

XINDA is located in the southern suburb of a scenic city named Jiangyin which is only two-hour drive from Shanghai. Our company is on the Huangtang exit of Huning expressway.

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CABLE COMPOUNDS
电缆料应用

**XINDA CO-KNEADER FOR
CABLE COMPOUNDS**

PVC / HFFR / Semicon / Peroxide / Silane XLPE

**新达往复式单螺杆混炼挤出机
在电缆料行业中的应用**

PVC / 低烟无卤阻燃 / 半导屏蔽 / 化学交联 / 硅烷交联 电缆料

Jiangsu Xinda Tech Limited
江苏新达科技有限公司

About XINDA

XINDA, founded by Mr.Kong Xiangming in 1988, is a prominent enterprise known for its outstanding products and perfect service in areas both domestic and abroad. The main products are compounding systems(Co-Kneader & Twin screw extruder), plastics recycling equipments, color masterbatches and various polyesters staple fibers. XINDA products have been sold to over 70 countries and regions worldwide.

In 1999, the first set of reciprocating kneading and extruding system in China was developed by Xinda. On March 16, 2000, a team of seven experts, including Professor Geng Xiaozheng from Beijing University of Chemical Technology and Professor Zhao Anchi from Tsinghua University, conducted a thorough inspection and certification of the machine. Later, on July 10 of the same year, the China Plastics Processing Association, led by President Liao Zhengpin, officially recognized the machine. The experts unanimously agreed that the successful development of the reciprocating kneading and extruding system filled a significant gap in the domestic market, ending the reliance on imports. This innovation addressed the limitations of twin-screw extruders, allowing for efficient shearing, orientation, cutting, folding, and stretching of materials, resulting in superior dispersion and mixing.

新达集团是一家由孔祥明先生于1988年创立，致力于向海内外客户提供优质产品和服务的知名企业。我们的主要产品有：往复式混炼挤出机、剖分式同向平行双螺杆混炼挤出机、塑料回收再生成套设备、涤纶色母粒和涤纶短纤维。新达产品远销世界70多个国家及地区。

1999年我国第一台往复式单螺杆混炼挤出机诞生于新达公司。2000年3月16日，北京化工大学耿孝正教授、清华大学赵安赤教授、轻工业塑料研究所刘英俊、高工等7名专家亲临现场对该机进行了考察和认证。同年7月10日，中国塑料加工协会廖正副理事长亲自主持鉴定，与会专家一致认为：**往复式混炼挤出机的研制成功填补了国内空白，结束了我国不能独立制造，长期依靠进口的历史，弥补了双螺杆挤出机只能对一薄层物料进行剪切的缺陷，对物料进行剪切、取向、切割、折叠、拉伸，达到高效的分散和分布混合。**



Certificate



XINDA in Cable Compounding Industry

XINDA Co-Kneader is used by well-known cable companies worldwide, specializing in the production of PVC, HFFR, XLPE, PEX cross-linkable and semi-conductive cable compounds.

新达设备在电缆料行业的应用

新达往复式单螺杆混炼挤出机被国内外知名电缆公司广泛采用，专业生产PVC、HFFR、XLPE、PEX交联电缆和半导电屏蔽等电缆料。

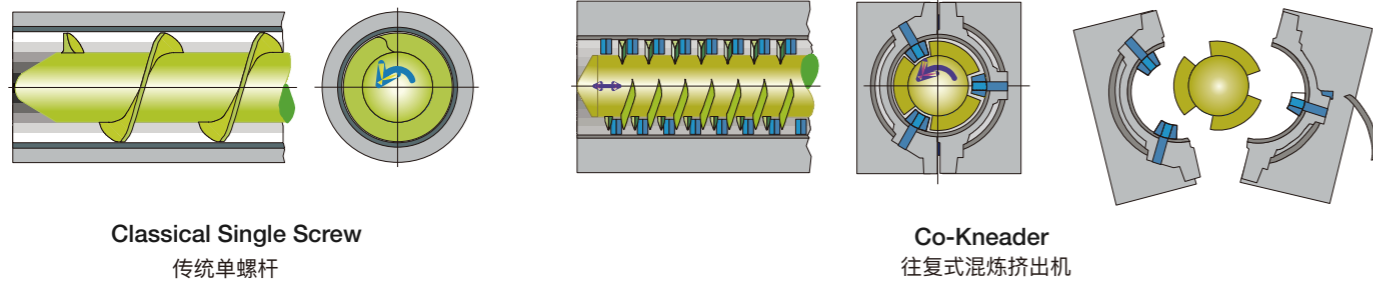
Co-Kneader Advantages

- Gentle shearing
- Precise temperature control
- Low process temperature
- Uniform distribution of various additives
- High filling rate of inorganic powder
- Flexible screw configurations

