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ROBOT WARS

In the fight to improve a building's thermal efficiency, windows have always been a primary challenge. Stricter regulations across Europe have given momentum towards wider spaced double glazing and triple glazing, both of which means heavier and more awkward to install windows and glazing panels. The use of structural glass in both residential and commercial buildings also adds to the issue, as does tougher manual handling rules. As a result, window and glazing installation is increasingly becoming a job for highly skilled people working with innovative glass handling equipment.

The prototype Woods vacuum cup

In recent years the spider crane has become a widely used piece of kit for glaziers. As a result, they are now available with a wide array of vacuum lifting attachments, searcher hooks or cantilever beams. And unlike the specifically designed glazing robots are widely available from a range of rental companies. However glazing robots are also finding a wider market, with manufactures adding new models at quite a pace.

WOOD VALVE GRINDER

The first vacuum lifters for glazing began to arrive in the early 1960s with companies such as Woods Powr Grip in Montana pioneering the equipment. Howard Wood opened Wood's Auto Electric repair shop in 1947 and after years of struggling to hold small engine valves during the lapping process he designed and built a tool that used a suction cup with small vacuum pump mounted on a wooden handle, that quickly latched onto the flat surface of an engine valve and held it firm.

His 'Woods Powr Grip' took off and a glazier friend suggested he developed a vacuum cup for glass handling. The resulting product incorporated a red-line vacuum indicator on the pump that warned the user if vacuum loss occurred, a check valve retained the vacuum while pressure was restored without breaking the cup's grip.

Wood began mass producing vacuum cups for glass handling in 1963 and was granted a patent for his design in March 1966. The cups were first introduced to the American market by traveling salesmen but as popularity grew, they appeared in national and international glass handling equipment catalogues.

In the late 60s, he developed and patented a battery powered, sealed foam vacuum lifter for use with cranes capable of handling loads up to 270kg. Howard Wood died in 1983, at the age of 73 and the company is now managed by a third generation.

FIRST IN THE UK

Although cranes equipped with vacuum lifters have been one of the most reliable methods for lifting and placing large glass panels, they cannot resolve all of the challenges glaziers face, especially when it comes to tight and hard to reach areas. This is where the purpose designed compact glazing robot is invaluable.

KEY ADVANTAGES

Glazing Robots can often lift and install glass more easily and quicker than the alternatives, while some, such as the Oscar Glazing Robots are very light and compact - the smallest weighing as little as 550kg without counterweight - allowing them to squeeze into tight spaces and install glazing with lower ground bearing capacity.

A modern Woods Powr Grip MRT4 vacuum lifter

Wheeled stabilisers allow the robots to lift more while remaining compact and help reduce the risk of toppling over sideways on an imperfect surface or from a swinging load. An adjustable glazing head frame also allows it to fit the size of the glazing to be lifted.

Radio remote controllers are pretty much standard, while a side shift function which allows the glass panel or window to be 'shuffled' into place without repositioning the robot. The frame can also tilt, rotate and slew.

The Oscar 600 weighs just 550kg without counterweights and can lift up to 600kg

Dingli's 1,500kg glass lifting head mounted on its 86ft/26 metre BT2615ERTGS all electric boom lift

ICE RINK REPAIR

One example of using a glazing robot resulted from an incident during an ice hockey game at the Odense Sports Arena in Denmark. A puck smashed through the Lexan safety panel behind the goal. In the past it would take two people 10 minutes to replace it. But new regulations from the Danish Ice Hockey Federation have more than doubled the size and weight of the panels to more than 100kg making manual installation more challenging. In this incident the game was delayed 80 minutes while staff sourced a small lift and the help of five employees.

The arena then purchased a Smartlift SL280 to carry out the panel installation. It has special ice tyres so that it can travel across the ice carrying the safety panels. Because the ice at the rink is normally between minus five and minus eight degrees Celsius the suction pads have been designed to work in freezing temperatures retaining suction capacity down to minus 30 degrees.

The Smartlift SL280 carrying a Lexan safety panel across the ice

"On the ice rink there is plenty of space but away from the ice it is limited with many narrow passageways and tight corners so it is important to have a machine that we can manoeuvre everywhere," said technical service manager Morten Nielsen.

The Smartlift's side shift is also invaluable when installing the heavy safety windows which are fitted into 5mm wide rail, the side shift feature and precise controls makes the installation and easy process. The SL280 has allowed the larger heavier panels to once again be installed in just 10 minutes by two employees.

BOOM ALTERNATIVES

The growth in glass handling equipment has seen the introduction of many interesting and innovative products including Chinese aerial lift manufacturer Dingli's 1,500kg glass lifting head for its 86ft/26 metre BT2615ERTGS all electric boom lift.

The vacuum head is made up of eight autonomous vacuum pads which do not require tubes from a central pump. The modular design is based on a product the company launched in 2020 which has been extended from 500kg to 1,200kg and now 1,500kg.

