



# Do more with pallets:

- Double-deep stacking
- One sided loading
- Hydraulic extensions
- Dual load transport

## Telescopic forks

Hydraulic lift truck forks  
Save time, space and money



**kooi** Reachforks®

A trademark of Meijer Special Equipment

**MSE - Forks**  
Forklift Truck Attachments

# Kooi-Reachforks®

are attachments that can be used throughout industry to save time, space and money.

MSE-Forks was the first to develop a hydraulic extending and retracting lift truck fork. Since their introduction in 1980, KOOI-ReachForks® have become the benchmark in materials handling. With one and two cylinders in each fork and an integrated equaliser system, MSE-Forks guarantees you the best Telescopic fork on the

market. By using KOOI-ReachForks for double-deep stacking, storage volumes can be dramatically increased. Trucks and trains can also be completely loaded and unloaded from one side, reducing turnaround times and improving safety.



## Additional advantages of the KOOI-ReachForks:

1. Interchangeable wear resistant strips.
2. Reinforced heel giving less deflection.
3. Honed cylinder bores improve seal life.
4. Hard chromed piston rods protected by outer forks.
5. Specially designed wiper ring protects the forks even in dirty conditions.
6. Special design fitting guard for easier connection of the forks onto the fork carrier.
7. One or twin cylinders in each fork allow the forks to work in all kind of applications.
8. Unique design outerforks includes integrated wear plate (400HB) for longer fork life.
9. Fully integrated oil channels and hydraulic parts means working parts are protected reducing maintenance costs.
10. An ingenious combination of laser cutting and sheet metal work construction ensures that sleeves do not catch when withdrawing from pallets. The sleeves corners are fully rounded off along all edges.

### Equalizer Range

The equalizer range of KOOI-ReachForks have one or two cylinders per fork and feature an integrated flowdividing system, first developed by MSE-Forks. The one cylinder telescopic forks are extremely useful for double-deep racking applications while the two cylindered design is commonly used for loading and unloading trucks and trains.

### Power Range

The original twin cylinder telescopic design is still the most powerful fork and has standard capacities ranging up to 10500 kg. but also very heavy applications of 30.000 kg. are possible. This Telescopic fork has proven reliable in even the most demanding conditions.

### Thin Range

Developed for use with US and non-standard pallets like Optiledge® pallets and cardboard pallets where a thinner profile is needed for easier entry.

### Slim Range

The small telescopic forks have only one cylinder per fork and have a very narrow fork section for the entry of brick and blocks for example or handling beverage. Because of their special width, these telescopic forks are frequently applied onto double fork spreaders handling four, two or even one pallet.

### Slide Range

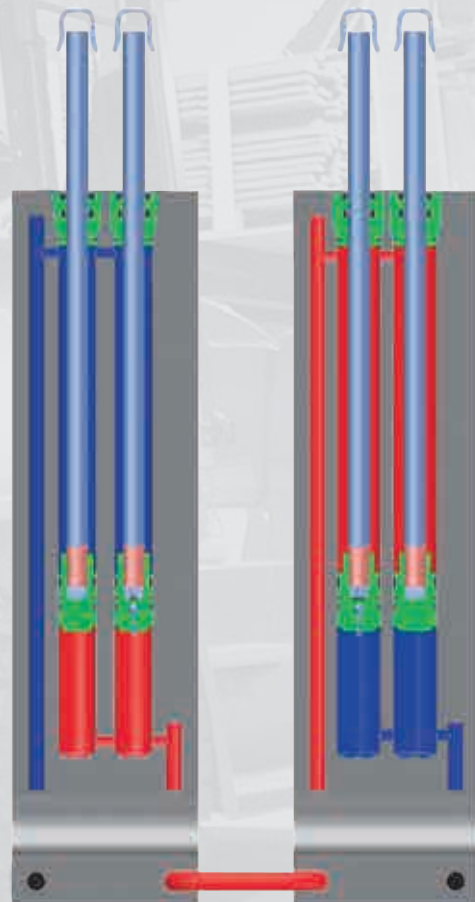
These Telescopic forks allow a variety of different pallet sizes to be handled safely without damage to pallets or goods. They also eliminate the manual handling problems associated with mechanical fork extensions.

