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Still pushing the envelope

It may have taken many years, but the aluminium boomed crane now appears to be making its mark as a useful tool among the mobile crane community in a good number of markets. The coming of age is almost certainly related to its main advantage of offering substantial cost savings compared to an All Terrain crane when carrying out certain types of lifts.

In most countries crane rental companies have typically supplied a crane based on its nominal capacity - the higher the capacity, the longer its boom and the more it could lift - and for several decades that was certainly the case. However in recent years this has been turned on its head as new concepts, materials and technology became available and manufacturers developed new products, many of them focused on a certain type of lifting, rather than being all things to all customers.

As a result many of these new product types require users to keep an open mind to recognise their potential for specific applications. This has required crane rental companies, a) to take a leap of faith in the new concept and b) have the ability to 'sell the concept' and educate regular crane users that there is a better... or different way... of lifting their specific loads. Not everyone is able to convince a regular crane customer who calls for a 50/60 tonne All Terrain that a four tonne aluminium crane can do the job as well and can in fact be far more effective and even cost less.

The aluminium boomed crane has

several advantages. First it has excellent reach and while it hasn't the absolute nominal capacity, it can lift more than enough at more than 30 metres radius to carry out work such as installing roof trusses, air conditioning units etc... in fact anything that doesn't weigh more than about a tonne and which needs to be handled at up to 35 metres, or a 250kg load at around 40 metres.

The fact that more than one manufacturer is now fully active in the sector certainly helps spread the message compared to a single player. Given that the concept has been around for some time it is unusual in that there are still only two main manufacturers - Klaas and Böcker - which are located around 20km from each other in Ascheberg and Werne to the north of Dortmund in Germany. However the same is true for spider cranes - with Unic and Maeda - and mobile self-erecting tower cranes with Spierings and Liebherr. All three products remain niche in comparison to other crane types.

Klaas was established in 1933 by Theodor Klaas, the father of Ludger Klaas the current owner and chairman of the board. It remains a



Klaas boom sections welded with the stir welding method

family business run by the second and third generation of the Klaas family. The current chief executive is George Küter who is married to the founder's daughter.

Klaas developed the inclined material and furniture lift in the late 1940s, but it wasn't until the 1970s and 1980s that Ludger spotted the opportunities and benefits of using aluminium for crane booms, producing his first aluminium crane in 1993. Mounted on a 7.5 tonne truck it had a lift capacity of 500kg. This proved a turning point in the company's history and the basis for developing other machines, including firefighting equipment. It partnered with Iveco Magirus in 2000 and now produces three ranges of firefighting and rescue machines. In 2005 it developed the new TS aluminium boom profile - which it still uses today - which it says helps reduce weight while increasing strength and stability.

The company has been responsible

for many innovations over the years and in 2013 it started using the stir welding method on its aluminium booms. The welding process fuses the two elements of a boom section without adding additional material, resulting in zero distortion, increased strength and improved stability. There are apparently just four stir welding machines in the world with Klaas now operating two of them.



The aluminium boomed crane has excellent reach





The development of the inclined elevator played a major role in the development of the Klaas company

Böcker, on the other hand, was founded in 1958 by master blacksmith Alfred Böcker who established a metalwork and forge workshop. At first the company concentrated on producing farming implements and feed fences. However the following year Böcker developed the knee joint construction lift for transporting roofing tiles onto the roof. In 1962 the company delivered the first trailer mounted speed lift for carrying bricks and corrugated sheets to roof tops or elevated working areas which could be extended to 16 metres.

By the end of 1964 the company had sold 1,000 lifts and needing more production space, moving to its present facility and head office in Werne. In 1968 it developed its first double jointed lift allowing tiles to be transported over the ridge to the rear side of the roof. This was followed by the S-L-30 speed lift mounted on a truck chassis and due to the extendable aluminium rails the lift could extend up to 30 metres. The trailer materials lifts continued selling well with the 5,000th made in 1970 and the

7,000th just two years later in 1972. At this point 25 percent of sales were exported and the company was renamed Albert Böcker GmbH & Co.

