ERE

拉伸流变挤出实验设备

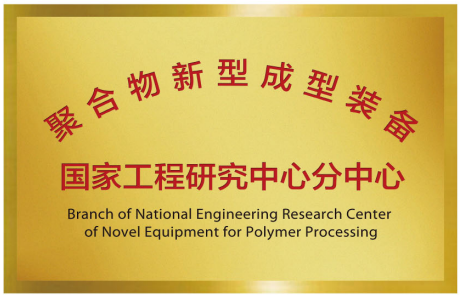
Elongational Rheology Extruder for Experimental Series

SiiCO

星 联 科 技

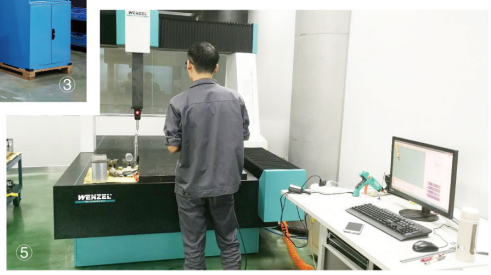
公司简介
COMPANY PROFILE

广东星联科技有限公司成立于2015年，注册资金6000万元，由星联投资、华南理工大学院士团队、战略投资人及经营团队共同出资成立的高科技企业，公司拥有中国工程院瞿金平院士发明的“基于拉伸流变的高分子材料塑化输运方法及设备”专利技术，是一家聚焦高分子材料智能制造装备、高性能新材料的研发、生产、销售和服务的国家高新技术企业。公司秉承“专业专注、共创共享”的核心价值观，以“推广普及拉伸流变技术，不断开创高分子材料应用的新领域”为使命，推动“拉伸流变挤出技术”全面产业化，力争成为高分子材料加工技术的领跑者。



Established with registered capital of 60 million in 2015, Siiico Technology is a National High-Tech Enterprise jointly funded by XL Investment, Academician Team of South China University of Technology, Strategic Investor and Management Team, focusing on R&D, production, sales and service of intelligent manufacturing equiment for polymeric materials and new high performance material, with owning patent technology of “Method and a Device for Plasticizing and Transporting Polymer Material based on Elongation Rheology” invented by Qu Jinping, who is the Academician of China Academy of Engineering. Adhering to the core value of “Professionalism & Dedication, Mutual Creation & Sharing”, Siiico has persisted in the mission of “promote elongational rheology technology and explore new application for polymer” to propel comprehensive industrialization of the elongational rheology technology and strive for the leader of the processing technology of polymeric materials.

研发制造
R&D, Manufacture



① 瑞士车磨复合
Studer United Grinding &Turning

② CNAS认可实验室
Laboratory Approved by CNAS

③ 德玛吉加工中心
DMG CNC

④ 德国真空处理炉
SCHMETZ Vacuum Furnace

⑤ WENZEL三坐标检测仪
WENZEL Bridge CMM

专利技术
PATENTED TECHNOLOGY

公司核心技术“基于拉伸流变的高分子材料塑化输运方法及设备”经国家相关部门鉴定属“国际首创、国际领先”，已获得中国、美国、日本、欧洲等十多个国家和地区的专利授权。该项技术获得了2014年中国发明专利金奖，2015年国家技术发明二等奖。

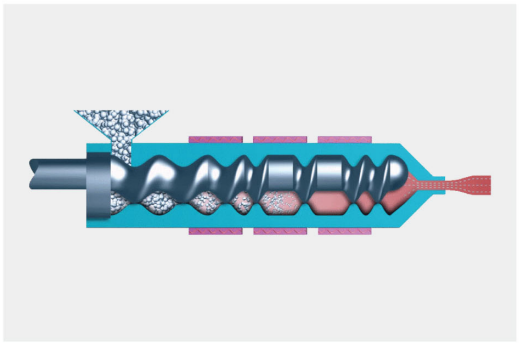
The core technology “Method and a Device for Plasticizing and Transporting Polymer Material based on Elongation Rheology” , which was awarded with “Gold Award of Chinese Outstanding Patented Invention” in 2014 and “The Second Prize of National Award for Technological Invention” in 2015, has been identified as “International Initiative and Leading Level” by national department and granted patents in more than 10 countries and regions including China, U.S.A., Japan and Europe.

