

# HIGH TECH Profile EXTRUSION



THEYSOHN | TECHNOPLAST | TOPF

SYNCHRONIZE TO PERFECTION

A MEMBER OF  HTI GROUP



## Adding Value Through Experience

Thanks to Theysohn, High Tech Extrusion has decades of experience in the designing and manufacturing of profile tools. The company brings to bear all of its knowhow in the processing of PVC and WPC materials.

The especial strength of High Tech Extrusion is creating complete extrusion lines comprised of everything from extruders, profile tools and calibrating tables to haul-offs, saws, guillotines, delivery tables and packaging systems used in the production of window profiles, cable ducts, gutters, technical profiles and foam profiles that do or do not have a co-extruded layer.

The world's largest manufacturer of window profiles relies on High Tech Extrusion's profile extrusion lines.

High Tech Extrusion employed its in-depth command of experience-derived values and its highly-specialized knowhow in all areas of the process technologies used in manufacturing PVC profiles in the development of the OMNIA series of extrusion lines. These enable our customers to reliably increase their operating efficiency and thus productivity.





## Highly Productive: The OMNIA Profile Extrusion Lines

OMNIA profile extruders' key advantages: they yield higher rates of performance and they minimize energy costs. The reduction in the number of exposed cables and tubes lessens the potential sources of malfunctions, thus reducing the number of unplanned interruptions of operations

The 25% increase in output achieved by the extruder results in a corresponding rise in productivity. This is accompanied by a reduction in energy costs. It only takes a few steps to completely remove and employ the newly-developed vacuum canister. This can be during the operation of the OMNIA extruder. This saves time, upkeep services and money.

**Ahead-of-occurrence quality control**  
A pressure sensor forms the heart of the

electronic monitoring of the degassing. The system sounds an alarm in cases of values falling outside the floors and ceilings set for the vacuum. This, in turn, enables the avoidance of defective output.

A profibus links the calibrating tables, haul-off, saw or guillotine steering system to the control unit of the OMNIA extruder. An ahead-of-occurrence system of quality securing uses in-chart trends and alarm ceilings to compile and report all extrusion parameters. These enable the system to apprehend divergences before they result in quality deficiencies.

### **High-end electronics and remote-access maintenance**

Developed with Siemens (and thus guaranteeing worldwide support) were both the robust 19-inch touch panel and the most important electronic components. Created especially for industrial applications, the panel is used to control the operations of the entire OMNIA profile extrusion line. The control unit is easy to swing into the desired position when changing tools. Linking the electronic components to the control system is a profibus. This enables the automatic - meaning there is no need for external access - loading from the system of the requisite parameters upon replacement of the components.

The use of profibus-compatible components enables the Intranet or Internet-

based diagnosis of all problems. This is undertaken by High-Tech-Extrusion's service technicians, who first log in and then locate and take care of errors.

This system also permits the running and controlling of two or more starve feeders on both stand-alone or synchronized bases. This permits the separate feeding by individual components. This imparts the highest degree of flexibility to materials feeding operations. The screw length of the OMNIA profile extruder has been especially extended to a ratio of 28 D, so as to permit its processing of window, foam, formulas and recycling materials.

The new geometry of screw array featured by the OMNIA extruder yields an optimization of the length/thickness ratio. This, in turn, enables a low disturbance melt and homogenization of the molten matter. Specially-developed vacuum bolts facilitate a substantially improved degassing of the matter. The use of a ceramic coating causing the proactive core tempering of the screw shafts found in the area in the washers leads to the shafts' being manufactured to have long service lives.