往复式优势

- 柔和的剪切
- 精确的温度控制
- 软化点加工
- 高效分散各种添加剂
- 无机粉体填充率高
- 灵活的螺杆组合

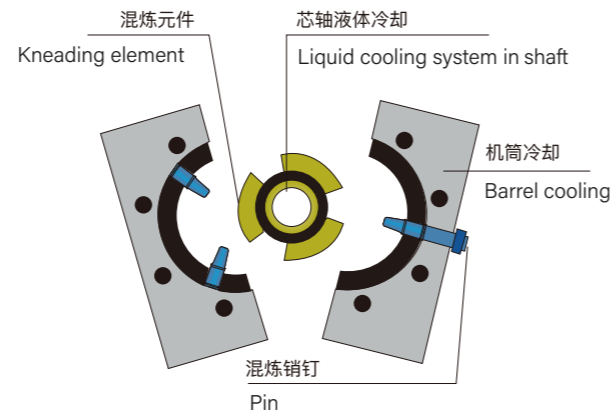
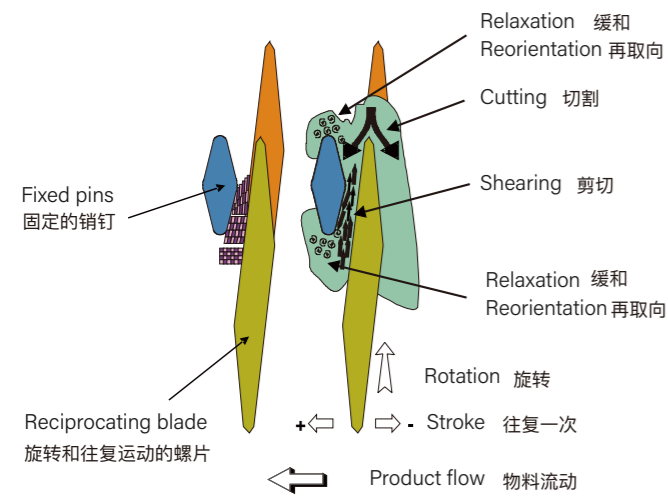
Working Principle 工作原理



Classical Single Screw
传统单螺杆

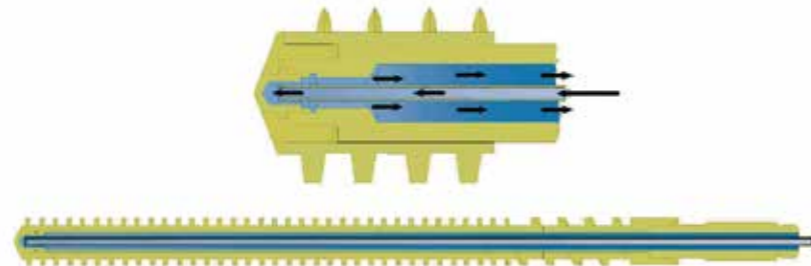
Co-Kneader
往复式混炼挤出机

Shear Mechanism in the Co-Kneader 往复式混炼挤出机的剪切机理

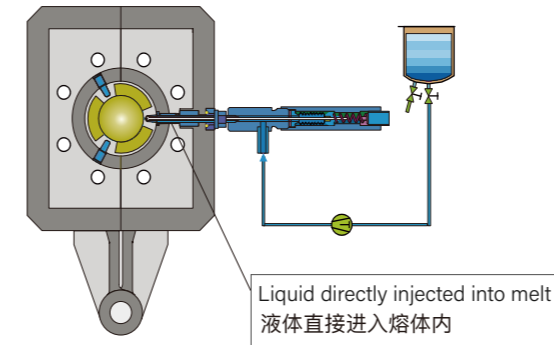


Temperature Control 温度控制

Barrel : Liquid or electrically heated/water cooled
机筒：液体或电加热 / 水冷却
Shaft : Liquid heated/cooled
芯轴：液体加热 / 冷却



Liquid Injection System 液体注射系统



The liquids are directly injected into the melt at the appropriate time and place
液体在适当的时间和位置直接注入熔体内

The process is extremely accurate, safe and hazard free
工艺过程准确、安全和无害

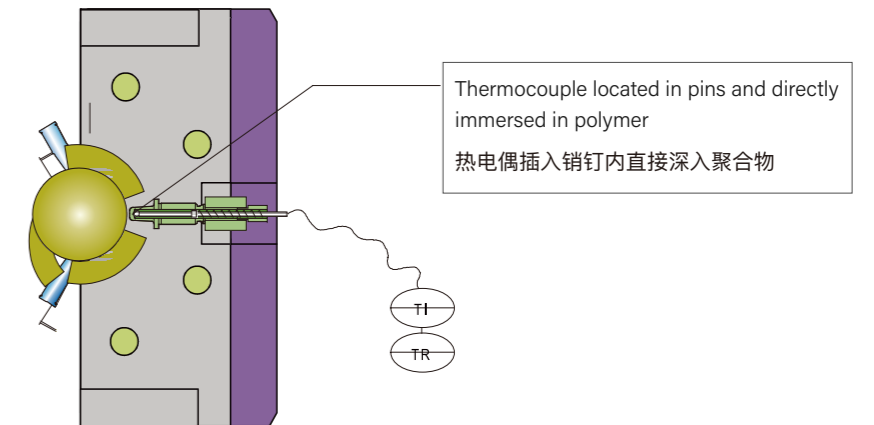
There are no losses due to volatilisation and no deposits on metal surfaces
无挥发带来的损耗，在金属表面无附着

Hollow Pins for Thermocouple 热电偶插入销钉内

Direct immersion in polymer
直接深入聚合物内

Precise melt temperature
准确的熔体温度

Temperature stability of the process
加工过程中物料受热均匀



Easy adaptation of screw configuration 螺杆结构易于调整

The screw consists of individual elements, that can easily be exchanged or replaced

