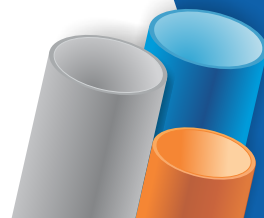
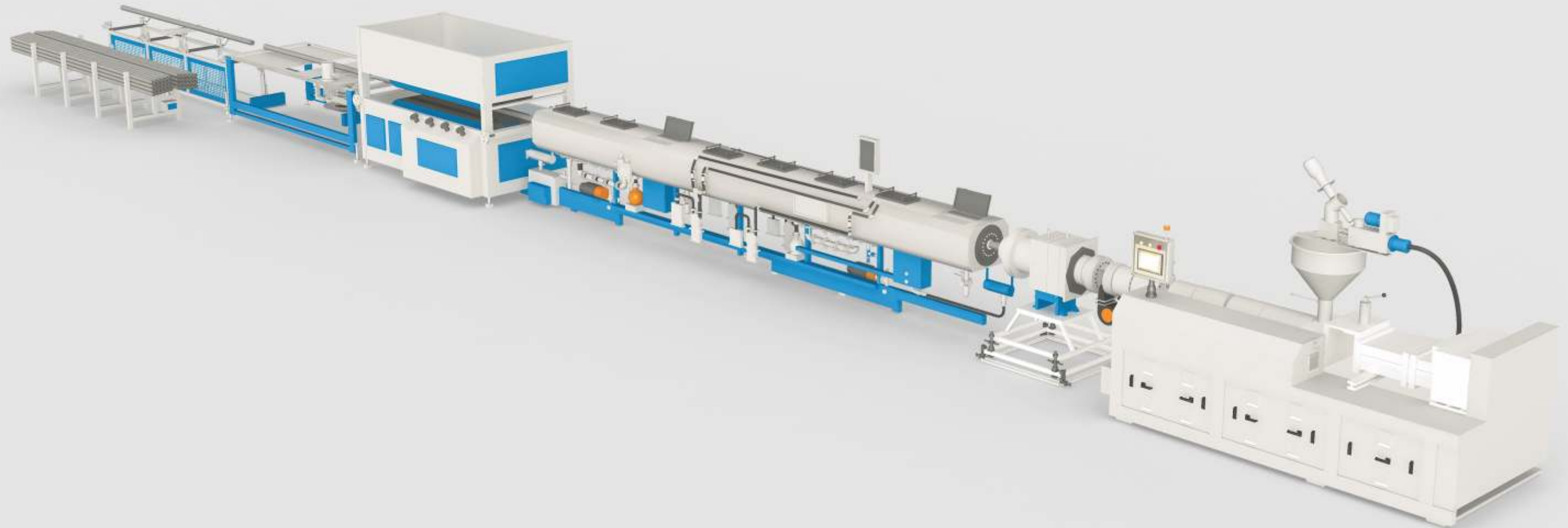




## Pipe extrusion lines





Windsor Machines Limited is India's largest plastic processing machinery manufacturer and exporter for over four decades.

The division is well equipped with state of the art technology and expertise to meet the growing challenges of extrusion machinery the worldover.

Over the years, Windsor has spread its wings across 65 countries with an installation base of over 16000 machines.

## About WINDSOR

Windsor by virtue of its long history and extremely high technical competence has established itself as a sound global player in the field of extrusion machinery. Thanks to the erstwhile technical collaborations and its continuous R&D that helped Windsor create a satisfied customer base around the globe.

Windsor's unique philosophy of working on customers' profits has earned the company accolades for being a machinery supplier with lowest running cost (per kilo of polymer produced).

The veterans in the industry would definitely recollect our 1st generation models like RC100, TSC65 and TSC80. We are proud to say that these lines are running successfully even today after they are being fully depreciated. In 90s came KTS series of PVC pipe plants with higher L/D ratios and relatively higher outputs. These were IIInd generation models with 18-22 L/D ratios. Then came, after the millennium year, our third generation extruder with L/D ratios going up to 28:1 and introducing European gear boxes in higher models. These extruders are presently competing the international brands in terms of reliability, aesthetics, power optimization and sturdiness.

In polyethelene segment also we have achieved strides by developing the first 1200 kg/hr extruder in India. Currently we have a complete range to cater to various needs of industry.

Windsor has also been known for its traditional expertise in Dies – both PVC and PE. Today we have mastered the Multiple Die concept to ensure highest possible outputs in smallest sizes.

