

Uponor

Complete Extrusion Lines for Plastic Pipes

VALUE THROUGH KNOW-HOW



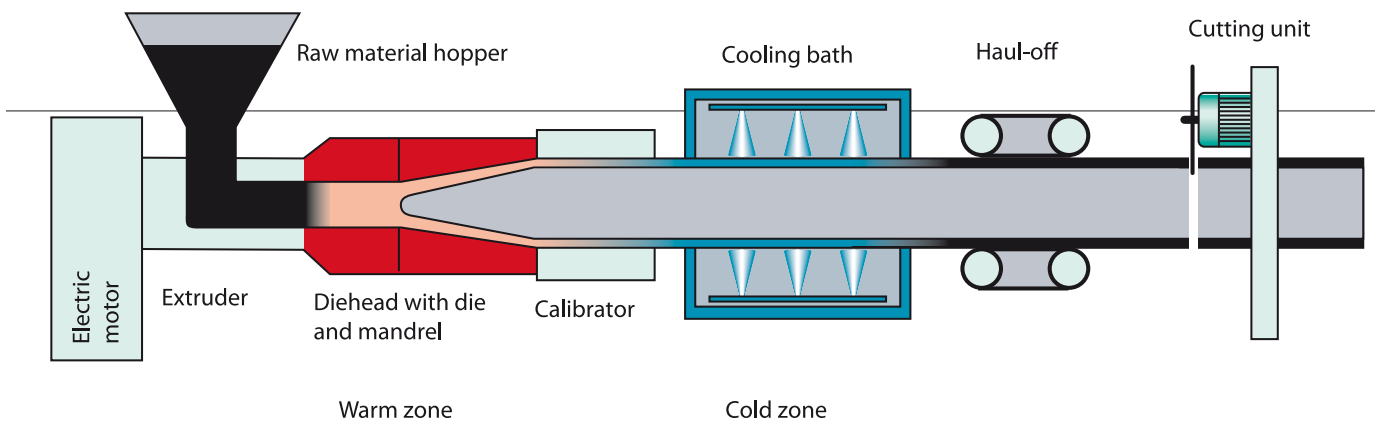
Delivering Know-How: Extrusion Lines by Pipe Manufacturer

THE 50 YEARS OF EXPERIENCE IN DESIGN AND MANUFACTURING OF PLASTIC PIPE EXTRUSION LINES ENSURES SUCCESSFUL SOLUTIONS FOR EVERY CUSTOMER.

BEING ALSO A PIPE MANUFACTURER, WE CONSTANTLY STRIVE FOR NEW INNOVATIONS IN TERMS OF QUALITY AND PRODUCTIVITY.

Uponor Infra provides complete extrusion lines for PE-HD pipe manufacturing in dimensions ranging from 16 up to 1600 mm. In addition, we also supply PERT, PP-r and PEX-pipe manufacturing equipment.

As we pass on this know-how to the customers. Who is not only getting the best technology, but a business-ready, complete production concept. Our heavy duty extrusion lines enable the production of several different products like tap water, gas, PE casing pipes, heating pipes, meaning the capacity can be adopted to where needed at the time.





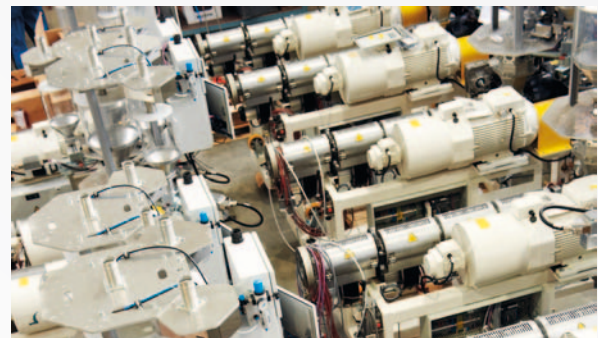
Efficient Raw Material Handling

Raw material handling system is designed to transfer raw materials to the feed hopper of the extruder and to keep the manufacturing process continuous. The system comprises the following components:

- Vacuum conveyor, which transfers raw material granulate from the storage bunker to the feed hopper of an extruder, or alternatively to an optional dryer.
- An optional raw material dryer completed with a vacuum conveyor, which transfers raw material granulate from the dryer to the feed hopper of the extruder. Tubes for transporting of raw material are of stainless steel. Air ducts of the raw material transfer system are of aluminum alloy.