积木式螺杆、易于调节螺纹元件组合

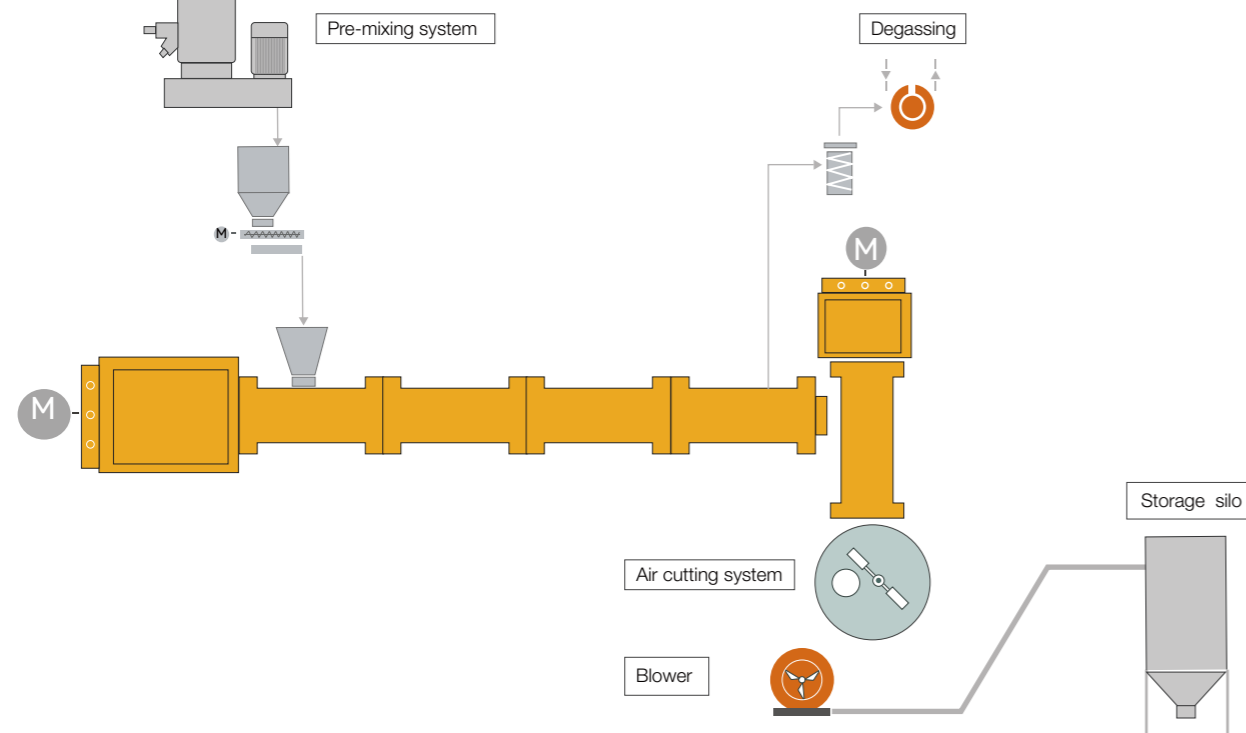
PVC Cable Compounds PVC电缆料

PVC cables are now widely used in various electrical applications because of the advantages of PVC such as chemical resistance, water resistance, heat resistance, robustness, elasticity and flexibility. Due to its excellent properties, PVC is mainly used for wire insulation or cable jackets.

聚氯乙烯电缆具有耐化学性、耐水性、耐热性、坚固性、弹性和柔韧性等优点，现已广泛应用于电气领域。由于其优异的性能，聚氯乙烯主要用于电线绝缘或电缆护套。



Layout 流程图



PVC cable compounds feature diverse temperature resistance levels and formulas, incorporating numerous additives. Achieving a uniform melt requires even dispersion of these additives, and maintaining low processing temperatures is crucial for high-quality products.

Co-Kneader offers key features to meet these mixing needs:

- ④ The screw profile can be changed by adjusting the order of the segmented screw elements and liners, allowing the same machine to handle various formulations
- ④ Multiple flights and pins enhance kneading, ensuring even distribution of additives in the melt
- ④ Temperature probes inserted into pins in each processing zone provide accurate real-time melt temperatures, enabling tight control over the process temperature

PVC电缆材料具有不同的耐高温等级和配方，并添加了许多添加剂。实现高效混炼需要对这些添加剂进行均匀分散，同时保持低加工温度对高质量产品至关重要。

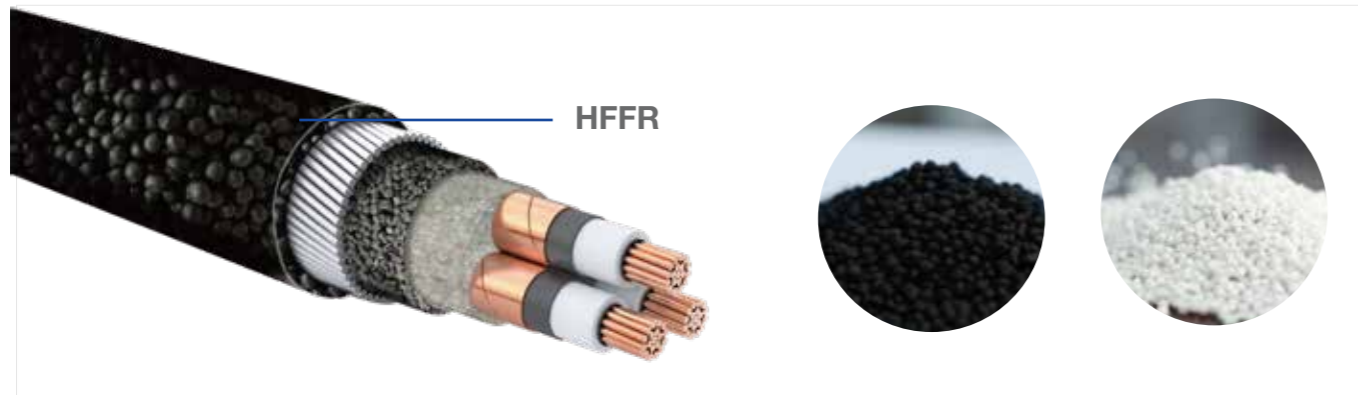
新达往复机提供了满足这些混合需求的关键特点：

- ④ 可通过调整模块化设计的螺杆和衬套的顺序，改变螺杆形状。同一台机器可以满足各种配方的加工需求
- ④ 混炼螺片和销钉之间相互作用，确保添加剂在熔体中的均匀分布
- ④ 插入销钉的温度传感器提供每个加工区准确的实时熔体温度，使工艺温度控制更加精确

HFFR Cable Compounds 低烟无卤阻燃电缆料

HFFR cable is the short form of Halogen Free Flame Retardant cable. Unlike the PVC cable, the materials used in HFFR cable insulation and sheath have been produced as a material that does not conduct flame and poison for a certain time during fire incidents, thus people trapped in fire can have better chances for their rescue. HFFR materials are produced by compounding EVA, PP and PE polymers with ATH (aluminum trihydroxide) or MDH (magnesium hydroxide) in a proportional ratio. HFFR cables are now widely used in indoor buildings, such as airport, subway, hospital, school, shopping mall, office building, and etc.

