

**Manufacture of Rubber Extrusion Equipment
Expertise in Rubber Extrusion Process&Techniques
Customized Production Lines
Turn-key Engineering**



BAINA 浙江百纳橡塑设备有限公司
百纳 ZHEJIANG BAINA RUBBER & PLASTIC EQUIPMENT CO.,LTD.

Tel: +86-576-87685299 Fax: +86-576-87685311
M.B: +86-013606765832 E-Mail: xxw5832@zjbaina.com
Website: www.zjbaina.com
Video Website : http://www.zjbaina.net
ADD:18Chunhui Dong Road,Yong An Industrial
Zone,Xianju,Taizhou,Zhejiang,China



Website

浙江百纳

ZHEJIANG BAINA RUBBER&PLASTIC EQUIPMENT CO.,LTD



[→ COMPANY PROFILE](#)

Zhejiang Baina Rubber & Plastic Equipment Co., Ltd., was founded in 1998 with a total investment of USD 17.5 million which, is a professional manufacturer of complete plants and products of rubber and plastic. it is a national high and new technology enterprise, medium and small-sized enterprise of Zhejiang province, and municipal innovation pilot enterprise. Located in modern Industrial Zone, Xianju County, it covers area of more than 67,000 m², including building area of 60,000 m².

As a leader enterprise, Baina has focused on the development and production of rubber and plastic equipment and products for many years.

In term of the equipment our main products includes **rubber extruders, three (four) composite microwave vulcanization production line, salt bath (LCM) vulcanization production line, EPDM or NBR &PVC A/C insulation hose/sheet vulcanization production line, Yoga mat extrusion production line,steel edge rubber water stopper vulcanization production line, silicone rubber vulcanization production line.**

In term of the products, we have automotive air conditioning hoses, bathroom tubes, braided tubes, rubber sealing strips and low density EPDM sponge sheet.

Our equipment are exported to **Germany, Sweden, Italy, Spain, America, Japan, India, Russia, Israel, South Korea, Turkey, Saudi Arabia and over 32 countries.** Our annual output is more than 200 production lines. We offer equipment and technical support to more than 3000 famous rubber production enterprises in domestic and oversea market, and maintaining a long-term partners relationship.

Our company has a provincial research center with abundant R&D strength, cooperates with many domestic higher institutions, and also has advanced international rubber COTS and laboratory equipment. Recently, we have 32 authorized patents(includes 24 invention patents), and 12 provincial level scientific research projects such as national torch plan, national key new product project in the nearly three years. Some fields of our company have reached the international advanced level.

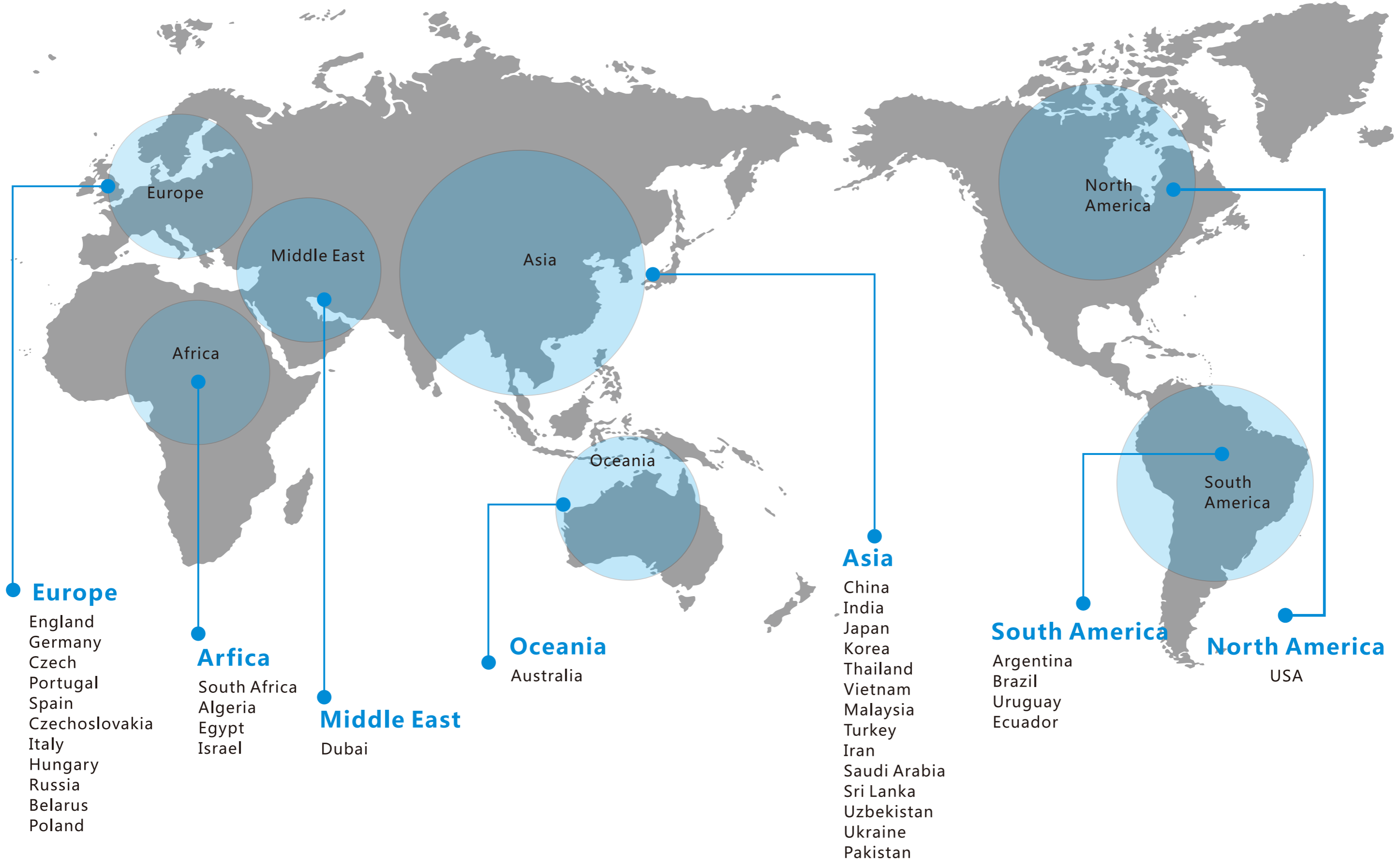
We sincerely invite customers from home and abroad to visit our company and look forward to make long-term cooperation and mutual benefits!



CLIENT LIST



Global sales network



CUSTOMIZED RUBBER EXTRUSION PROCESS

RUBBER TECHNIQUES AND TURN-KEY PROJECT



In the diversified rubber industry, innovative thinking and systematic research and continuous development are the key to success.