# einorstux oder extrusion

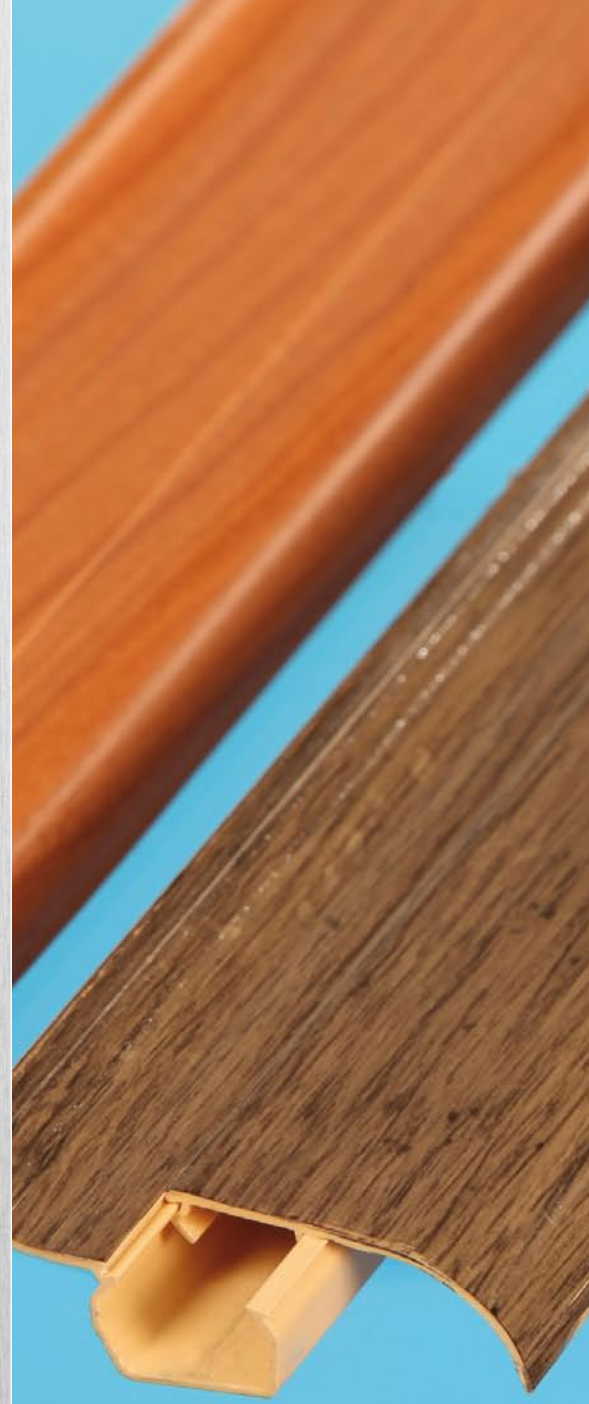
## Perfect synchronized components

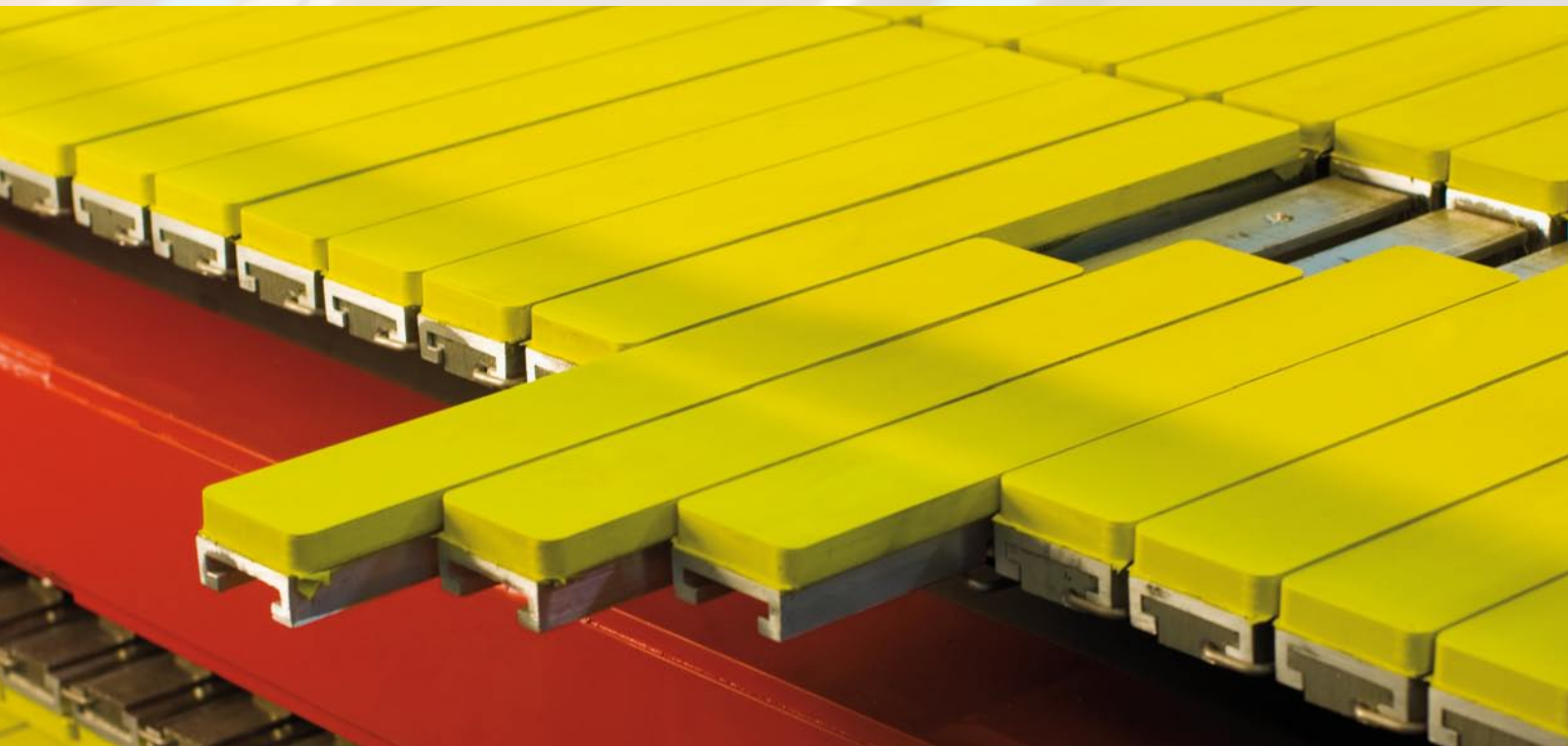
A profibus links the haul-off speed and saw cutting system to the control unit of the OMNIA extruder. An ahead-of-occurrence system of quality securing uses in-chart trends and alarm ceilings to compile and report all extrusion parameters. These enable the system to apprehend divergences before they result in quality deficiencies.

The innovative torpedo holder version of the newly-developed stream-liner pipe head guarantees the lowest possible loss of mass. The lack of longitudinal waves evinced in the pipes permits reductions in the amount of materials used in production operations and of excessive weights.

The length of the die sets can be adjusted using front rings to meet the needs of various formulas and outputs. The handling has been greatly improved by the optimally designed and highly ergonomic pipe head support system. The arraying of two pipe heads on a V block distribution system enables double extrusion.

Patented by High Tech Extrusion, a feed block system used to produce three-layer pipes featuring foam or recycling cores yields savings on materials of 30%–40%. This results in large-sized reductions of production operation costs.





## Highly Reliable Profile Extrusion Facilities

The OMNIA profile extruder features a low level of complexity leading to a high rate of reliability.

The proven torque master gearbox incorporated into the OMNIA extruder's transfer case requires only four shafts (instead of seven) to operate. This reduction in complexity is accompanied by a higher percentage of performance. This, in turn, enhances operating reliability.

The use of a central gear wheel to link the drive shafts to the screws moderates the latter's radial movement. This, in turn, minimizes any alterations of the screws' flank clearance, thus enhancing the processing unit's service life.

