

New developments in stacking

At glasstec 2002, German engineering company Grenzebach Maschinenbau introduced three new products. These are, in response to the requirements of coated glass, a tin-side/air-side stacker, a Pick-at-fly Robot that can take sheets from a moving conveyor, and a Five-Axis robot that can handle sheets weighing up to 600 kilos.

Piers Evans

An arial view of Grenzebach premises in Hamlar, Germany



New developments in stacking

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At *glasstec 2002*, Grenzebach Maschinenbau announced that it has greatly enhanced its range of glass stacking equipment. At the fair, the German company presented three machines that enable it to offer an appropriate stacker for all applications and glass sizes, “whether a large format up to 1,000 kilos or small formats of 20 kilos sheets.”

TIN-SIDE/AIR-SIDE STACKER

The new machines at the Dusseldorf trade fair included a *Tin-side/air-side stacker* – a response to the increasing global demand for coated glass.

This imposes special demands on production machinery. Coating is generally on the so-called air-side, so, as far as possible, glass should be touched only from below, from the tin side, in order to avoid unwanted marks.

Grenzebach’s tin-side/air-side stacker has a suction frame that can be turned by 180 degrees so it dives between the transport rollers to take off the sheets from underneath. The stacker, of course, also functions in the “normal” way by taking off sheets from the upside.

Alternatively, the equipment can also be used for feeding, in other words, taking glass off the rack and putting it on the transport conveyor either from the top side or from underneath.

The special advantage for the operator is that, where previously two machines were necessary, stacking from above or from underneath, the glass is now stacked by a single device.

PICK-AT FLY ROBOT

A further innovation in the field of stackers, one that its makers consider of special interest for the production of small glass sheets, is the *Pick-at-fly Robot*. This system can take off and stack sheets directly from a moving transport conveyor. This

Grenzebach’s Pick-at-fly Robot



is intended to provide ‘a real alternative’ to manual take-off for existing lines and special production variations. Grenzebach reports that this system can be completely integrated into the company’s optimization strategy is, and ensures, an improved economic use of resources. At the same time, it is intended to reduce loss of glass due to cycle problems in the stacking area.

FIVE-AXIS ROBOT

Undoubtedly, the development at *glasstec* with the greatest visual impact was the *Five-Axis Robot*. This, for what the company proudly says is the first time, can handle glass sheets with a net weight of up to 600 kilos over a radius of 4.2 metres. It enables sheets of this great weight to be taken directly from the main line and stacked to both sides.

Based on a SCARA robot, each stacker can reach two stacking positions, increasing flexibility when sorting by quality.



The Five - Axis Robot

The makers point out a further advantage in the possibility of addressing two stacking racks – thus avoiding delays caused when changing racks.

Grenzebach also claims that, with this stacking technology, the mechanical alignment of sheets is no longer necessary. A series of sensors detects the position of the glass plate, especially its alignment. The actual position is calculated in the robot programme so that the sheets are stacked precisely. An additional benefit is the possibility of stacking the sheets on the long or short side, as desired, without the need for a rotating station.

However, the biggest advantage of the system, according to the makers, is its dual-mode operation. The two five-axis portal robots, standing next to each other, can be combined so that, working in tandem, they can stack a single large-format glass plate. The movement of both robots is synchronized so that the plate can be stacked on the left or on the right. This is forecast to greatly influence the layout of the total cold end.

Until now, several stackers were necessary, each with equivalent side legs for stacking large or medium-sized formats. By arranging several five-axis portal robots in pairs this task can now be done completely within the main line.

CUTTING HEADS

Visitors at glasstec could also see new cutting heads. These are designed to offer further advantages in addition to the proven electro-magnetic generation of cutting strength. Reduced weight results in shorter positioning times. Another important advantage is the larger working range of cutting strength. Previous technology allowed stepless availability from 0 to 150 Newtons, but, with the new cutting heads, says Grenzebach, up to 250 Newtons can be achieved. This has very positive effects on the cutting quality of thick glass, in particular.

THE COMPANY

The Grenzebach Group designs, manufactures and installs automated material flow production lines. It aims to offer “unique ideas and state-of-the-art technology” that, claims the company, result in “highly efficient” high-tech equipment, offering “exceptional reliability” and lifespan. The original company – founded in 1920

by Josef Grenzebach, the father of the present Chairman of the Board and owner, Rudolf Grenzebach – now has six component operations.

The development of an electronics division in the Seventies was followed by expansion into the United States, where *Grenzebach Corporation* was set up in Newnan, Georgia, in 1988, and China, where *Grenzebach Machinery (Shanghai) Ltd.* was established in 2001.

In the same year, *Grenzebach Fördertechnik GmbH* was set up with the partner company *CMM Fördertechnik/France* (a specialist in the construction and assembly of conveyor equipment for car manufacturing) in Eggenstein near Karlsruhe, Germany. In 2002, Grenzebach acquired AKI Dryers, based in Eugene, Oregon, United States, to consolidate its position as a supplier of production lines for gypsum plaster boards. Later in the same year, it took over Babcock BSH in Bad Hersfeld, Germany. Today, there are 450 employees at the main plant in Ham-lar, including 170 engineers, around 435 at the Bad Hersfeld site, 40 in the United States, 21 in China and eight at Grenzebach Fördertechnik. Orders from the glass industry generate around 55 per cent of turnover. The remainder is derived from the building materials industry. ■

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