Over the past 20 years, BAINA has made continuous development in custom-made rubber equipment and adhesive formula technology, and has maintained a leading position in the world of rubber extruders, of which makes us proud.

BAINA equipment is able to meet the requirements of global customers including Germany, for producing and processing rubber products with high technical content, and also in tire and cable industries.

BAINA laboratory equipment and BAINA special machines can be found in laboratories of large rubber manufacturers all over the world.



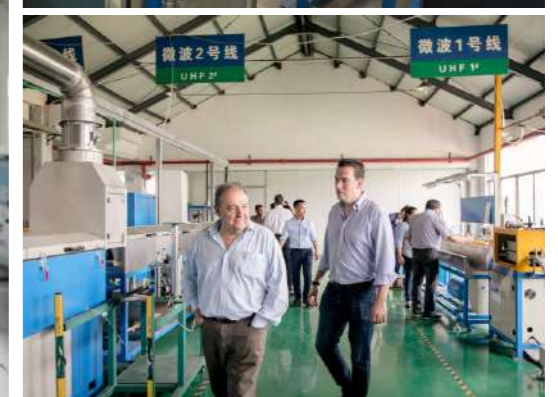
BAINA will carry out rigorous analysis and Research on all projects and production processes, and constantly improve and innovate the existing technology to enhance the competitive strength in the market according to the changing market.

BAINA is focused on the following aspects of the actual operation, thus ensuring the production of rubber equipment and production line to meet international standards, so that customers can eventually produce high quality rubber products.

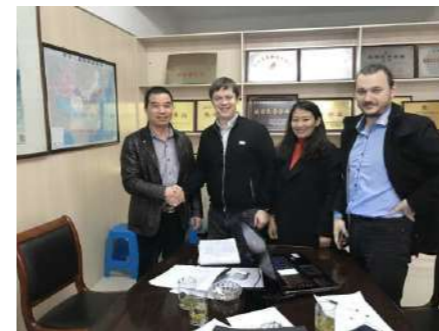
- 1、 independent research and development, production of rubber production line and the highest specification of extruder.
- 2、 network application technology and the actual operation of the production line into a quality management system.
- 3、 product inspection and systematic test, optimize production process control.
- 4、 Continuous innovation and research and development.

As the most extensive manufacturer in the field of rubber extrusion industry, BAINA can provide a full range of solutions for the following types of rubber products:

- 1、 Rubber strips for automobile and construction industry.
- 2、 Cooling water hose, turbocharger hose, fuel hose, automobile radiator hose, automobile A/C hose, cold shrink tube, etc. for all continuously extrusion rubber hoses.
- 3、 medical silicone hose, food grade silicone sealing strip, silicone tube.
- 4、 NBR&PVC and EPDM air conditioning insulation tube, insulation sheet.
- 5、 EPDM dash-proof adhesive strip
- 6、 rubber water stopper , steel edge water stopper.



→ Company scale



EXTRUDER DEVELOPMENT HISTORY

→ 10th Generation Rubber Extruder

Optimized from the 9th generation, Full import configuration is adopted for the whole machine.

German GWK temperature control system (accuracy up to $\pm 1^\circ\text{C}$) was adopted to improve the stability of rubber extrusion.

German Becker vacuum system is applied to improve the compactness and stability of rubber products.

Active feeding with Rossi frequency conversion reducer to drive independently to meet the technological requirements of different rubber.

HMI operating system is to realize information monitoring and remote control in PC or mobile APP.



→ The 9th generation rubber extruder (2018.08)



The 9th generation 90mm20D Vacuum type rubber extruder applied with Rossi reducer(Made in Italy) Italian Fitz servo motor(Made in Italy) (optional Siemens) Fitz servo driver(Made in Italy) (optional Siemens). The screw and cylinder sleeve are all made of Japanese material. The body of the machine is made of 38CrMoAl, which improves the coaxiality of the body assembly and prolongs the service life of the body and the screw. Full touch human-machine interface operation system can realize information reading and remote control on computer or mobile phone APP.

→ 8th Generation Rubber Extruder (2018)

Screw and barrel imported from another countries, screw can be moved forward and backward in order to extrude rubber products more stability; SERVO motor by Siemens brand (made in Germany) or PHASE(made in Italy),Control by all touch screen, you can control and see all data by computer or mobile' s APP. Remote monitoring working condition of rubber machines.



National Torch Plan project undertaker
High - tech enterprises



→ 7th Generation Rubber Extruder (2015 -2017)



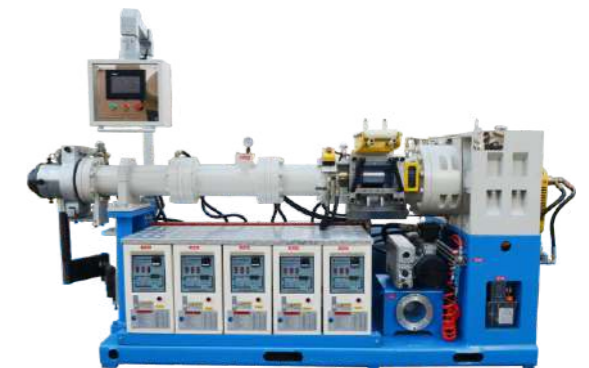
Applied with hand protection system at the feeding area on the basis of the 6th Generation Rubber Extruder,safety improved.Multistage filtration system for the vacuum system,effectively improve the service life of the vacuum pump.38CrMoAL alloy material integration body,no solder points,improving the coaxial degree of the fuselage assembly to prevent barrel scratching phenomenons,enhancing the barrel processing precision as well as adopting the nitriding treatment, the rubber screw is treated by spraying alloyservice, thus the service life is strongly improved.

PLC system to storage the technical production data and HMI,more intelligent, more convenient.

→ 6th Generation Rubber Extruder (2014-2015)

First grade filtering device for vacuum system has been applied on the basis of the 5th Generation Rubber Extruder.

The 10mm extruder body frame steel plate is processed with one-time laser cutting ,edge-forming technique.



→ 5th Generation Rubber Extruder (2011-2013)



Firstly introduced with PLC system to storage the technical production data and HMI based on the 4th Generation Rubber Extruder .

→ 4th Generation Rubber Extruder (2008-2010)

Applied with Modular temperature control system, temperature control accuracy is $\pm 1^{\circ}\text{C}$,

Extruder is applied with helical sleeve cooling system to make the temperature transmission more directly to ensure the rubber does not get over-cured under high temperature and continuously working process, improving extrusion stability.



→ 3rd Generation Rubber Extruder (2005-2007)



Applied with Modular temperature control system, temperature control accuracy is $\pm 1^{\circ}\text{C}$, extruder is applied with perforated barrel for water circulations (the circulations is easy to clog when water quality is bad, and temperature control accuracy is dis-satisfactory).

