



□ Jumbo Compounding

- Polyolefin Compounding
- ABS/POM
- Devolatilization



□ Polymer Compounding

- Color/filler and functional MB
- Engineering plastic reinforcement
- TPE/TPR/TPV
- Cable compounding



□ Polymer Foam Extrusion

- CO₂ foam XPS board
- Graphite EPS beads pelletizing
- PET Foam Core
- PLA Foam Beads pelletizing
- XPE Foam Sheet



□ Direct Extrusion

- EVA/POE solar film
- UHMWPE battery separator film
- BOPET/BOPA/BOPP film extrusion
- Steel pipe coating



□ PET Recycling & Extrusion

- Bottle flakes recycling (BTB)
- PET fiber/film recycling
- Undried PET sheet extrusion
- PSF/POY direct extrusion

Specializing in PET Sheet Extrusion & Technology



■ PET chips



■ PET sheet roll



■ PET fruit box



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Walk The Talk



USEON has been pushing the boundary of China-made twin screw extruders. Since the first set of China-made high torque twin screw extruder installed in **2007** at USEON, there has been more than **4000** sets of USEON-made high-performance twin screw extruders working worldwide. Over the years, SAT series have stood the test of time. Now the brand-new SAT series redefine the art of the state.

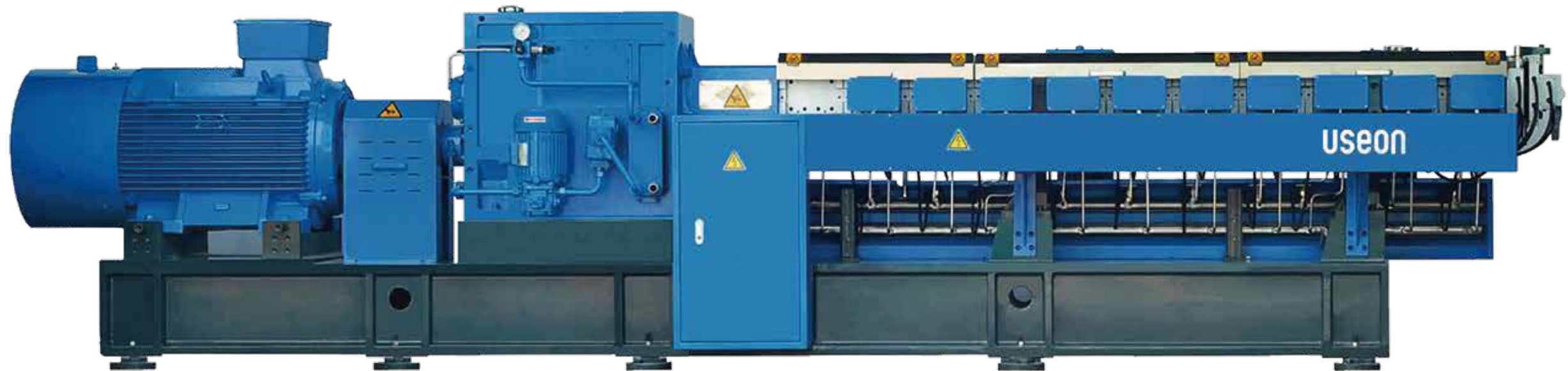
S-Safety—stability creates productivity. Safety provides stability. SAT series are designed on the basis of sufficient safety protection both in mechanical and electrical ways.

A-Accuracy—accuracy means accurate control that is supported by high precise mechanical parts, ingenious design and reasonable electrical program control. The high precise screw and barrel provides excellent self-cleaning capability, as well as accurate residence time control.

T-Torque—increasing specific torque ratio without compromising safety factor, newly SAT has brought the specific torque factor up to 13 Nm/cm³ that can make the polymer extrusion process with less energy, yet better quality.