Raw Material Handling System

TYPE	Type 1	Type 2	Type 3	Type 4
Capacity kg / h	500	1000	1500	2000



Real-Time Monitoring, Real-Time Value

Gravimetric control system (GCS) monitors the raw material consumption in real-time mode and compares it to the haul-off speed. If any deviation of actual metric weight from its calculated value occurs, GCS corrects the speed of the extruder or the speed of the haul-off unit. According to the Customer's demand and requirements, the GCS instrumentation and software are delivered either for single-flow or multi-flow monitoring. A basic GCS is comprised of following components:

- feed hopper
- weighing hopper
- metering valve and frame
- PLC with single user interface
- line speed measurement with closed loop control
- screw rotary speed measurement
- measurement of screw output per one revolution (gr/r)
- interfaces for upper level control and printer (optional)

Single Screw Extruders

The pipe extruder is designed for the manufacturing of polyolefin pipes. The product range comprises extruders with screw diameters from 18 to 150 mm.

- Barrier screw: Nitratated steel, HV 950 – 1000
- Grooved feed bush: used with a barrier screw enables high plastification rates and low melt temperatures
- Extruder barrel: Nitratated steel, HV 950 - 1000
- Temperature control zones, heating/cooling
- Heating zones of extrusion die flange.

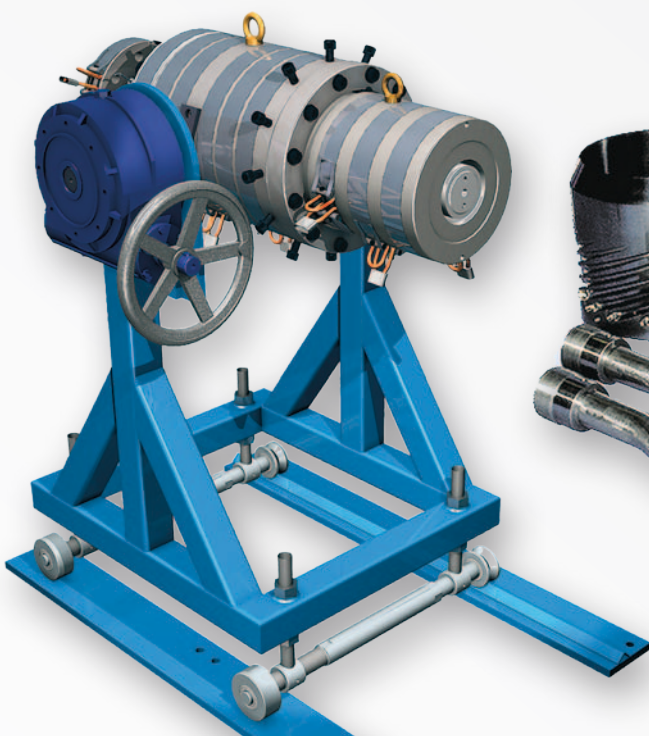


Diversified Extrusion Tools

The Uponor Infra extrusion dies enable pipe extrusion of polyolefin materials, such as PE (HDPE, MDPE) and PP. The die-heads are of spiral distribution type. Dimensioning of the flow channels is based on the rheological characteristics of the most frequently used types of plastics. Optionally the die head can be equipped with Internal Cooling System for shorten cooling length or increasing output.

The Advantages:

- low head volume enables short dwell times and low thermal stress impressed upon the melt
- low pressure build-up even at high material throughput at low stock temperature
- precise distribution of the melt which minimizes the wall thickness deviations
- short self-cleaning time when changing the colour of raw material
- high mechanical characteristics of the pipe.



