Find Out Your Solution

Polyolefin Pelletizing
Jumbo Extruder
Underwater Pelletizer

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

Under-water Pelletizing System
Huge capacity: 1–50 tons/hr
Micro–beads
Elastomer and hot melt pelletizing
Foam beads: EPS/EPLA/XPET

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

Walk The Talk

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useon–u+ En 2024–04 / 01

U series twin screw extruder

Advancing
Efficiency
&
Quality

Useon

Torque

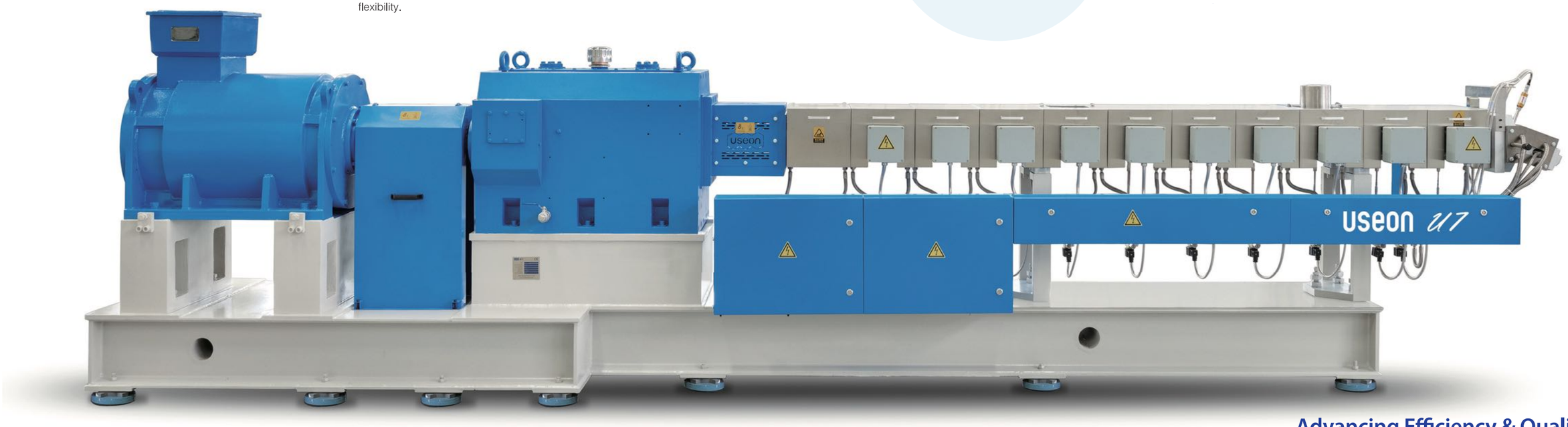
The Transformation results from 18 years accumulation

Innovative Design, Industrial Advancement, Process Improvement, Enhanced Management—U+ Rollout

The U+ series twin–screw extruder is the application of the latest process technology by Useon. Compared with the previous generation SAT models, the torque is increased by 36%, the speed is increased by 50%, and up to 100% throughput increase can be achieved. It is mainly used in granulation production requiring high speed and high torque, such as engineering plastics and masterbatch preparation. In PET extrusion processing, where the specific torque of 15 Nm/cm^3 can significantly reduce IV drop. The U+ series adopts high reliability process sections (wear–resistant barrel, HIP screw, efficient heating, high–precision temperature control) and a variety of material configurations. The newly designed heavy–duty welded base features extremely high torsional resistance factor, providing higher equipment safety and stability, ensuring both high standardization and flexibility.

Applications of U+ Series Twin-Screw Extruders:

– Engineering plastics, reinforcement or filling.
– Masterbatch preparation, providing better mixing and dispersion effects
– High–volume filling, including talc powder, calcium carbonate, wood powder, etc.
– Elastomers.
– Polyester recycling.
– Direct extrusion.
– Continuous processing with high torque.



Useon

U+Series—Faster / Higher / Stronger

Delicate design and meticulous attention to detail enable U+ to meet customers' more challenging technical requirements, helping them achieve advancements in efficiency as well as quality.

