

# HIGH TECH Pipe EXTRUSION



THEYSOHN | TECHNOPLAST | TOPF

SYNCHRONIZE TO PERFECTION

A MEMBER OF  HTI GROUP



## Adding Value Through Experience

Thanks to Theysohn, High Tech Extrusion has years of experience in the designing and manufacturing of complete pipe extrusion lines. It brings all of its expertise to bear in the production of PVC.

A specialty of High Tech Extrusion is complete lines. These are comprised of extruders, pipe tools, vacuum tanks, spray tanks, haul-offs, cutting saws, belling facilities and packing systems. Another specialty is the production of three-layer PVC composite pipe used in the transporting of sewage.

Also supplied by the company are complete systems used in the manufacturing of

- compact pipes for sewage
- pressure, electrical insulation, irrigation and C-PVC-hot water pipes and
- drainage systems.

This capacity has led the world's largest producers of pipes to rely over the last few decades upon High Tech Extrusion's pipe 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 pipes to develop the OMNIA series of extrusion lines. These enable our customers to reliably increase their operating efficiency and thus productivity.



## Highly Productive: The Omnia Pipe Extrusion Line

OMNIA pipe extruders' key advantages: they yield higher rates of performance and they minimize energy costs.

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 takes only a few steps to completely remove and empty the newly-developed vacuum canister – even while the extruder is operating. This results in time savings, in the simplification of upkeep services and thus in the reduction of costs.

### Electronically-monitored system of defective output avoidance

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.

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

Developed with Siemens were both the robust 19-inch touch panel and the most important electronic components. Created especially for industrial applications, the 19 inch touch panel is used to control the operations of the entire OMNIA pipe 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 pipe extruders has been especially extended to a ratio of 32D, so as to permit its processing of compact, foam and recycling materials.

