

EVERYTHING'S COMING UP HOSES

When a global manufacturer needed preformed plastic hoses for its new range of forklifts, it turned to the company it knew could deliver a flexible – and highly successful – solution

With its X-range reach trucks, global player Linde has introduced a new generation of forklift trucks that combine high efficiency and longevity with outstanding operating comfort and safety. The advanced capabilities of the X-range products really come into their own in demanding environments such as narrow aisles and storage applications.

In conceiving and constructing this new concept, Linde's engineers relied exclusively on high-quality components. For the fluid conveyance of the mast hydraulics, they used conventional and preformed thermoplastic hoses from Eaton Synflex.

"We have been using Synflex hoses in our forklifts for over 10 years now," says Nigel Hodgson, X-range project leader at Linde Material Handling in Basingstoke, UK. "So we were already very familiar with the reliability of the products and the flexibility of the engineers at Eaton Synflex."

Synflex, a member of Eaton Corporation's Fluid Power Group, has over 50 years' experience in

developing and manufacturing hose and tubing for a wide variety of applications. Its thermoplastic hoses are renowned worldwide for their low weight, UV resistance, unlimited shelf-life, long flex-impulse life and the ability to produce continuous lengths over two kilometres.

"Synflex's ability to deliver individually preformed hoses made it easy for us to decide to use its thermoplastic hoses in the newly developed X-range reach trucks," Hodgson continues. "Using preformed hoses not only allows us to assemble the parts more quickly, but it also makes it possible to construct a very compact mast and load handler. As the forklifts are especially created for narrow environments as well as high lift, this is an important advantage."

Designed for challenging environments

The X-range comes in four basic versions with lift heights from 4,655mm (R 14) to 6,955mm (R 17 and R 17 HD) and a standard fork length of 1,000mm. The panoramic clearview triplex mast lift, is operated by a 12W AC motor.

The Eaton Synflex thermoplastic hoses complement these specifications with an average

working pressure of 250 bar and a relief pressure of 280 bar.

Not only is the pressure high, but the working conditions are demanding as well. In ambient warehouses and temperature-controlled cold stores all over the world, the hose construction is exposed to temperatures between -30 to +50°C – but this is still well within the Synflex temperature range of -54 to +100°C.

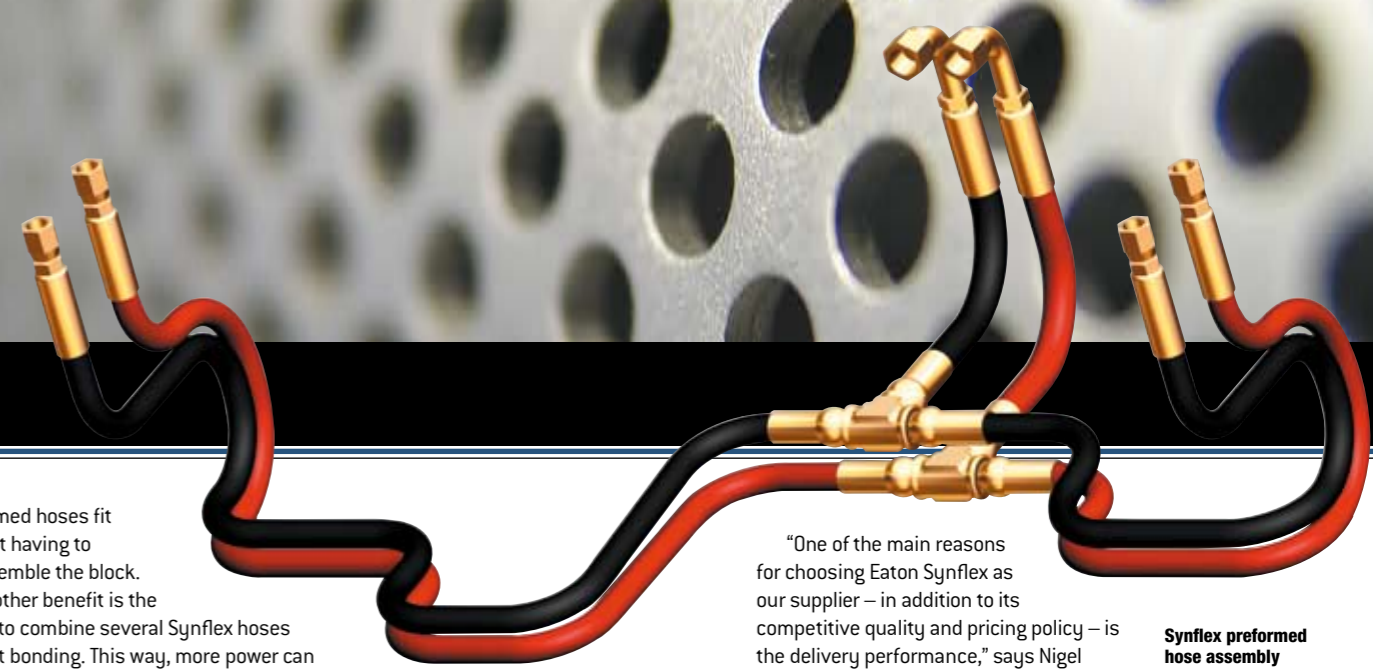
"We were able to use standard materials and standard hydraulic oil as medium," says Hodgson. Notwithstanding these harsh working environments, the forklift trucks are designed for an operating time of up to 1,000 hours between services and up to 23 hours in three consecutive shifts in some applications, posing quite a challenge for the hydraulics system and fluid conveyance.