### The need for an Equalizer system.

Uneven movement is the most significant problem encountered when using any telescopic forks. This can lead to twisting of pallets which can cause dangerous situations when loading or unloading and is particularly hazardous when working at height in double-deep racking systems. MSE-Forks self-equalizer system guarantees 100% synchronization of movement.

### Other advantages of the Equaliser Range

- Visibility is considerably improved through a reduction in the number of hoses and the absence of an external flowdividing system.
- When the load is not centralized on the KOOI-ReachForks the equalizer forks will compensate the force on the hydraulic forks automatically.
- Easy and quick connection onto the fork carrier.
- Lower fitting costs because of the absence of separate flowdivider.



# Applications

**Double-deep-stacking: The use of double-deep- stacking increases warehouse capacity by up to 30% compared to “single-deep” warehouse operations.**

The fact that the KOOI-ReachForks can reach twice as far as normal forks from one side means that the racking at each side of the aisle can be doubled.

Double deep storage has become a very popular choice in “high throughput” operations and is ideal for Cold stores, Dry

stores and the storage of multiple pallets of the same products, known as FILO (First In Last Out) principle. Kooi-ReachForks are the best system for changing any type of forklift truck into a “double-deep” truck. The Double-deep-stacking application has already generated considerable cost savings.



## Telescopic Forks vs. Pantograph system

Telescopic forks can also have some important benefits in single-deep and double-deep applications. Compared to reach trucks with a pantograph or moving mast, the relatively light Telescopic forks result in a reach truck with better stability, visibility and higher lifting capacity. Telescopic forks have some distinct advantages compared to a pantograph such as:

1. Reduced attachment weight (approx. 35%).
2. When using trucks with a fixed mast it is no longer necessary to have a bottom racking beam, increasing warehouse capacity and reducing overall racking costs
3. Virtually the same lost load thickness as standard forks and optimum visibility.
4. Shorter mast compared to the total lift truck height.
5. All parts are integrated inside the forks and cannot be damaged. Fewer items require maintenance, meaning reduced operating costs.
6. Easy to install on new or existing lift trucks.
7. Double pallet transport possible with same reach system.

## Loading and unloading

Trucks as well as trains can be completely loaded and unloaded from one side. It is no longer necessary to turn the vehicle or approach the trailer from both sides. This way of pallet handling makes the operation safer than the traditional method because all the operations are carried out from one side. The time saving is  $\pm 30\%$ . The reduced amount of space required for turning means that extra space is created which can, for example, be used to store additional goods. Of course we cannot calculate the benefits for the truck driver but the fact that the trailer only has to be opened from one side and the fact that no extra manoeuvre is required should not be underestimated.



## Double pallet transport

K001-ReachForks can be extended to transport two pallets at a time. This can generate considerable benefits involving large volumes or long distances. Combinations with a fork positioner and spreader are possible as well, allowing you to handle 4 pallets at a time which improves the loading and unloading speed of trucks and trains enormously.



## Hydraulic extensions

These telescopic forks allow a wide variety of different pallet sizes to be handled safely and quickly without damage to the pallets or goods. They also help to reduce the safety risks and wasted time often associated with the use of manual forks extensions.

These state of the art fork extensions have a special cross section so that the underside of the outerforks cannot catch pallet boards, preventing damage.



Hardened wearstrip

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### Telescopic forks on fork positioners

Telescopic forks can be used with most fork positioners. This combination can save a lot of time when a variety of pallet types are being handled. One, two or even four pallets can be handled by special small telescopic forks mounted on a double fork positioner.



### Telescopic forks on truck-mounted forklifts

A lot of 'piggyback' lift trucks are equipped with Telescopic forks. The fixed mast in combination with the Telescopic forks provide a stable, lightweight machine with a relatively high capacity.



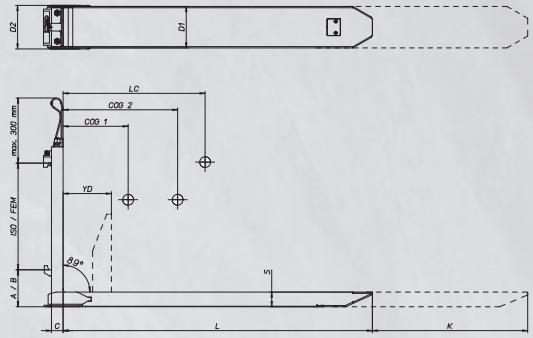
### Telescopic forks on side-loaders and heavy capacity trucks

Telescopic forks are frequently used on side loaders for "double-deep" stacking operations and to help manoeuvre the load. They have the advantage over traditional pantograph attachments of not affecting platform width while adding little weight.