HFFR电缆是无卤阻燃电缆的简称。与PVC电缆不同的是，HFFR电缆的绝缘和护套材料是在火灾事故中一定时间内不传导火焰和毒性的材料，因此被困在火灾中的人员有更好的获救机会。HFFR材料是由EVA、PP和PE聚合物与ATH(三氢氧化铝)或MDH(氢氧化镁)按比例复配而成。HFFR电缆目前广泛应用于机场、地铁、医院、学校、商场、写字楼等室内建筑。

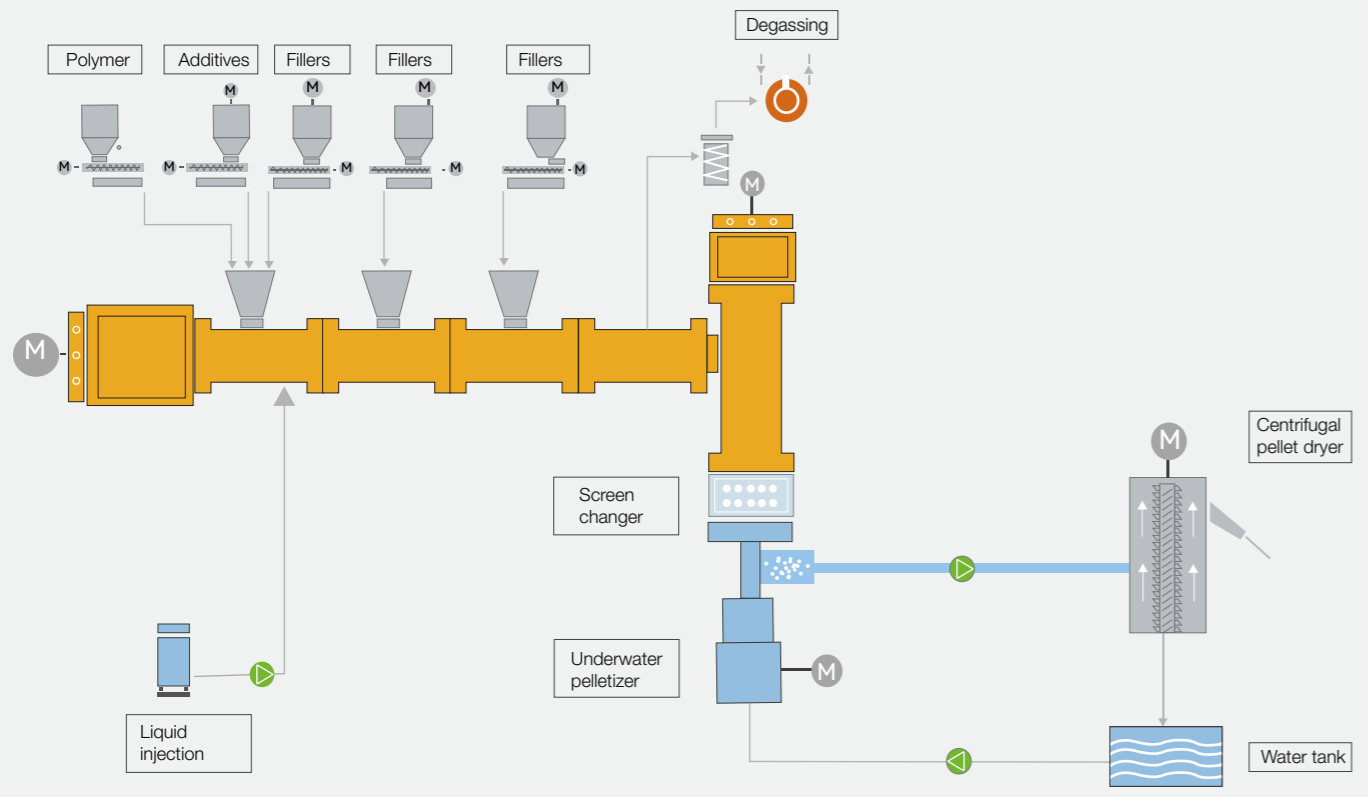


The processing temperature range for ATH and MDH filling materials are relatively narrow, which increases the difficulty to process the HFFR cable compounds. The unique working principle of the Xinda Co-Kneader makes it an ideal equipment in HFFR cable compounds application.

