

# UHMW-PE Extrusion Line

## 超高分子量聚乙烯挤出设备

基于获中国发明专利金奖的**ERE**拉伸流变技术

Based on **ERE** technology won the China Invention Patent Gold Award



中国发明专利  
Chinese Invention Patent  
专利号 (No.): ZL 200810026054.X

国际首创·国际领先

INTERNATIONAL INITIATIVE AND LEADING LEVEL

**Siiico**  
星联科技

# 广东星联科技有限公司

## SIICO TECHNOLOGY CO., LTD.

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,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。公司位于广东省佛山市南海区三山新城,地处粤港澳大湾区内,靠近广州南站、毗邻港澳。

公司拥有中国工程院院士瞿金平教授发明的“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,并研制出具有自主知识产权的“拉伸流变挤出设备”(简称**ERE**),目前公司主营产品有:

- 让超高分子量聚乙烯制品实现高效、高性能加工的**ERE**拉伸流变挤出设备
- 为高分子材料研发提供全新实验方案的**ERE**实验设备
- 对高分子防水卷材行业生产工艺带来重大突破的**ERE**连续法胶粘剂生产系统
- 实现高效、高性能加工的超高分子量聚乙烯制品
- 更易加工的食品级全生物降解复合材料
- 终结农用地膜白色污染的“高强度高耐候易回收地膜”——高堡膜

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, Siico Technology is a National High-Tech Enterprise jointly funded by XL Investment, Academician Team of South China University of Technology, Strategic Investors and Management Team, focusing on R&D, production, sales and service of intelligent manufacturing equipment for polymeric materials and new high performance material. We are located in Sanshan New City, Foshan, Guangdong Province, which lies at the Guangdong-Hong Kong-Macao Greater Bay Area, close to Guangzhou South Railway Station and adjacent to Hong Kong & Macao.

Owning the patented 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, Siico has successfully developed “Elongational Rheology Extruder (referred to as **ERE**)” with independent intellectual property rights. Our comprehensive range of products include :

- Elongational Rheology Extruder for UHMW-PE Series
- Elongational Rheology Extruder for Experimental Series,

which provides a new experimental option for the optimization of polymeric processing technology

- **ERE** Continuous Adhesive Production System, which has brought a major breakthrough in the production process of polymer waterproofing membrane industry
- UHMW-PE Products with superior performance
- Food-grade Fully Biodegradable Composite Materials, which can be easier to process
- Terminator for White Pollution on Mulch Film —— “High strength, Weather resistant & Easy-to-recycle Mulch Film” (Gaobao Film)

Adhering to the core value of “Professionalism & Dedication, Mutual Creation & Sharing”, Siico 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.



# ERE专利技术

## PATENTED TECHNOLOGY

广东星联科技有限公司拥有华南理工大学瞿金平院士发明的“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（简称 ERE 技术），将传统以剪切流变为主导的塑化输运方式，转变为以拉伸形变为主导的、熔体体积交替蠕动变化的塑化输运方式，突破了百年来高分子材料产业以“螺杆”为标志的发展模式，在 高分子材料加工技术发展史中具有里程碑式的意义。

Siiico Technology owns the patented technology of “Method and a Device for Plasticizing and Transporting Polymer Material based on Elongation Rheology” (referred to as ERE technology) invented by Academician Qu Jinping of South China University of Technology, which has transformed the plasticization of transportation process dominated by conventional shearing rheology to that dominated by elongational rheology and alternate peristalsis of melt volume. This revolutionary invention breaks through the development mode marked by “screw” in the polymeric material industry over one hundred years and will be a milestone for polymer processing.

## 核心优势

### Core Advantages

输运能力强，剪切作用弱，混合分散效果好，停留时间短且可精准设计，物理增容能力强。

Strong conveying capability, Weak shearing force, Homogeneous compounding and dispersion, Narrow distribution of residence time with precise control, Effective compulsory compatibility by physical means.