# einorstux or extrusion

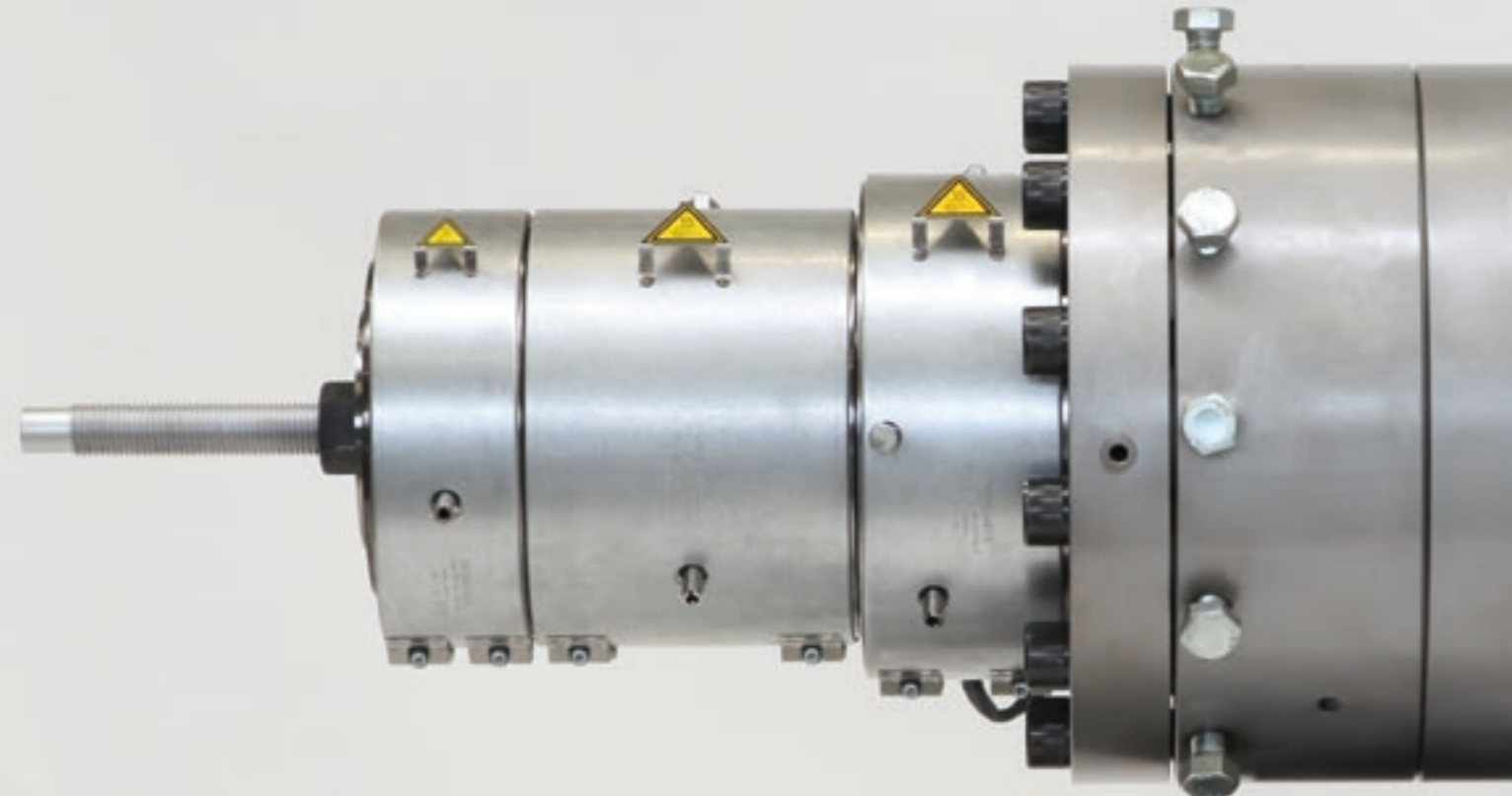
## Perfect synchronized components

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 streamliner pipe head 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 Pipe Extrusion Facilities

The OMNIA pipe 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.

### Excluding rubbing-caused disturbances

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 precluding any rubbing-caused disturbance of operation.

### 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 undercarriage to minimize splashing and thus loss of energy. Helical gearing placed on the drive step increases the service lives of the bearing by 1.4 to 1.8 times. This increase is accompanied by one of the intervals between maintenance operations on the gearbox's components.