The transmission device at the feeding area adopts the automatic lubrication system.

→ 2nd Generation Rubber Extruder (2004-2005)

Improved the thermostatic device on the 1st generation, temperature control accuracy is $\pm 2^{\circ}\text{C}$, extruder is applied with perforated barrel for water circulations (the circulations is easy to clog when water quality is bad, and temperature control accuracy is dis-satisfactory).



→ 1st Generation Rubber Extruder (1998-2003)



Simple configuration with ordinary heating device, temperature control accuracy is $\pm 3^{\circ}\text{C}$, extruder is applied with perforated barrel for water circulations (the circulations is easy to clog when water quality is bad, and temperature control accuracy is dis-satisfactory).

→ Latest model of 7th generation 120mm (150mm/200mm) rubber extruder



Applied with hand protection system at the feeding area on the basis of the 6th Generation Rubber Extruder, safety improved. Multistage filtration system for the vacuum system, effectively improve the service life of the vacuum pump. 38CrMoAL alloy material integration body, no solder points, improving the coaxial degree of the fuselage assembly to prevent barrel scratching phenomenon, enhancing the barrel processing precision as well as adopting the nitriding treatment, the rubber screw is treated by spraying alloy service, thus the service life is strongly improved.

PLC system to storage the technical production data and HMI, more intelligent, more convenient.

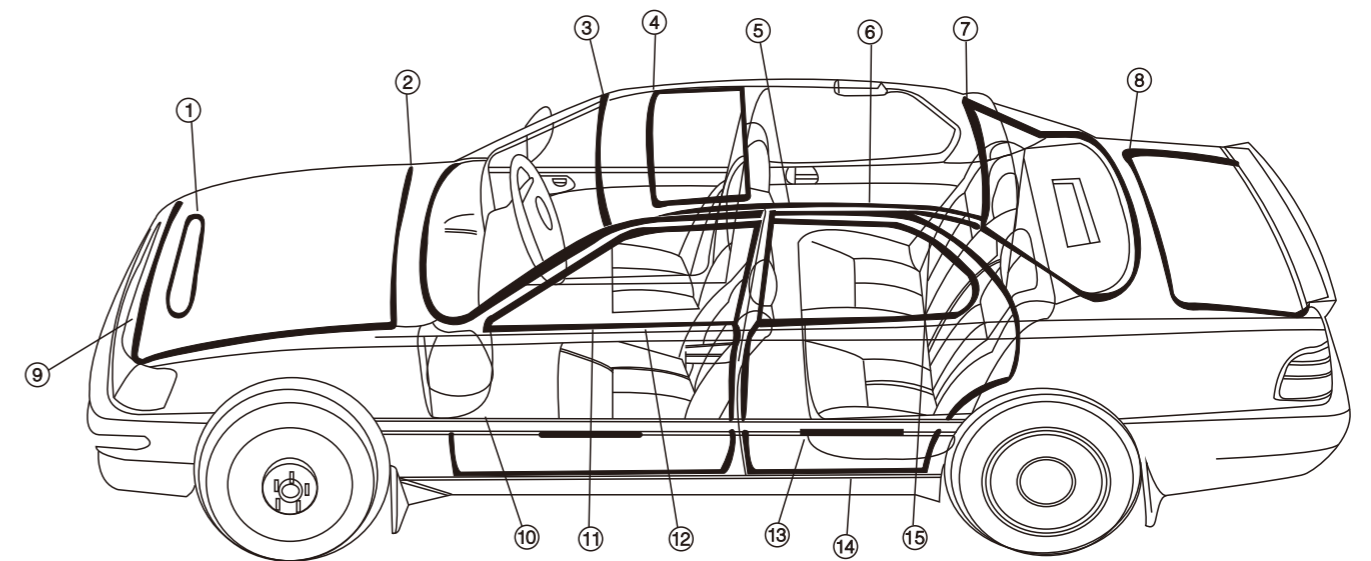
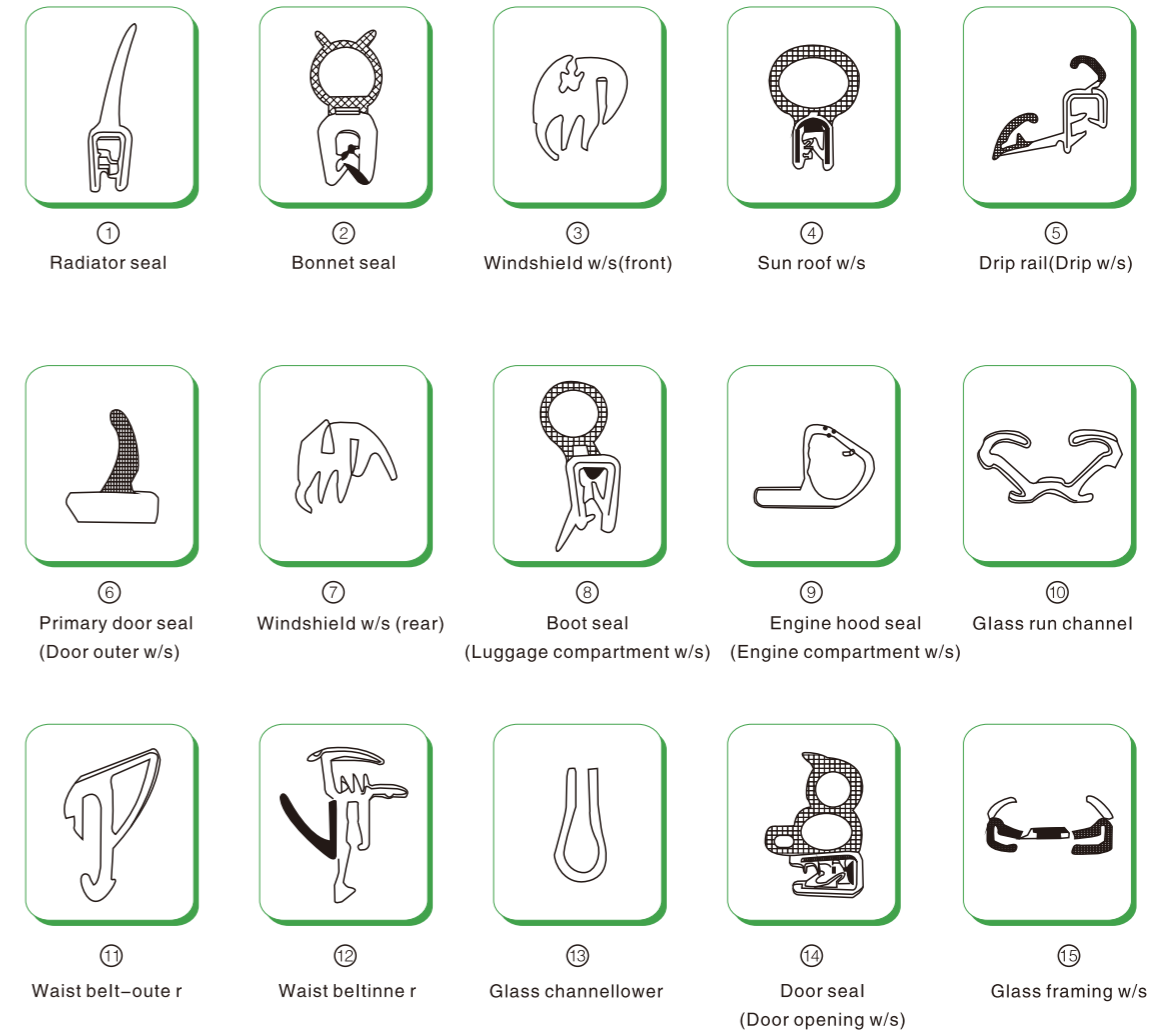
→ New type rubber gear pump extruder



