LiftRunner B-Frame triple feeding	LiftRunner C-Frame	LiftRunner E-Frame	LiftRunner E-Frame double feeding
Tarpaulin roof with roller shutter	○	○	○	○	○
Preparation for retrofitting a tarpaulin roof	○	○	○	○	○
System configuration hydraulic	●	●	●	●	●
System configuration electrical	○	○	—	○	○
Cable installation under the tiller	●	●	—	●	●
Cable installation above the tiller	○	○	●	○	○
E-Frame basic tiller for ground-level use	—	—	—	●	—
Combination of rigid and flexible links suitable for ramp travel	●	●	—	○	●
C-Frame basic tiller	—	—	●	—	—
Foot guards on wheels	—	—	—	○	○
Position flags for better sensory perception	○	○	—	○	○
Easy prong adjustment	—	—	○	—	—
Electrogalvanising	○	○	○	○	○

● Standard ○ Option — Not available

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STILL is certified in the following areas: Quality management, occupational safety, environmental protection and energy management.

Tugger train trailers EN 03/23 Subject to technical modifications.

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