SAT-A MILESTONE OF USEON

SAT series stands for USEON standard compounder for most polymer processing. We not only provide high quality machines, but also can help you develop the new applications of SAT. The screw speed ranges from 100 up to 1200rpm. The L/D ration covers from 20 up to 80. The degassing or vacuum system and side feeders can be incorporated into SAT system easily. It provides the optimal cost-effective investment.



Key Technology for PET Sheet Processing

Useon is the pioneer in China to recycle PET by twin-screw extrusion with crystallization-free drying. Backed by extensive field practice, we consistently limit intrinsic viscosity (IV) drop to $\leq 0.03\text{dl/g}$.

- 1

High-Torque Extruder

Low Temperature & Low Speed Operation
- 2

High-Fill-Ratio Feeding System

Maximised Throughput Rates
- 3

High-Vacuum Degassing System

Superior Color Retention

Minimal IV Drop

Low-Molecular-Weight VOC degassing
- 4

Highly Optimised Screw Configuration

Optimal Plasticising Intensity &

Enhanced Molecular Weight Distribution
- 5

Ultimate-Efficiency Cooling System

Ultra-Transparent Sheet Quality
- 6

Fully Automated Winding System

Superior Operator Experience



Technical Specifications: Drying-Free PET



Sheet Extrusion Line

Extruder Model	Single-Layer Extrusion Line				Multi-Layer Co-extrusion Line		
Raw Material	PET.APET.RPET.CPET.PETG						
Extruder	SAT75	SAT85	SAT95	SAT110	SAT75 / SAT52	SAT85 / SAT52	SAT95 / SAT65
Power	160KW	220KW	355KW	500KW	160KW / 45W	220KW / 45W	355KW / 75W
Range	0.15–3mm						
Width	600–3000mm						
Throughput	500–700kg/h	700–900kg/h	900–1500kg/h	1500–2000kg/h	500–700kg/h	700–900kg/h	900–1500kg/h

Technical Features & Advantages

- 100% PCR Processability: Supports processing of 100% post-consumer recycled (PCR) material with no pre-treatment or crystallization drying required.
- Energy-Efficient Drying-Free Design: Eliminates crystallization drying; coupled with permanent magnet synchronous motors (PMSM) for maximum energy savings and high efficiency.
- High Efficiency Vacuum System: Lowers IV drop with a highly stable vacuum level consistently maintained at -0.1MPa .
- Advanced Barrel & Screw Geometry: Redesigned barrel and screw configuration optimizes devolatilization and dewatering while minimizing IV drop.
- Integration of Die from JC Times: Equipped with premium dies from JC Times to ensure stable, uniform extrusion.
- Siemens Servo & Dual Closed-Loop Control: Delivers superior extrusion pressure stability and simplified operation.
- High-Rigidity Rollers: Heavy-duty, high-stiffness roller design guarantees product thickness tolerances within $\pm 0.005\text{mm}$.
- Smart Automation: Integrated with fully automatic winders and shaft-handling unloaders for smart, hands-free production.
- Robust After-Sales Support: A comprehensive service network ensuring rapid, reliable response to your needs.

PMSM + high-torque gearbox + safety coupling

A Next-Gen Powerhouse Safeguarding Your Barrel and Screws

We utilize Permanent Magnet Synchronous Motors (PMSM) to drive our extruders. Compared to conventional AC induction motors, PMSMs deliver energy savings of 5% to 15% . For instance, a 220 kW PMSM can save approximately 300 to 500 kWh of electricity per day.

Additionally, our PMSMs feature built-in alignment and adjustment capabilities. During installation, we meticulously measure and fine-tune coupling runout to ensure equipment vibration is minimized to the absolute limit, significantly extending the machine's operational lifespan.