由于氢氧化铝和氢氧化镁无机填充材料的加工温度窗口相对较窄，加大了低烟无卤电缆料的加工难度。新达往复机独特的工作原理，使之成为低烟无卤电缆料的理想加工设备。

- ⊙ The L/D is short, and the axial and radial mixing are carried out simultaneously to ensure the best dispersion and distribution mixing effect. Its homogenization time is short, minimizing the residence time of the material in the barrel
- ⊙ The real melt temperature is measured by the thermocouples inserted into the pins, the temperature curve is uniform, and the process parameters are stable and reliable. the temperature control accuracy can reach $\pm 1^{\circ}\text{C}$
- ⊙ The unique screw design can meet the high filling requirement of inorganic flame retardant fillers
- ⊙ It can be matched with upstream and downstream equipment, such as feeding system, melt pump, pelletizing system, etc. according to different process requirements
- ⊙ 长径比短,轴向和径向同时混炼,保证最佳分散和分布混合效果,均化时间短,减少物料在机筒的停留时间
- ⊙ 通过温控销钉测得熔体真实温度,温度曲线均匀,工艺参数稳定,可靠,温控精度可达到 $\pm 1^{\circ}\text{C}$
- ⊙ 独特的螺纹设计可满足高比例的无机阻燃剂填充要求
- ⊙ 可根据不同工艺需求,搭配上下游设备,如喂料称、熔体泵、切粒系统等

Layout 流程图



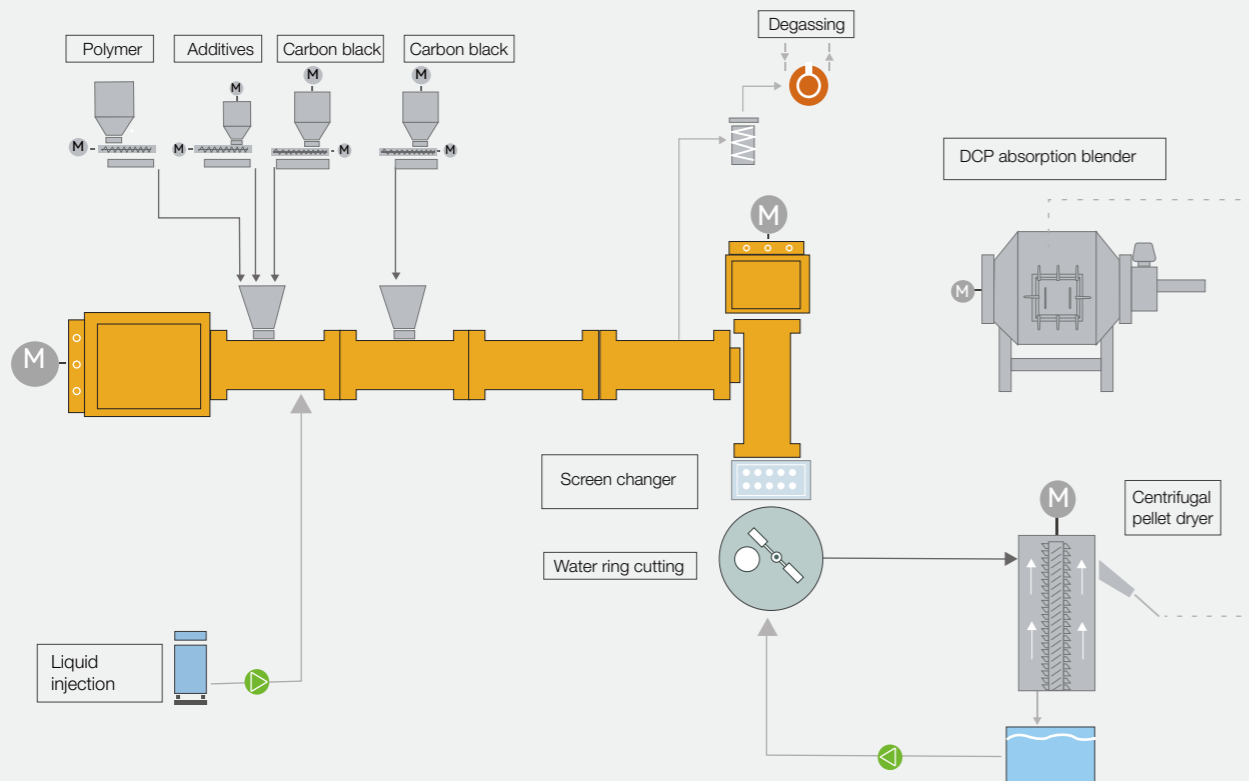
Semi-conductive Cable Compounds 半导屏蔽电缆料

Semi conductive cable compounds are used in the wire and cable industry as two semi conductive layers for enclosing crosslinked Polyethylene (XLPE) layer to ensure the insulation performance of medium voltage and high voltage power cables. The production process requires that the conductive carbon black structure is not destroyed, highly dispersed into polymer matrix and evenly distributed to the melts for obtain a homogeneous compound. At the same time, polymer is required to be degraded as little as possible.

半导屏蔽电缆料在电线电缆行业中,作为包裹交联聚乙烯 (XLPE) 层的两层半导电屏蔽层,以保证中压和高压电力电缆的绝缘性能。生产工艺要求导电炭黑结构不被破坏,高度分散到聚合物基体中,并均匀分布到熔体中,以获得均匀的化合物。同时,要求聚合物的降解程度尽可能低。



Layout 流程图



Since XINDA Co-Kneader can realize the perfect dispersion of high structured carbon black into the polymer matrix. Xinda Co-Kneader becomes the ideal choice of manufacturing the semi-conductive compounds. It can help achieve the desired conductivity with excellent distribution of the carbon black without damaging the original structure of the carbon black.