Key Performance Features:

- Screw speed up to 900–1200 RPM
- Specific torque and power density up to 15 Nm/cm^3
- Higher filling and lower shear rates, resulting in higher product quality
- High–efficiency motors and precision temperature control systems
- HIP screw elements and wear–resistant barrel
- CE certified by TÜV
- Unique barrel cooling channels, effectively enhancing cooling efficiency
- High–efficiency heating bars for rapid barrel heating and energy savings
- Newly designed structural steel welded base
- Customized control system for medium to small–scale compounding
- Side feeding and venting options, suitable for various pelletizing ways
- Available production capacities ranging from 5kg to 4t/h

Technical Parameters

U+ Series	Screw Speed rpm	Power kW	Specific Torque Nm/cm^3	Throughput Range kg/h	Screw Diameter mm
U2	1200	37	13.6	5–120	27
U3	1000	90	15	50–250	36
U5	1000	250	15	150–750	52
U6	1000	450	15	300–1500	63
U7	1000	678	15	600–2200	71
U9	900	1340	15	1000–4000	93

Processing Section Material

	Material code	Description	Treatment	Application	
				Wearing resistance	Anti–corrosion
Screw element	UE06	Tool steel	Entire quenching	▲▲	▲
	UE11	Iron–based powder metallurgy tool steel	HIP hardening	▲▲▲▲	▲
	UE16	Iron–chromium–based powder metallurgy tool steel	HIP hardening	▲▲▲	▲▲▲
	UE21	Special SS	Surface hardening	▲	▲▲▲▲
barrel	UB05	38CrMoAlA	Surface hardening	▲	▲
	UB10	Nickel–based powder metallurgy tool steel	Oval one–piece liner	▲▲▲	▲▲
	UB15	Tungsten carbide alloy steel	Inside coating	▲▲▲▲	▲▲
	UB20	Special SS	One–piece liner	▲	▲▲▲▲

* Other materials can be customized as per processing task and requirements

■ High Torque Drive Components

With a specific torque of 15 Nm/cm^3, higher production efficiency and compounding quality are achieved, signifi–cantly increasing throughput and reducing specific energy consumption.

■ Efficient and Reliable Processing Section

The barrel is equipped with 4–6 radial U–Cooling chan–nels distributed axially, enhancing cooling efficiency, reducing barrel deformation, and ensuring long–term stability in conjunction with high–precision screws.

■ Precision Temperature Control System

Efficient heating and excellent cooling design, combined with proprietary temperature control software developed by Useon, enables outstanding temperature control accu–racy in the processing section, providing precise and stable processing conditions for polymers.

■ High Throughput

Designed for larger throughput on the basis of polymer rheology simulations, the strand pelletizing or underwater pelletizing die heads achieve more stable and high through–put

IS Torque

Useon

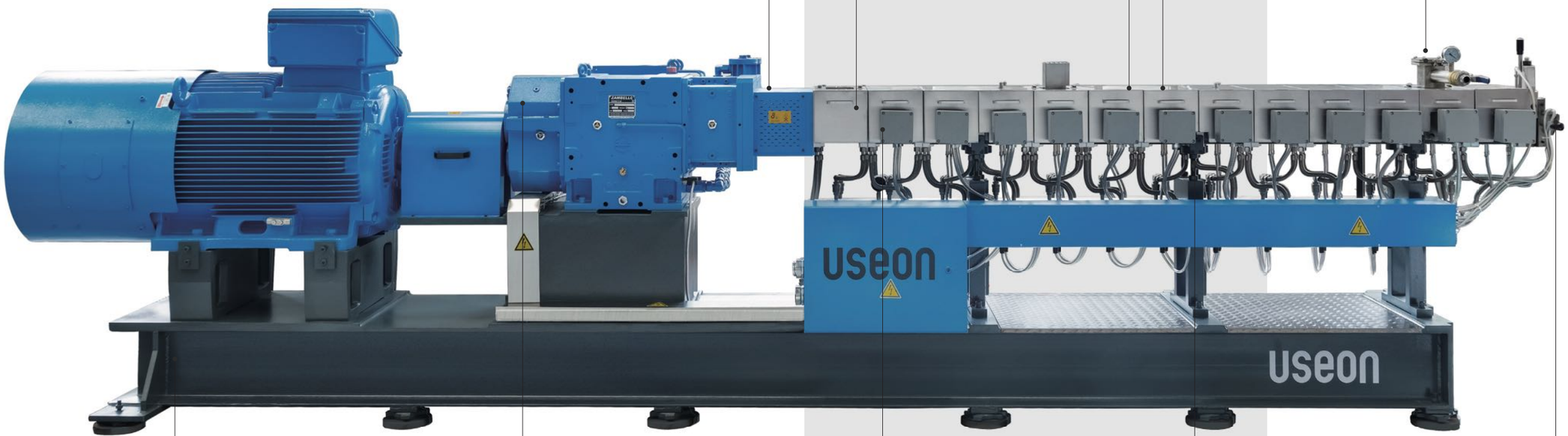
Higher speed design
The maximum screw speed can reach up to 1200 rpm, and the screw speed as well as motor configuration can be selected according to the process, meeting more application scenarios.