Useon's Proprietary High-Torque Gearbox

Engineered with a high safety factor, our new SAT Series Gearboxes elevate the specific torque level up to the 13 N.m/cm³ class. In the PET extrusion process, this translates directly to lower energy consumption, minimized material shear rates, and higher screw filling degrees, resulting in exceptional end-product quality. This is the concrete embodiment of how we translate technology into a definitive product advantage



Extrusion Safety Coupling: Ultimate Drivetrain Protection

Twin-screw extruders operate under demanding conditions prone to material clogging, metal contamination, overfeeding, and screw seizing. Because screws, gearboxes, and shafts are extremely costly to manufacture, an unshielded jam can instantly snap screws and shatter gears—resulting in exorbitant repair costs and prolonged downtime. Our Safety Coupling instantly disengages the drive upon torque overload, isolating shock loads to safeguard the entire core drivetrain.

Key Technical Advantages

1. Stable Rated Torque Transmission

Delivers zero-backlash, rigid power transmission during normal production. Engineered for the continuous high-torque, medium-to-high speed operations of extruders, ensuring high transmission accuracy without compromising throughput or plasticizing stability.

2. Vibration Damping & Misalignment Compensation

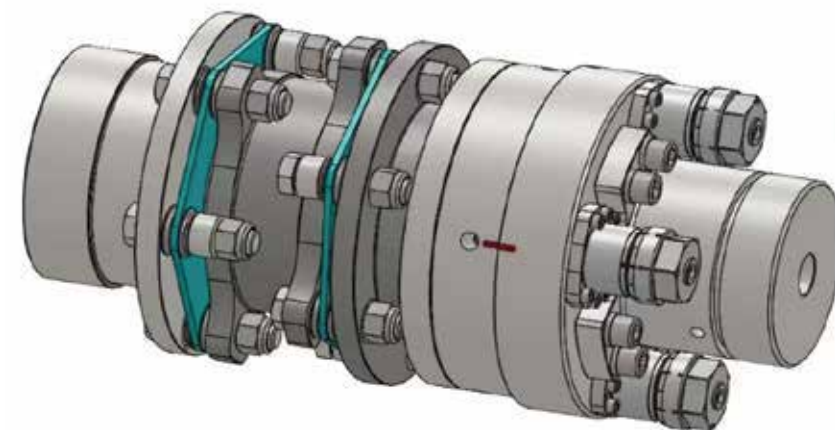
Integrates an elastomeric or disc pack structure to compensate for axial, radial, and angular misalignment between the motor and gearbox. It dampens shock vibrations from motor start-ups and screw compounding, effectively reducing gearbox noise and extending bearing service life.

3. Millisecond-Level Overload Disengagement (Core Function)

When the load exceeds the preset torque threshold, the coupling completely disengages within 1 to 5 ms. The driving and driven ends separate entirely, reducing residual torque to near-zero and preventing overload shocks from propagating upstream to the screws and gearbox.

4. Signal Interlock for Instant Shutdown (Preventing Secondary Clogging)

Equipped with proximity switches or speed sensors, the coupling sends an instantaneous signal to the control cabinet upon disengagement. This interlock automatically shuts down the main motor and feeders, preventing continuous material feeding that would worsen barrel clogging, thereby minimizing clean-out downtime.