The advantage of KOOI-ReachForks compared to other devices such as a pantograph is a greater residual capacity will be achieved through its lower attachment weight. The machine is easier to operate, has better performance, is more cost effective and the driver's view is not obstructed.



# Specifications and options



**Equalizer Telescopic forks: one or two cylinder per fork. Includes integrated equalization system.**

Model	Capacity Kg. / 600 mm.	Section D1/D2 x S mm.	Length mm. / Stroke mm.	Lost Load Thickness mm.	CoG1 mm. ±	CoG2 mm. ±	Mass Kg. ±	ISO/FEM
RG2 20 1100/0750			1100/0750		395	565	147	
RG2 20 1200/0850	2000 kg.	131/139 x 57	1200/0850	45	440	645	156	2A
RG2 20 1350/1000			1350/1000		515	755	170	
RG2 30 1100/0750			1100/0750		370	535	157	
RG2 30 1200/0850	3000 kg.	131/139 x 57	1200/0850	45	419	610	166	3A
RG2 30 1350/1000			1350/1000		490	720	180	
RGN2 35 1100/0750			1100/0750		380	550	179	
RGN2 35 1200/0850	3500 kg.	131/139 x 62	1200/0850	50	425	625	190	3A
RGN2 35 1350/1000			1350/1000		495	735	206	
RG4 25 1100/0750			1100/0750		395	580	178	
RG4 25 1200/0850	2500 kg.	161/169 x 57	1200/0850	45	435	655	190	2A
RG4 25 1350/1000			1350/1000		515	770	206	
RG4 35 1100/0750			1100/0750		370	545	191	
RG4 35 1200/0850	3500 kg.	161/169 x 57	1200/0850	45	415	615	202	3A
RG4 35 1350/1000			1350/1000		485	730	218	
RG4 45 1100/0750			1100/0750		370	545	191	
RG4 45 1200/0850	4500 kg.	161/169 x 57	1200/0850	45	415	615	202	3A
RG4 45 1350/1000			1350/1000		485	730	208	
RG4 58 1100/0750			1100/0750		330	490	247	
RG4 58 1200/0850	5800 kg.	161/169 x 62	1200/0850	50	375	560	260	4A
RG4 58 1350/1000			1350/1000		440	665	280	

## Power Range

RG4 77 1100/0750			1100/0750		325	485	331	
RG4 77 1200/0850	7700 kg.	215/227 x 66	1200/0850	50	370	555	349	4A
RG4 77 1350/1000			1350/1000		435	665	376	
RE4 105 1100/0750			1100/0750		315	445	420	
RE4 105 1200/0850	10500 kg.	215/227 x 76	1200/0850	60	360	510	443	5A
RE4 105 1350/1000			1350/1000		425	610	477	

## Thin Range

RE4 32 1100/0750			1100/0750		350	530	175	
RE4 32 1200/0850	3200 kg.	161/169 x 47	1200/0850	45	395	600	184	3A
RE4 32 1350/1000			1350/1000		464	712	199	

## Remarks

- Minimum operating pressure 10 MPa, maximum 25 MPa.
- Capacities shown are nominal. For heavy-duty applications please contact your dealer.
- Other capacities and dimensions on request.
- The capacities shown apply to the forks and not the lift truck.
- All forks have a 6 mm thick integrated wear plate under the complete outer sleeves for longer life span.
- The lift truck manufacturer must determine the combined Telescopic fork and Lift truck capacity.
- MSE-Forks reserves the right to modify and improve their products without prior notice being given.
- For optimal speed and minimum loss of pressure the recommended minimum hose diameter is 8 mm.
- In cold-storage applications KOOI-ReachForks® can be used down to -30 degrees Celcius, contact your dealer.