→ Three(four, five) Co-extruded microwave vulcanization equipments and process technology



Section Drawing



→ Three(four, five) Co-extruded microwave vulcanization equipments and process technology



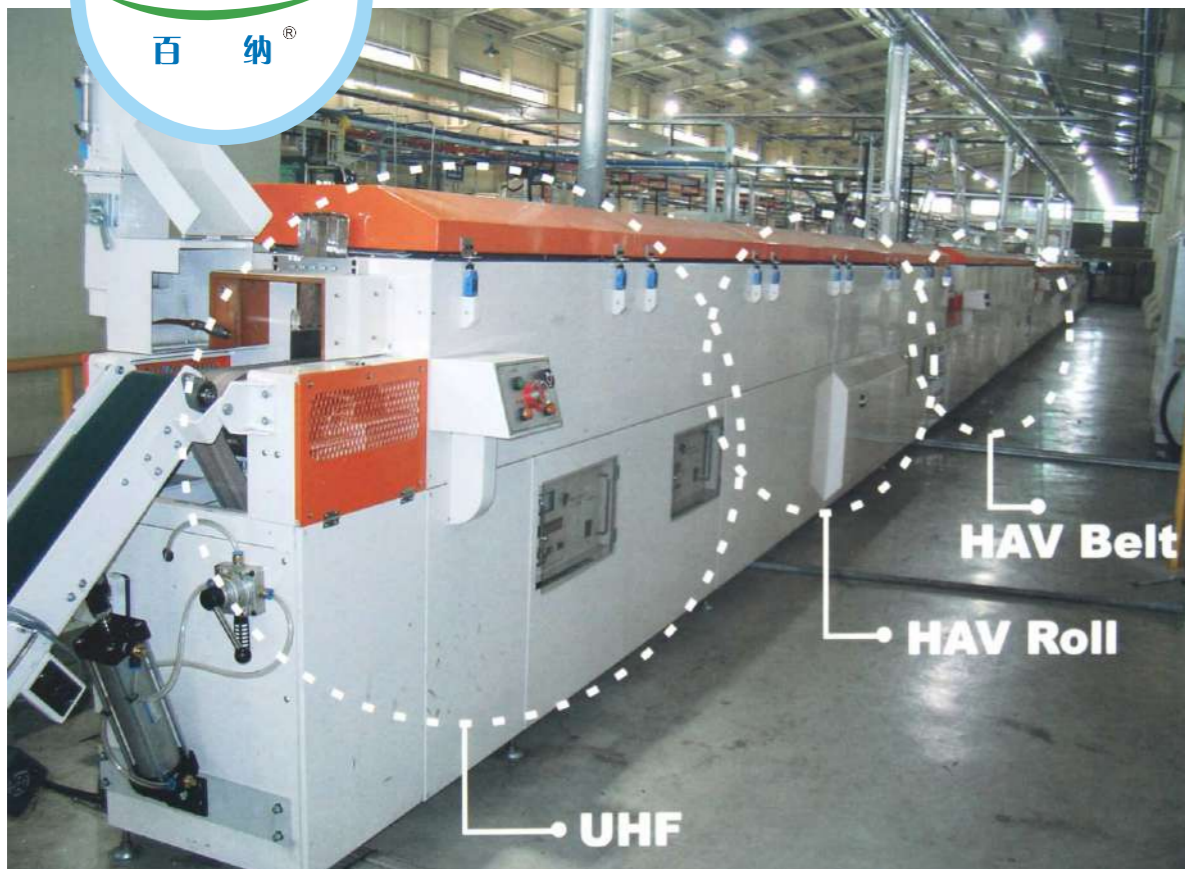
→ Automotive roof window seals



→ Three(four, five) crosshead



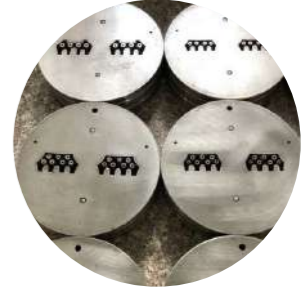
→ Microwave vulcanization production line and process technology.



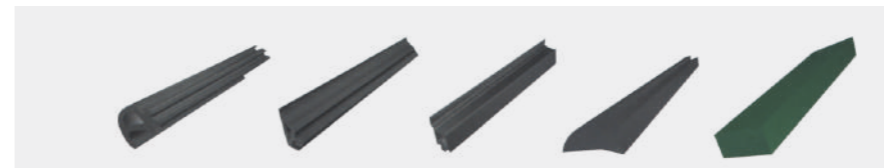
C

onstruction sealing system

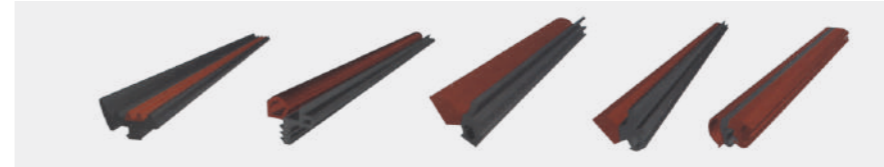
- Products are widely used in building curtain wall, steel windows and doors, aluminum alloy energy-saving windows and doors, wooden windows and doors, building deformation joint, industrial doors and windows.
- Divided by specification
 - Building curtain wall vulcanized rubber seal (gasket)
 - Plastic profile casement seal
 - Aluminum alloy energy-saving doors and windows seal
 - Wooden doors and windows seal
 - Building deformation joint rubber seal
 - Industrial door seal
- Divided by material
 - EPDM rubber sealing strip (EPDM, EPDM-S)—current development trends
 - Thermoplastic sealing strip (Santoprene)
 - Silicone rubber sealing strip (Silicone)
 - Neoprene sealing strip (Neoprene)
- Divided by adopted standard
 - National standard: JG/T 187-2006
 - Japanese standard: JIS A 5756:1997
 - American standard: ASTM C-864-99
 - German standard: DIN 7863, DIN 5510



fire resistance products



co-extruded products



cord products



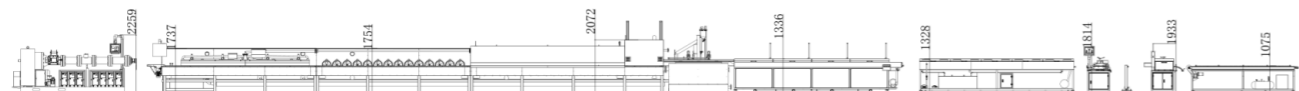
→ New salt-bath vulcanization production line(LCM)