Efficient barrel insulation
Each section of the barrel is equipped with a separate insulation cover that can be easily removed. The interior of the cover is made of environmentally friendly and efficient insulation materials, achieving higher energy efficiency.

Unique cooling channel design
Each section of the barrel has 4–6 radial U–Cooling cooling channels distributed axially, improving cooling efficiency and reducing radial deformation of the barrel.

High-performance processing section materials
The barrel adopts composite lining, and the screw elements are made of hot isostatic pressing (HIP) materials, which have higher wear resistance or corrosion resistance, achieving a longer service life.

Abundant process section configurations
The processing section can be equipped with side forced feeding, side venting, and enhanced vented feeding units, meeting higher proportions of filler in–take, and achieving superior product quality.



High rigidity base
The newly designed high–rigidity base is welded with structural steel, with minimal creep and deformation, ensuring more stable equipment operation. The process–ing section is partially covered with stain–less steel panels to meet higher hygiene requirements.

Higher specific torque
The design specific torque of U^+ is 15 Nm/cm^3, providing higher power input, achieving higher filling rates, reducing average shear rates, significantly increas–ing throughput, and reducing specific energy consumption.

Efficient heating bars
Each section of the barrel is equipped with 4–6 efficient heating bars with higher power density, achieving higher heating efficiency, and convenient single–piece replacement.

Precise temperature control system
Efficient heating and excellent cooling design, combined with proprietary temperature control system software developed by Useon, enable outstanding temperature control accuracy in the processing section, providing accurate and stable processing conditions for polymers.

High-capacity heads
Designed for larger throughput on the basis of polymer rheology simulations, the strand pelletizing or underwater pelletizing die heads achieve more stable and high throughput

Useon

With leading technology and wealthy experience, we provide high performance tailor-made compounding lines for you. Useon

has accumulated 18 years of process technology and rich experience, focusing on meticulously designing every process of extrusion lines to help you enhance your competitiveness.

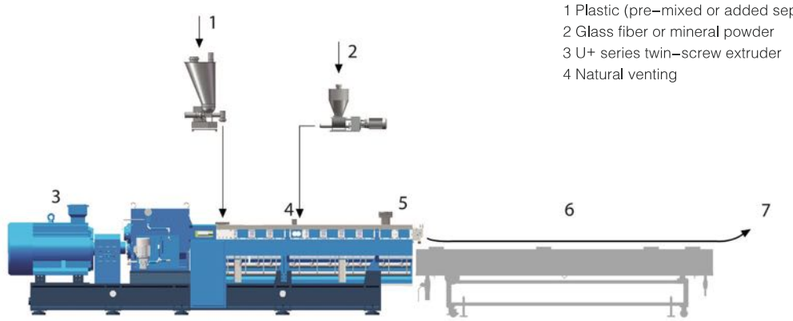
The U3 twin-screw extruder for engineering plastics and masterbatch R&D and small-scale production.

We will share our experimental center and compounding extrusion pilot line with you, which can optimize equipment design and product process development under actual process conditions. We are committed to providing first–class solutions to ensure that your production line meets current demands and is adaptable to future developments.

Our designs not only focus on production efficiency but also prioritize energy utilization, environmental protection, and sustainability. Through collaboration with us, you will obtain a highly customized compounding line that get the most out of your investment.