## Twin Screw Pipe Extrusion Line | PVC

PVC being a heat sensitive material necessitates a very controlled temperature during processing. Extrusion of PVC is best possible with twin screw extruder with relatively less power as compared to single screw. Windsor twin screw extruders are known for the power optimisation and are offered in the range from 110 Kg/hr up to 1500 Kg/hr.

### Features :

- Minimizes energy inputs
- Achieves uniform pumping
- Front barrel with HSS sleeve offered for selected models
- Minimizes wear & tear
- Economic replacement option
- Japanese PID digital temperature controllers  
high accuracy of  $\pm$  TC
- Hard face coating for screw flights on selected models
- PLC controls as standard on select models



### Extruder Specifications :

Models		KTS 110	KTS 140e	KTS 170	KTS 200	KTS 250	KTS 300e	KTS 350	KTS 450	KTS 550	KTS 700	KTS 900	KTS1500
Screw Diameter	mm	52	52	65	65	65	71	71	91	91	91	110	135
Screw Speed	rpm	5-50	5-52	4-45	5-53	5-53	5-53	5-53	4-40	4-45	4-40	3-32	3-26
L/D Ratio	-	20:1	22:1	18:1	18:1	22:1	22:1	28:1	22:1	25:1	28:1	28:1	28:1
Main Motor	KW	11	11	15	22	22	30	30	45	56	75	90	160
Max. Output	Kg/hr	100-110	130-140	150-170	180-200	230-250	280-300	330-350	420-450	520-550	650-700	850-900	1300-1500
Pipe Range (Single Die)	mm	20-110	20-110	20-200	20-200	63-250	63-250	110-315	110-400	110-400	160-400	160-400	250-630
Pipe Range (Twin Die)	mm	19-50	19-50	19-50	19-50	20-110	20-110	20-110	20-110	63-200	63-200	90-200	110-250

\* KTS 450 & above with European Gear box. \* KTS 700 & above with PLC.



## Die Head | PVC Processing

WINDSOR offers spider dies, right up to 630 mm dia with single head, also dual and quadruple head.

Advantages :

- High volume low pressure design ensures wider thickness range
- Uniform melt distribution throughout the entire pipe circumference
- Twin die heads for higher outputs in smaller diameters
- Dual die with dual downstream for pipe sizes 20-110 mm & 63-200 mm
- Extruders utilization from 80-100% even with smaller pipes

Die head with trolley for P-200 and above models for easy movement

P 200



TDH 50



QDH 32



### Single Head Die Specifications :

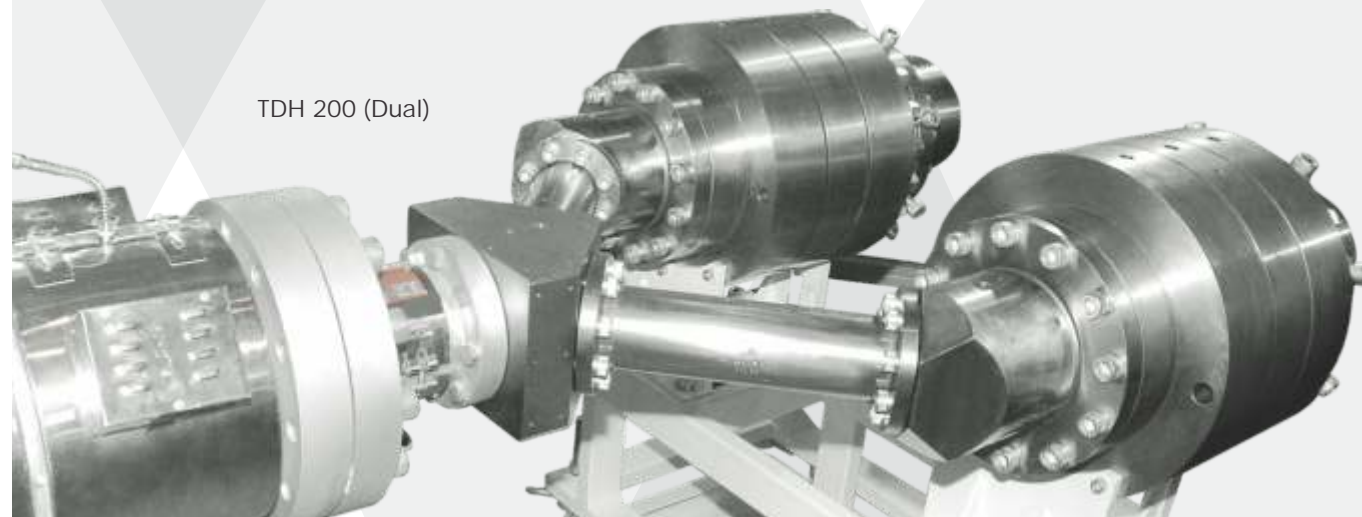
Models		P 63	P 110	P200 LV	P 200	P 250	P 315	P 400	P 630
Pipe Range	mm	20-63	20-110	63-200	63-200	90-250	110-315	110-400	250-630
Output Capacity up to	Kg/hr	100	200	250	320	425	550	700	1000

