Compounding Plants for the Cable Industry
Continuous Cable Compound Processing

The cable industry requires more and more consistency, reproducibility and consistent product cleanliness towards the use of continuous compounding systems.

Since founding, X-Compound manufactured and continuously developed suitable compounding plants for the processing of any kind of wire & cable materials.

Due to a high expertise X-Compound advanced to a market leader. X-Compound supplied complete compounding plants to important cable manufacturers.

The major demands are

- Accurate dosing
- Perfect dispersion and homogeneity
- Energy-saving process
- Versatility

The design and versatility of the process relevant parts allows a smooth and intensive kneading and mixing as well as the accurate control of the required process temperature profiles.
Halogen-free Flame Retardant Compounds (HFFR)

Flame retardant cable compounds are designed to have reduced flammability in order to protect the operation of the cable.

HFFR halogen-free cable compounds are the optimum solution for a broad range of cables meeting IEC fire test standards. Used for both insulation and jacketing, HFFR halogen-free cable compounds maximize value by providing superior process efficiency. Its innovative low-density formulation increases yield, lends to minimizing waste and processes under lower extruder motor load.

Applications

> Low price cables for buildings, ultrathin wires for automobile up to military/aerospace cables

Advantages of the X-Compound Kneader Technology

> Work in of high filler content up to 80% by a split feed system
> Special degassing system related to the kneader and the product inlet zones to allow optimal filler-intake
> Injection of coupling agent liquids into the melt
> Accurate process temperature control to prevent degradation of the fillers. (e.g. ATH < 185°C)
> High flexibility for the processing of a large variety of compounds with a unique screw profile
PVC Cable Compounds

A significant role in the cable industry is the use of PVC insulation material. The market share is worldwide more than 70% of the cable sector.

PVC cables are mainly used in the low voltage segment in applications as:

- Telecommunications
- Installations
- Machinery and equipment
- Automotive industry
- Household
- Communication- and control cables
- Semi conductive PVC cables

PVC cable compounds are divided into the categories

- Insulation
- Sheathing
- Bedding

For PVC compounding combined with the pelletizing system X-Compound use the established cascade kneader design.

Requirements, such as homogeneous gelification by controlling of product temperature and as well as dispersive distribution of the fillers and additives will implement superbly in the X-Compound Kneader. Furthermore a large operation window can be covered with a single screw configuration, which is decisive for frequently formulation changeovers.

Advantages of this two stage process are easily handling, fast recipe changeovers and excellent self cleaning behavior.

X-Compound offers

- Turn key projects
- Hybrid (PVC/HFFR) compounder
Cross-linkable PE Compounds (XLPE)

Peroxide cross-linkable XLPE (PEX-A)

The peroxide cross-linkable XLPE compounds are applicable for medium and high voltage cables.

The peroxide cross-linkable XLPE compounds have to fulfill exceptional demands in cleanliness and quality to reach high physical requirements on dielectric strength and lifetime.

The X-Compound inline process is designed as follows:

> In the first step the polymer with the additives (except peroxide) have to be mixed to a homogeneous well dispersed compound and fed through a high performance filter system to assure the highest possible purity degree.

> The second step contains the inline transport of the pure polymer pellet into a specially designed mixing tumbling machine which incorporates the peroxide mist over a controlled time period.

The process as described allows the production of super clean material on high throughput rates.
Cross-linkable PE Compounds (XLPE)

Silane cross-linkable XLPE (PEX-B)

Silane grafted (Sioplas) cross-linkable Polyethylene (XLPE) compounds are suitable for the use in the manufacture of low voltage as well as medium voltage cables up to 33 kV.

Independent steps:

1. Preparation of the grafted polymer
2. Cable extrusion with addition of catalyst masterbatch (~5%).

Both compounds are produced on the X-Compound Kneader. Due to economic reasons it is recommendable to buy the catalyst masterbatch from specialised manufacturing companies.

Advantages of the X-Compound Kneader

- Direct injection of silane into the polymer melt
- Minimum material deposits inside the process area due to the self cleaning kneader principle
- Perfect mixing behavior allows reduction of silane quantity
- Reproducible grafting reaction

Silane XLPE Line LV, MV
Semi Conductive Compounds

One of the key components in power cables are semi conductive compounds.

The main task on the manufacturing of semi conductive compounds is the perfect incorporation of high structure carbon black into the polymer matrix. In order to keep the required conductivity it is of importance to prevent any damage of the carbon black structure.

The X-Compound Kneader is well adapted to requirements as homogenizing and dispersing (break up of agglomerates), wetting and distributing of pigments, additives and fillers into the polymer matrix.

Advantages of the X-Compound Kneader Technology

- Uniform mixing and distribution of high structure carbon black
- Split feeding of conductive carbon black which permits high level of filler loading and minimize the critical formation of agglomerates
- Precise temperature control to prevent degradation of the heat sensitive polymers
- Smooth mixing process to avoid damage of the filler chain structure

Semicon Line

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XLPE Semicon
Special Applications

Speciality grades, and value added compounds are designated to make use of the specific features of the X-Compound Kneader technology.

The controlled shear effect of the X-Compound Kneader is the key to produce any kind of speciality compounds.

Following Specialty Compounds Requiring the X-Compound Kneader Technology

- EPDM/EPR elastomer cable compounds
- Irradiated, cross-linked compounds
- Thermal resistant Silicone cable compounds
- Tailor-made blends and alloys for specific mechanical and chemical resistance
- Additive blends used in the cable compounds
- Cable compounds with grafted chemistry
Control Systems & Service

Control Systems

X-Compound designs and builds complete control systems with visual displays for Turn key plants as well as for replacements or supplements to existing plants. On request we also manufacture less sophisticated control systems.

The application of existing peripheral plant components as well as their incorporation via Profibus network is also part of our standard programme.

Basically our control systems are designed as follows: A PC based Windows system which performs plant monitoring and controlling together with a programmable logic controller (PLC). The process and the plant are visualised using a series of on-screen pages and allowing interactive display and modification of current setpoint values and alarms.

Service

X-Compound is your reliable partner for the supply of spare parts covering oscillating single screw compounders of nominal size up to 600 mm.

X-Compound offers

> High quality, durable, and corrosion resistant
  - kneading elements
  - barrel liners
  - kneading teeth
>
> All spare parts, e.g.
  - screw shafts
  - worm shafts
  - lubrication pumps
  - process chamber sealing systems
  - die plates
  - pelletizing knife arms
>
> Interchangeable kneader barrels completely refurbished and guaranteed
>
> Any individual part for gear boxes or complete interchangeable gear boxes, all guaranteed

Our spare part service is well-known for

> High quality
> Low prices
> Short delivery times
## Technical Data

### Technical Data

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<th>Type</th>
<th>Screw diameter (mm)</th>
<th>Process length L/D</th>
<th>Speed max. rpm</th>
<th>Max. drive power (kW)</th>
<th>Screw diameter (mm)</th>
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### Process Data

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<th>Black Jacketing</th>
<th>PVC Insulation/ sheathing/ bedding</th>
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Subject to change without notice.
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