### Slim Range, specially designed to handle brick & block and beverage

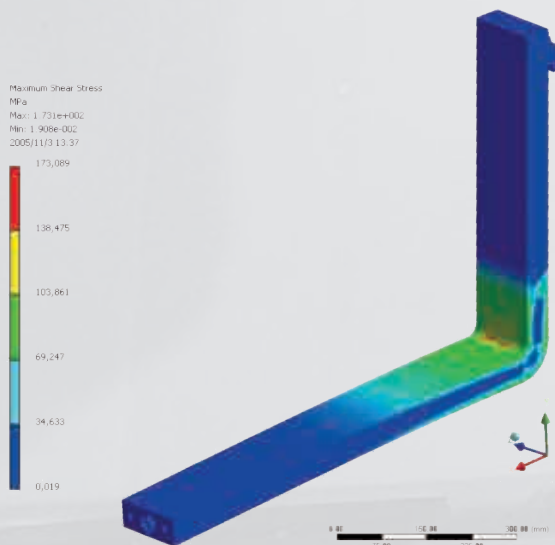
Model	Capacity Kg. / 600 mm.	Section D1/D2 x S mm.	Length mm. / Stroke mm.	Lost Load Thickness mm.	CoG1 mm. ±	CoG2 mm. ±	Mass Kg. ±	ISO/FEM
RE2 27 1150/0700			1150/0700		445	630	106	
RE2 27 1250/0800	2700 kg.	89/81 x 63	1250/0800	60	490	705	113	2A
RE2 27 1400/0950			1400/0950		565	825	122	
RE2 37 1150/0700			1150/0700		415	575	132	
RE2 37 1250/0800	3700 kg.	89/81 x 73	1250/0800	60	465	650	139	3A
RE2 37 1400/0950			1400/0950		535	755	151	

### Slide Range, specially designed to replace manual fork extensions

REE2 17 0800/0400			0800/0400		215	240	90	
REE2 17 1000/0200	1700 kg.	128/128 x 40	1000/0200	40	290	310	105	2A
REE2 17 1200/0800			1200/0800		375	495	116	
RGE2 20 0800/0400			0800/0400		395	565	147	
RGE2 20 1000/0200	2000 kg.	131/131 x 57	1000/0200	45	440	645	156	2A
RGE2 20 1200/0800			1200/0800		515	755	170	
RGE2 30 0800/0400			0800/0400		365	530	155	
RGE2 30 1000/0200	3000 kg.	131/131 x 57	1000/0200	45	415	605	163	3A
RGE2 30 1200/0800			1200/0800		485	715	179	

### Remarks

- The Slide range needs a minimum overlap of 400 mm (retracted length-stroke).
- The Slim range needs a minimum overlap of 400 mm (retracted length-stroke).
- For optimal speed and minimum loss of pressure the recommended minimum hose diameter is 8 mm.
- In cold-storage applications KOOI-ReachForks® can be used down to -30 degrees Celsius, contact your dealer.
- Capacities given are for normal circumstances. For extreme applications contact your dealer.
- MSE-Forks reserve the right to modify and improve their products without prior notice.



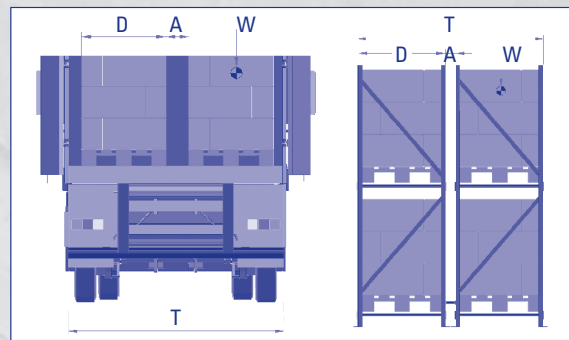
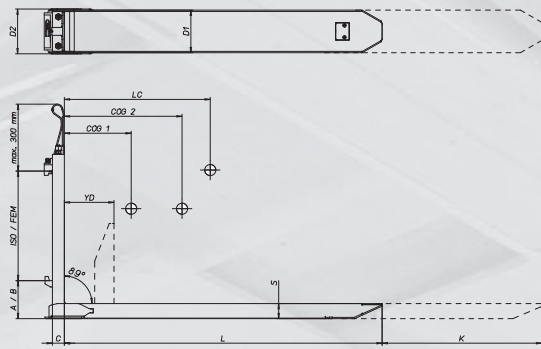
Slide range Telescopic forks can be used as extension forks for handling 4-way pallets on the long or short side for example.