Demonstration of Typical Engineering Plastic Reinforcement Lines

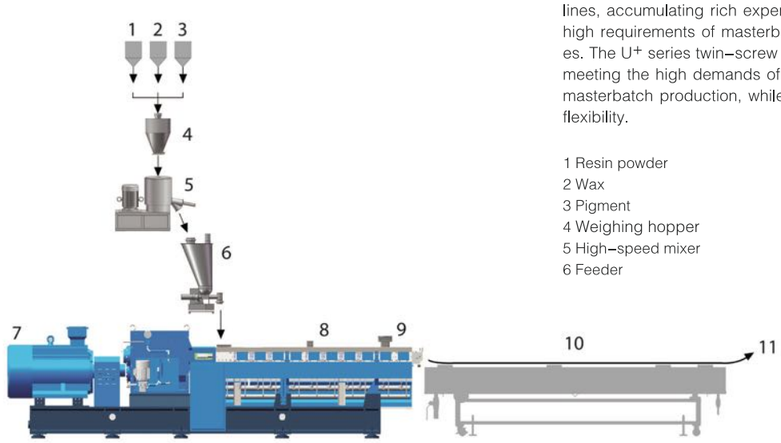
Engineering plastic reinforcement typically requires the uniform dispersion of reinforcing materials in the plastic matrix to ensure the final product has good mechanical properties and durability. The high torque characteristics of the U+ series provide sufficient mixing capability to effectively blend the reinforcing materials with the plastic matrix, ensuring uniformity of the mixture.



1 Plastic (pre–mixed or added separately)
2 Glass fiber or mineral powder
3 U+ series twin–screw extruder
4 Natural venting
5 Vacuum venting
6 Water bath
7 To dryer and pelletizer

Typical Masterbatch Production Line Demonstration (Pre-mix Process)

Useon has delivered over 700 high–performance masterbatch pelletizing lines, accumulating rich experience in this field. Useon understands the high requirements of masterbatch production for compounding process–es. The U+ series twin–screw extruder has excellent mixing performance, meeting the high demands of pigment dispersion and uniform mixing in masterbatch production, while also improving production efficiency and flexibility.



1 Resin powder
2 Wax
3 Pigment
4 Weighing hopper
5 High–speed mixer
6 Feeder
7 U+ series twin–screw extruder
8 Natural venting
9 Vacuum venting
10 Water bath
11 To drying and pelletizing unit

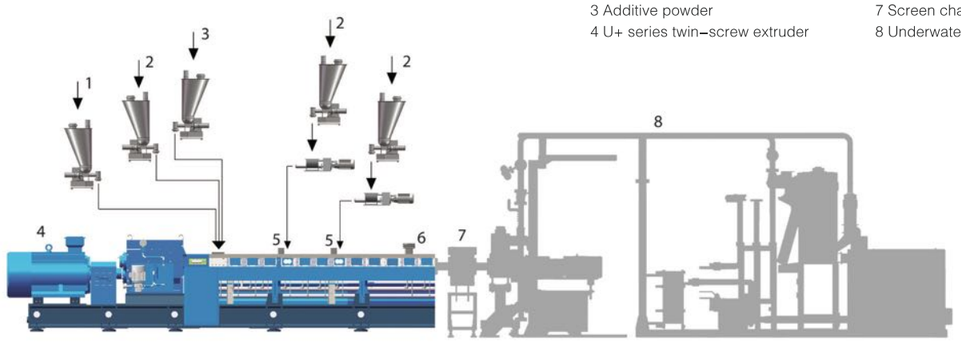
Advancing Efficiency & Quality

Useon

Demonstration of High-Filling Compounding Line

The U+ series twin–screw extruder can be used to manufacture high–quality high–filled mixtures. It is primarily used in the production of polyolefin high–filled materials, with fillers including calcium carbonate, talc, or titanium dioxide.

