

Technical Specification For

0+3 Silane crosslinked cable production line

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Appendix 1:

Technical specification for 0+3 Silane crosslinked cable production line (can be extruded in layers)

This line is mainly applied for silane crosslinked cable production line of kilovolt voltage class. It is a warm-water crosslinking production line.

1. Main technical parameters:

1.1 Conductor: 25~500mm²

1.2 Voltage class: 6~15kV and under this voltage class

1.3 Extrusion thickness

a. Φ 65 extruder 0.5~2mm

b. Φ 90 extruder 0.5~2mm

c. Φ 120 extruder 2.5~6.6mm

1.4 Materials

Conductor: compressed Cu, aluminium stranded conductor

Conductor shield: silane crosslinked semiconducting inner shielding material

Insulating material: silane crosslinked material

Insulation shield: silane crosslinked semiconducting easy-strippable outer shielding material

1.5 Line speed: 0~60m/min

1.6 Extruder arrangement

Φ 65-25D+Φ 120-25D+Φ 90-25D

Horizontal type, each extruder can independently extrude product.

1.7 Energy consumption

Electricity: installation capacity 550kVA, 380V, 50Hz,
3-phase and 4-wire

Water: water pressure 0.2~0.6Mpa

Water consumption: 10m³/h (circulating water in reservoir)

2. Main equipment and technical requirements

2.1 End shaft pay-off stand 1 piece

Drum diameter: 1250~2500mm GB4004-84

Drum width: 950~1900mm

2.2 Caterpillar haul-off

Motor: Z4 DC motor 11KW

Pulling speed: 0~60m/min

Pulling force: 2t

2.3 Φ65-25D Extruder

Material of screw and barrel: 38CrMoAl

Hardness: >850HV

Heating and cooling way: electric heating and wind cooling

Temperature control accuracy: ±2℃

Motor: Z4 DC motor, 45KW

Extrusion output: 50L/h

L/D: 25:1

Heating Zone: 5 zones

Rotating speed of screw: 47rpm

This is used to extrude shielding layer or insulation layer.

2.4 Φ120-25D Extruder

Material of screw and barrel: 38CrMoAl

Hardness: >850HV

Heating and cooling way: electric heating and wind cooling

Temperature control accuracy: ±2℃

Motor: Z4 DC motor, 110KW

Extrusion output: 250L/h (silane material)

L/D: 25:1

Heating Zone: 7 Zones

Rotating speed of screw: 40rpm

This is used to extrude insulation layer.

2.5 Φ 90-25D Extruder

Material of screw and barrel: 38CrMoAl

Hardness: $>850\text{HV}$

Heating and cooling way: electric heating and wind cooling

Temperature control accuracy: $\pm 2^{\circ}\text{C}$

Motor: Z 4 DC motor, 55KW

Extrusion output: 80L/h

L/D: 25: 1

This is used to extrude insulation layer or insulation shielding layer.

2.6 Triple-layer crosshead

Application: When to produce crosslinking cable of 6~15 KV voltage class, conductor shielding layer, insulating layer and insulation shielding layer can be extruded at a time. When to produce double layer of crosslinking cable this voltage class, we can choose one of the three extruders to extrude the insulation layer in accordance with the manufacturing technique requirement.

Material: 38CrMoAl

Heating way: oil heating

Temperature control accuracy: $\pm 2^{\circ}\text{C}$

Conductor dia.: 6~22mm

Outlet wire dia.(max.): 41mm

Extrusion thickness:

First layer: 0.5~2mm

Second layer: 2.5~6.6mm

Third layer: 0.5~2mm

2.7 Warm and cooling water trough

Material: Stainless Steel 304,

Warm water section: 12m

Temperature control range: 60~80°C accuracy: $\pm 5^{\circ}\text{C}$

Cooling section: 36m

Two circulating water pumps and two 0.5m³ water tanks.

2.8 Drying device

To blow off the water drop on the cable surface.

2.9 Caterpillar haul-off

Motor: Z 4 DC motor, 7.5KW

Pulling speed: 0~30m/min

Pulling force: 2t

With a meter counter

2.10 End shaft take-up stand

Drum dia.: 1250~2500mm GB4004-84

Drum width: 950~1900mm

Traversing speed: 1~70mm

Take-up speed: 0~30m/min

2.11 Electrical and temperature control system

a. Main drive adopts Parker 590 series

b. RKC temperature control instrument is applied to machine body temperature control of three extruders.

Temperature accuracy is $\pm 2^{\circ}\text{C}$.

c. Display the electric current and voltage (rotation speed) of DC drive.

d. Temperature display of every temperature measuring point for warm water section.

e. Display of the line speed

f. Melt pressure display of three extruders

g. Synchronous control can be selected in the production line, and programmable logic controller (PLC) is applied to operate the line synchronously.

h. Acoustic-optical alarm system

Overpressure alarm for melt pressure of barrel on extruder.

Water pump stop alarm.

2.12 Accessories

a. A set of tools for disassembling the crosshead.

b. Tools for disassembling the screw of $\Phi 65$, $\Phi 90$ and $\Phi 120$ extruder. One set for each extruder.

c. Three sets of extrusion die-tools for test run

d. A tool car.

2.13 The following parts should be prepared by customer

a. Air and water connecting pipe and installation materials.

b. Wire and cable for installation (Supplier will offer cable table).

2.14 Acceptance of production line

After commissioning, test the production line with empty running. When both parties think everything is ok, conduct the trial production acceptance. In most cases, there are three specifications of big, medium and small size. See the specific specifications in the following table. (Supplier offers the die-tools)

Order No.	Specification	Voltage	Quantity
1	35mm ²	1kv	1000m
2	70mm ²	8.7kv	1000m
3	185mm ²	15kv	500m

The customer can also change the cable varieties according to the cable sales status. Both parties can make other discussion, but the die-tools will be prepared by customer.

This production line should accord with the requirements of

configuration clause in GB/T12706-2002 standard. It will be regarded as the inspection and acceptance of production line after the three specifications of cable from trial production line reach the standard.

Appendix 2:

Main Components

No.	Name of Equipment	Specification	Quantity
1	Pay-off stand	Φ 2500 mm (End shaft-type)	1 pc.
2	Caterpillar haul-off	Pulling force: 2t	1 pc.
3	Triple extrusion crosshead		1 pc.
4	φ 65 Extruder	L/D: 1: 25	1 pc.
5	φ 120 Extruder	L/D: 1: 25	1 pc.
6	φ 90 Extruder	L/D: 1: 25	1 pc.
7	Cooling water trough	Material: Stainless Steel 304 , length: 36m	1 set
8	Drying device		1 pc.
9	Caterpillar haul-off	Pulling force: 2t	1 pc.
10	Take-up stand	Φ 2500mm (end shaft type)	1 pc.
11	Electric control cabinet		1 set
12	Material feeding device for three extrudes &		1 Set

	dosing device for insulation material		
13	Oil heater of crosshead		2 pcs.
14	Sparker		1 pc.
15	Tooling accessories (dismantling tool)		1 set
16	Outer dia. measuring device		1 set