技术发明人：瞿金平 中国工程院院士
Technology Inventor : **Prof. Qu Jinping**
Academician of China Academy of Engineering

技术创新
Technology Innovation

利用几何拓扑偏心转子结构，通过公转与自转的结合，使容腔体积不断地变化，对腔内物料进行周期性的挤压和拉伸，实现拉伸形变支配的高分子材料塑化输运过程，突破了百年来高分子材料产业以“螺杆”为标志的发展模式。

The technology of **ERE** takes advantage of geometric topology eccentric rotor structure with combination of revolution and rotation to make the continual volume change of the chamber which carry out periodic extrusion and elongation of materials, and finally to realize the plasticization and transportation process of polymeric materials dominated by elongational deformation. This revolutionary invention breaks through the development mode marked by “screw” in the polymeric material industry over one hundred years.



设备特性
CHARACTERISTICS

弱剪切
Weak Shearing Force

物料剪切速率低，材料分子链破坏少，可实现易分解、加工温度范围窄的热敏性材料的挤出。

Less damage of molecular chain basing on low shearing rate of material by **ERE** facilitates the extrusion of thermal sensitive materials with easy decomposition and narrow range of processing temperature.

强拉伸
Strong Elongational Force

塑化过程中，物料压力高，拉伸作用强，有利于流动性差异大的不同物料体系共混挤出加工。

High pressure of the material and strong elongational effect in the process of plasticizing is conducive to the blending and extrusion of different material systems with large fluidity difference.

输送能力强
Strong Conveying Capability

基于体积变化的完全泵送输运原理，能够建立高挤出压力，适宜超高或超低粘度物料的加工。

Based on the principle of complete pumping transportation with volume change and high extrusion pressure can be established by **ERE** which is suitable for processing ultra-high or ultra-low viscosity materials.

混合分散均匀
Homogeneous Compounding and Dispersion

物料塑化受拉伸形变支配，能有效打开纳米粒子团聚，实现纳米粒子在聚合物基体中的分散。

The plasticization of materials dominated by elongation deformation in **ERE** can effectively break agglomeration of nanoparticles and realize the dispersion of nanoparticles in polymeric matrix.

停留时间分布窄
Narrow Distribution of Residence Time

线性正位移输运过程，避免了挤出加工中物料无序、随机等不可控的运动，适合反应挤出加工。

Linear positive displacement transport process of **ERE** avoids uncontrollable movement of material disorder and randomness in extrusion, and is suitable for processing of reactive extrusion.

物理强制增容效果明显
Effective Compulsory Compatibility by Physical Means

拉伸流场的强制分散混合能力，使不相容的聚合物在不添加相容剂的 条件下表现出较强的相容性。

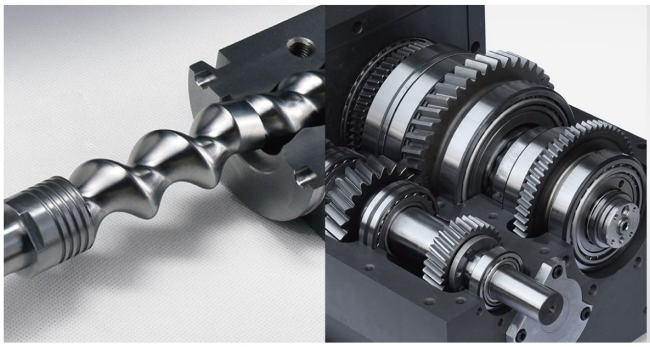
The compulsory dispersion and compounding of elongation flow field makes the incompatible polymer show strong compatibility without adding compatibilizer.

* 该产品通过CE认证
The products have been certified by CE institution.

设备配置
MAIN CONFIGURATION

ERE拉伸流变挤出实验设备系列专为研究院、高校、企业等研究和开发高分子材料新配方、新加工工艺而设计和制造的新型挤出实验装备。

ERE Experimental Series is a new type of Elongational Rheology Extruder designed for research institutes, universities and enterprises to explore new formulations and processing technology of polymeric materials.



