

## lifting &amp; access

# KOOI-REACHFORKS improve efficiency and safety

Hydraulic telescopic forks are more and more used for improving internal logistics because they save time, space and money. The original MSE slogan is now more current than in the past because of the present economical situation. Nowadays every company wants to work faster and more efficiently in order to reduce costs. Expensive automation solutions are purchased, external experts check the company and expenses are cut down. Most of the time these measures are very painful. Simple and efficient help is often not used because peo-

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Meijer Special Equipment (MSE), based in the north of The Netherlands, is the World's largest manufacturer of telescopic lift truck forks which are sold under the trade name KOOI-REACHFORKS®.

Many companies still load and unload trucks from both sides. The lift truck driver has to drive around the truck repeatedly. By using telescopic forks it is possible to load and unload pallets from one side. This not only saves 15% in time, it is also much safer because the lift truck is always at one side of the truck. This creates more space which can

be used for extra storage. Because of the extra space trucks can even sometimes be loaded and unloaded indoors.

Another example of more efficient handling can be achieved when the telescopic forks are used as hydraulic extensions. A lot of companies do not know that goods are often damaged by forks that are too long. Research points out that this is an important issue, but, despite the detection, it seems that logistic managers do not do anything about this problem. Let's have a look at the following:

A client has got pallets in different dimen-

sions and the goods that need to be transported are wrapped. The lift truck driver is always in a hurry and therefore he will always drive the forks in a pallet without thinking about the size of the pallet. When using smaller pallets, forks will stick out at the back of the pallets and will damage the goods that are behind it. The pallet will have to be wrapped again, it has to be stapled manually and the lift truck and the lift truck driver are occupied. Because of this the standard logistic process is disturbed enormously with these extra costs. With the special "Slide range" hydraulic forks those damages can be prevented and it's even possible to transport two pallets at the same time which saves the

lift truck driver an extra drive.

Stacking pallets double deep with hydraulic lift truck forks has become a generally accepted way of storing pallets. Lift truck manufactures specialising in warehouse trucks and racking specialists are promoting this concept because of its excellent utilization. By stacking pallets double deep, four pallets can be stored between each aisle which offers  $\pm 25\%$  extra storage volume.

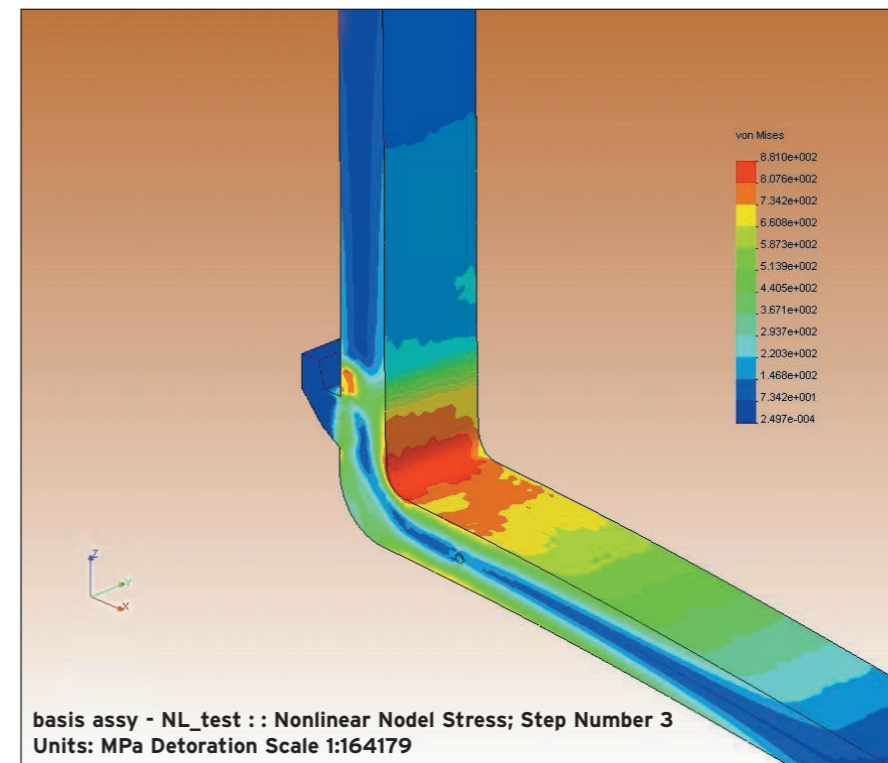
The NDHSS is also a new system that can be used to store more volume in the existing or new warehouse. This mast extender can simply be mounted on every lift truck and only needs one extra hydraulic connection. The load thickness is nil, so the residual capacity is hardly influenced. When the customer has to drive from one place to another, one is dependent of a certain under-door clearance. This under-door clearance in combination with the required lift height determines what type of mast has to be used. Using a triple mast will influence the visibility of the lift truck driver, it will even become worse when a four-part mast is being used. Here the "Narrow Double Height Shift System" can solve the problem. The standard



lift height can be extended from 200 mm. to 500 mm. A simple solution that saves space, because pallets can be stacked higher than before and more goods can be stored.