The new generation of salt bath vulcanization line of BAINA has unique advantages in producing rubber strips for automobile industry and construction industry: high efficiency and low energy consumption.

The BAINA salt bath production line (LCM) is designed with compact combination. Its prominent feature is that the waste salt produced after the initial purification of the adhesive strip is very low. Modern computer processing production control system including pressure control and remote data transmission are adopted. Automatic brine circulation system avoids environmental pollution caused by waste water.

The entire production line includes the vulcanizing conveyor, cooling and washing unit, traction, cutting and winding device.

Production line layout of LCM line



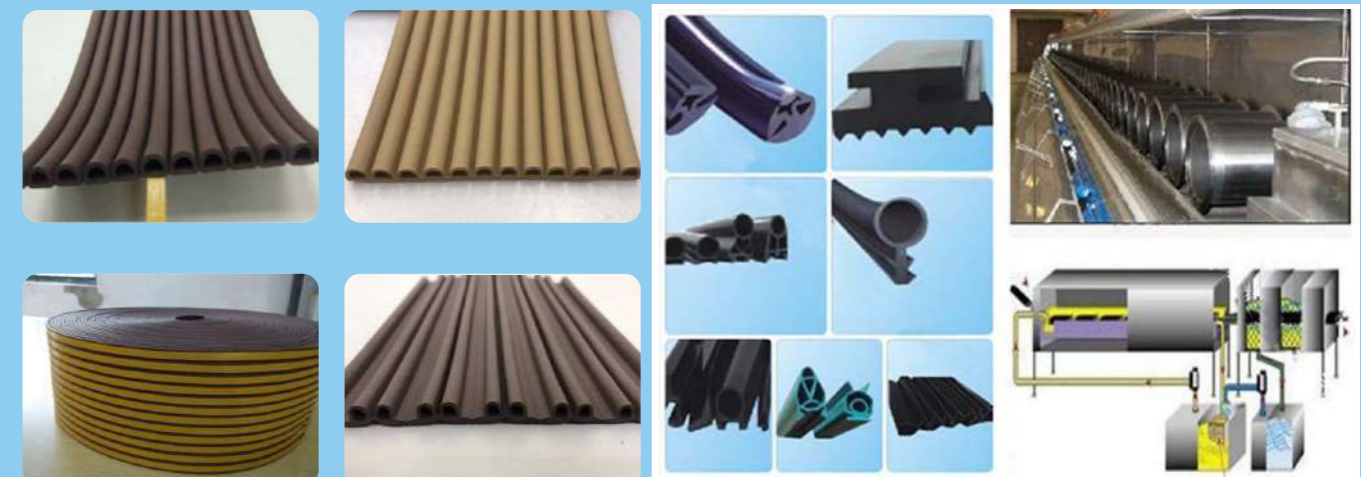
→ Environmental protection, high efficient, energy conservation and safety of LCM salt-bath vulcanization system for rubber profiles.

The characteristics of LCM Technology:

Compared with other rubber vulcanization technologies, such as microwave vulcanization (UHF), the characteristics of LCM system are outstanding. It is mainly manifested in its excellent processing quality, high vulcanization speed and wide practicability.

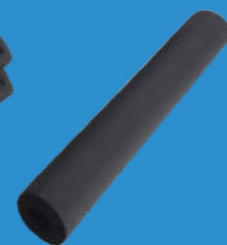
- 1、 With excellent heat transfer performance due to curing bath. Vulcanization of rubber profiles is complete and uniform throughout the section.
- 2、 During vulcanization, the rubber profile with high density salt bath is subjected to uniform pressure, and the vulcanization deformation is very small.
- 3、 salt bath inhibited the formation of low sulphide zone on the surface of rubber, and the rubber treated by LCM had good mechanical properties.
- 4、 salt bath vulcanized rubber surface micro porous and smooth, beautiful appearance.
- 5、 has no effect on vulcanization of reinforcing materials inside rubber profiles.
- 6、 formulations containing polar materials and non-polar materials are suitable.
- 7、 suitable for oxidizing and aging rubber.
- 8、 Sulfur vulcanization, peroxide vulcanization and resin vulcanization can be used.
- 9、 If peroxide is vulcanized, nitrite can be avoided.
- 10、 suitable for color rubber products with low scrap rate.
- 11、 easy to operate.
- 12、 No need to add special compound additives to rubber such as UHF technology.
- 13、 can simplify and thinner the cross section design of rubber profiles.
- 14、 at the same curing speed, the LCM system has shorter length .
- 15、 energy consumption is less.
- 16、 The main wastes are solid impurities. Because the rubber is completely inserted into the salt bath species, it produces less pungent odor.

BAINA is the only rubber extrusion equipment manufacturer to launch new LCM vulcanization system in China. The system includes sulphide salt, production technology and equipment operating system, which solves the problem of recovery and recycling of sulphide salts, and fundamentally eliminates the pollution of the environment.