### **The gears – offering long service lives and high reliability**

The gearbox is equipped with a combined splash and forced-feed circulating lubrication system. This gearbox-lubrication aggregate is integrated into the gearbox. Two lubricants are fed into two separate oil circulation systems. One of these has the greater viscosity required by slowly-operating transfer cases in order to avoid pitting. The other lubricant has the low viscosity needed in the quickly-operating reduction gear to minimize splashing

and thus loss of energy. Helical gearing specially placed on the distribution gear reduces wear on the tandem bearing and increases the service life of the bearing by 1.4 to 1.8 times.

### **Simple design means simplicity of use and reliability**

That is why OMNIA extrusion lines feature an ingenious cabling concept. It groups the cables conveying electricity and linking sensors in a single strand. This enables the avoidance of cable breakage caused by ones being thoughtlessly thrown on the floor. This new arrangement increases the cables' lives of service.

Deploying its expertise in offering a complete range of products, High Tech Extrusion has developed an innovative quick change system for profile tools. Using it, the operator needs only to undertake a few steps to quickly and easily change the tool. Exposed cables are avoided. This is connected to the tool. The simple assembly of the tools reduces expenditures for scheduled maintenance and cleaning.

### **Quality: produced layer by layer**

Manufactured from high-strength nitrided steel, our screws are designed in a corporate facility. The screws are coated with molybdenum using a plasma spray process yielding the best possible coating of the substance. This provides the screws with especially good gliding and galling-minimizing characteristics. The barrels are made from one piece – meaning that they are not comprised of stages and transitions. This method is

the only way of guaranteeing the attaining of the narrowest possible tolerances. Barrels are subjected to long-term and in-depth nitriding (two-stage gas nitriding) providing them with a high degree of abrasion resistance.

To handle extremely abrasive materials, the screws and barrels can be manufactured with special coatings.

The elliptical shape of the output zone – patented by Theysohn – guarantees more efficient transmissions of cooling and heat. The evenness of temperature of the molten mass being treated gives rise to the capability of producing pipes of narrower tolerances and less excessive weight.

### **Clean cooling water yields high quality surfaces and enhances gloss effects**

The OMNIA extrusion lines and their downstream equipment employ a closed water circulation system. This solution intelligently increases the reliability of production operations and of product quality.

This system yields a number of key advantages. The hermetic water closed system minimizes the amount of dust in the cooling water running through the calibrating table. The system prevents the incidence of algae and the warming of the water. Dust and algae in cooling water can impair the quality of the profile surface. Clean cooling water enhances gloss effects of the end-product.



## Highly Efficient Profile Extrusion Facilities

OMNIA's new gearbox is space-saving. Its 98% rate of operating efficiency sets a new standard. The resulting saving of energy – amounting to more than 50% - joins with the calibrating table in enabling the achieving of the highest degree of operating efficiency.

The gearbox of the OMNIA extruder is mounted vertically, enabling the placement of the motor underneath it. This permits the profile extrusion line to be situated in an especially space-saving way in the profile manufacturing facility. This especially lean method of assembly allows, to provide an example, two OMNIA XTP 87 extruders engaged in the manufacturing of two window profiles to be placed nearly parallel to each other, with a center distance of only 500 mm. Another option is the mounting of the electronic control box on the left or the right of the frame. This provides customers with great flexibility of set ups.

### **Perfected: the Theysohn torque master gearbox**

The proven torque master gearbox has

been further developed and optimized. Thanks to a patented innovation, the new unit achieves a 98% rate of utilization. This results in significant savings of energy as compared to the current and horizontally-arrayed Theysohn torque master gearbox. The high factors of application shown by the torque master gearbox and the patented helical gearing of both screw drive shafts guarantee the gear components of having extremely long service lives. The screws' evenness of torsion minimizes their abrasion.