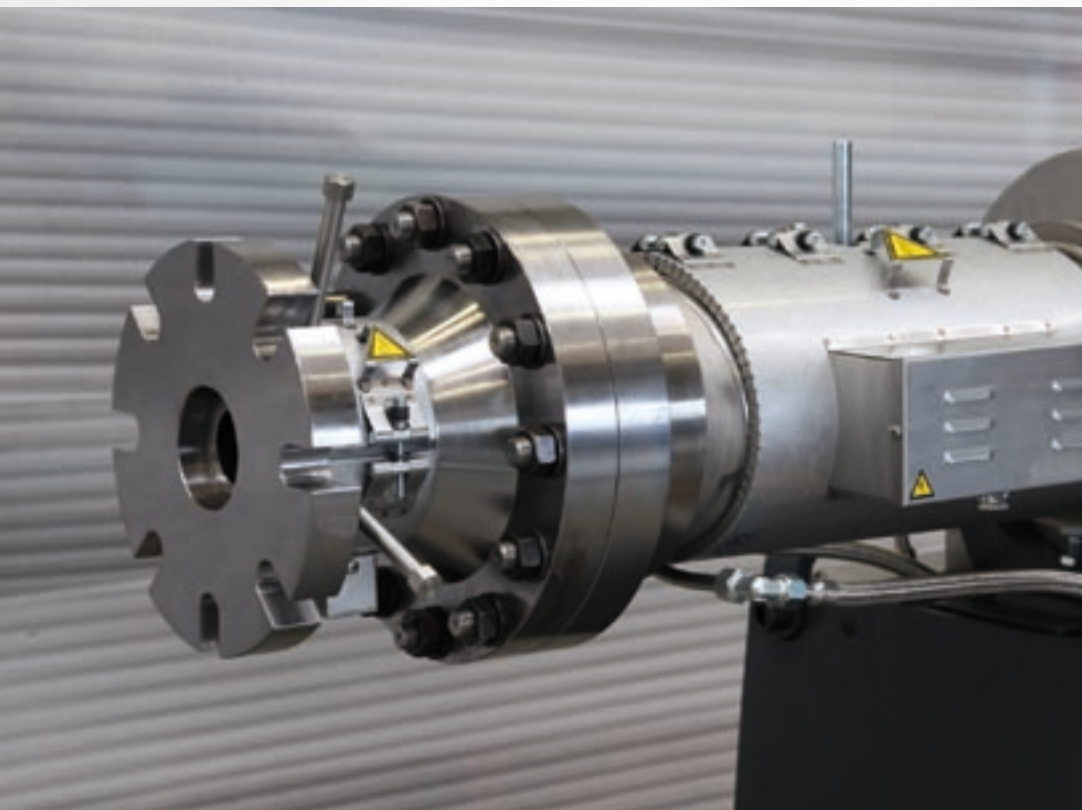
### Quality: produced layer by layer

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, and that they are capable 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.

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.

The air conditioning of the electronic control board of the OMNIA extruder uses a heat exchanger, thus enabling the control board to be kept dust-free and precluding dust-caused malfunctions.



## Highly Efficient Pipe Extrusion Facilities

OMNIA's new gearbox is space-saving. Its 98% rate of operating efficiency is setting a new standard

The gearbox of the OMNIA extruder is mounted vertically, enabling the placement of the motor underneath it. This permits the pipe extrusion line to be situated in an especially space-saving way in the pipe manufacturing facility. This especially lean method of assembly allows, to provide an example, two OMNIA XTR 87 extruders engaged in the manufacturing of three layer pipes 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.

### Further development of successful products

High-Tech Extrusion's proven torque master gearbox has been further developed and optimized. The new and pivoted assembly of the gearbox enables the saving of space and energy. The integration of the oil pump has resulted

in reduction of noise. 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

- 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.
- Reduced energy consumption in the undercarriage of the gearbox



# Pipe Extrusion Process



## Deposit Table and Pipe Turner

**Belling Machine**  
for cement rubber rings  
and Rieber system

**Planetary Saws**  
for severing in-phase  
of pipes

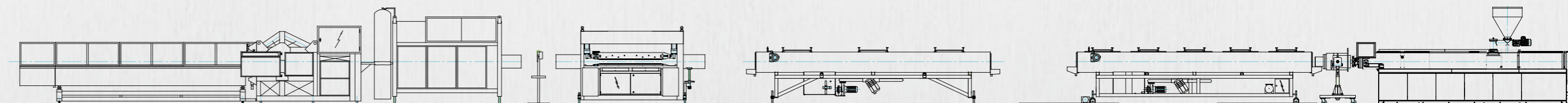
**Multiple Caterpillar  
Haul-Offs**

**Spraying Tanks**

**Calibrating Tanks**  
with single or double  
vacuum chambers

**Pipe Heads**

**Extruder**



## HIGH TECH EXTRUSION's complete solutions are comprised of the following components:

### Conical and parallel extruders with output ranges of 10 – 1500 kg/h

- optimized extruders featuring the lowest consumption of energy
- gearboxes with extremely long service lives and not needing repairs
- the most advanced 32D-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

### PVC pipe heads for speeds of up to 20 m/min

- torpedo holder version of the newly-developed stream-liner technology guarantees the lowest possible loss of mass
- lowest possible longitudinal waves of the pipes enable savings of materials used in production operations

- modular die sets applied to achieve a single pipe dimension using a variety of sizes of casing heads
- adjusting of the die sets' length to take into account various formulas and outputs through front rings
- ergonomic pipe head supports producing improved handling.
- double extrusion through use of 2 pipe heads placed on a V block distribution system
- Nirosta vacuum calibrating systems with front cooling yielding high speeds of up to 20 m/min

