Elettromeccanica Bovone, based in the area of Alessandria, northern Italy, is a company that needs little or no introduction to flat glass converters. With its fleet of straight-line edging, double-edging, bevelling and washing machines, it has built up a solid reputation as a producer of high-quality plants of proven reliability. Thousands of such units have been sold worldwide, and this has done much to establish the company name. Indeed, such is Bovone’s reputation, that the company claims the recent crisis in the glass industry failed to dent sales, and orders continued to flow in from customers attracted by its track record in this sector. 1999-2000 was, in fact, a very good year for sales and orders. The company points to this as a confirmation of its philosophy that quality pays and,

For many glass converters, the name Elettromeccanica Bovone is rightly synonymous with straight-line edging machines and bevelling machines. However, the company feels that this does not do justice to its full scope as a producer of solutions for flat glass converters.

A major manufacturer of mirror silvering lines, it believes that this production reflects the true face of Bovone as a producer of complete lines and not just excellent single machines, a claim that it backs up by pointing also to its supply of fully automated lines for laminated glass converters.

Dermot Heaney
indeed, confesses that it will be a challenge to match the same performance.

**RECENT CHANGES**

Nevertheless, Bovone has no intention of resting on its laurels. The new impetus is reflected at a number of levels. The company is now wholly owned by Vittorio Bovone, a change that is marked by a strong sense of focus and a solid commitment to building on its reputation. Another sign of change is the arrival in mid-February of Roberto Bacchini, the company’s new Sales and Marketing Manager, formerly with Pesaro-based Intermac. Glass-Technology International spoke to Bacchini about the company’s short-term plans and its policy for the longer term.

**MOVE TO NEW PREMISES**

One tangible sign of the wind of change within Bovone is the imminent move to a new facility. The underlying aim of the shift is to have enough production space to work on bigger lines, a lynch-pin of Bovone policy for the future. The new company premises lie nearby and cover a total area of 12,000 square metres. Production is expected to transfer to the new site by August 2002. The move will be accompanied by an increase in operatives, further proof of the confidence, commitment to growth and the development of new products and plants.

**RE-IMAGING**

The most important development in terms of policy is the desire to flesh-out the Bovone image by making customers conscious of the full extent of the company’s production range. The management is conscious that the company’s image has been largely, though understandably, tied to its range of edging and bevelling machines. However, it is anxious to let customers know that this product type is not entirely representative of its full capacity and versatility as a manufacturer of glass-converting machinery. The
company believes the time is ripe for a re-imaging operation that reflects the range of Bovone expertise and trains the spotlight on other kinds of production where the company feels it is a leader, in particular mirror silvering lines and laminated glass lines.

MIRROR-SILVERING LINES

Luigi Bovone, the company founder, originally set up the business in 1954 to produce mirror-silvering equipment. Although the business quickly diversified to produce other plants for mirror producers and flat glass converters, mirror silvering continued as a core activity to the present day.

The company is particularly anxious to draw attention to this side of its operations and to remind customers how active it is in that particular market. With in excess of 100 such lines installed worldwide, it is continuing to build on this track record, and currently boasts a number of important orders.

PRESTIGIOUS CUSTOMERS

A reflection of Bovone’s expertise in this field is the number of silvering line installations it has supplied around the world and the importance of some of its customers. Today, mirror production is increasingly in the hands of float glass producers. This means that whenever Bovone is approached about a silvering line, there is inevitably a connection with one of the main float glass manufacturers. In Italy alone, for example, Bovone has supplied such a line to the San Sepolcro-based Arglass, the biggest independent European manufacturer. Another impressive reference is the Saint-Gobain Group member, Fabbrica Pisana. There, too, a Bovone silvering line is currently in operation.