EPDM/NBR&PVC insulation pipe/sheet
vulcanization line





Rubber hose production line

Application fields

- Automobile cooling system hose (battery cooling rubber hose of new new energy automobile)
- Automobile radiator hose
- Automobile heating system hose
- Automobile turbocharging system hose
- Automobile THV/CPT oil pipe



Specification

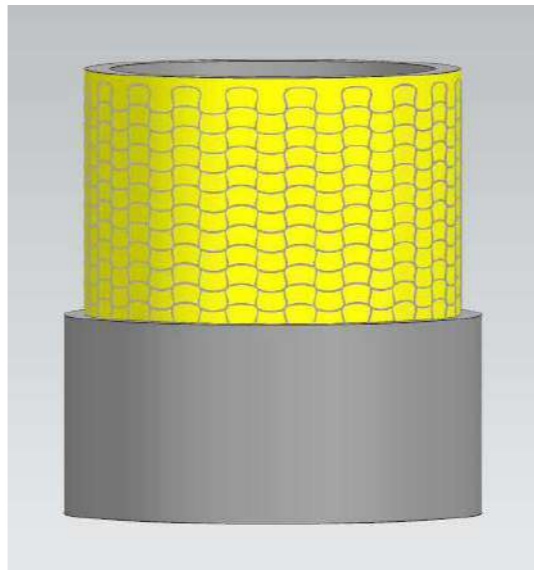
φ5mm~φ80mm

Production line speed

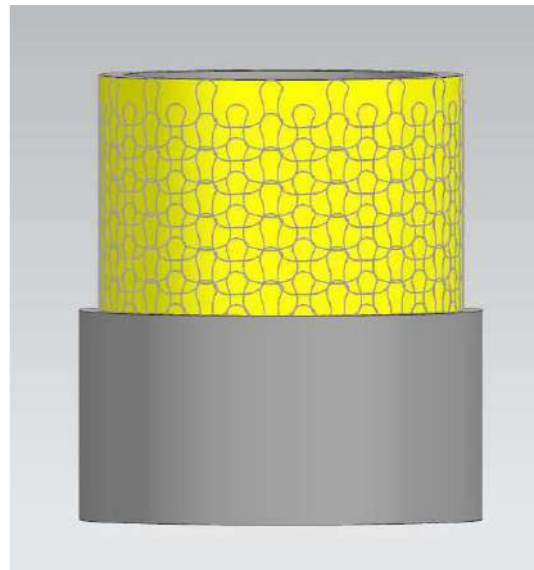
6~10m/min (knitting type)
4~20m/min(spiral type)



Application fields



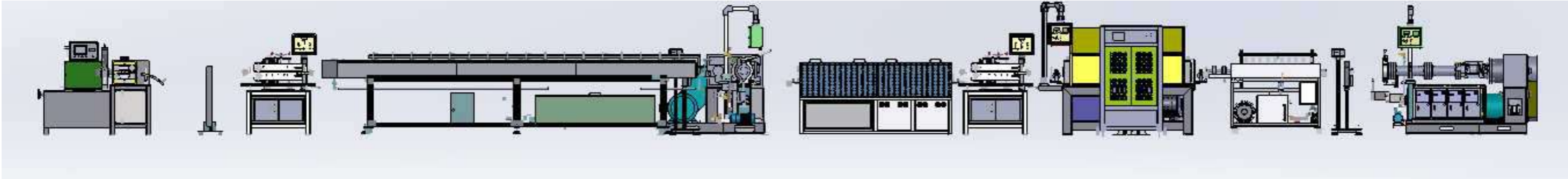
Sketch for Plain Stich



Sketch for Lock Stich

How to select

The knitted hose production line of BAINA. can producethe above two kinds of knitted hose, the knitted structure selection should be basedon the final hose product requirements of customers.



cutter

puller

6m cooling tank

OD controller

90mm16D extruder

2.5m infrared oven

puller

knitting machine

cooling tank

OD controller

90mm16D extruder

↑
↓
spiral machine

→ Rubber hose production line

Application fields

- Aufomobile cooling system hose
- Automobile heating system hose
- Automobile air conditioning system hose
- Automobile fuel pipe
- Automobile vacuum brake pipe
- Automobile vacuum brake pipe
- Oxygen pipe and acetylene pipe
- Hose for gardening use

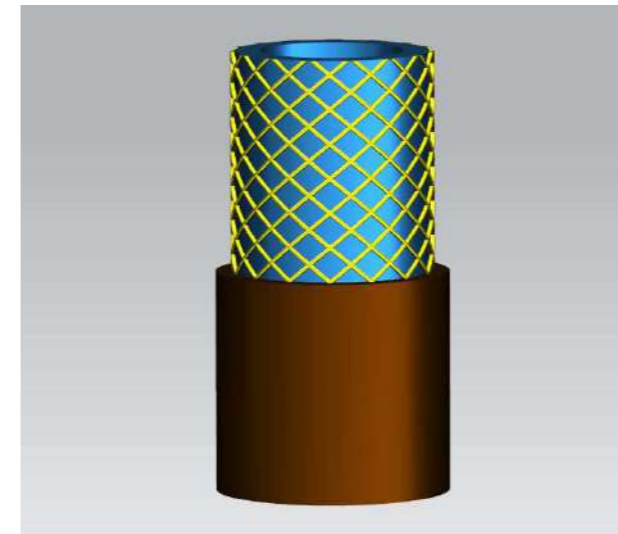
Specification

φ3mm~φ50mm

Production line speed

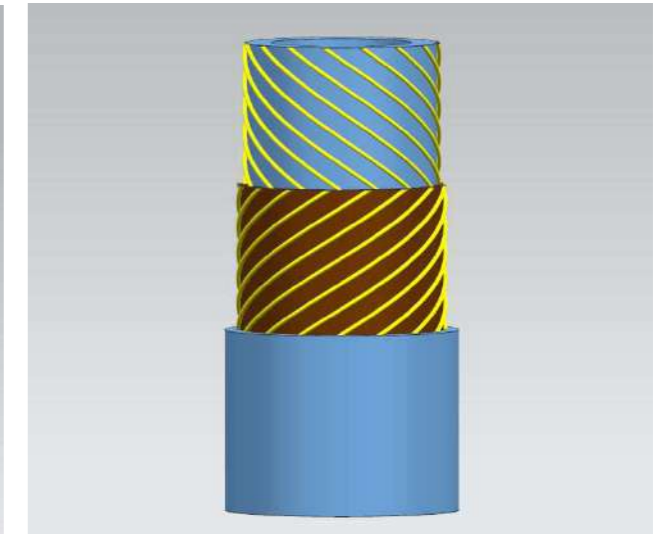
8~20m/min

Spiral Structure Sketch



structure1

suitable for mandreless low pressure spiral hose with low yarn coverage density, burst pressure ≤ 6Mpa



structure2

suitable for mandreless high pressure spiral hose with high yarn coverage density, burst pressure ≥ 10Mpa