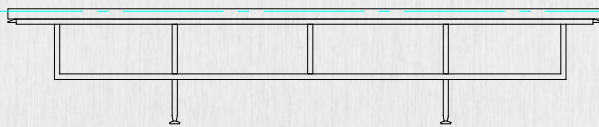
### **Energy efficiency**

Energy reduction is achieved by

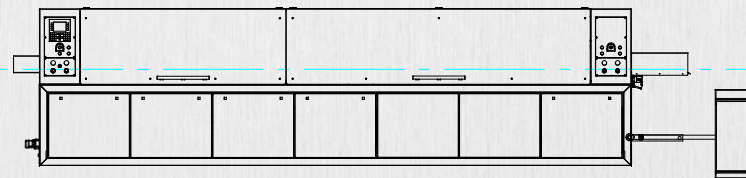
- the newly-developed gearbox, which has a 98% rate of utilization
- axial flow fans used in cooling barrels (positive side effect: reduction of noise)
- insulating heating bands incorporated into the barrels' heating systems
- no longer any need to cool water thanks to the placement of a newly-developed, thermally-insulated cooling flange on the barrel
- exclusively employed in OMNIA extruders are AC drives, dispensing with the need for maintenance-intensive carbon brushes and the incurrance of blind current. This results in a reduction of energy consumption.
- an innovative vacuum concept supplying the calibrating table with the precise amount of vacuum needed at the moment. Water pumps ensure the provision of water currently needed. The frequency-regulated vacuum pumps join with the controlled water pumps in giving rise to savings of more than 50% in energy and costs.

# Profile Extrusion Process

Tilting table



Haul-off and Protective film unwinder and Saw/Guillotine



## Die HIGH TECH EXTRUSION's complete solutions comprise the following components

### Conical and parallel extruders with output ranges of 10 – 1400 kg/h

- optimized extruders featuring the lowest consumption of energy
- gearboxes with extremely long service lives and not needing repairs
- the most advanced 28D-long screw arrays used for compact, foam and recycling materials
- optimal melting quality featuring the lowest rates of screw and barrel abrasion
- ellipse-shaped barrel contours used in tempering the molten matter without fluctuation of mass temperature caused by a lack of heating/cooling cycles
- a single strand of cables between extruder and tool possible

### PVC profile tools for optimized mileage

- tools for window profiles, foam profiles, cable ducts, gutters, downpipes, sheets as well as windowsills and partitions made from PVC
- tools for decking, siding and fencing systems made from WPC

- designed to achieve the highest production speed: window sections of up to 5.5 m/min; foam profile of up to 3 m/min; cable ducts, gutters and downpipes of up to 10 m/min
- sheets of up to 1000 mm profile width
- use of high-quality steel forms the basis of the long service lives and high reliability of the dies and calibrators
- optimized cooling of the profile through the turbulence of the water in the water-based calibrators in the patented turbulence tank
- simple and easy-to-understand structure enables quick and uncomplicated upkeep of tools and guarantees long service lives
- no need for exposed tubes thanks to the direct link-up between calibrating table and tool.

### Calibrating tables sized from 3.5 to 20 m

- single and double extrusion
- thanks to modular sizes, most efficient cooling zones requiring least investment

- highest quality of profile and narrowest tolerances of production through optimal intermeshing of calibration length and extruder output rates
- controlling vacuum pumps save energy
- optimized and further developed water circulation systems saving energy and minimizing malfunctions
- controlling and centralized recording of data can be undertaken via extruder
- optional PCE units for the molding of sealants

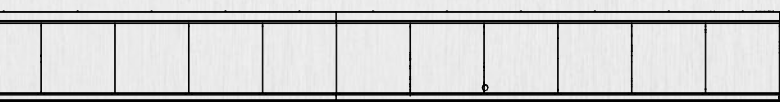
### Profile pull-off for the range of 1.2 to 3 kN and of line speeds of up to 10 m/min

- synchronization with the extrusion control
- long contact surfaces for optimal transmission of force
- synchronous motors for separate driving of the upper and lower caterpillars and for the avoidance of fluctuations of pull-off speeds and excess weights