## 优势应用领域

### Advantaged Applications

- 极端流变高分子材料加工领域（如超高分子量聚乙烯、聚四氟乙烯等挤出加工）
- 热敏感高分子材料加工领域（如生物降解材料加工）
- 需要强制增容的复合材料加工领域（如胶粘剂连续挤出生产）
- 需要混合分散且同时成型挤出的高分子材料加工领域（如PVA薄膜一步生产法）
- 需要严格控制物料停留时间的高分子材料加工领域（如相容剂的生产）
- Processing of polymer material with extreme rheological properties (e.g extrusion of UHMW-PE, PTFE)
- Processing of thermal sensitive materials (e.g Biodegradable Materials)
- Processing of composite materials required effective compulsory compatibility by physical means (e.g Continuous Production for Adhesive)
- Processing of polymer material required homogeneous compounding & dispersion, as well as direct forming (eg. One step for PVA Film Blowing)
- Processing of polymer material required with accurate control of residence time (e.g Production of Compatilizer)

ERE技术相关成果经国家部委鉴定为“国际首创、国际领先”水平，先后获得2014年中国发明专利金奖，2015年国家技术发明二等奖，2020年中国国际工业博览会CIIF大奖。核心技术已获得中国、美国、日本、欧洲等13个国家和地区的国际专利授权。

The core technology of ERE was awarded with “Gold Award of Chinese Outstanding Patented Invention” in 2014 , “the Second Prize of National Award for Technological Invention” in 2015 and “CIIF Award in the 22<sup>th</sup> Session China International Industry Fair” in 2020, which has been identified as “International Initiative and Leading Level” by Departments of National Ministries and granted patents in more than 13 countries and regions including China, U.S.A, Japan and Europe etc.



### 中国发明专利金奖

WIPO-SIPO Award for Chinese Outstanding Patented Invention



### 国家技术发明二等奖

The Second Prize of National Award for Technology Invention

# 超高分子量聚乙烯 ERE拉伸流变挤出设备

## ELONGATIONAL RHEOLOGY EXTRUDER FOR UHMW-PE

ERE 拉伸流变挤出设备系列是根据广东星联科技有限公司拥有的“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（简称 ERE 技术）进行研发及制造，配置超高分子量聚乙烯挤出专用结构，可实现超高分子量聚乙烯制品的高效、高性能挤出。

Elongational Rheology Extruder Series is developed and manufactured on the basis of patent technology “Method and a Device for Plasticizing and Transporting Polymer Material based on Elongation Rheology” (referred to as ERE technology) owned by Siiico Technology Co., Ltd. The core extrusion system of this series is especially designed structure for UHMW-PE extrusion, which succeeded in high efficiency processing of UHMW-PE with superior performance.

### 设备优势

#### Advantages of Equipment



#### 拉伸形变主导

可以很好地保持高分子材料的分子量以充分发挥材料自身性能

#### Dominated by Elongational Deformation

The molecular weight of the polymer material can be well maintained to give full play to the properties of the material itself.



#### 运输塑化能力强

可以建立高挤出压力，并保证稳定高速挤出

#### Strong Plasticizing Capability

High extrusion pressure can be established and kept stable extrusion with high-speed.



#### 混合分散能力强

可以通过特殊的混合结构以提升复合材料性能

#### Strong Compounding and Dispersing Capability

Composite performance can be improved through special hybrid structures.

### 技术参数

#### Technical Specification

设备型号 Model	转子直径 Dia (mm)	长径比 L/D	主电机功率 Motor Power (kW)	产量 Output (kg/h)	设备尺寸 Machine Size (mm)
ERE-30	30	24	5.5	20	2000×600×2500
ERE-40	40	22	18.5	50	3000×800×3000

备注：产量与材料相关，具体配置以合约为准，特殊规格可以定制。

Remarks: The output is subject to material itself and the specific configuration should take for contract for final criterion. Special specifications can be customized.