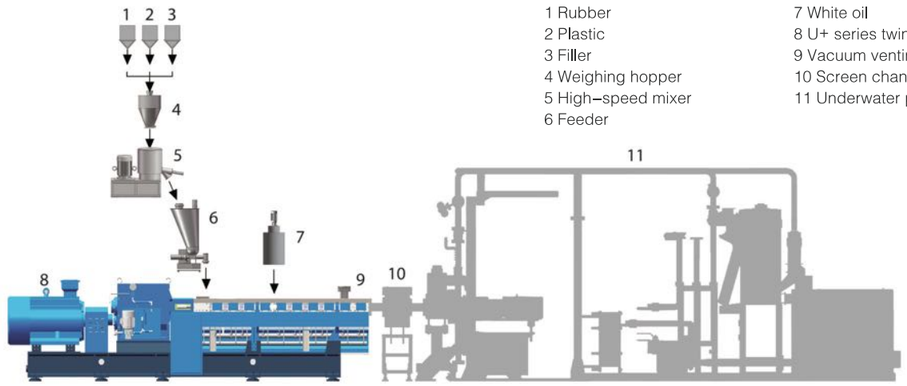
1 Resin
2 Mineral powder filler
3 Additive powder
4 U+ series twin–screw extruder
5 Natural venting
6 Vacuum venting
7 Screen changer
8 Underwater pelletizing system



Demonstration of Typical Elastomer Line

The production of elastomers requires sufficient reaction time and good dispersion effects. The dedicatedly designed screw elements of the U+ series twin–screw extruder facilitate effective premixing of liquids and polymers. The high–torque gearbox and modular barrel design enable it to handle elastomer production requirements with high quality.

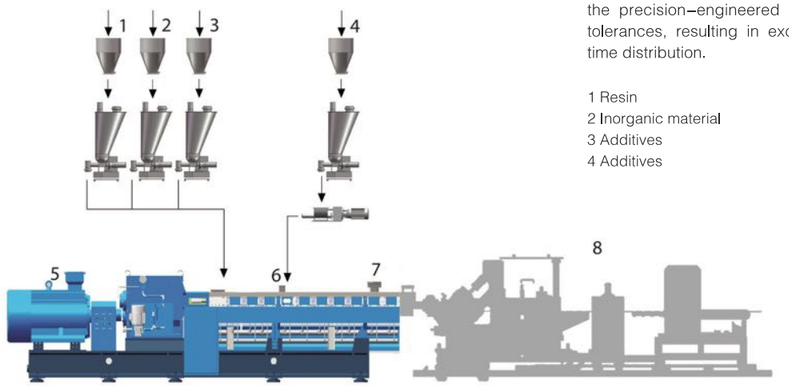
1 Rubber
2 Plastic
3 Filler
4 Weighing hopper
5 High–speed mixer
6 Feeder
7 White oil
8 U+ series twin–screw extruder
9 Vacuum venting
10 Screen changer
11 Underwater pelletizing system



Demonstration of Direct Extrusion

The high–torque gearbox of the U+ series twin–screw extruder allows materials to have lower actual temperatures inside the barrel, while the precision–engineered barrel and screw elements ensure tight tolerances, resulting in excellent dispersion and optimal residence time distribution.

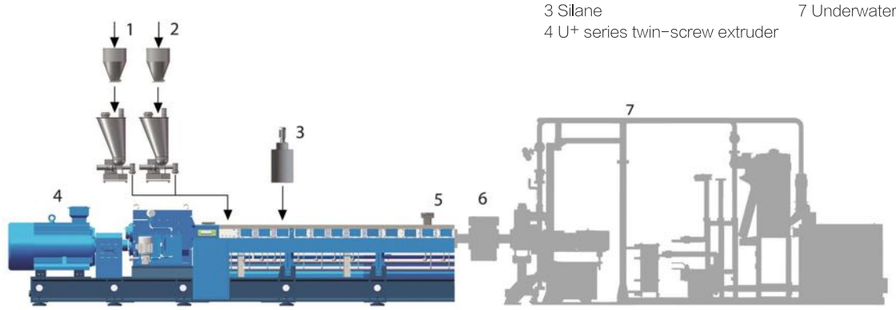
1 Resin
2 Inorganic material
3 Additives
4 Additives
5 U+ series twin–screw extruder
6 Natural venting
7 Vacuum venting
8 Calendering system



Demonstration of Typical Line for Crosslink Cable Compounds

To achieve high–quality cable compounds and ensure satisfactory economic benefits, reliable compounding and pelletizing techniques must be adopted. The Useon Two–Stage series is particularly suitable for mixing materials sensitive to temperature and shear. This two–stage extrusion system consists of a U+ twin–screw extruder and a single–screw extruder.