挤压系统
Extrusion System

- 定子及转子构成
  Consist of Rotor and Stator
- 独特的复合运动方式
  Unique Compound Motion Style
- 型腔无局部突变和死角
  Without Abrupt Change Point and Dead Zone in Chamber

驱动系统
Drive System

- 高扭矩输出
  High Torque Output
- 航空级铝合金箱体
  Aircraft Grade Aluminum Alloy Used for Gearbox Casing
- 精密伺服驱动系统
  Precision Servo Drive System
- 自主研发动力分配单元
  Self-research Power Distribution Unit

控制系统
Control System

- 操作人性化
  User Friendly Features
- 工业模块设计
  Industrial Module Design
- 进口品牌元器件
  Import Brand Components

功能设置（可选）
Functional Settings (optional)

- 视频记录
  Video Recording
- 数据采集分析
  Data Acquisition and Analysis
- 工艺模板储存
  Process Template Storage
- 上位机软件控制
  Master Computer Soft Control
- 可编程自动实验
  Programmable Automatic Experiment

技术参数
Technical Specification

型 号 Model	公称直径 Dia. (mm)	长径比 L/D	加热区 Heating Zones	最高工作温度 Max. Tem. (℃)	最高转速 Max. Rotor Speed (rpm)	产 量 Output (kg/h-LDPE)	总功率 Total Power (kW)
ERE-16	16	18	3	350	100	4	4
ERE-30	30	18	4	350	100	15	20

* 如需了解设备更多参数及资料，请与我司市场部联系。
Please contact with our marketing department for more details of the equipment.

应用范围
APPLICATIONS

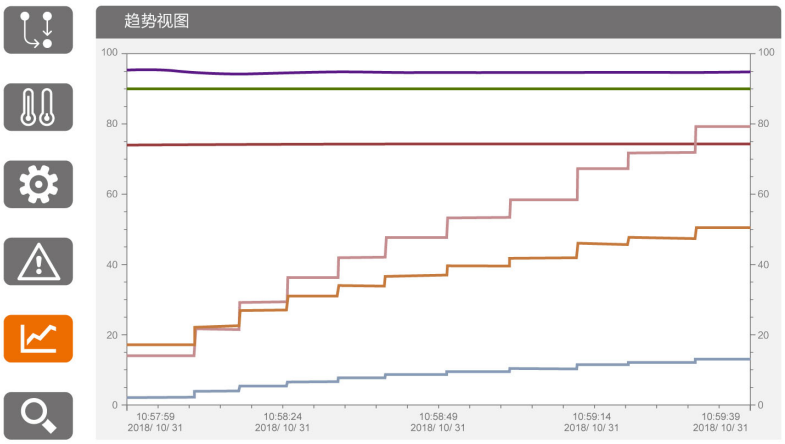
ERE实验设备比螺杆挤出方案具有分散混合能力强、分子量降解少、能耗低等优势，可应用于不同极性材料的相容挤出，纳米分散、热敏性材料等极端流变行为材料的加工。**ERE**实验设备同时兼备了传统“双螺杆”混合混炼及“单螺杆”直接成型的功能，为高分子材料加工工艺优化提供了全新的实验方案。

Owing superiority of strong dispersion and compounding, less molecular weight degradation and low energy consumption by comparing with screw extrusion, **ERE** has wide applications in the processing of compatible extrusion with different polar materials, Nano-dispersion, thermal sensitive materials and other materials with extreme rheological properties. Simultaneously combining the functions of compounding performance from traditional “twin-screw” and direct forming from “single-screw”, **ERE** provides a new experimental option for the optimization of polymeric processing technology.

流变工作站
Rheological Station

过程分析、配方研发、工艺优化、数据对比

Process Analysis, Formulation Development, Process Optimization and Data Comparison




1 毛细管 Capillary


2 狭缝 Capillary


3 橡胶 Garvey


4 造粒 Pelletizing


5 流延 Tape Casting


6 吹膜 Film Blowing

改性塑料
Modified Plastics

填充改性、纤维增强、合金共混、纳米复合、反应接枝、热塑性弹性体复合

Filling Modification, Fiber Reinforcement, Alloy Blending, Nano-composite, Reactive Grafting, Thermoplastic Elastomer Composite