### Special ISO standard for Telescopic forks

MSE-Forks confirm that all their hydraulic telescopic forks comply fully with ISO 13284. This means that all inner sections of the Telescopic forks are tested to 3 times their rated capacity. In addition all outer forks are also tested to 3 times their rated capacity. Finally a random selection of forks are subjected to a dynamic endurance test of 1.000.000 cycles with an overload of 25% which complies to ISO 2330 (Fork arms).





**Formula to determine the measurements of the Telescopic forks**

- T = total dept (mm.)
- W = maximum weight of pallet (kg.)
- D = dept of pallet (mm.)
- A = space between the pallets (mm.)
- O = standard overlap 350 mm.
- LC1 = load center retracted 600 mm.

- Formule retracted length mm. (L):  $(T-O) / 2 + O$
- Formule stroke mm. (K):  $L - O$
- Formule distance palletstops mm. (YD):  $L - D$
- Formule load center extended mm. LC2:  $T - (0,5 \times D)$
- Formule capacity Telescopic forks RG:  $W \times LC2 / LC1$

**Example:**

- D = 1200 mm.
- T = D+A+D = 2450 mm.
- W = 800 kg.
- A = 50 mm.
- L =  $(2450 - 350) / 2 + 350 = 1400$  mm.
- K =  $1400 - 350 = 1050$  mm.
- YD =  $1400 - 1200 = 200$  mm.
- LC2 =  $2450 - (0.5 \times 1200) = 1850$  mm.
- Capacity =  $800 \times 1850 / 600 = 2466$  kg.

**Table 1 Load center of Telescopic forks (mm.)**

	1150	1250	1350	1450	1550	1650	1750	1850
100	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
200	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
300	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
400	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
500	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
600	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20
700	RG2 20	RG2 20	RG2 20	RG2 20	RG2 20	RG4 25	RG4 25	RG4 25
800	RG2 20	RG2 20	RG2 20	RG2 20	RG4 25	RG4 25	RG4 25	RG4 25
900	RG2 20	RG2 20	RG4 25	RG4 25	RG4 25	RG4 25	RG2 30	RG2 30
1000	RG2 20	RG4 25	RG4 25	RG4 25	RG2 30	RG2 30	RG2 30	RG4 35
1100	RG4 25	RG4 25	RG4 25	RG2 30	RG2 30	RG4 35	RG4 35	RG4 35
1200	RG4 25	RG4 25	RG2 30	RG2 30	RG4 35	RG4 35	RG4 35	RG4 45
1300	RG4 25	RG2 30	RG2 30	RG4 35	RG4 35	RG4 45	RG4 45	RG4 45
1400	RG2 30	RG2 30	RG4 35	RG4 35	RG4 45	RG4 45	RG4 45	RG4 45
1500	RG2 30	RG4 35	RG4 35	RG4 45	RG4 45	RG4 45	RG4 45	RG4 45

Always round the capacity required up to the next model in the range. In the example above you would need the RG4-25-1400/1050. You can also use Table 1 to determine the Telescopic fork model you require.

**Table 2**

**Indication of residual capacity for the most common Telescopic forks. Lift truck manufacturer needs always to confirm measurements.**

Model:	RG2 20	RG2 20	RG2 20	RG4 25	RG4 25	RG4 25	RG4 25	RG2 30	RG2 30	RG4 35	RG4 35	RG4 45	RG4 45
Lift truck cap. (kg.)	1200	1600	1800	1200	1600	1800	2000	2000	2500	2000	2500	3000	3500
Lift truck x (mm.)	350	350	350	350	350	350	500	500	500	500	500	500	500
LC 600 mm.	950	1310	1485	935	1290	1470	1670	1650	2110	1670	2100	2180	3030
LC 1350 mm.	515	715	815	505	700	800	975	995	1230	975	1245	1515	1780
LC 1450 mm.	475	665	750	460	650	740	915	905	1150	910	1170	1425	1680
LC 1750 mm.	395	550	635	375	535	620	770	765	975	790	1015	1215	1435
LC 1850 mm.	375	530	605	360	515	590	740	735	945	730	950	1160	1370

Table 2 gives a rough indication of the residual capacity of your lift truck in combination with our Telescopic forks. Please be aware that the lift truck manufacturer always needs to confirm the measurements of residual capacity.

# Standard options

Over many years MSE-Forks has acquired a great deal of knowledge enabling to offer K001-ReachForks with specific customer options.