Even more advantages

In addition to robustness, Synflex preformed thermoplastic hoses offer a host of other advantages to forklift construction. For example, they make it possible to reduce or eliminate bent metal tubing and hose and tubing combinations, along with the transition fittings. Synflex hoses are particularly useful where flexibility is required and where there is the need to eliminate abrasion or interference. Furthermore, these preformed hoses are custom-designed to meet the specific needs of each hydraulic system. Because the tailor-made, preformed hose

Using tailor-made preformed hoses reduces assembly time and eliminates scrap





Synflex preformed hose assembly

assemblies reduce scrap to zero, they are valued by production managers.

They can also reduce installation effort, thereby shortening manufacturing cycles and providing cost savings. The preformed hoses can be installed in tight or hard-to-reach areas much more easily than bent metal tubes or unformed hoses. The preformed hose is easy to flex so that it goes around, or between, components. Once they have been installed, they maintain their flexibility and act as vibration absorbers, which can greatly reduce system fatigue and eliminate premature failure. In addition, preformed hoses allow for slight equipment variations, or tolerance build-up, which reduces the potential for rejects.

Field repair and servicing can also be made easier with these hoses. Whereas bent metal tubes can be difficult to



remove, the flexibility of preformed hydraulic hoses means they can be removed easily. The hoses can also ease removal and servicing of other system components, as they can be pushed out of the way to allow access to other areas.

When space is of the essence

The Synflex preformed thermoplastic hoses are particularly advantageous where installation spaces are tight. "For the Linde project, we designed and supplied a variety of tailor-made hose forms in order to comply with the routings in the mast construction," explains Ian Brazier, sales manager Synflex Europe at Eaton Hydraulics in Gembloux, Belgium.

This illustrates one of the greatest advantages of the Eaton Synflex products: no matter how twisted and winding the ducts for hydraulic connectors may be,

preformed hoses fit without having to disassemble the block.

Another benefit is the ability to combine several Synflex hoses by heat bonding. This way, more power can be conveyed without the individual hoses losing capacity as they move against each other – a particularly important consideration with the constantly altering impulses found in forklift applications.

"As Linde also attached great importance to the possibility of assembling the X-range reach trucks in confined areas, we supplied STC (snap-to-connect) fittings that save time and assembly space," Brazier adds. "Furthermore, we replaced some steel pipes with formed hoses, or a combination of pipe and formed hose, which allows for flexing and also reduces the overall weight."

"One of the main reasons for choosing Eaton Synflex as our supplier – in addition to its competitive quality and pricing policy – is the delivery performance," says Nigel Hodgson. "Linde will continue to rely on Eaton Synflex preformed thermoplastic hoses for one of the most vital parts of our forklift products."

As the long-standing partnership between Linde and Eaton Synflex moves forward, it forms the basis for future developments. **IVT**
 Ian Brazier is Synflex business development manager for EMEA and has been with the company for 24 years

Fast, responsive delivery

Focusing on a customer's special requirements by developing individual solutions goes hand in hand with just-in-time delivery, product support and field service. Fast, flexible response to changes in product specifications is also essential to staying competitive.

Preformed hoses can be installed in tight or hard-to-reach areas



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