成型加工
Molding Processing

造粒、薄膜、片材、管材、棒材、异型材

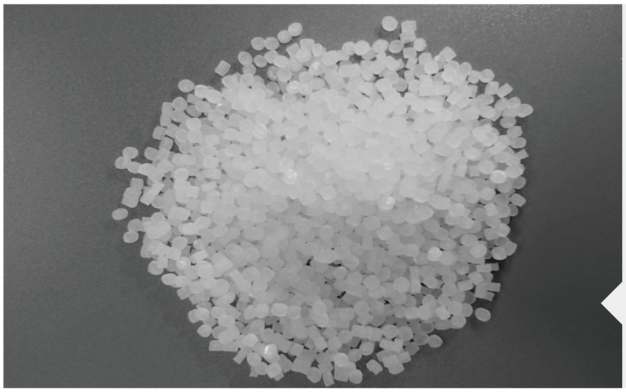
Granulation, Film, Sheet, Pipe, Rod, Profile

挤出发泡
Extrusion Foaming

物理发泡、化学发泡

Physical Foaming, Chemical Foaming

应用案例
TYPICAL CASES



反应挤出
Reactive Extrusion

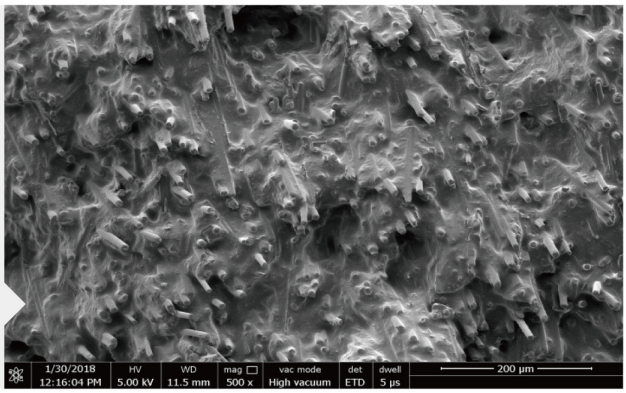
停留时间可控、接枝率高、副反应少
Controllable residence time, high grafting rate and less side effects

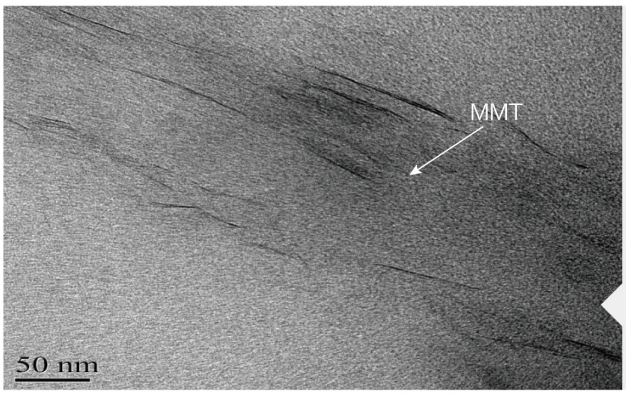
* PE-MAH 产品图
Pic. Of PE-MAH Product

纤维取向
Fiber Orientation

纤维沿挤出方向取向度高、保留长度高
High orientation and retention length of fibers along direction of extrusion

碳纤维 / 硅橡胶复合材料垂直于挤出方向SEM图 *
SEM of carbon fiber/silicon rubber composite material perpendicular to the direction of extrusion





纳米材料分散
Dispersion of Nanomaterial

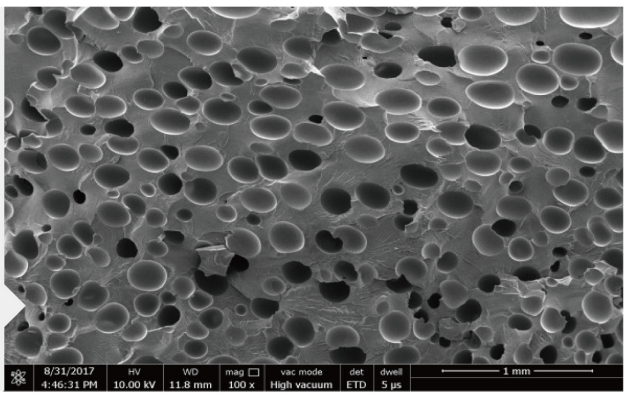
插层明显、分散均匀、无团聚
Clear intercalation, uniform dispersion and free-agglomeration

* PP/纳米MMT（1%）复合材料TEM图
TEM of PP/ Nano MMT (1%) Composite

挤出发泡
Extrusion Foaming

泡孔均匀细密、发泡倍率高、开孔率低
Uniform and fine cell, high foaming ratio and low porosity

LDPE发泡SEM图 *
SEM of LDPE Foaming



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星联科技官网

ERE实验设备资料