## Palletstops

- Y1 palletstops are intended to stop the forks protruding too far through the pallet, thus preventing damage to goods and pallets standing behind.
- Y2 palletstops serve the same purpose and can also be used to support a separate load back rest.
- Y3 palletstops support the load and allow frequent repositioning of the forks on the carriage.



## Extra wear protection

Extra protection can be added to the forks. High-grade steel sections can be welded under the complete length of the forks or incorporated into the nose.

## Load back rest

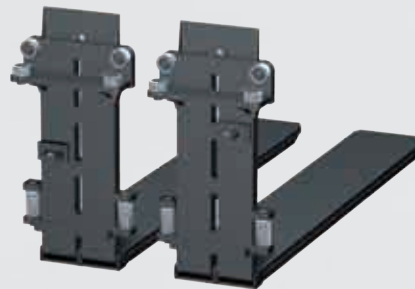
The load back rest supports the load and moves forward with the outer fork. It is bolted onto the Y2 palletstops but still allows the distance between the forks to be changed. MSE-Forks supplies two types of load back rests, namely a standard design and a load back rest for reach lift-trucks. When the load back rest is used, the effective length of the telescopic forks is reduced by 25 mm. Where possible the pallet stops should be moved back 25 mm to prevent this.



Width under site	Width upper side	Height
750	750	1200
700	1000	1200
725	1000	1200

## Special mountings

Special mountings such as fork positioners and fork spreaders are the result of the considerable experience we have acquired over the last 20 years. Our engineering department can change all your 2D drawings into 3D models. 3D modelling enables measurements to be adapted for use with other specifications.



## Camera system

MSE-Forks is working together with the Dutch manufacturer of industrial camera-systems Orlaco Products b.v. The miniature camera is completely integrated on side of one of the telescopic forks. The advantage of this system is that the driver of the lift-truck is able to see how the ReachForks are positioned in all circumstances. This is particularly helpful to the driver in double-deep stacking application making the operation safer and more efficient.



# Other Products

## Double Height Shift System

This unique mast extension range is designed to adjust the height of a standard lift-truck mast. This is especially useful if the existing mast does not comply with the requested height. The mast extensions enable lift-trucks to be enhanced with an additional telescopic boom. The same lift-truck can then handle extra pallets at a higher level without a larger load centre being required.



## Load positioning systems

If the side-loader lift truck is operating on rough ground, one of the forks can compensate for the difference in height ensuring the safe loading and unloading of goods. Damage or is reduced and the risk of load slipping off the forks is decreased. This powerful attachment is sold under the name Single Height Shift System. Also possible in combination with KOOI-ReachForks.



## Manually extendible slide-on fork extensions

Using special sheet metalworking techniques, a slide-on extension has been created that is partially open along its lower surface, but has the characteristics of a closed sleeve.



## Mountable telescopic Jib cranes

The Jib crane is provided with a loading hook. By using the deep bore technology, the portable arm can move in and out hydraulically from the driver's seat. All hydraulic parts are integrated cannot be damaged. Jib cranes can be delivered with fork pockets and mounting hooks.





### Production and safety standards

MSE-Forks requires its KOOI-ReachForks to be of the highest quality and we can only guarantee this by complying with all applicable international standards:

#### ISO 9001-2008

Model for quality assurance in design/development, production, installation and servicing.

#### ISO 13284

Fork arm extensions and Telescopic fork arms. Technical characteristics and strength requirements. (Safety factor of 3 at all times).

#### ISO 2328

Hook on type fork arms and fork carrier. Mounting dimensions.

#### ISO 4406

Hydraulic fluid power - Fluids Method for coding level of contaminations by solid particles.

#### ISO 3834-2

Quality requirements for welding. Fusion welding of metallic materials.

#### CE

European Machinery Directives 2006/42/EC



### Palletless handling?

Since 2003 MSE-Forks has introduced a new patented system the so-called RollerForks® which can be used for palletless container handling. For more information please visit our website [www.rollerforks.com](http://www.rollerforks.com)



A trademark of Meijer Special Equipment



Oudebildtdijk 894

9079 NG St. Jacobiparochie

The Netherlands

Website: [www.mse-forks.com](http://www.mse-forks.com)

Telephone: +31 (0) 518 - 49 29 29

Telefax: +31 (0) 518 - 49 29 15

E-mail: [info@mse-forks.com](mailto:info@mse-forks.com)