Save Energy, Produce More: High Performance 37 L/D Extruder

High output 37 L/D extruder series for the demands of energy saving and constant distribution.

Standard water-cooled AC -motor:

- Excellent coefficient of efficiency (92,9 %).
- Low noise level <75 dB(A), without heat losses to the production hall.

Energy saving water-cooled drive:

- The intelligent frequency converter adjusts magnetization according to the load, which means improved efficiency.

Advanced barrel cooling:

- Cooling fins and ceramic heaters ensures accurate melt temperature. Internal cooling of the screw is optionally available.

Constant output:

- Spiral grooved feed section creates circumstances for formation of even constant and homogenous high output of the melt flow.

Closed loop cooling system:

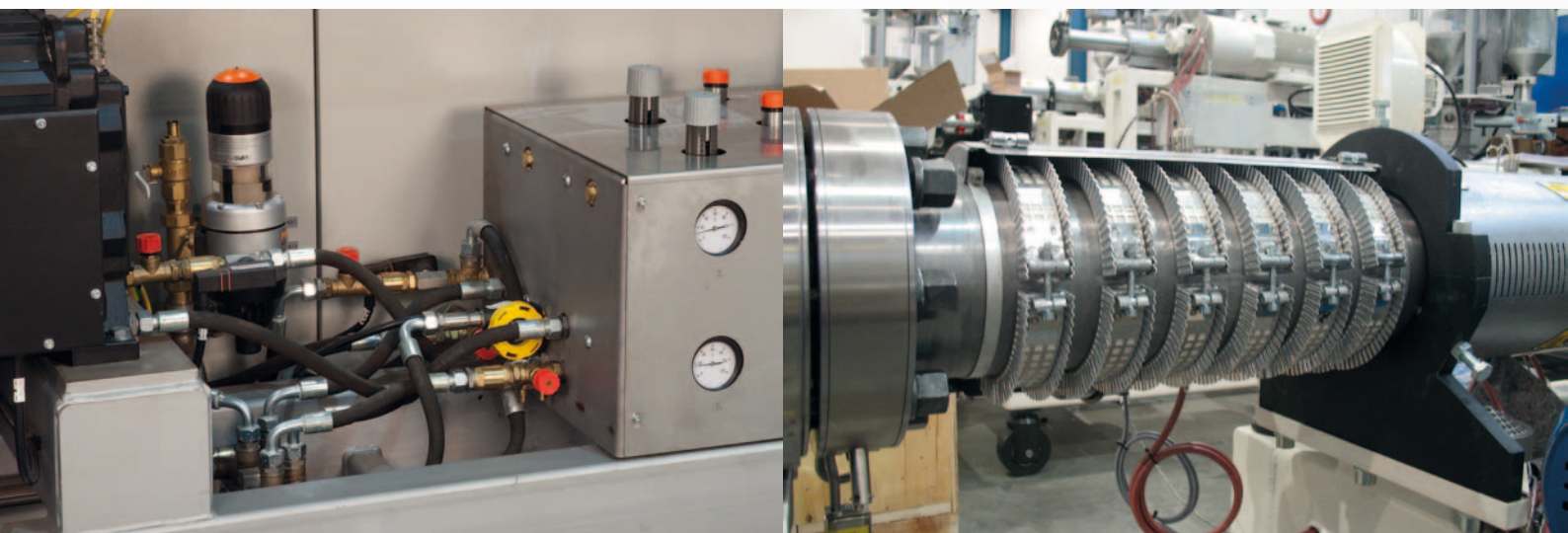
- Extruders provided with closed cooling system have water-cooled motor, drive, control cabin, gear and barrel. Internal screw cooling as option.
- The system is silent with no heat losses to the environment.
- It is easy to connect to the factory's cooling system or process water. Due to glycol composition the closed system remains clean and rustless.