# 设备配置

## Main Configuration

### 控制系统

- 人性化设计, 操作便利
- 进口品牌元器件

#### Control System

- User friendly features for convenient operation
- Import brand components

### 自主研发的动力分配单位

- 承载能力高
- 5级高精度, 运动输出精准

#### Independently-developed Drive Distribution Unit

- High load-carrying capacity
- Grade 5 high precision, accurate motion output

### 主驱动电机

- 伺服电机 + 行星减速器
- 精准调速

#### Main Drive Motor

- Equipped with servo motor + planetary reducer
- Accurate speed regulation



专利号 ( Chinese Patent No. ): ZL 200810026054.X

### 功能设置

- 远程控制, 可配置远程模块进行远程监控和维护
- 主机称重计量喂料, 可进行精确的品质控制和“米重”或“产量”两种控制模式的切换

#### Functional Settings

- Remote control, remote modules can be configured for remote monitoring and maintenance
- Gravimetric system, provide with precise quality control and easy switching between “weight” & “output” control models

### 拥有自主知识产权的挤压系统

- 定子及转子构成
- 独特的复合运动方式
- 定子和转子相互啮合, 可根据需求增添混合分散等功能模块

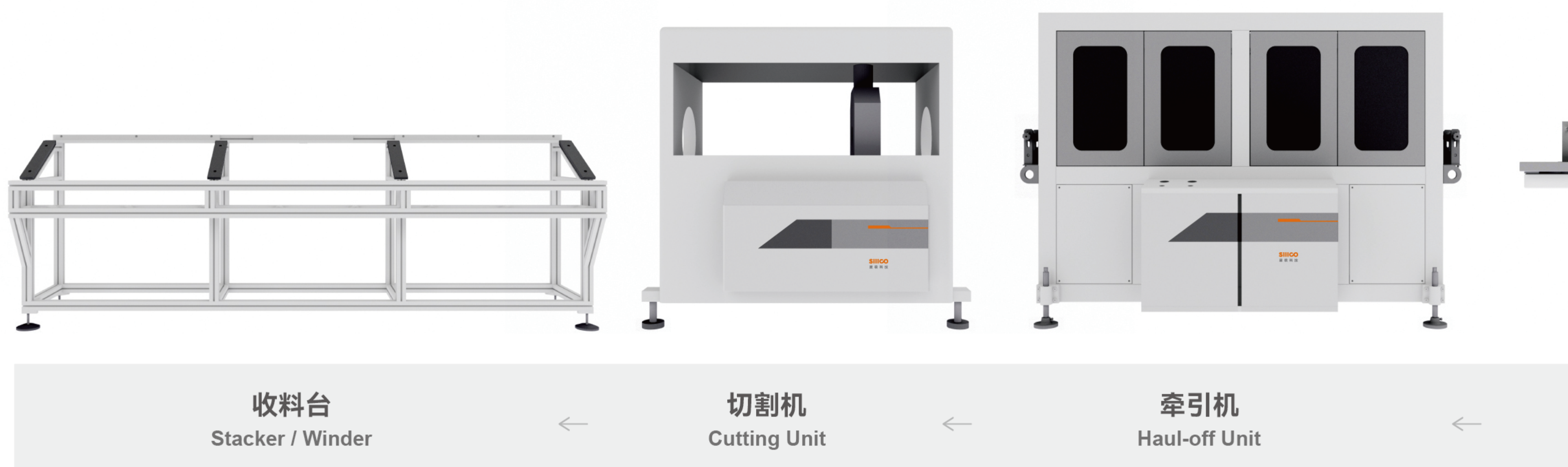
#### The Extrusion System with Independent Intellectual Property Rights

- Consist of rotor and stator
- Unique compound motion style
- The stator and rotor are engaged with each other and functional modules such as compounding & dispersing can be added depending on requirements