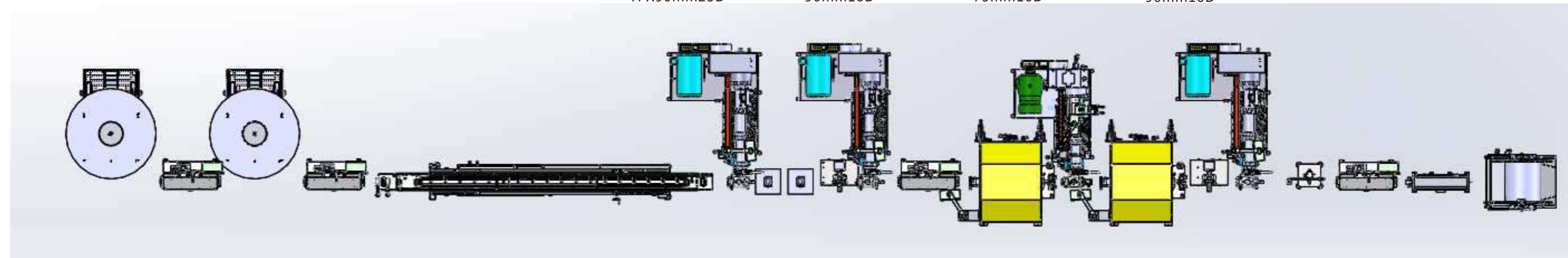


TPX90mm25D

90mm16D

75mm16D

90mm16D



coiling

puller

coiling

puller

6m cooling tank

roller*2

OD controller puller

36 spiral machine

36 spiral machine

dancer

puller

silicone oil tank

pay-off

→ Rubber hose production line

Application fields

Automobile air conditioning system hose

Automobile fuel hose

Automobile brake hose

Automobile power-assisted steering hose

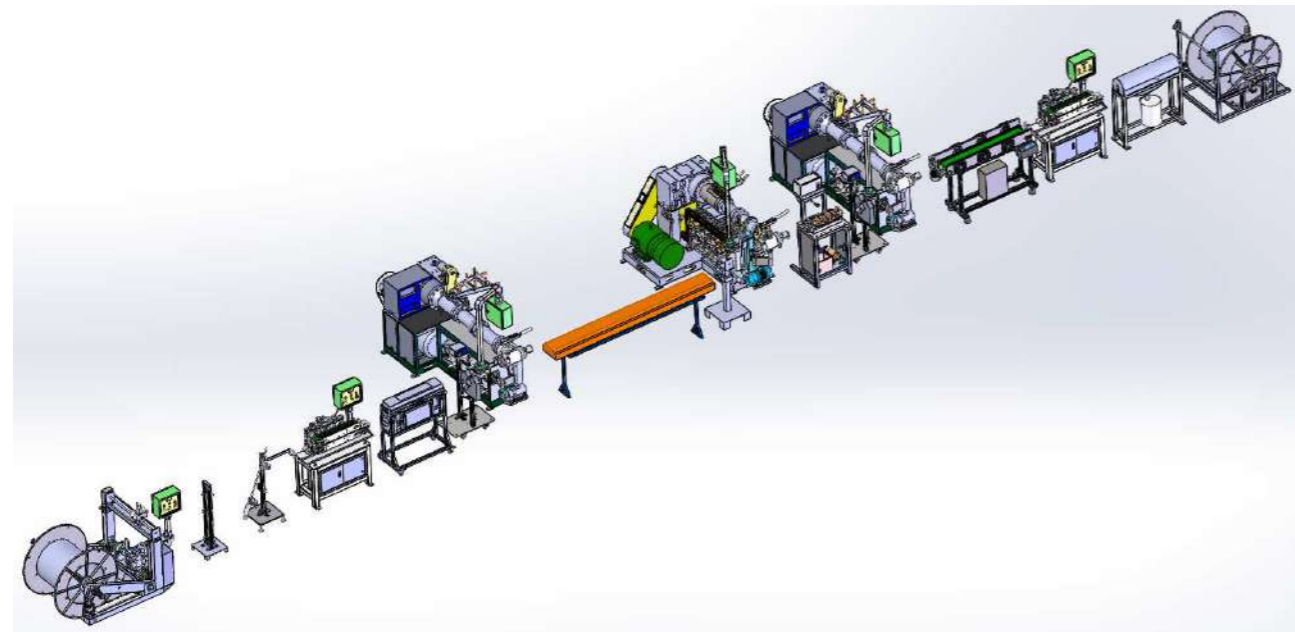
Specification

φ3mm~φ30mm

Production line speed

Extrusion: 8~20m/min
braiding: 1~2m/min

Inner layer process



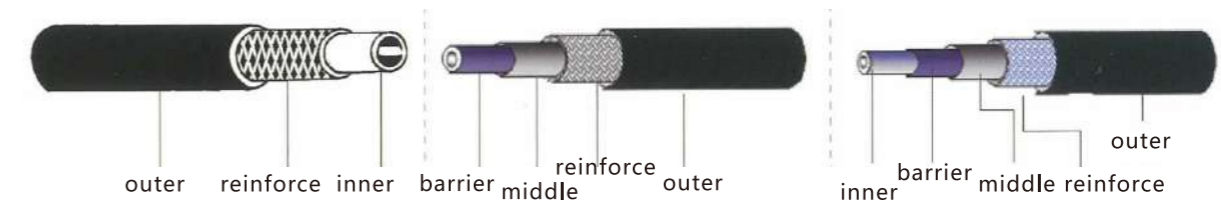
coiling machine ← dancer ← puller ← Talcum powder ← OD=90mm16D ← coolin convey ← roller ← 75 nylon ← gluing ← OD=90mm16D ← 3m cooling ← puller ← isolator ← pay off