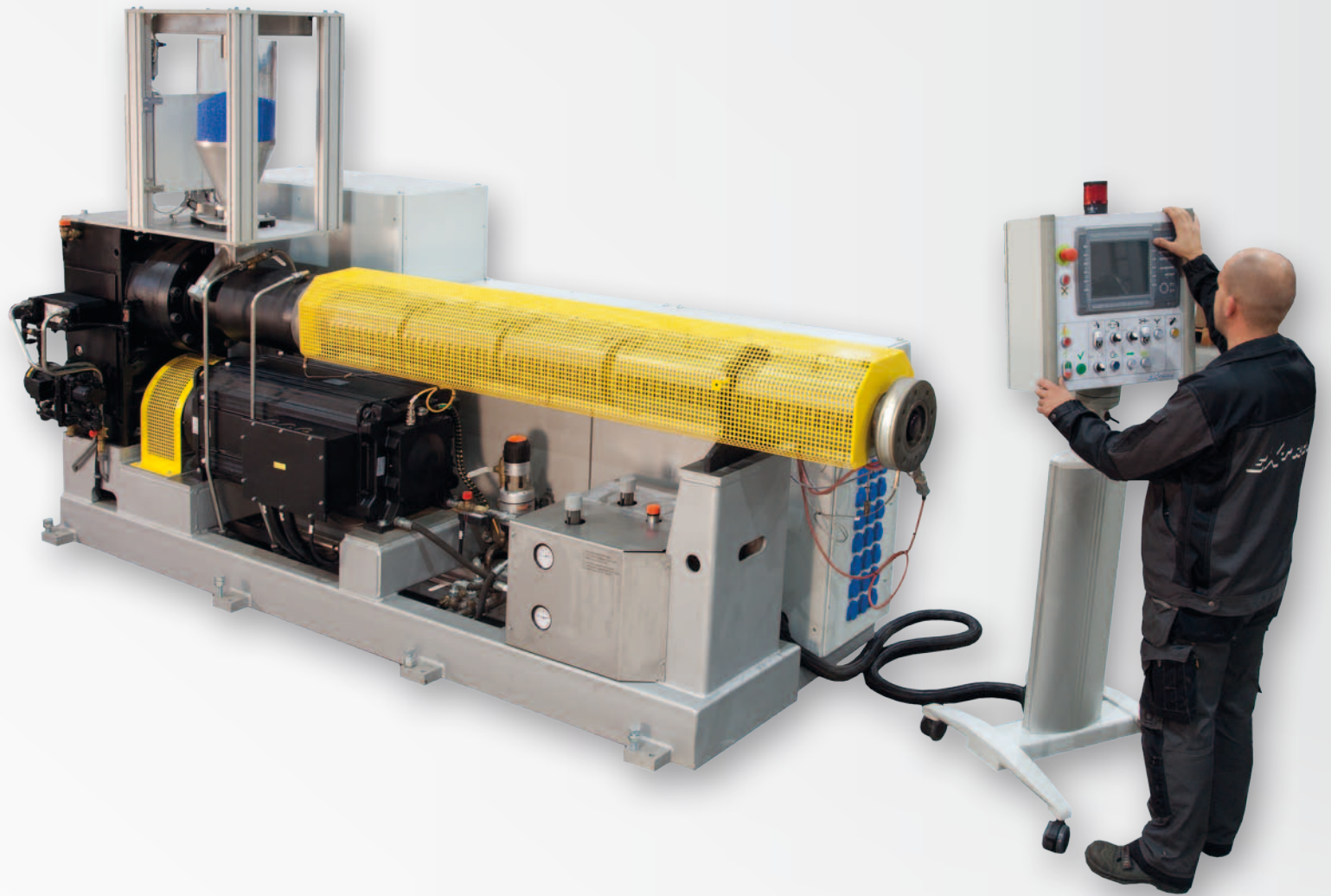
Movable operator control panel and Internet remote connection:

- Mobile control panel can be moved either side of the extruder or even near to pipe head.
- Multilingual selected by push button.
- The PLC includes Ethernet for the remote connection by VPN router or internet connection with customer's accessible I.P. Address.

Mixer (Option):

- The mixer ensures huge increase of output and homogenous melt with even distribution for different kind of master batches. The hemispherical cavities of the mixer force the raw material travelling along the barrel continuously changing direction, causing shearing and cutting action to the melt.