# 超高分子量聚乙烯制品生产线

## UHMW-PE PRODUCTION LINE

ERE 拉伸流变挤出设备系列是根据广东星联科技有限公司拥有的“基于拉伸流变的高分子材料塑化运输方法及设备”专利技术（简称 ERE 技术）进行研发及制造，配置超高分子量聚乙烯挤出专用结构，可实现超高分子量聚乙烯制品的高效、高性能挤出。设备挤出稳定，所产制品表面光滑，形状尺寸偏差小，具有耐磨性能好、力学性能强等特点。



## 管材 / 棒材生产线

### Pipe / Rod Production Line

设备类型: ERE-30 / ERE-40

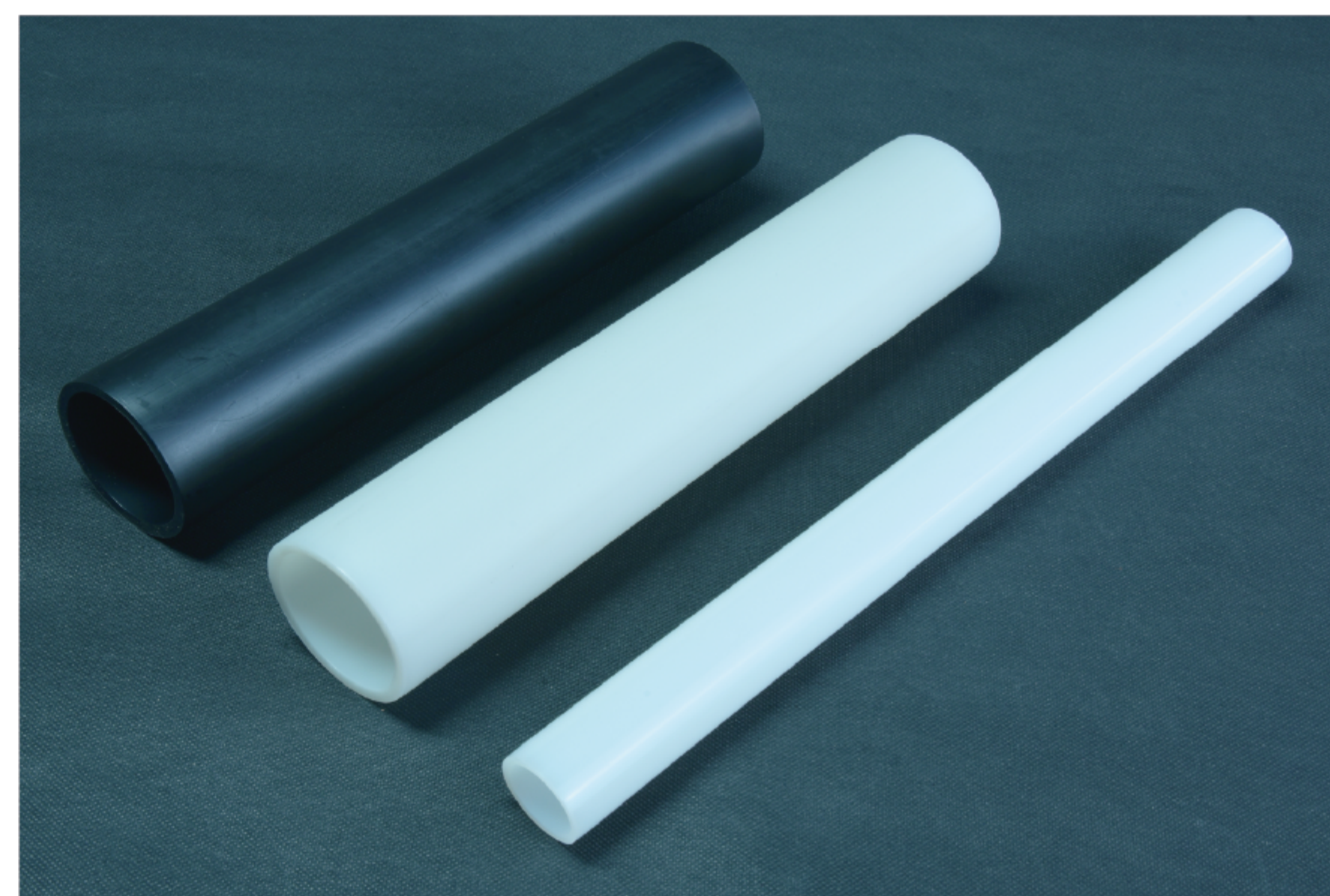
直径范围:  $\phi 20 - \phi 280$  mm

辅机配置: 定型台、冷却水槽（风箱）、牵引机、切割机、收料台

Extruder type: ERE-30 / ERE-40

Diameter range:  $\phi 20 - \phi 280$  mm

Auxiliary machines: Calibrator, Cooling Tank (Bellow), Haul-off Unit, Cutting Unit, Pipe / Rod Stacker