### Feed block for the manufacturing of 3-layer pipes with foam or with recycling cores

- patented feed block system for the manufacturing of 3-layer pipes with foam or with recycling cores
- 30% - 40% reduction of material employed yields a great potential for saving
- utmost flexibility of production: pipe dimensions of 32 - 710 mm through use of pipe heads
- long service lives thanks to less need to clean

### C-PVC hot water piping systems

- specially-modified screw arrays and pipe heads enable greatest possible output and optimal quality of both single and double extrusion
- for all C-PVC formulas on the market
- used in manufacturing pipes for hot water, sprinklers and chemical pipes and from 12 – 450 mm acc. to the ASTM and DIN norms

### Cooling tank systems of 63 mm to 800mm and 6 to 10 m

- vacuum, double vacuum and spray tanks available in gradations of 63, 110, 160, 250,315, 400, 500 630 and 800 mm
- bath sizes 6, 8 and 10 m in length
- modular sizes yield most efficient cooling zones and lowest amount of requisite investment
- highest quality of pipes featuring narrowest tolerances of production through optimal intermeshing of cooling tanks and rate of extruder output

### Flue

- optimal relaying of the extrusion pressure without distortion of pipes, achieved through use of multiple caterpillar haul-offs (2 – 8 caterpillars)
- thanks to this, lowest fluctuations of extrusion speed and thus avoiding of excessive weights
- easier handling through centralized setting of diameters
- essential easing of commencing of large-sized pipe dimensions through optional starting cable winches
- thanks to use of belt haul-offs, no tunnel marks on the surface of thin-walled pipes of small dimensions and high extrusion speed of up to 25 m/min

### Cutting and planetary saws

- cutting and planetary saws with automatic chamfer facilities
- shortest changing times through central tightening system
- standard equipment: automatic suction of sawdust

- extended saw benches used for the highest cutting cycles and production speeds

### Belling systems

- Belling facilities for solvent cement sockets, rubber rings or Rieber systems
- 1, 2 or 4 stationary automatic devices according to number of bells/hour required
- optimal packaging using pipe turner

## Complete Solutions for:

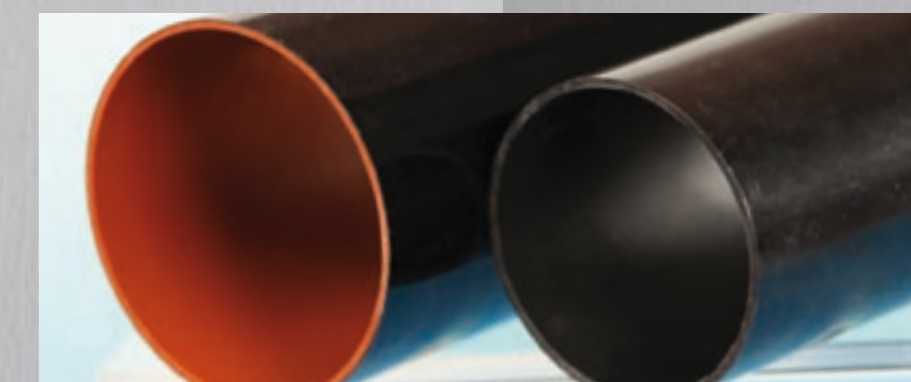
**PVC compact pipes**  
16 – 710 mm

**PVC three layer foam core pipes**  
32 – 710 mm

**PVC cable protection pipes:**  
10 – 400 mm

**C-PVC hot water pipes:**  
10 – 400 mm

**Co-extruded pipes made from recycling materials with covering layer**



## 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 pipe 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, pipe extrusion lines, sidings, wood plastic composites from the mixing plant, extruders, tools, calibration tables, exhaust hoods, saws and guillotines, pipe sleeve plants or tilting tables.

## HIGH TECH EXTRUSION

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