Advanced Calibration Tools

Calibration gives the pipe its final shape and size.

Uponor Infra provides complete range of calibration sleeves for vacuum and pressure calibration. Our long experience in pipe manufacturing allows precise designing of the sleeves that optimizes production. High quality calibration tools ensure round pipes with excellent surface and lower overweight of the pipe products.

Pipe Calibration Tanks

The calibration tank can be either of single or double chamber construction. The bottom part of the unit is used as a water reservoir, which ensures precise temperature control in the calibration tank. The temperature of the calibration tank is kept on the desired level by a thermostat. The calibration tank is installed on the rail tracks, anchored to the workshop's floor. The longitudinal movement of the calibration tank is motorised.

Haul-off unit

The haul-off unit grips the pipe over a long length and pulls it at a constant speed. The haul-off consists of a number of pulling belts around the pipe. The pulling belts, which are located under the extrusion axis, are mechanically adjustable and upper ones are driven pneumatically.

Pipe cutting equipment

Pipes with a diameter over Ø 160 mm are usually cut to the standard length.

Circular saws

Circular saws for cutting pipes of outer diameter up to Ø 250 mm.

Planetary saws

The planetary saw is delivered as a single cut unit. By request any planetary saw can be equipped with two-step cutting heads. The initial cut is executed by disk saws and the final operation by cutting blades. In that way ingress of sawdust inside the pipe is prevented.

Vacuum Calibration Tanks

TYPE	VCA 63-6	VCA 110-6	VCA 250-6	VCA 400-6	VCA 630-6	VCA 800-6	VCA 1200-6
Pipe diameter Ø, mm	10 - 63	20 - 110	50 - 250	63 - 400	110 - 630	250 - 800	630 - 1200

Spray Cooling Baths

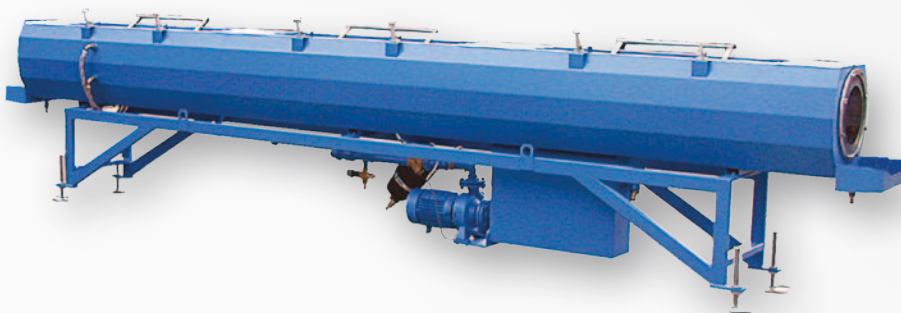
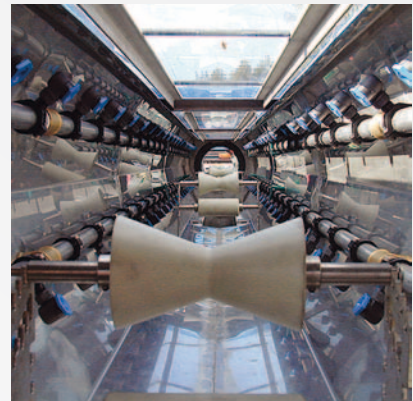
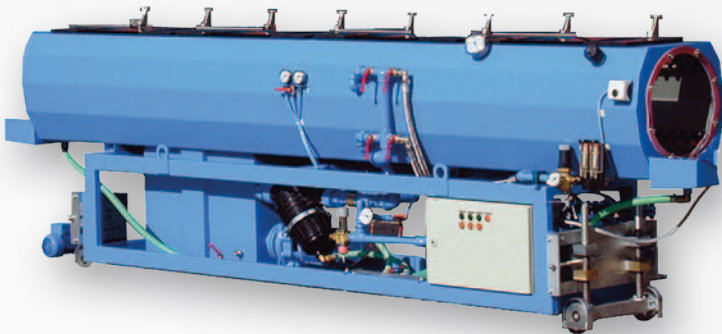
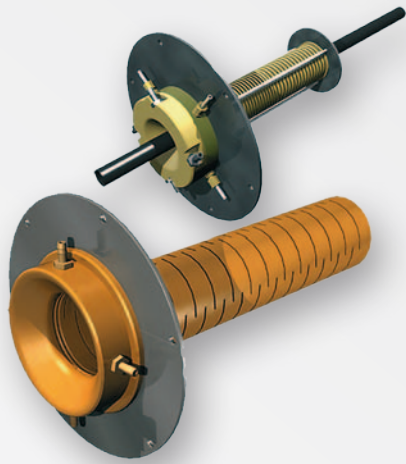
TYPE	SB 63-10(6)	SB 110-10(6)	SB 250-10(6)	SB 400-10(6)	SB 630-10(6)	SB 800-10(6)	SB 1200-10(6)	SB-1600-6(4)
Pipe diameter Ø, mm	10 - 63	20 - 110	50 - 250	63 - 400	110 - 630	250 - 800	630-1200	710-1600