## 异型材生产线

### Profile Production Line

设备类型: ERE-30 / ERE-40

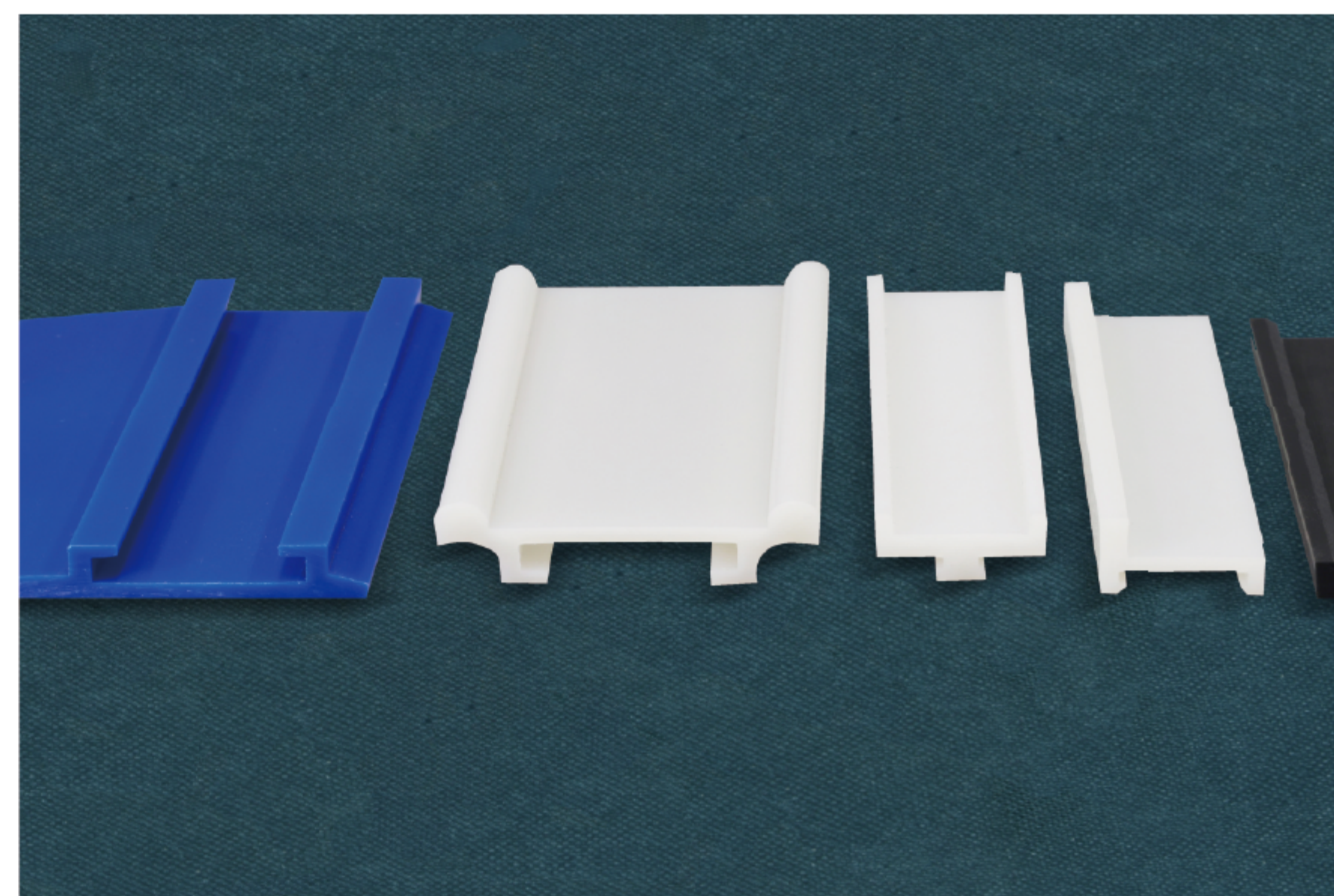
模具规格: 可根据客户需求定制

辅机配置: 定型台、冷却水槽、牵引机、切割机、收料台（收卷机）

Extruder type: ERE-30 / ERE-40

Mold specification: Can be customized according to customer requirements

Auxiliary machines: Calibrator, Cooling Tank, Haul-off Unit, Cutting Unit, Profile Stacker (Winder)



Elongational Rheology Extruder Series is developed and manufactured on the basis of patent technology “Method and a Device for Plasticizing and Transporting Polymer Material based on Elongation Rheology” (referred to as **ERE** technology) owned by Siiico Technology Co., Ltd. The core extrusion system of this series is especially designed structure for UHMW-PE extrusion, which succeeded in high efficiency processing of UHMW-PE with superior performance. The machine works stably and the product extruded has the characteristics of good wear resistance and strong mechanical properties with smooth surface, little deviation of shape and size.