MARKETS

With almost 90 per cent of production being exported, it is no surprise to learn that the company has mirror-silvering customers worldwide. Bovone boasts lines throughout Europe in countries like Greece, Sweden, the United Kingdom, Germany, France, and Spain. In Asia, one of the biggest lines hitherto produced is currently working in a Saint-Gobain-owned facility in South Korea. Similar lines have also been installed in North and South America, as well as in Africa. Bacchini explained that percentage-wise, exports were more or less evenly spread across world markets. “We should be better placed to exploit the market from the new premises,” explained Bacchini, “because such lines, which can be up to 150 metres in length, require a great deal of space. The increased factory space will enhance delivery times, which is something all customers are very sensitive to.

LINES FOR NEW-GENERATION MIRRORS

Bacchini also announced that work is already underway on plant for silvering the new generation of copper-free mirrors. There is increasing demand for this system from customers, due to the introduction of more stringent environmental norms. Bacchini claims that the company is already in a position to supply lines that feature this technology, thanks to agreements with suppliers that can provide it. On demand, the company can offer customers a solution for the copper-free process that does not breach existing patents.

Until now, Bovone had supplied its own silvering formula with its silvering lines. These are versatile enough to work equally well with Bovone solutions or those supplied by other manufacturers.

STRAIGHT OR U-SHAPED LINES

Bacchini explained that Bovone can also manufacture straight or U-shaped lines. The latter system allows customers to exploit available space more efficiently and allows converters to carry out loading and unloading operations in the same area. Bacchini pointed out that this configuration is becoming increasingly com-
mon, because it facilitates unloading and loading operations. Silvering lines are an intermediate process. Converters take delivery of float glass in lorries or crates, process it and then deliver it for further processing elsewhere. The U-shaped solution enhances this side of operations.

**SPECIFICATIONS OF A TYPICAL LINE**

Each line is custom-made to customer requirements. There are two choices of standard widths, 2.6 metres or 3.3 metres, with lengths that vary according to customer requirements and the number and combination of sections, though the average length is roughly 150 metres. Stainless steel features prominently in the construction of components for all wet sections on a line - in particular washing, scrubbing, rinsing, chemical solution spraying, drying and water cooling sections. The main supporting frame, top and side protection covers, tank hoods, exhaust system and conveyor roller hubs on the chemical solutions sections are all made of AISI 304 stainless steel.

Conveyor rolls have a diameter of 100 millimetres, and of 128 millimetres on the chemical section. Throughout the line, the rollers are supported at two ends and rotation is obtained thanks to double-protection bearings.

The control panel is mounted at the beginning of the line. It features a synoptical board for operating all drives and to monitor the emergency system. A further set of control panels is mounted at intervals along the line, to operate homogeneous sections. Electrical connections between control panels and line sections are an integral part of the line; customers need only connect the control panels to the mains supply.

All Bovone mirror silvering lines are assembled and tested at the Bovone facility before delivery to customers. All non-stainless steel components are treated with epoxy primer for galvanized sections, basic polyurethane enamels and polyurethane coating enamels. Where a section does generate noise, levels do not exceed 85 db - scale A, measured at a distance of one metre and a height of 1.6 metres. All sound readings are taken in the factory, conform to European standards. Similarly, all mechanical and electrical components also observe European safety standards. Equally importantly, such lines follow Bovone standards, combining high performance with the kind of sturdiness and reliability provided by the company’s in-depth engineering skills and technological know-how.

**LAMINATED GLASS LINES**

With 25 years of experience in the production of laminated glass lines, Bovone feels that this is an equally important aspect of the company identity. Here too, a realistic assessment of company expertise and market conditions has prompted the management to focus
on this aspect of its operations. The growing demand for safety glass, as a result of tougher safety norms introduced in a wide number of countries around the world, is one good reason for the company’s commitment to this kind of production. In addition, there is an increasing demand for automation and for greater quality and precision within this field, something the company is more than well-placed to exploit. This commitment translates into the production of lines that meet demand from the global market.