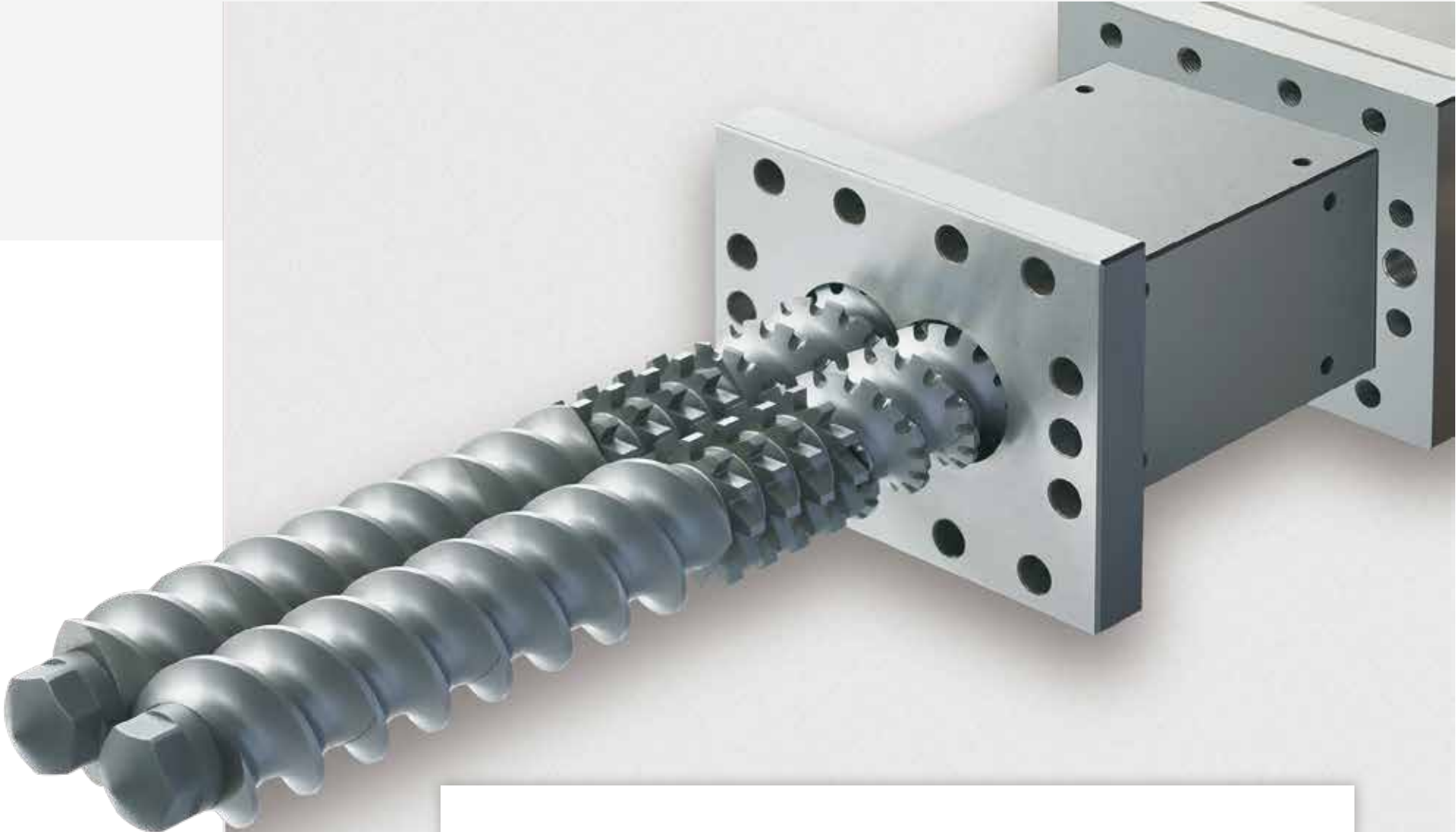
SCREW ELEMENTS

Precise screw elements made by CNC tools provide SAT better intermeshing and self-wiping performance which ensures the entire processing no dead corner and better control in RTD (residence time distribution).

The ratio of outside diameter and inside diameter determines the free volume. SAT series extruder feature the excellent self-wiping functions. Combining with screw torque and free volume, the Do/Di of SAT is optimized at 1.55 that provide sufficient torque while remain enough free volume.

Except various screw geometry, we supply several materials of screw elements for different processing purposes. We also can configure different screw materials in different processing sections to optimize the lifetime of the complete screw.