## 板材生产线

### Sheet Production Line

设备类型: **ERE-30 / ERE-40**

宽度范围: 60-1200 mm

厚度范围: 2-30 mm

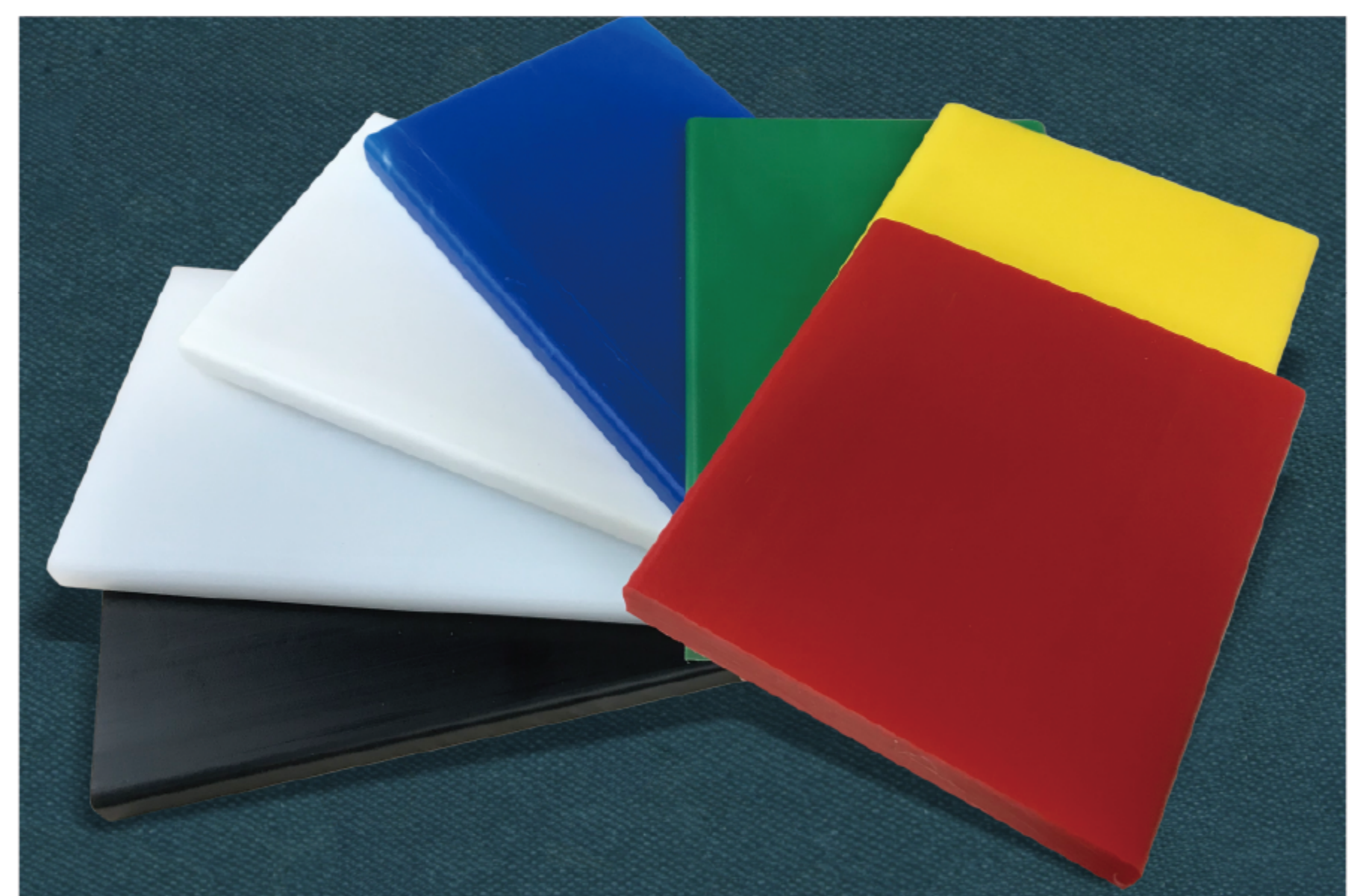
辅机配置: 定型台、冷却水槽、牵引机、切割机、收料台

Extruder type: **ERE-30 / ERE-40**

Width range: 60-1200 mm

Thickness range: 2-30 mm

Auxiliary machines: Calibrator, Cooling Tank , Haul-off Unit, Cutting Unit, Sheet Stacker



## 片材生产线

### Film Production Line

设备类型: **ERE-40**

最大宽幅: 1600 mm

厚度范围: 0.3-2 mm

辅机配置: 多辊牵引机、冷却架、切割机、收卷机

Extruder type: **ERE-40**

Max. width: 1600mm

Thickness range: 0.3-2 mm

Auxiliary machines: Multi-roller Haul-off Unit, Cooling Bracket, Cutting Unit, Winder