### Multiple Head Die Specifications :

Models		TDH 50*	TDH 63 (Dual)	TDH 110 (Dual)	TDH 200 (Dual)	QDH 32 (Quadruple)
Pipe Range	mm	19-50	20-63	20-110	63-200	19-32
Output Capacity up to	Kg/hr	200	200	400	650	280

\* In common down stream equipment.

TDH 200 (Dual)



## Single Screw Pipe Extrusion Line | Polyolefins

- Understanding extrusion market requirements thoroughly, WINDSOR extruders take lead in technical superiority
- The screw and barrel are designed and developed to match specific raw material and end product requirement by simulation software
- We offer barrier screws yielding improved output rate, low melt temperature and improved melt quality



- Grooved Feed Systems :
- Improved material conveying capacity
  - Higher output compared to conventional design
  - Pressure invariance
  - Uniform throughout & melt temperature



### Plain Barrel Extruder Specifications :

Models		LX 18*	LX 25*	LX 40	LX 50	LX 65	LX 75	LX 90	LX 120
Screw Diameter	mm	18	25	40	50	65	75	90	120
L/D Ratio	-	20:1	24:1	26:1	26:1	26:1	26:1	26:1	26:1
Main Motor	kW	0.75	3.75	7.5	15	30	37.5	56	110
Max. Throughput (HDPE)	Kg/hr	1.5-2	5-6	18-20	36-40	90-100	120-130	170-190	300-320

- Smooth Bore Extruders for PVC application available.
- \* Jokey extruder for stripping.

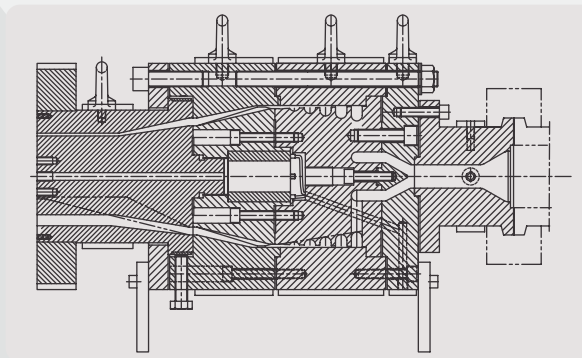
### Grooved Feed Extruder Specifications :

Models		LX 65G	LX 65G	LX 90G	LX 90G	LX 120G	LX 120G	LX 150G
Screw Diameter	mm	65	65	90	90	120	120	150
L/D Ratio	-	30:1	30:1	30:1	30:1	30:1	30:1	30:1
Main Motor	kW	56	75	110	150	220	315	355
Max. Throughput (HDPE)	Kg/hr	170-190	200-220	325-350	430-450	600-700	900-1000	1100-1200



## Die Heads | Polyolefin Processing

- Most versatile Spiral Mandrel Design Die
- Advantages :
  - Improved inner pipe surfaces
  - Short purging times
  - Optimized back pressure allows a balance of compression & melt temperature control
  - Uniform melt flow can be achieved yielding minimum wall thickness deviation
  - WINDSOR spiral die is versatile by design which enables PE, PPR, ABS processibility only by changing the toolings



### Die Specifications :

Models		SM 50	SM 110	SM 200	SM 315	SM 450	SM 630
Pipe Range	mm	12-50	20-110	63-200	110-315	160-450	225-630
Output Capacity up to	Kg/hr	100	250	350	500	700	1000

### Special Co-extrusion Die Heads :

Models		CSM 50	CSM 50/R	CSM 110	CSM 110/R	CSM 110 HV	TSM 110	TSM 110 HV	3P CSM	4P CSM
Pipe Range	mm	12-50	12-50	20-110	20-110	20-110	20-110	20-110	20-50	20-50
Outer Thickness Range up to%		90	10	90	10	85	10:80:10	15:70:15	90	90
No. of Layers		2	2	2	2	2	3	3	2	2
Output Capacity up to	Kg/hr	100	100	220	220	300-350	220	380-400	450	600