新达往复机可实现高结构炭黑在聚合物基体中的完美分散,是制造半导屏蔽电缆料的理想选择。它可以在不破坏导电炭黑原有结构的情况下,使炭黑的分布良好,从而达到理想的电导率。

- ⊙ High dispersion of carbon black
- ⊙ High filling rate of carbon black
- ⊙ Flexible liquid injection position
- ⊙ Gentle shearing minimize damage to high structure carbon black
- ⊙ Precise temperature control minimize polymer degradation
- ⊙ Flexible screw configuration
- ⊙ 炭黑分散性好
- ⊙ 炭黑填充率高
- ⊙ 灵活的液体注射位置
- ⊙ 温和剪切从而减少对高结构炭黑的破坏
- ⊙ 精确的温度控制以减少聚合物降解
- ⊙ 灵活的螺杆组合

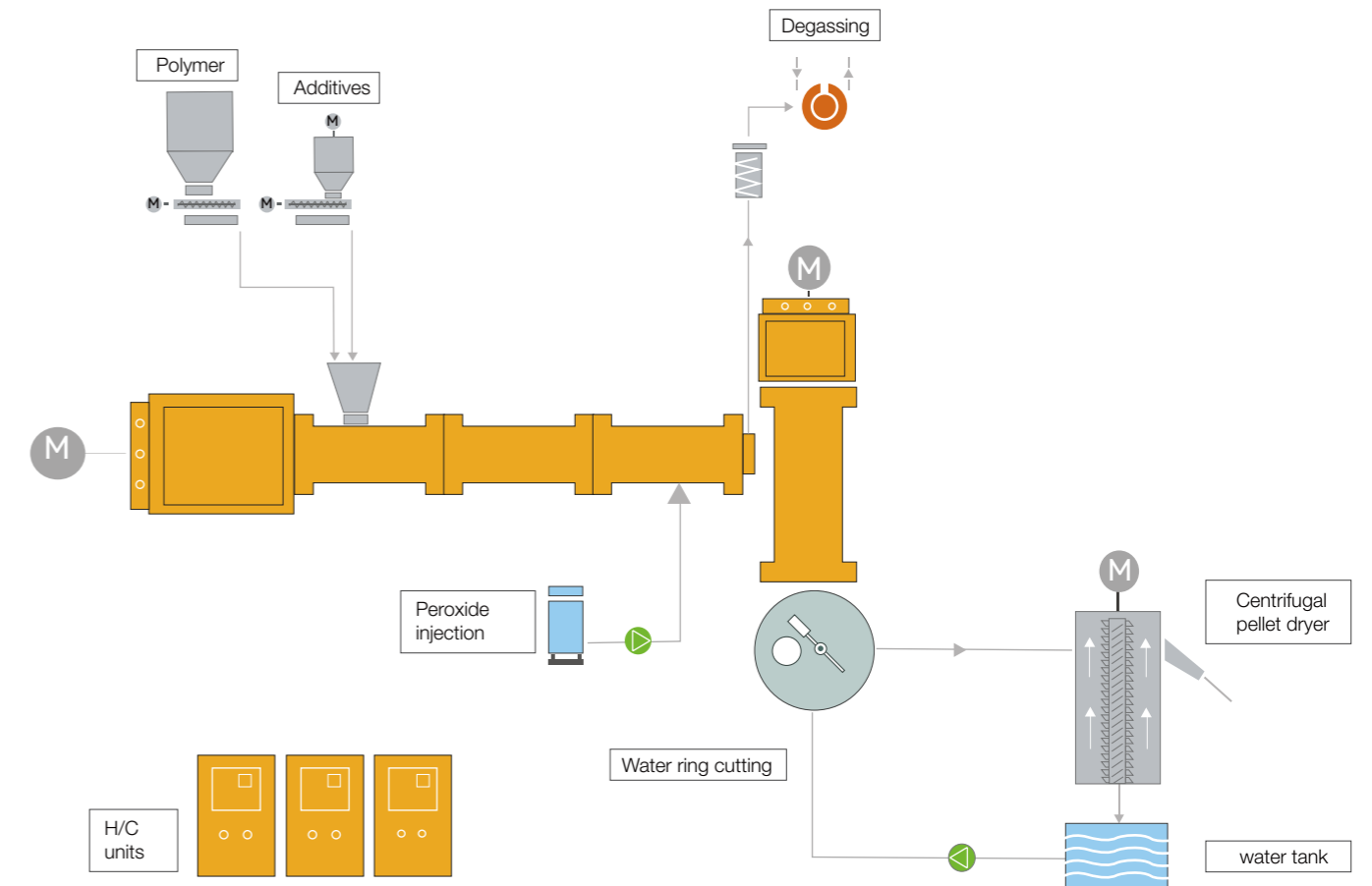
Peroxide XLPE Cable Compounds 化学交联电缆料

During the process of peroxide XLPE (Peroxide cross-linkable polyethylenes) cable compounds, the temperature processing range is quite narrow. With the unique working features of mild shear and kneading efficiency, XINDA Co-Kneader can ensure the precise temperature control to avoid the least polymer breakdown. Besides, the peroxide liquid can be injected into the molten polymers through any pin positions.

在过氧化物交联聚乙烯(XLPE)电缆料的合成过程中,工艺温度范围很窄。新达往复机具有温和剪切和高效混炼的独特工作特点,可确保精确的温度控制,有效避免聚合物的分解。此外,过氧化物液体可以通过任何销钉位置注入熔融聚合物中。



Layout 流程图



XINDA Co-Kneaders are ideal for producing peroxide-based cross-linked polyethylene (XLPE) cable compounds due to their efficient mixing and temperature control.