The first furniture speed lift was produced in 1974 with boom lengths of up to 47 metres. In 1987 Albert's son Robert made the first compact PH passenger lift replacing a ladder to work indoors. Its first truck mounted aluminium crane - the AK 25/650 - was developed in 1989. Weighing 7.49 tonnes it had a 650kg capacity and a working radius of 23.5 metres. A year later Robert took over from his father and began working on ways to improve the product line through new designs, introducing the octagon aluminium boom profile in 1994 which helped take the capacity of the truck mounted cranes to 1,000kg. With growing demand for cranes with longer booms and more compact stowed dimensions the company developed a new seven section telescopic boom in 1997 for use on cranes up to the AK 36/1000. To put this into perspective, crane booms in general were shorter at the time and mostly limited to five sections. Shortly after this Böcker launched the first aluminium crane on a trailer - the AHK 27/700 - which was light enough to be towed by a car, a product that appeals mostly to the Germanic markets where towing long heavy trailers is the



Largest crane in Böcker's line up is the AK 52



The new Klaas K1100 RSX is the most powerful aluminium crane it has produced

norm, whether large trailer lifts, trailer cranes or simply to transport equipment. Today the company is run by Robert's son Alexander Böcker who took over at the end of 2014 following the untimely death of his father.

Both companies have continued to develop and evolve the truck and trailer mounted cranes, and while the trailers are still very popular in their home market of Germany, it is the truck mounted cranes that are now making the running, selling well to its export markets. For Klaas - which claims to have produced 30 to 50 percent more cranes than Böcker - France, Belgium, the Netherlands and Poland are its fastest growing markets.

Böcker has five truck mounted

cranes in its product line - the AK 37/4000, AK 36/4000, AK 42/4000, the AK 46/6000 and its largest the AK 52 which has a standard three tonne lift capacity but with options for six and 12 tonnes. Klaas on the other hand offers six models - the K27-32 TSR, the K750RS, the K850RS, the K900 RSX, the K950 RSX and its largest and most popular model the K1003 RSX which has a three tonne standard capacity with a six tonne option.

In last November's issue of Cranes & Access (issue 21.8) we covered Klaas' open days held at its head office facility in Germany. At that time chief executive George Küter talked about the company and its products, hinting that it was working on a new 'large' truck



Böcker AK 46/6000



Klaas K750RS



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The new Klaas K1100 RSX has a 60m boom reach

mount which should be launched in January/February 2020. That new machine has just been unveiled, with the company claiming that it is the largest, most powerful aluminium crane yet produced. We thought we would look for ourselves and compare the Klaas K1100 RSX which has a maximum reach of 60 metres and can lift 350kg at 55 metres with Böcker's largest - the AK 52.

One of the main features of all

the Klaas cranes - according to the company - is the performance gains from using the aluminium stir welding process. Boom production was the company's main bottleneck limiting further growth, so four years ago Klaas ordered a Swedish stir welding machine - the first company to employ the technology for crane booms. It added a second machine about six months ago which is now fully integrated and production capacity has improved significantly.



The Klaas stir welding joint

The increased strength and stability gained also allows Klaas to design larger capacity machines and use aluminium for all of its boom sections rather than using a steel base section like on the Böcker.

The new Klaas K1100 RSX v Böcker AK 52?

With a maximum hook height of 60 metres and a six tonne maximum hook capacity the new K1100 RSX is the largest and most powerful machine in the Klaas range of aluminium cranes. But how does it compare with Backer's largest - the AK 52?

Both are mounted on 26 tonne GVW, three axle chassis but the Böcker has recently added the option of mounting it on a 32 tonne four axle chassis if required which allows for a more compact outrigger set up. On a three axle chassis

the Klaas is more compact in that its outrigger width is less than six metres (5.94m) compared to the Backer's eight metres - possibly due to its extending counterweight? - giving it the edge when working on congested work sites with limited set up space.

The K1100 RSX features a five section 38 metre boom topped by an 18 metre four section telescopic luffing jib giving a maximum tip height of just over 60 metres. It can lift two tonnes to a height of almost 38 metres at a 20 metre radius or take a tonne out to 35 metres at a height of 31 metres and handle 350kg at a radius of 46 metres and a height of 35 metres.

Features include a 2.5 tonne winch, a variable extending counterweight system, radio remote controls and automatic levelling. It also features dual boom lift cylinders, twin lung cylinders and a separate diesel power unit helping save fuel, while a hybrid drive is also available.

The Böcker AK 52 features one less main boom section, plus a three section luffing jib for a maximum 52 metre tip height, with the option of taking it up to 55 metres with a three metre jib extension. The crane has a maximum radius of 45 metres and can take one tonne out to a 34 metre radius or a height of 30 metres.

Performance

While the Klaas grabs the headlines for reach - taking 350kg to a radius of 46 metres at a height of 35 metres which is unquestionably impressive - the Böcker AK 52 has a much stronger mid-range load chart.

Looking at the maximum three tonne capacity on a single fall for each crane, the Böcker can take the load out to almost to twice the radius (17 compared to nine metres) and twice the height (31 versus 17 metres) - this is probably where the greater outrigger spread

How the new K1100 RSX compares with the Böcker AK 52?