Material	Description	Hardness	Abrasion	Corrosion
W6Mo5Cr4V2	Through hardened tool-steel	58~60HRC	<div><div></div></div>	<div><div></div></div>
Cr12MoV	Through hardened alloy steel	58~60HRC	<div><div></div></div>	<div><div></div></div>
SAM10/CK45	HIP-composite bi-metal steel	58~62HRC	<div><div></div></div>	<div><div></div></div>
38CrMoAlA	Hardened and tempered nitrided steel	>HV940	<div><div></div></div>	<div><div></div></div>
440C	Hardened Stainless steel for food	54~56HRC	<div><div></div></div>	<div><div></div></div>
C-276	Hastelloy	180HB	<div><div></div></div>	<div><div></div></div>



BARRELS / LINERS

SAT adopts ingenious cooling channel design which provides more efficient cooling performance and easier maintenance job. Modular design allows barrel sequence can be optimized with different barrel material as per the characteristic of processing task.

To ensure the precision, all SAT barrels are processed by CNC machines and checked by CMM (Coordinate Measuring Machine). We have various barrel structures to cater for different feeding types, venting types and liquid injection.

Material	Description	Hardness	Abrasion	Corrosion
Cr12MoV	Through hardened alloy steel	60~62HRC	<div><div></div></div>	<div><div></div></div>
W6Mo5Cr4V2	Through hardened tool-steel	60~62HRC	<div><div></div></div>	<div><div></div></div>
Ni60+25%WC	PM-boned HIP nickel base material	62~64HRC	<div><div></div></div>	<div><div></div></div>
38CrMoAlA	Hardened and tempered nitrided steel	>HV940	<div><div></div></div>	<div><div></div></div>
440C	Hardened Stainless steel for food	54~56HRC	<div><div></div></div>	<div><div></div></div>
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Triple-Stage Liquid-Ring Roots Vacuum System

Our system features a triple-stage configuration consisting of a primary liquid-ring vacuum pump paired with secondary and tertiary Roots pumps. By compressing gases progressively through three stages, the system achieves an ultimate vacuum level approaching absolute vacuum.

Plug-and-Play Installation: The integrated unit requires only a few basic connection interfaces to become fully operational, simplifying setup and deployment.

Low Maintenance, High Reliability: Engineered for stable, trouble-free continuous operation, the system boasts an exceptionally low failure rate and requires minimal professional maintenance, drastically reducing lifecycle operating costs.

Three-Lobe Roots Design with Advanced Sealing: The Roots pumps utilize a heavy-duty three-lobe rotor design. Combined with a mechanical-plus-composite sealing system, this robust barrier effectively prevents volatile process gases from migrating into the oil reservoir, eliminating the risk of oil emulsification.

Self-Contained Closed-Loop Water Cooling & Conservation System

To address the high water consumption typically required by liquid-ring pumps, we have engineered an independent, closed-loop water recirculation tank integrated directly into the vacuum skid.

Active Cooling Fan: A top-mounted high-efficiency cooling fan continuously dissipates process heat from the recirculating water, maintaining optimal operating temperatures.

Automatic Make-up Ball Valve: An integrated float-controlled ball valve manages automatic water replenishment, eliminating the need for manual monitoring and manual refills.

Eco-Friendly & Sustainable: This closed-loop configuration drastically reduces waste-water contamination and freshwater consumption, aligning with modern green manufacturing standards.



Simultaneous Venting & Hydrolysis Prevention

Active vacuuming through both natural and high-volume venting ports rapidly extracts moisture, preventing PET hydrolysis and minimizing IV drop.

Zone 5 | Auxiliary Vacuum Venting: Originally designed for natural atmospheric venting, extensive testing proved that connecting Zone 5 to the vacuum pump significantly enhances sheet transparency and toughness. This auxiliary vacuum also reduces downstream gas load, allowing Zones 7 and 8 to achieve deep, stable vacuum levels.

Zones 7 & 8 | High-Efficiency Devolatilization: Features dual, elongated high-volume venting ports. The underlying screws are configured with grooved, high-conveying elements to maximize melt surface area and accelerate surface renewal. Operating near absolute vacuum, these ports ensure the complete removal of core moisture and volatiles.