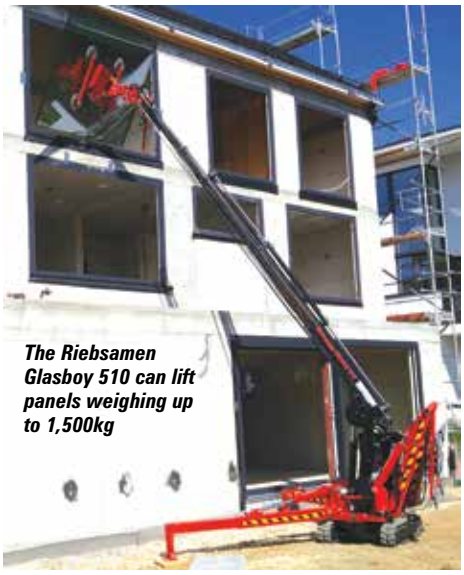
The aerial work platform base - identical to the four wheel drive boom lift version - is equipped with an 80 volt 520Ah high capacity lithium battery pack with quick charge capability of 1.5 hours. The boom lift can take 1,500kg to its maximum lifting height of just over 26 metres. The glass handling head can rotate 360 degrees, tilt forward 30 degrees and back 90 degrees and articulate 160 degrees for precise placement of panels - all of which is operated from a wireless radio remote controller.

The machine has proved itself on several large projects, lifting and installing an average of 13 very large glass panels in a typical working day, with a maximum of 16 panels having been achieved on one project.

GLASBOY 510

The Glasboy 510 from Riebsamen is a tracked spider with a three dimensional suction head that can be used for placing glass panels up to 1,500kg. The tracked unit can also pick and carry the panels weighing up to 600kg using its side mounted vacuum lifter. Overall weight with 200kg suction head is 2,650kg. Maximum horizontal reach is 7.55 metres with 410kg and it can raise 1,500kg to a height of 7.1 metres.

According to Riebsamen the Glasboy 510 is the best of both worlds. "Thanks to the option of the specially developed side vacuum, glass panels up to 600kg can be safely transported. Meanwhile panels of up to 1,000kg can be lifted to a height of up to 11 metres."



The Riebsamen Glasboy 510 can lift panels weighing up to 1,500kg

The Glasboy 510 can transport panels up to 600kg

UPLIFTER DOOR INSTALLER

Uplifter has recently added the new UPT400 - a lightweight handler aimed at installing large and heavy doors such as fire and sound proof doors. Weighing 425kg it has a lift capacity of 400kg, lateral swivelling of the vacuum head and a shelf above the wheels for the door. The unit also features a manual side shift for maximum flexibility reducing manoeuvring. Stone, tiles or wood can also be safely lifted. ■

The Uplifter UPT400

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TC22

New **TeleCrawler**
TC22S - TC22N

- **22m** working height
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New ***DSE*** basket with dual side entry and mesh floor

THhe Libro 3000 Overhang Beam, Corner Lifter, and two DSZ2 Glass Vacuum Lifters at art'otel

OVERHANG BEAM AT ART'OTEL

When UK glass handling specialist GGR was presented with the challenge of installing large curving glass panels and artistic corner glazing on the new art'otel hotel, on the Battersea Power Station redevelopment it developed a custom solution using standard products.

The unusual design of the hotel includes a curved glass structure that snakes along the new promenade. From the beginning of the project, the installation of the artistic corner glazing was clearly going to require specialist tools and a tailored lifting solution.

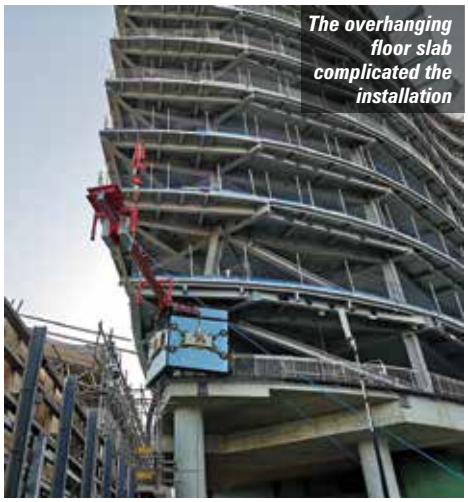
With the two panes of corner glass at almost 90 degrees and weighing 1,200kg, the installation was made more difficult by the existing overhanging floor slab right above the glass façade. The corner units required tools capable of not only lifting the weight of the glass and coping with the awkward shape as well as tackling the issue of being having to install the glass from above using the site's tower crane. GGR supplied a tailored solution specifying a Libro 3000 Overhang Beam with Corner Lifter and two DSZ2 Glass Vacuum Lifters.

The 3,000kg capacity Libro 3000 has a capacity of 2,200kg on the optional Corner Lifter attachment. Although isn't the largest overhang beam in the company's range it offers the ability to fit under the deepest overhangs when combined with the Corner Lifter attachment. The two DSZ2's provided a combined lifting power of 1,500kg and supported the glass from either side.

The unit is powered by a 24 volt rechargeable battery which drives the counterweight rack and pinion saddle, which moves along the steel beam to balance the load under the hook. Operated by a radio remote controller it also offers the user the ability to limit the saddle travel by using a moveable cut-off switch, and it has its own transport stand that can be left attached or removed to save weight. The overhang beam can also be adjusted from the remote controls if needed.

The combination gave the customer the reach and angles needed for the installation, with up to a 4.1 metre overhang capability and up to 90 degree angles. The combination of the installation tools and glass was close to the maximum lifting capacity of the tower crane being used. Any other solution may have required a larger crane adding to the cost of the contract. The close proximity of the hotel to an active rail track added an additional complication, preventing the customer from freely choosing any larger lifting solution.

preparing for the lift



The overhanging floor slab complicated the installation

The 164 room art'otel - complete with gym, spa and rooftop pool, in house gallery and high class restaurant - is within the Grade II listed power station building which closed down almost 40 years ago. ■

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