

# Profilglass: increased and improved production in response to growing market demand

*During a recent visit to the premises of Profilglass, in central Italy, Glass-Technology International was able to walk around the continuous casting area where development and expansion is still undergoing to increase the company's production of aluminium for profiles. Moreover, the introduction of a new de-greasing plant is enabling the company to supply its profiles with improved cleanliness.*



Office building and aerial view



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**G**iancarlo Paci, founder of Profilglass, set up his first company, which is still up and running at present, for the production of light switch surrounds in aluminium, no longer used in the European market but still in use in other parts of the world.

Then, as usually happens, a manufacturer of double-glazing units asked him if he could make a "profile". He tried, was successful, and Profilglass was set up in 1982. At present, the production line is in continuous expansion and Profilglass is expanding with it.

At present, the company occupies an area of

Degreasing plant



about 125,000 square metres, divided up among several buildings, and expansion is underway, with the construction of two new furnaces for aluminium.

The company is totally self-sufficient, as it imports the aluminium coils from its supplier in Egypt, and all other processes from then on are carried out strictly in-house.

## SALES AND MARKETING

Profilglass is present in over 90 countries worldwide, covered by a network of agents and sales personnel. Sales and marketing are constantly increasing at the company, even in those countries defined as "emerging" – such as Russia, Lithuania, Estonia, Ukraine, Romania. Asia is another good market, generally speaking.

Competition is strong from these "low cost" countries, but this low cost also includes low quality. Profilglass, on the other hand, guarantees its products are certified as far as their high quality is concerned.

Historically speaking, Profilglass has an "interesting" market in Japan, where sales started in 1988, and are continuously increasing. Sales are about 30 per cent of the Japanese market.

As far as China is concerned, a new normative has just been put into practice that states that all new buildings must have IG units. Considering the size of the country, the market is incredibly vast and Profilglass already has quite satisfying sales there.

Turnover of Profilglass was EUR 150 million in 2005, with the Group figures even higher at about EUR 250 million, as foreseen by previous budgets.

Production of aluminium (300 different types) amounts to about 470 million metres, with 85 per cent dedicated to exports, and the possibility of further growth in the near future.

During the visit to Profilglass, *Glass-Technology International* was shown around the company production areas by Marketing Manager Susanna Omicioli, and Matteo Paci, who described the various production phases involved in the manufacture of its profiles.

## DEGREASING MACHINE – AN EXCLUSIVE OF PROFILGLASS

The company now has four continuous casting plants and an innovation for the company this year is its new machine for de-greasing of aluminium – an extra benefit for end users of its profiles. With the new de-greasing machine, Profilglass has almost eliminated the problem of complaints regarding dirt on IG units.

### *Susanna Omicioli*

The de-greasing machine – a complete innovation as far as the double-glazing market is concerned - removes grease from the coils of aluminium as they come into the workshop. This means that the aluminium is already relatively free of grease before it is processed. Moreover, the aluminium bars also undergo a

Cold-mill



second de-greasing process during production on the roll-forming machine. Therefore, the end-users receive material that does not leave hands dirty and that is perfect as far as adhesion with the sealing agent is concerned, an important characteristic for glassworks assembling IG units. And, therefore, this represents an enormous improvement for Profilglass' products and for the service it gives its clients.

### *Paci*

De-greasing is a very complex process that needs technology and investments and, moreover, the payback in terms of money is seen in

the quality of the finished product. With this additional de-greasing process, Profilglass supplies its clients with high quality products, which are clean (so that when the glass is installed in the frames they do not get too dirty because of excess grease) and that do not cause vapour and halo effects in the corners of the glass. All this is part of the quality process of Profilglass.