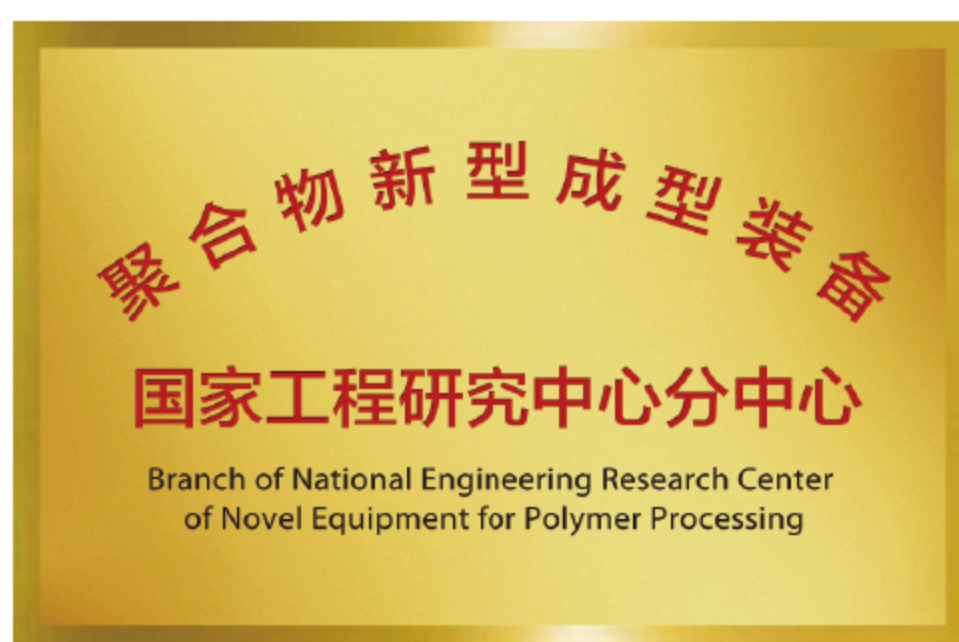
# 荣誉资质

## HONORS & QUALIFICATIONS



中国发明专利金奖、国家技术发明奖、专利证书

China Invention Patent Gold Award, National Technology Invention Award, Patent Certificates



聚合物新型成型装备  
国家工程研究中心分中心

Branch of National Engineering Research Center  
of Novel Equipment for Polymer Processing



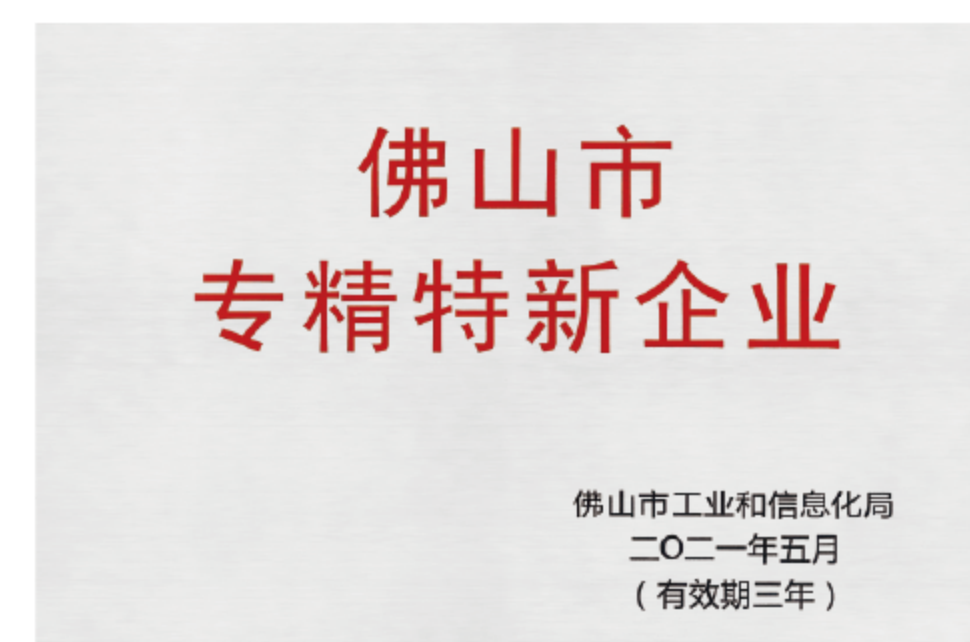
广东省高分子产品智造  
技术研究院分院

Branch of Guangdong Intelligent Manufacturing  
Research Institute for Polymer Product



高新技术企业

National High-Tech Enterprise



佛山市  
专精特新企业

佛山市专精特新企业

Foshan Specialized, Refinement, Differential  
and Innovation Enterprise

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星联科技官网  
Website



星联科技公众号  
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