Triple-Stage Inline Protection: Three high-efficiency filtration units are integrated into the piping between the venting ports and the vacuum pump, trapping volatile condensates to protect pump internals.

Precision Filtration. Constant Flow. Perfect Shaping. The Ultimate All-in-One Solution for High-End Extrusion

Continuous Melt Purification:

Delivers nonstop, high-precision filtration to completely eliminate downtime and production losses.

Constant Pressure Delivery:

Utilizing a precision melt pump to balance flow rates and pressure differentials for surge-free extrusion.

Accurate Die Shaping:

High-end extrusion dies guarantee ultimate dimensional accuracy and flawless product profiling.

One-Stop Downstream Solution:

An integrated system engineered to build extrusion lines with low pulsation, maximum yield rates, and extended continuous runtimes.



L-Type 3-Roll Calender System

The system features an L-type 3-roll calender configuration (Rolls 1 and 2 are aligned horizontally, while Rolls 2 and 3 are positioned at a 45° incline). With the horizontal alignment of the first two rolls, the die extrudes vertically downward. This design facilitates effortless commissioning and rapid start-up for finished product output.

Engineering Specifications & Technical Advantages

Premium Bearings & Zero-Clearance Assembly:

Equipped with world-renowned bearings (NSK / SKF) to guarantee a roller runout accuracy of <0.005mm during operation. The bearings are mounted using a shrink-fitting process, ensuring a zero-clearance fit between the bearing and the shaft.

Siemens Synchronous Multi-Drive:

Driven by high-performance Siemens servo motors, ensuring precise speed synchronization across all three rollers. This completely eliminates surface defects such as chatter marks or ripples on the finished sheet.

Zero-Backlash Gearboxes:

Utilizes international top-tier reduction gearboxes, guaranteeing zero backlash within the internal gear trains for extremely smooth torque transmission.

High-Pressure Hydraulic Clamping:

Roller clamping is actuated by heavy-duty hydraulic cylinders. Each cylinder delivers up to 10 tons of clamping force with zero pressure fluctuation during production, ensuring optimal flatness and consistency of the sheet.

High-Efficiency Thin-Wall Rollers with Mirror Finish:

Features 15 mm thin-wall rollers to optimize heat transfer, boosting cooling efficiency by 15% to 30% compared to traditional thick-wall designs. The roller surfaces are hard-chrome plated and polished to a surface roughness of Ra0.015um. This ultra-mirror finish guarantees a flawless, high-gloss sheet surface.

High-Strength 42CrMo Alloy Steel:

The outer shell of the rollers is fabricated from high-grade 42CrMo alloy steel. Its superior surface strength and hardness prevent any scratching or denting caused by high-stiffness sheets.

Monoblock Spiral-Groove Core:

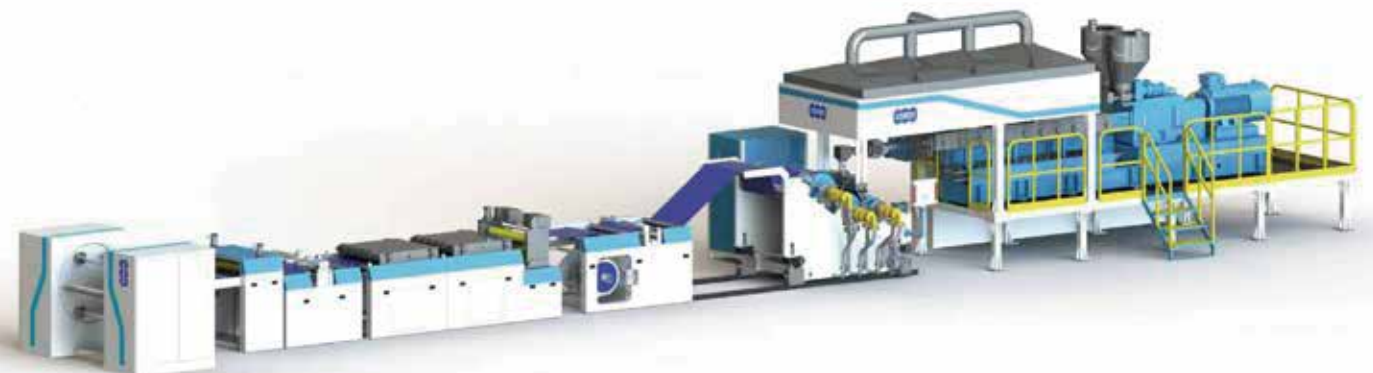
The internal core is integrally machined with a milled spiral flow channel. This structural design provides robust support to the outer roller shell, preventing any bending or deflection under high calendering pressures.