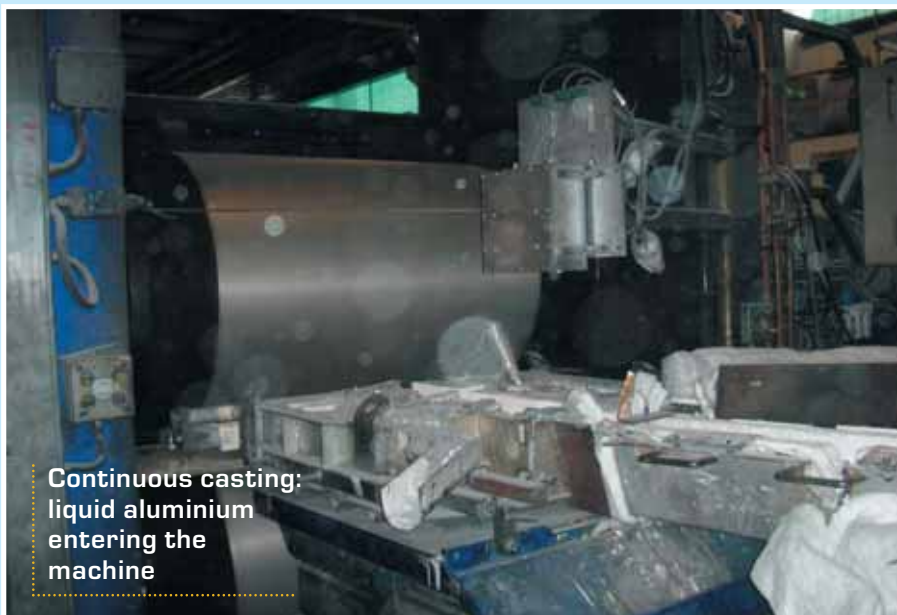
### *Omicioli*

The de-greasing procedure created an additional expense for Profilglass, as it involved a considerable investment. This does not mean that Profilglass profiles were not "clean" before. They were de-greased in-line on the roll-forming machine but this process was often not sufficient to make the end product perfect.

### *Paci*

In fact, it has created extra costs for the company but, if we want to have a high-quality product, there is no other solution. In the last few months, since the introduction of this machine, there have been no products coming back to the company and no complaints. This machine avoids a lot of problems and ensures that we work with the best quality aluminium possible.

Aluminium is never the same from one batch to another, and its quality can change from one day to the next. In order to compensate this situation, Profilglass has two different machines, as per the production type the aluminium is destined for. The stress-reliever is able to tension the aluminium band, and another to de-grease it electrolytically.



Continuous casting:  
liquid aluminium  
entering the  
machine

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## CONTINUOUS CASTING

*Paci*

Two continuous casting furnaces came on stream in 2001 and 2003, and at the moment, the company is in the process of starting up another two. There are another two machines being installed that will be ready to start up in the next few months.

The aluminium is present inside the furnaces and the furnaces are tilted, pouring liquid metal into the system. The liquid aluminium passes in channels and comes out solidifying between two rollers, which are cooled internally with water. This means that in the space of 60 millimetres, the aluminium goes from liquid form at 700°C to solid at 200°C in a total length of 30 metres. We go from raw or recycled material to having coils of aluminium.

The aluminium coils, weighing about 10,000 kilos, can start with a thickness of six millimetres and by means of various steps of laminating can reach 0.3 – 0.35 millimetres, which is the thickness that is more frequently used for spacers. The quantity of aluminium produced in the continuous casting is approximately 50,000 kilos, but will reach about 60,000 kilos next year.

Profilglass is part of a group of companies that use aluminium for various applications, such as, for example, ski sticks, wheelchairs and stairs, but all companies of the group work with aluminium produced in the continuous casting area.

As far as double-glazing spacers are concerned, Profilglass uses about 20,000 tons of aluminium a year, with demand continuously growing. This is also due to the fact that the dif-

Continuous casting: coil exit



ference in thermal insulation when plastic profiles are used is so small, that the global value of the unit is only very slightly different. And it has been seen that using gas in the space between the two sheets of glass, or using low-E glass or other improved glass types, obtains better and more immediate results.