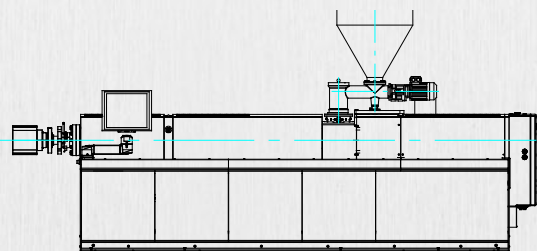


**HIGH TECH  
EXTRUSION**

Calibrating table



Profile tool



Extruder

## Complete Solutions for:

### Protective film unwinder

- unwinding units integrated into the haul-off device and handling the affixing of protective films on to the top layers

### Saws/guillotines

- saws and guillotines whose speed has been synchronized with that of the extrusion and for the severing of profile into the desired lengths

### Tilting table

- Deliverable in a variety of forms for the depositing and packaging of the profile

PVC window profile

PVC windows double-strand extrusion

PVC windowsills

PVC door profile

PVC wall cladding profile

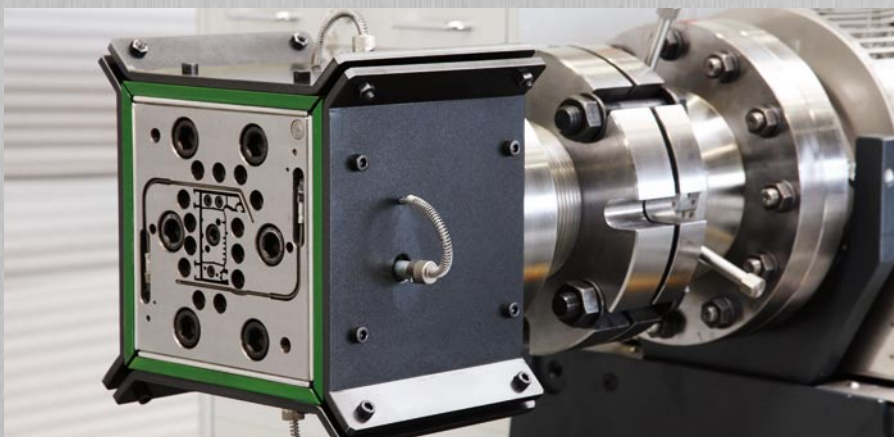
PVC gutters and downpipes

PVC cable ducts

PVC baseboard  
and technical profile

PVC foam profile

All of the above-mentioned profile manufacturing lines can also be offered for coextrusion



## HIGH TECH EXTRUSION

The High Tech Extrusion Group is a pioneer in the extrusion industry. It is the only company in the world which supplies turn-key extrusion lines developed and manufactured on its own, i.e. the OMNIA series produced at its headquarters in Korneuburg, Austria.

### **Not only connoisseurs, but masters**

Many companies claim they can build perfect components for extrusion lines, but what about the perfect interaction of these components operating as a whole? High Tech Extrusion understands the entire extrusion process and technology, and aligns the individual components to precisely harmonize with each other.

High Tech Extrusion relies upon the longstanding experience gained by the companies Theysohn in Korneuburg near Vienna, Topf and Technoplast Kunststofftechnik as well as Austrotool in Micheldorf, located in Upper Austria, along with Extruder-Komponenten

Salzgitter in Germany. Each of these firms has contributed its special know-how to this new technology group. Together these enterprises can develop and produce components which are optimally synchronized with each other to form complete profile extrusion and profile extrusion lines.

The sales office in Pune, India is responsible for serving the Asian and East African markets, whereas the subsidiary in Moscow, Russia coordinates the group's business activities in Russia, Belarus, Ukraine and neighboring countries. High Tech Extrusion belongs to the High Tech Industries (HTI) Group.

On the basis of its various competence centers, High Tech Extrusion has the expertise required to support customers in designing and building complete production lines or take full responsibility on the customer's behalf. High Tech Extrusion provides you with comprehensive support and can also deliver turn-key facilities, whether your needs involve window profiles, technical profiles such as cable ducts, gutters, drainpipes, profile extrusion lines, sidings, wood plastic composites from the mixing plant, extruders, tools, calibration tables, haul-offs, saws and guillotines, pipe turner or tilting tables.



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## HIGH TECH EXTRUSION

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