#### From design to safe usage.

MSE is selling its telescopic forks under several trade names but the most well known trade



name is KOOI-REACHFORKS®. MSE invests  $\pm 8$  percent of its turnover in development and improvement of new and existing products. The important safety factor is the spearhead of MSE and partly because of this, MSE's telescopic forks are prescribed by almost all leading lift truck manufacturers.

The 3-dimensional design and draw packet of MSE, One Space Designer, includes a module "analysis" in which different constructions can be calculated. These calculations give you a clear view of the strength and stiffness of a construction. Unfortunately, this module also has its shortcomings. Non-linear, contact, dynamic and fatigue calculations cannot be executed. These simulations are very important for the telescopic forks because in practice lift trucks are driven with extended forks most of the time and floors are not always flat. MSE has its products checked by an independent company that is specialised in Finite Element Method (FEM). By using COSMOSDesignSTAR's advanced features IDEA Heavy Equipment is able to analyse complex constructions in regard to strength and stiffness in a relatively simple way. This means that the construction that needs to be analysed is divided (meshed) into a finite number of parts which are called "elements". Depending on the required precision, the calculation model can be made up out of beam, sheet volume-elements. Within the individual elements the stresses and the displacements are approached by polynomes of which the order depends on the type of element. The elements are connected with other elements.

With the help of these calculations, engineers are able to adjust a construction until the FEM calculations indicate an optimal construction. This is of course a theoretical analysis and therefore these values will also have



to be tested in actual practice. MSE works with experts from outside its company because independent research is more objective than own research.

The internationally well-known research centre Bodycote Materials Engineering from Lancaster (UK) is doing periodic dynamic endurance tests for MSE's telescopic forks. It is known, or it should be known, that all telescopic forks have to meet the international ISO standard 13284. After many years of postponing, this standard was finally realized. In general it says that the inner forks as well as the outer forks must meet a safety factor of 3

without materials breaking or becoming permanently deformed. Strange thing is that this standard does not prescribe a dynamical test like the ISO 2330, the standard for regular lift truck forks, while telescopic forks are mostly used with extended forks. Think of the application when hydraulic forks are being used as forks extensions. Bodycote tests different telescopic forks with varying capacity and suspension in a life test. This endurance test takes 1 million cycles with an overload of 25% of its nominal capacity and the forks may not break while undergoing this extremely heavy life test.

Results are compared to the FEM method and if necessary MSE's design will be adjusted. This research is a matter of great importance because MSE wants to keep to the standards of the ISO and the European Machinery guidelines. Both standards have been called to life in order to enlarge safety for personnel. The machine itself comes in second place. That is why it is a matter of great importance that lift truck manufacturers know what kind of application can be used, because only 10 % of the applications are mounted and tested at the lift truck manufacturer. This does not apply for the side-shift.

All remaining attachments are mounted at authorized lift truck dealers worldwide. In most cases the CE mark is already put on lift trucks at the factory, but this does not guarantee safety because the machine is out of sight of the manufacturer. Actually this is a remarkable thing because it is the producer/manufacturer who gets blamed when things go wrong. Unnecessary suffering can be prevented when a fixed safety certificate is given to suppliers in which they declare that they have met the set safety requirements/standards. An example is that lift truck dealers probably do not know the new standard for explosion-proofed trucks. Not only the lift truck has to meet the new ATEX guidelines, also the attachments have to meet these guidelines. The applications can be checked by different internationally recognized authorities, for example the KEMA or TUV. Having done this the manufacturer of the application receives a certificate which officially declares that the product has been checked and that it has been approved. Contrary to other guidelines, a certificate is handed in and with this, safety has been made more specific. All together, much more can probably be improved as far as safety goes, but every self-respecting manufacturer will have to act to the best of one's knowledge in order to supply clients with a safe application.

More information: [www.telescopiforks.com](http://www.telescopiforks.com)