Pressure Calibration Tanks

TYPE	PCA 1200	PCA 1600
Pipe diameter Ø, mm	400 - 1200	710-1600

Haul-Off Units

TYPE	PVL 110/3	PVL 250/4	PVL 400/6	PVL 630/6	PVL 800/6	PVL 1000/8	PVL 1200/10	PVL 1600/12
Pipe diameter Ø, mm	16 - 110	50 - 250	40 - 400	110 - 630	140 - 800	160 -1000	315 - 1200	710 - 1600



Full Process Control

The control system constantly monitors the manufacturing process on its every stage and corrects current production parameters to the set value. Basic control system provides following services to the manufacturing process:

- Speed control of all installed drives of the production line
- Temperature control and adjusting to the set point
- Control of water level in calibration tanks and spray cooling baths
- Pressure control of raw material melt
- Raw material flow control
- Alarm reporting and diagnostics.

Integrating the gravimetric control into the basic control system enables enhanced process monitoring and run mode optimization, saving raw materials and other resources.

Extended operation control system

The operation control system of a single extrusion line can be connected to the PC-based upper level control system, which integrates and administers control systems of all installed production lines of the factory. This enables effective and comprehensive process control, including operation security and co-ordination. The extended operation control system allows the manufacturing process automation.

Wall thickness ultrasonic measure control (UMC)

The wall thickness ultrasonic measure control is to maintain the high and stable product quality and to minimize consumption of specific raw materials. The core of the ultrasonic measure control system is the high-speed ultrasonic evaluation electronics and the sensor system. The processed data is displayed on the UMC output screen and used by the process control system to correct the performance of the extrusion line.

The UMC controls the following operations and related parameters:

- metric weight (haul-off / extruder)
- minimum wall thickness (haul-off)
- wall thickness profile (die head centering)
- diameter (vacuum)
- extruder/start-up ramps
- component dosing
- co-extrusion.

Aftersales

Uponor Infra provides services by our skilled and professional staff. Our customer service offers original spare parts with flexible and short delivery times.

Customers' staff is trained in Finland and during the start up at the customers' premises. Our experienced technicians assists and helps you to maintain best quality products in your manufacturing line.

We invest time in understanding the customer and provide top-class service from start to finish. Our customers' success is our success



Professional Solutions for Plastics Industry

Uponor Infra is a joint venture between the Uponor Corporation and the KWH Group established in 2013 by merging the two owners' infrastructure businesses. The company has a leading position in the infrastructure pipe systems markets in northern Europe, with operations also in North America and Asia. The technology and licensing department, formerly known as KWH Pipe Ltd, Technology, is based in Vaasa, Finland.

Since the 1960's, the Technology department of Uponor Infra has been supplying equipment and technology solutions for customers worldwide. Uponor Infra offers a wide range of high quality products and services and carries out complete turnkey factory projects.



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