Unlike silvering lines, which generally tend to be large-scale configurations, laminated lines vary greatly, depending on the needs and type of production. There are also other variables, like the size, the kind of lamination involved - mono or multi-layer PVB - the loading, unloading and assembly system used - manual or automatic - and the kind of fuel source used for the autoclave, such as gas, oil or electricity. Bovone has taken all these factors into account to develop a modular system in which each module encompasses a range of solutions to meet possible demands. Choice is built into the whole system, from glass size, to manual, semi-automatic or fully automatic, PLC-controlled assembly of pieces, to the same range of systems for handling. A special feature of the Bovone oven module on such lines is the availability of a gas-fired autoclave, which cuts the total installation cost and reduces maintenance overheads.

The modular system can handle maximum glass sizes of between 1,300 x 3,200 millimetres and 3,300 x 6,000 millimetres. Minimum dimensions range from 250 x 350 millimetres to 3,300 x 2,000 millimetres on jumbo sizes with automatic handling, or 400 x 700 millimetres with manual handling. Glass
thickness of 60 millimetres satisfies virtually all standards for safety and bullet-proof glass.

**AUTOMATED LAMINATED GLASS LINES**

The glass sheet passes from the loading station to the cleaning section, where it is prepared on both sides to ensure that not even the slightest trace of dust or residues remain. The glass then proceeds to the climatized assembly section and is treated with a dust-repelling coating.

**ASSEMBLY SECTION**

Once in the assembly section, proper automation ensures the highest standards of accuracy. The glass sheet is moved rapidly by two traverse tables that maintain the correct distance from the next sheet to be treated. The tables position the first sheet for the assembly phase. This section features a suction-pad lifter mounted above the line, which automatically raises the sheet and positions it for assembly. The PVB rolls are housed above the line. An automatic device selects the required roll, unrolls the film and positions it on the assembly table. The operation is automatically repeated as required by the composition of the laminated sheet. Cutting is effected by an automatic roller blade device situated near the roll. Operators can choose from ten different rolls, each of a different size and colour; the length and number of cuts can also be pre-selected. This means that the appropriate roll is automatically positioned, unrolled and cut to the required length.

Once assembled, the panel moves on to the final station in the assembly section, where it is trimmed.

**HEATING AND PRESSING SECTION**

From here, the panel proceeds to the heating and pressure section. It first passes into the pre-heating oven, where electric- or gas-powered lamps heat the panels. Here, the temperature is maintained at a low level so that the PVB layer remains inert. The sheet then passes to the first roller section, equipped with steel, rubber-coated rollers. The roller coating has a specially grooved surface to enhance the elimination of air bubbles. Pressure levels are constantly monitored from the control panels.

The second oven is either gas- or electric-powered. Here the glass panels are heated to higher temperatures to ensure that the PVB melts and bonds with the glass. A second roller press completes this phase of operations. All phases in this section are automatically PLC-controlled by way of previously set-up thermal diagram of the ovens.

**UNLOADING SECTION**

The panel then proceeds to the unloading section, where it is raised into a vertical position by two pneumatically powered arms. The panel is now ready to be transferred by suction frame to the stacking train from where it will pass into the autoclave for final treatment.
The company stresses that this innovative design is the culmination of many years’ experience in the glass handling, washing and heating sectors. As with laminated glass itself, the strength of Bovone products is made up of layers of specific experience that cohere in a reliable and effective product.

**VITRUM**

The forthcoming edition of Vitrum in October will serve as a showcase in which visitors will be able to see Bovone from all sides. Bacchini announced that the company will be present with a 500-square metre stand. Besides the range of single edging and bevelling machines, the company will be putting its complete double-edging line on show for the first time. Some single-machine double-edgers have already been sold in Italy and the intention is to exhibit the complete line.

As always, Bovone will be putting the stress on quality and not on the price of machines. “We will be showing quality machines with technological features that guarantee performance, quality and reliability,” Bacchini confirmed.

Of course, it is not feasible to put an entire mirror silvering line or laminated glass line on show at a fair like Vitrum, but the company is examining solutions, including multi-media presentations, to increase customer awareness about lines that it regards as an essential element on its overall image.