Manufacturer Model	Klaas K1100 RSX	Böcker AK 52
Maximum capacity	3t single fall (6t two fall)	3t single fall (4t and 6t two fall and 12t four fall)
Boom max reach	60m	52m (55m with 3m jib extension)
Capacity @ max reach	350kg @ 55m	100kg @ 45m
Capacity/height/radius	6,000kg at 11m high & 7m radius	6,000kg at 23.5m high & 10m radius
	3,000kg at 17m to 9m radius	3,000kg at 31m to 17m radius
	2,000kg at 30m to 23m radius	2,000kg at 22m to 33m radius
	1,000kg at 31.5m to 35m radius	1,000kg at 30m at 34m radius
	350kg at 35m to 46m radius	100kg at 12m to 45m radius
Slew	360 degree continuous	360 degree continuous
Chassis GVW/axles	26 tonnes/3 axles	26 tonnes/3 axle or 32 tonne/four axle
Outrigger width max	5.94m	8m on three axle 6.4m on four axle
Outrigger width one side	-	5.71m
Extendable counterweight	YES	NO



The K1100 RSX can lift 1 tonne at 31.5m to a radius of 35m



Böcker has recently launched a four axle AK 52 which has a narrower outrigger set up

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The Klaas K1100 RSX can lift 350kg at a radius of 46m and height of 31m.

makes the difference. When lifting a load weighing two tonnes, the two cranes are similar, with the Böcker having the slighting longer radius, while the Klaas can take the load higher. However at one tonne the Klaas has just edged one metre in front taking the load to 35 metres radius at a height of 31 metres.

At the extreme the Klaas is far superior taking 350kg to a radius of 46 metres at a height of 35 metres. The Böcker can only manage 100kg to 45 metres radius at 12 metres height. So in essence if making a

choice between these cranes you need to consider the type of work to be carried out, requiring crane rental companies to gain a better understanding of their customers' or potential customers' applications.

As already mentioned Böcker has also just launched a new four axle AK 52 variation. Mounted on a 32 tonne chassis, the four axle machine benefits from a much narrower outrigger set up with its width reduced to 6.4 metres. It is still 460mm wider than the Klaas K1100, but a sizeable 1.6 metres narrower than the three axle AK 52. UK crane rental company Berry Cranes recently purchased a four axle 32 tonne machine - its second AK 52 - and said that the extra axle "proved decisive in the purchase, as the four axle crane offers the same lifting performance as the three axle version, but has a more compact working footprint, requiring considerably less space to set up".

New Böcker launches

As well as the four axle AK 52 Böcker has recently launched several new aluminium crane products along with two new



BöckerConnect gives real time information about the status and location of the cranes

platform attachments, an electric E-Drive and a digital customer portal BöckerConnect which informs the crane owner in real time about the status and location of its cranes. BöckerConnect can also show how and when the crane was used including lift performance. Technical documents, such as data sheets, operating instructions or maintenance schedules are also stored centrally.

E-Drive and eReady kit

All Böcker cranes are now also available with a 400 volt electric drive. Depending on the crane model a hybrid version can be achieved by installing a 13 or 30kW electric



AC/DC power pack, and depending on the available power supply, the crane can recharge while working or operate from a local power. Customers who do not want to pay



The new Böcker PK 350-D can accommodate up to three people or 350kg

for the E-Drive package can specify the eReady kit, which allows the easy retrofitting of the E-drive power pack at a later date.

Two new platforms

The new Böcker PK 600 platform - developed specifically for the AK 52 - has a maximum platform capacity of 600kg and can be hydraulically extended to 3.5 metres long during operation. Hydraulic platform rotation is 400 degrees.

The new 2.2 metre x 900mm, PK 350-D has the usual 180 degrees of platform rotation and can accommodate up to three people or 350kg. Böcker says that its Easy-Lock-System allows the truck crane to be converted into a fully integrated truck mounted work platform within a few minutes. For the AK 46/6000 this means a maximum working height of 40 metres, an outreach of up to 28 metres with 350kg in the basket increasing to 33 metres at a height of 15 metres with a 100kg platform capacity.



Conclusion

The performance of the aluminium truck crane continues to increase through improved manufacturing and technology developments. The latest Klaas K1100 RSX pushes the envelope further to level only matched by a sizeable All Terrain crane which is both much more expensive to purchase, to run and maintain.

"The aluminium boom crane is all about taking smaller loads - 500kg, one and two tonnes - as far out and as high as we can," says George Küter of Klaas. "The larger aluminium cranes are very cost effective when compared with steel boomed All Terrain cranes, where customers have to spend up to €100,000 more for the same performance. This is why these cranes are becoming more popular."



Böcker AK 46/6000 and AK 37/4000

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