## PPR | Pipe Extrusion Line

- Versatile screw designed for PE & PP Random Copolymer
- Sizes specifically designed with extra cooling arrangements and pre-cooling facilities



## Calibrating System | Vacuum & Pressure System

- Vacuum Sizing Tanks :
- Intensive cooling provided to ensure high production rate
  - Self cleaning spray nozzle
  - Accurate vacuum control, water level control & temperature control
  - Additional vacuum chamber and motorized axial movement provided from VST-250 and above for quick startup and less wastage
  - Manual slide rail arrangement for Axial and Transverse movement of the tank
  - Dual vacuum spray tanks on common frame for dual pipe extrusion line
  - Imported filters for online cleaning
  - Air operated solenoid valves optionally
  - Cyclone separator for vacuum pump optionally



\*Stainless steel tanks available on request

### Vacuum Sizing Tank Specifications :

Models		VST 110	VST 200	VST 250	VST 315	VST 400	VST 450	VST 630
Pipe Range	mm	16-110	20-200	50-250	50-315	63-400	75-450	110-630
Cooling Length	mm	4000/6000	6000	6000	6000	6000	6000	6000/8000
No. of Chambers		1	1	2	2	2	2	2

Optional : Stainless steel tanks / 8 mtrs. length available.

## Traction | Unit

- Up to 6 track tracting device to suit pipe diameters
- Different line speeds can be changed through change of sprockets (on request)
- Track adjustment by pneumatic control
- Direct drive offered for selected models
- Counter balance pressure to balance track weight for thin pipes
- Encoder for length measurement & feed back arrangement offered optionally
- Easy accessibility for maintenance of all components
- Dual twin-track traction units for dual pipe extrusion line





### Traction Unit Specifications :

Models		TTU 75	TTU 110	TTU 200	TTU 315/3	TTU 315/4	TTU 450/4	RA 630/6E*
Pipe Range	mm	12-75	16-110	20-200	32-315	40-315	75-450	110-630
No. of Tracks	Nos.	2	2	2	3	4	4	6
Max. Line Speed	Mtrs./Min.	16	15*	15*	10	10	7	6
Contact Length	mm	540	800	1200	1200	1200	1600	1450

\* Models with higher line speeds & wider speed range available on request.

## Cutting | Unit

Tube Cutting Unit (TCU) :

- Carbide tipped circular saw for longer life
- Pneumatically operated carriage movement
- Clamping force adjustable depending upon the wall-thickness of the pipe
- Maintenance free Top clamping
- Swarf removal system optional
- Trolley movement on linear motion bearings
- Special guillotine designed cutter for PPR pipes
- Dual cutter for dual pipe extrusion line
- Digital counter to measure length
- PLC based controls available optionally



### Cutting Unit Specifications :

Models		TCU 75	TCU 110	TCU 200	TCU 250	TCU 315	TCU 75/2	TCU 110/2	TCU 200/2
Pipe Range	mm	16-75	20-110	20-200	50-250	90-315	16-75	20-110	50-200
Cutting Speed (Max.)	Mtrs/Min.	15	15	10	10	6	15	15	15
Clamping From		Top	Top	Top	Side	Side	Top	Top	Top

\*Post extrusion equipment,  
manufactured in collaboration with



- Planetary Cutting Unit (PCU) :
- Preferred for pipe diameter range 75-400 mm
  - Swarf removal executed by a suction blower
  - Chamfering and Universal Clamping system

### Planetary Cutting Unit Specifications :

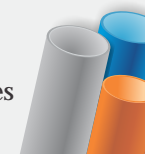
Models		RS25PZ	RS40PZ	RS63PZ
Pipe Range	mm	50-250	75-400	110-630
Cutting Speed (Max.)	Mtrs/Min.	10	7	4
Clamping System		Universal	Universal	Universal

## Coiling | Unit

- Two station coiler with pneumatic collapsing arms
- Suitable for pipe size up to 63 mm
- Online tension adjustment achieved through tension control
- Pneumatic pipe end retaining device provided to prevent loosening of the coil
- Auto traversing optionally available
- A. C. Drive
- Single station coiler available on request



Double Station Coiler





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Windsor Machines Ltd. reserves the right to change the specifications without prior notice.

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