- ⊙ Ensure uniform dispersion of material components, which is crucial for the stability of cable performance
- ⊙ Accurate temperature control prevents premature curing of peroxides, maintaining stability during processing
- ⊙ Efficient shear forces break down agglomerates while minimizing residence time, reducing the risk of unwanted reactions
- ⊙ Co-Kneader split barrels and detachable single screw design makes ease of cleaning

新达往复机具有高效的混合和温度控制功能,是生产过氧化物基交联聚乙烯(XLPE)电缆化合物的理想设备。

- ⊙ 确保物料成分均匀分散,这对电缆性能的稳定至关重要
- ⊙ 精确的温度控制可防止过氧化物过早固化,保持加工过程中的稳定性
- ⊙ 高效剪切可分解团聚体,同时最大限度缩短停留时间,减少不必要反应的风险
- ⊙ 往复机的剖分式机筒以及下阶分离式单螺杆设计,方便拆装清洗

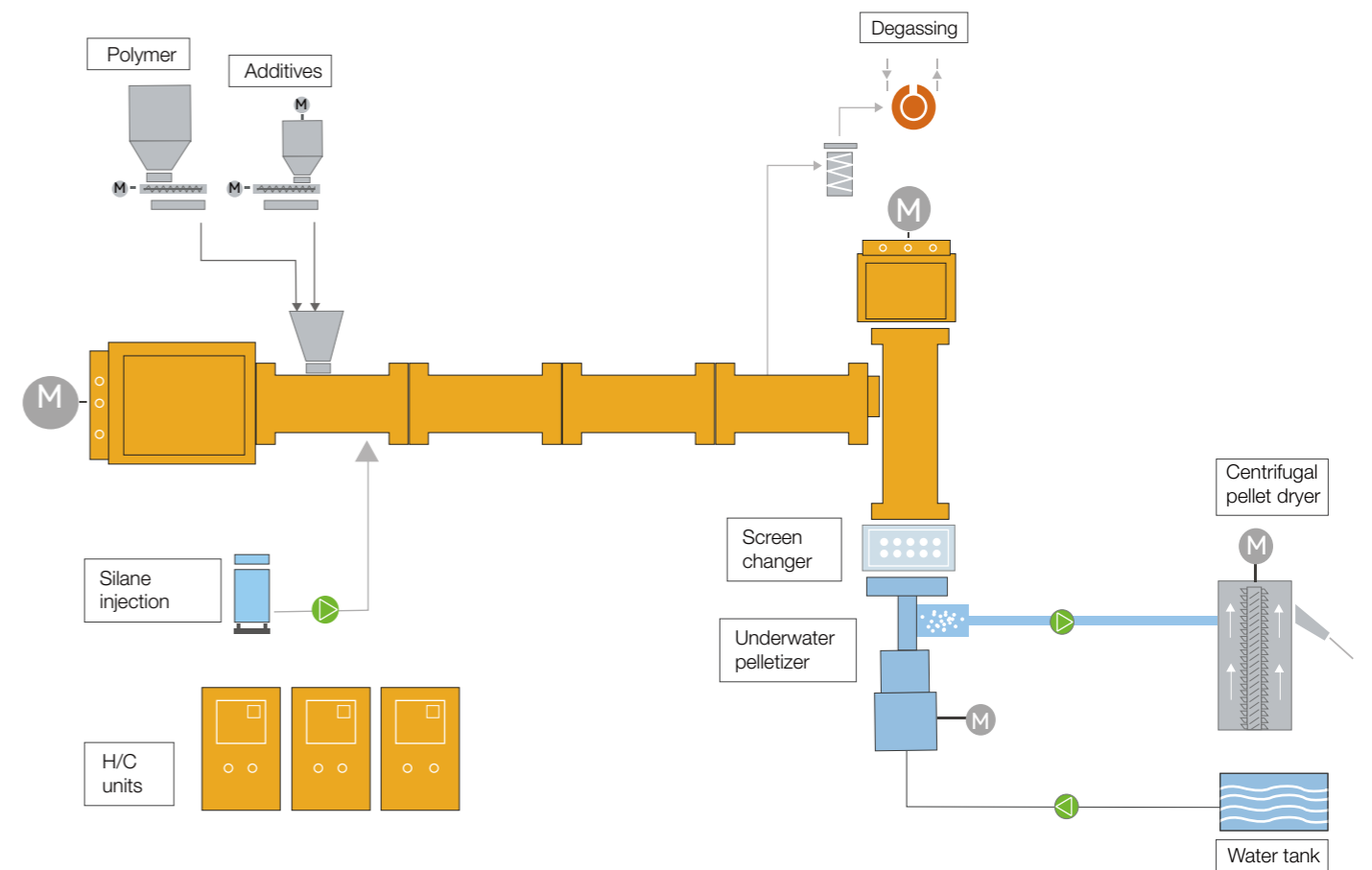
Silane XLPE Cable Compounds 硅烷交联电缆料

Silane cross-linkable PE cable is a chemically crosslinkable polyethylene compound which makes it possible to use in applications with higher temperature requirements that exceed the temperature stability of normal thermoplastic grades. Silane cross-linkable PE compounds have been well proven as the most cost-effective materials and are widely applied for cable insulation up to 10 kV.

硅烷交联PE电缆是一种化学交联聚乙烯化合物,可以用于温度要求高的电缆材料,具有超过正常热塑性塑料等级的温度稳定性。硅烷交联聚乙烯电缆料已被证明是最具成本效益的材料,广泛应用于10kv以下的电缆绝缘。



Layout 流程图



XINDA Co-Kneaders are well-suited for producing silane cross-linked polyethylene (XLPE) cable compounds due to their exceptional mixing and processing capabilities.