1 Resin
2 Additives
3 Silane
4 U+ series twin–screw extruder
5 Vacuum venting
6 Screen changer
7 Underwater pelletizing system



Reliability is our faith. This faith is built on scientific quality management. It is a comprehensive quality control system from R&D to delivery.

The U+ series twin-screw extruders are under full supervision throughout the manufacturing process, with results of each inspection step being traceable. During inspections, we use world-class instruments for quality control to ensure stable and reliable product quality, providing customers with trustworthy products.

Three-coordinate measuring machine measures overall coaxiality

Useon conducts coaxiality measurements on each equipment using a three–coordinate measuring machine, ensuring equipment stability and minimizing abnormal wear of barrels and components.

Roughness tester measures roughness of extruder barrels

Useon uses a roughness tester to quickly and accurately assess the quality of barrels, ensuring they meet design requirements and quality standards, thus enhancing product reliability.

Leeb hardness tester measures the hardness of extruder components

Components of twin–screw extruders are tested for hardness to ensure they meet specified hardness requirements. This helps prevent failures and damage to components caused by material quality issues.

CERTIFICATE

of Conformity
EC Council Directive 2006/42/EC
Machinery

Registration No.: AM 50559283 0001

Report No.: CN22AFQ9 001

Holder: USEON TECHNOLOGY LIMITED
NO.31,YUANTAI ROAD,DONGSHAN STREET,
JIANGNING DISTRICT,NANJING,
211100 Jiangsu
P.R. China

Product: Machinery
(XPS Foam production line)

Identification: Type Designation: [illegible]
Serial No.: [illegible]

Remarks: For details refer to test report CN22AFQ9 001.
A XPSm production line is incomplete machine, the protective fence, soundproof room with interlocking doors and pull up rope emergency stop shall be inspected after

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. This is to certify that the tested sample is in conformity with all provision of Annex I of Council Directive 2006/42/EC, referred to as the Machinery Directive. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex II of the Directive.

Certification Body

Ming Shan

Date 18.10.2022

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may be used if all relevant and effective EC Directives are complied with. CE

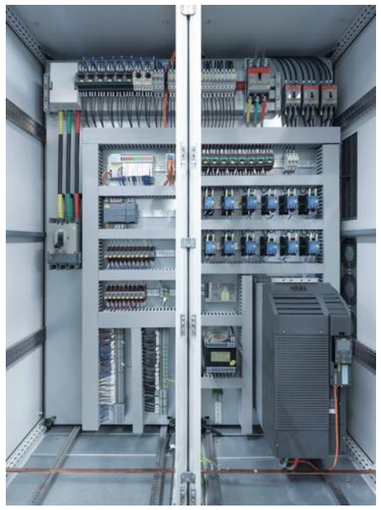
CE certified by TÜV

In addition to CE standards, we have implemented UL and CSA standards for some projects. In such projects, we have also gained more experience with international standards.

useon

Control System — Intelligent Extruder Digitization Control

Customizes Your High Performance Compounding Line



Useon provides a diverse range of control systems, from standard to customized, to meet comprehensive production control requirements. The integrated control system incorporates rich functionalities, including data logging, report generation, and recipe management. An intuitive and user–friendly interface significantly enhances equipment operation convenience.

- Data Collection and Integrated Management
- Recipe Management (including feed rates, temperatures, and speeds)
- Full–screen display of process flow
- One–button startup and multi–level authorization management
- Alarm analysis and maintenance reminders
- Support for multi–protocol communication upstream and downstream, with internet communication support through expansion
- Remote operation and maintenance

Useon Extrusion — Compounding Solutions Provider

As pioneers in plastic extrusion technology, we not only have senior experts in equipment design and manufacturing, but also specialists in material science and production processes who collaborate with you to explore and implement innovative solutions. We firmly believe that a good solution is half equipment and half service.

Through collaboration with numerous world–leading plastic raw material and plastic product companies, we have accumulated rich experience in project management and on–site implementation. These experiences will ensure the execution efficiency for new projects. Each delivery is not only a product or service, but also the beginning of a long–term collaboration.

U+ series