## ROLLING MILL

Profilglass has its own rolling mill where the coils of aluminium that have already been formed with continuous casting are reduced to the thickness desired. The largest rolling mill is used mainly to reduce the thickness of the aluminium from four millimetres to smaller thicknesses and there are other high-speed machines – 700-800 metres per minute - that can reduce the thickness of the aluminium considerably.

*Paci*

Profilglass has a total capacity of finished product of 80,000 tons, 50,000 from the casting line, while the other 30,000 are rough-shaped pieces that we buy from other companies. In the 50,000 tons produced in the Profilglass continuous casting process, more than 50 per cent is recycled material, internal – coming from processing, and also from other companies. However, the raw material that Profilglass uses mostly comes from one of its main suppliers based in Egypt, but also from other companies.

The new furnaces and other machinery that Profilglass is installing, an investment in the range of EUR 10 million, have a particular planning situation. Only the machinery can be seen at floor level, while the rest of the equipment, such as electronics and hydraulics, is in the “basement”. This layout was chosen because it is much cleaner and not as noisy.

## THERMIC TREATMENT

The cutting lines used by Profilglass are both transversal and longitudinal. Once the coils are ready, there is a special “shuttle” that is operated by a push button, which transports the coils to the stocking area. This is valid also for the coils coming from the rolling mill.

This particular method of transporting the coils, is also used to “protect” them, as many kinds of aluminium are treated thermically

which makes them prone to breakage. This is because, during the rolling mill process, the mechanical characteristics of the aluminium are modified, making it more resistant, but, at the same time, also more difficult to process. In some cases, and for some product types, where high processability is requested, such as bent profiles to be used in automatic benders, the elongation of the aluminium is fundamental, or it would break. With thicknesses used for profiles, the aluminium is extremely resistant but, at the same time, being less processable, it also needs a particular thermic treatment to “soften” it and to increase its processable characteristics. Therefore, it is treated inside a furnace for about 11 hours, at a temperature of about 300 degrees, a process that is the exact opposite of tempering!

All Profilglass’ furnaces use methane gas, and are regenerative, which means that the fumes that leave the furnace are sent to an exchanger where the exit air is pre-heated and, therefore, on the one hand enables us to have a

better yield and an inferior consumption of methane. On the other hand, it also allows fumes going into the atmosphere to have an ideal temperature.

The furnaces also work with nitrogen, with the oxygen content reduced to a minimum – 0.3 per cent - so as to prevent the aluminium from burning.

In the rolling mill area of Profilglass, the company takes the coils of aluminium and reduces the thickness of the coils coming from the casting to the one desired for that particular production - from four millimetres to the required thickness. Normally, the small rolling mill is used to reduce the thickness even further – and is very fast – 700-800 metres per minute.

In conclusion, the aluminium goes through the following process phases:

- casting;
- rolling mill;
- thermic treatment (if necessary);
- degreasing;
- slitting; and
- roll-forming.

**Aluminium  
treating  
ovens**





Slitting line

millimetres (obviously much better with 15-millimetre profiles).

If aluminium spacers are substituted with plastic ones, there is, obviously, a difference in thermal conductivity, but this can be compensated by the use of gas in the IG unit, or by using special glass types, which improve the thermal conditions immediately and substantially.

This is why the demand for aluminium profiles never really decreases.

This means that the demand for aluminium is constant, as the improvements can be obtained using other methods.

In fact, the market trend seems to be moving towards the use of low-E and other coated glass types to obtain improvements in thermal conductivity.

Profilglass is a technologically-advanced company, continuously on the look-out for new and avant-garde solutions, in an ever more global market, a company that works to match quality and cost. ■

## PROFILES

The sizes of the profiles depend on market preferences but also on thermal insulation that, however, reach a constant level with a 15-millimetre profile. This means that if a profile bigger than 15 millimetres is used, there are no insulation improvements, and these sizes, in fact, are used only with IG units that have internal venetian blinds. On the other hand, there is a considerable difference in thermal insulation between 6-millimetre profiles and profiles of 15

Finished product:  
aluminium spacer  
bars and georgian  
bars for IG units



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