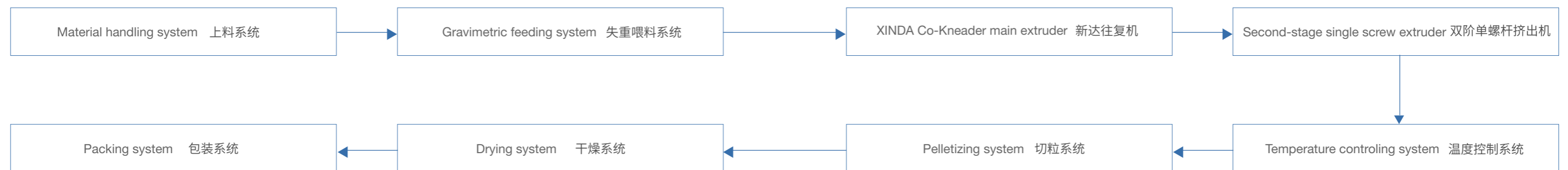
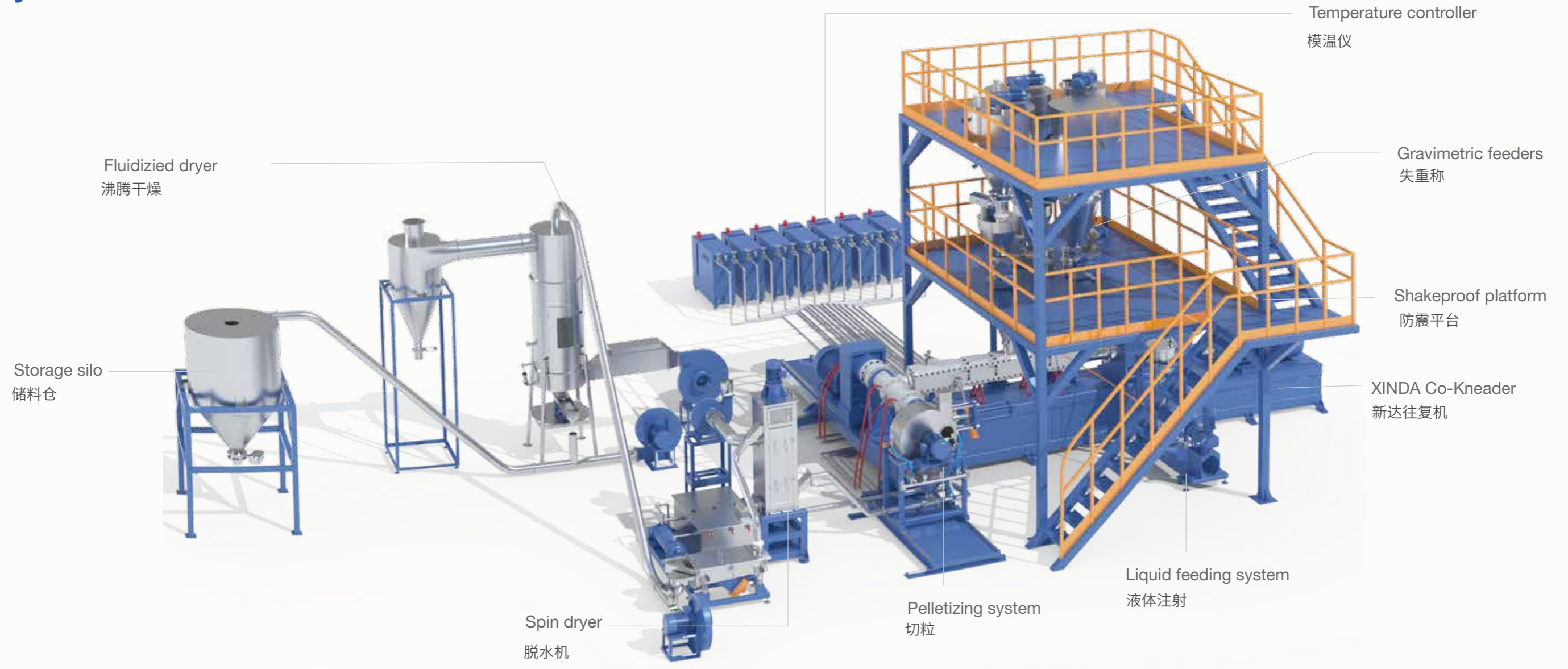
新达往复机非常适合生产硅烷交联聚乙烯 (XLPE) 电缆料,因为它具有卓越的混合和加工能力。

- Ability to achieve thorough and uniform dispersion of silane coupling agents and other additives, which is essential for ensuring consistent material properties.
- Precise temperature control offered by Co-Kneader is crucial for managing the reactivity of silane compounds during processing. This helps prevent premature cross-linking and ensures optimal curing conditions.
- Efficient shear forces facilitate the breakdown of agglomerates, while the design minimizes residence time, reducing the risk of unwanted reactions.

- 实现硅烷偶联剂和其他添加剂的彻底均匀分散,这对于确保材料性能的一致性至关重要
- 能精确控制硅烷化合物在生产过程中的加工温度,防止过早交联,并确保最佳的固化条件
- 高效剪切有利于分解团聚体,同时最大限度地缩短了停留时间,减少不必要反应的风险



Turn-key solution 交钥匙工程



XINDA Co-Kneader Product Series

新达往复机产品系列

SJW Series Three-flight Co-Kneader SJW三螺片往复机组

Specification 规格型号	SJW-45	SJW-70	SJW-100	SJW-140	SJW-200
Screw Diameter 螺杆直径 mm	45	70	100	140	200
Length Diameter Ratio 长径比	20~25	20~25	20~25	20~25	8
Main Motor Power 主电机功率 kW	15~30	55~75	90~132	160~220	350~450
Max.Screw Speed 螺杆最大转速 rpm	350	350	400	350	200
Reference Output 参考产量 kg/hr	40~60	100~250	300~500	600~1000	1000~1300

SKW Series Four-flight Co-Kneader SKW四螺片往复机组

Specification 规格型号	SKW-85	SKW-105	SKW-125	SKW-140	WKS-120 (PVC)
Screw Diameter 螺杆直径 mm	85	105	125	140	120
Length Diameter Ratio 长径比	18~22	18~22	18~22	18~22	10~15
Main Motor Power 主电机功率 kW	110~160	200~280	350~450	550~650	250~280
Max.Screw Speed 螺杆最大转速 rpm	500	500	500	500	500
Reference Output 参考产量 kg/hr	200~300	600~800	900~1200	1500~2000	1200~1800

Clients 合作客户