Shrink-Fitted Core & Outer Shell:

The internal core and the outer shell are assembled via a shrink-fitting process. This eliminates internal gaps, reinforcing the roller assembly so the wall will not collapse or dimple under localized pressure.

Extreme Precision & 0.005mm Sheet Tolerance:

With roller runout strictly controlled within 0.005mm, the final extruded sheet thickness tolerance is guaranteed to be within $\pm 0.005\text{mm}$.



Streamlined Downstream Auxiliary System

Integrated Downstream Processing:

Upon exiting the 3-roll calender, the extruded sheet seamlessly undergoes a continuous downstream process: edge trimming, silicone oil coating, slitting, and winding.

Precision Edge Trimming with Scrap Recovery:

The sheet width is precisely sized using two circular disc cutters actuated by pneumatic cylinders. This delivers clean, burr-free cuts with effortless setup.

Scrap Winding (Standard):

Dual-side waste edge winders are integrated for clean, organized scrap collection.

Inline Grinding & Re-feeding (Optional):

Can be retrofitted with an inline granulator to crush the trimmed edges and immediately convey the regrind back into the extruder hopper, dramatically slashing labor and raw material costs.

Uniform Silicone Coating & Drying:

Following slitting, the sheet receives a protective coating via a PU-silicone-wrapped roller that applies silicone oil with absolute uniformity. The coated sheet then passes through a dedicated oven for rapid, controlled drying.

Smart Tension-Controlled Winding:

The winding system is governed by a high-precision servo-control drive that maintains rock-solid tension stability and guarantees perfectly aligned, flush roll ends.

Full Automation (Optional):

An automatic turret winder is available to eliminate manual intervention during roll changes, significantly reducing operator workload and labor costs.



USEON -- Your Reliable Partner

Only with customer's support and trust, can we achieve more. A good strategic relationship can put both parties in win-win position, yet it can contribute to the industry. Many of our improvements were the result of working with customers, in this course, we witnessed the growth each other.

Cooperation Begins Understanding - Welcome To Consult Us

If you are a rich-experienced user of twin screw extruder, you could purpose any possible requirements on equipment and USEON will carry out your idea with our optional equipment. We can discuss further to determine the final solution.

If you have no professional know-how on extruder, our experts would like to share our expertise and knowledge with you to get the most reasonable solution and equipment. Our team will help you complete the whole project in a turn-key way.

In addition, our well-equipped lab center is open for you. We welcome you to test your new material, new recipe, new process and new ideas before you make decision. Our professionals are here for you.

How To Select A Suitable Extruder

Learn comprehensively about processing characteristics of your raw material and identify which type of screw extruder is suitable for your case.

Determine the main parameters, i.e. L/D, screw diameter, driving motors, screw speed according to throughput and process.

Select the auxiliaries, i.e. material loading, feeding, vacuum units, screen changers and pelletizing units according to the process purpose. Whether you purchase single set of extruder or a complete project, our experts will give you professional advice.

