greenprofile window

Extrusion of plastic window and building construction profiles
Setting benchmarks

battenfeld-cincinnati stands not only for state-of-the-art machine manufacturing and innovative technologies, but also for more than five decades of experience in the production of extruders and extrusion equipment.

We plan, design and install profile extrusion lines with perfectly coordinated components that feature high output combined with excellent end product quality all along the line and consequently have made battenfeld-cincinnati a market leader in single- and twin-screw extruder technology.

In all of this, functionality, machine availability and cost-efficiency are absolute priorities. With our quality standards, we are real partners for our customers, offering them top-class service. Here, we make a special point of comprehensive counseling in process technology, which is one of our special strengths.
Plastic window and building construction profiles – sustainable and energy-efficient

Due to sharply rising energy costs and the necessity and obligation to reduce CO₂ emissions, existing older houses and residential buildings have to be modernized. In Germany, for example, about 75% of existing residential buildings are more than 30 years old. Moreover, there is still considerable pent-up demand for the equipment of new buildings with plastic windows in Eastern Europe and the CIS countries. Worldwide, about 500 million windows are sold annually. The main sales markets are Asia (50%), Europe (30%) and North America (20%). In the development of windows and doors made of plastics, extruded hollow profiles play a vital part. Their invention dates back to the 1960s. Starting from the German-speaking countries, they went on to conquer the UK, the Benelux countries and France, and in the last 20 years Eastern Europe and Russia as well. In Western Europe, the market share of plastic windows is over 40%. But PVC windows also dominate the market in North America and China. Plastic windows and doors are made exclusively from PVC-U. They offer an excellent price/performance ratio, are easy to install and have excellent heat and sound insulation properties. Compared to wood and aluminum windows, they are extremely durable, dimensionally stable and easy to clean. They are resistant to weathering and to chemicals. One decisive advantage of plastic windows is their great variety in color and design.

Plastic profile extrusion – perfectly chiseled

Perfect coordination of all components in profile extrusion is the basis for top-class product quality. In cooperation with our partners, we have a worldwide production, sales and service network at our disposal, which ensures fast and efficient response to our customers’ wishes. battenfeld-cincinnati possesses extrusion expertise from individual planning to process technology counseling in order to achieve optimal performance with the right components. You can rely on our cost-efficient solutions.
Window and door profiles in action

In addition to windows and doors made of plastics, extruded window sills, blinds, roller blind boxes, balcony panels, gutters and cable conduits also belong to the market segment of window and building construction profiles. Here, we want to focus especially on plastic windows and doors that meet the highest standards concerning heat transfer coefficients (U values). The high quality of the PVC materials used ensures that the expansion coefficient remains stable even with extreme temperature fluctuations, thus preventing tension damage. Window and door profiles are hollow profiles, normally with 3-6 cavities in different geometries. Window profiles on the market have the traditional 58-mm installation depth as well as the modern installation depths of 70 or 88 mm. While preference is given to side-hung and pivot-hung windows in Europe, sliding window systems are frequently used in Asia. Their superior mechanical attributes, absolute dimensional stability and light weight facilitate handling and installation of plastic windows. Old window and building construction profiles are recyclable, new windows can be made from old ones, which makes a substantial contribution to responsible and sustainable management of resources.
PVC processing

PVC is a highly versatile material with a long history. PVC profiles feature light weight, excellent strength and dimensional stability. Plastic profiles are extruded from PVC-U, which is normally available as a dry blend, i.e. a powder blend. PVC is sensitive to shearing stress and high temperatures and is therefore processed on closely intermeshing parallel or conical twin-screw extruders. Which processing unit is used depends largely on the output performance class and the specific application. The screw geometries are adapted to the plasticization degree of each specific PVC compound. With the development of extended processing units, battenfeld-cincinnati has set new benchmarks. The 34D processing units offer improved product quality, higher output and an enormous processing window. Extremely high output levels can be reached with intelligent screw concepts. The interaction of extruder and die has a decisive influence on the overall performance and quality of plastic profiles. Extrusion dies should be designed in such a way as to optimally utilize the extruder’s plasticizing performance.

Through co-extrusion, the specific attributes of different materials can be combined in one profile. A trend towards using reclaim from recycled old windows has manifested itself for several years. For recycling profiles, the profile core is produced from high-grade reclaim and encapsulated with virgin PVC on the visible surfaces.
Reclaim content of up to 70% is possible. Co-extrusion lines consisting of a main extruder and a co-extruder are used to produce recycling profiles, which, depending on the customer's requirements, may come in various different configurations, for example as piggy-back versions or in an angled position. The machine combinations are operated via a single, common control unit.

A particularly cost-efficient high-performance extrusion concept is twin-strand extrusion of PVC profiles. The essential benefit is the cost-efficiency of the extrusion line. The integrated caterpillar haul-offs and cutting saws can be set and controlled individually. Today, line speeds of up to twice 6m/min can be reached in twin-strand processes. Thanks to continuous improvement in die and calibration technology, a further increase in line speeds can be expected in the next few years.
**Downstream equipment**

battenfeld-cincinnati profile extrusion lines are rounded off by downstream equipment precisely matching the performance class of the extruder and die. From a modular range of different calibration tables, single- and double-belt or caterpillar haul-offs and various cutting devices, processors can select the optimal downstream equipment for their particular application.

**Automation**

Powerful control systems that are easy to understand and to operate, in combination with a step-by-step automation concept, ensure efficient operation in all areas of profile extrusion.

All profile extrusion lines are equipped with an intuitively operating control system. Ultimate user-friendliness enables easy handling of even the most complex machine systems. Thanks to individual configuration options, operators can adapt the control system to their individual needs.

To facilitate monitoring of all parameters of the extrusion line, a modular monitoring concept has been installed, consisting of energy monitoring, production monitoring and maintenance monitoring. Automatic calculation of specific key figures supports processors in optimizing and increasing the efficiency of their extrusion lines.

The integration of system extensions such as dosing units, co-extruders and intelligent sensors in the central control system presents no problems whatsoever. The network functionality integrated in the control system provides access to remote maintenance and a facility to integrate the line in corporate production planning systems.