Sketch for braided structure



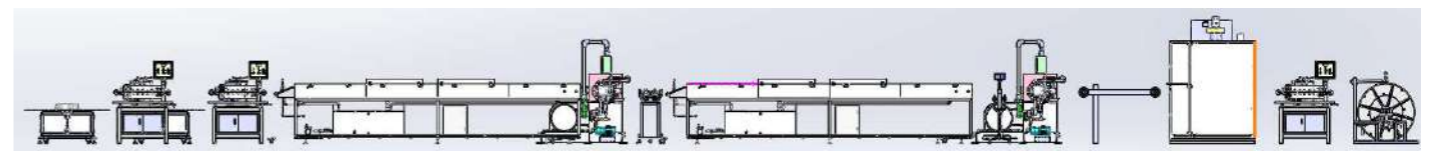
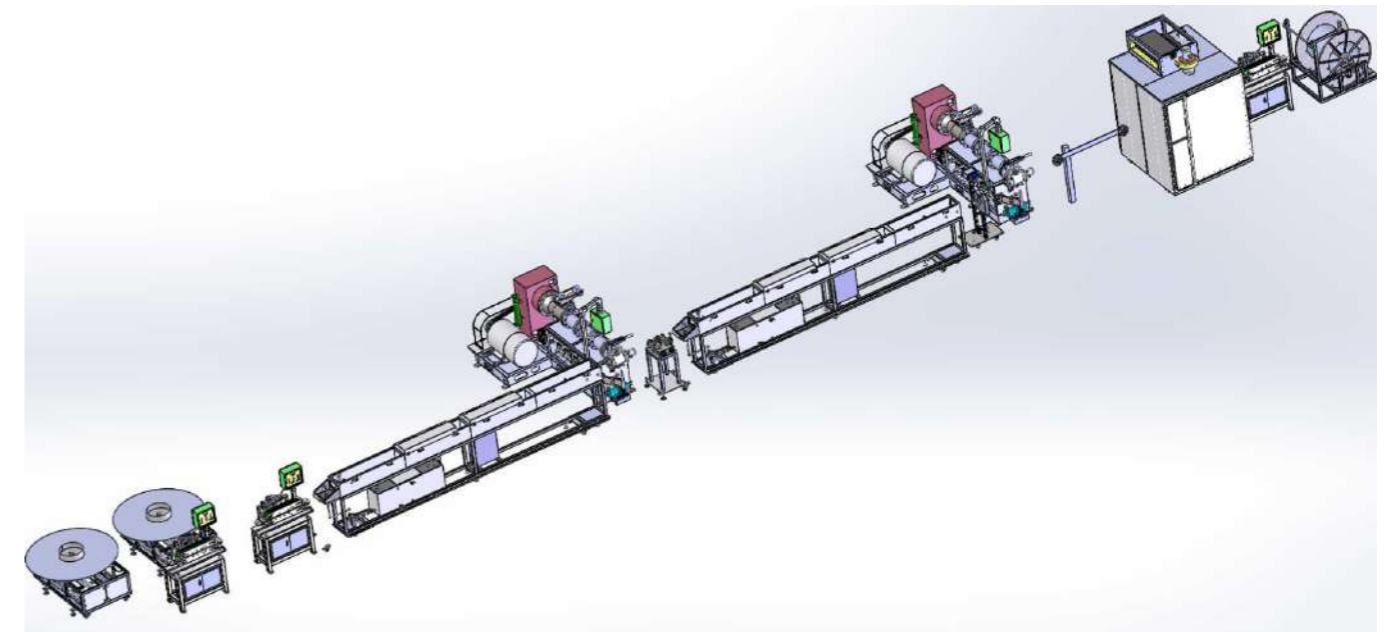
characteristic:

- ① Less OD changing rate
- ② high burst pressure reached at 40MPa
- ③ low production rate



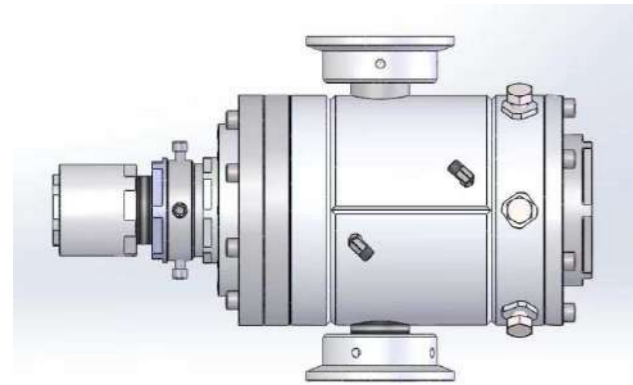
Braiding A/C hose structure

Outer layer process

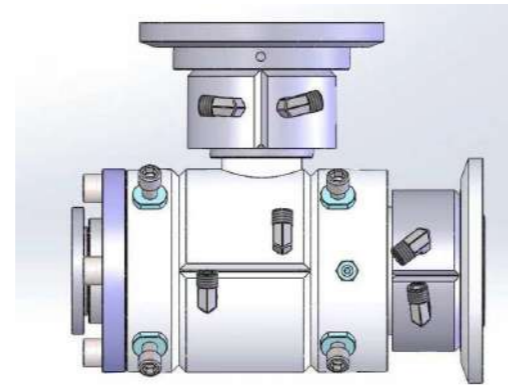


coiling coiling puller 6m cooling tank TPX120mm printer 6m cooling tank OD 90mm16D drying oven puller pay-off

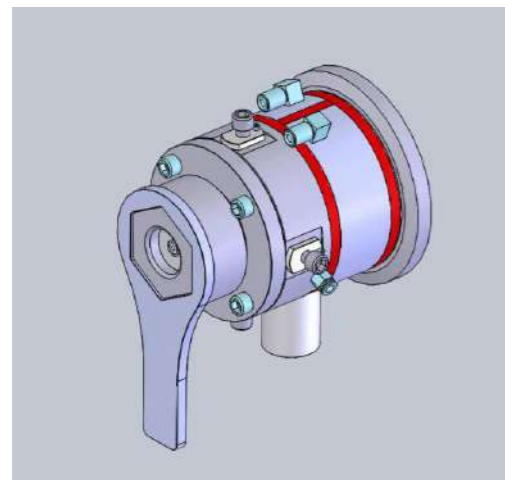
→ Rubber hose extrusion head



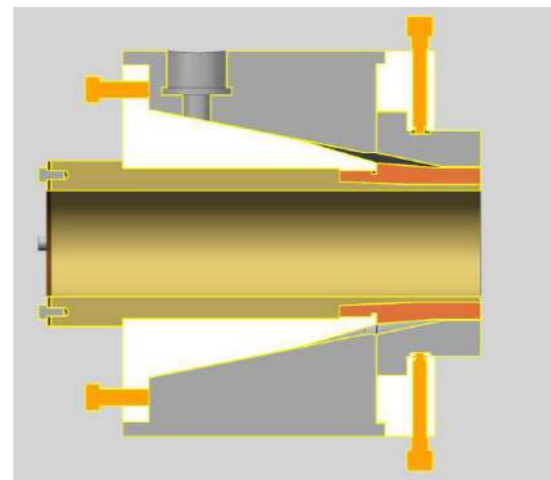
Complex Extrusion Head Type A (180°)



Complex Extrusion Head Type B (90°)



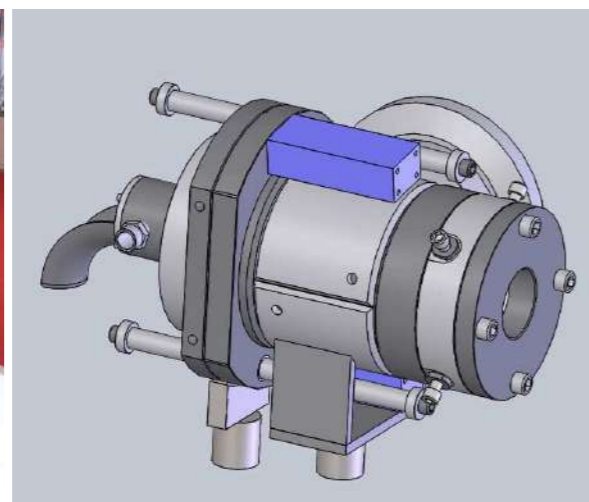
Straight tube head



co-extrusion tube head



Flow channel tightened by clamp ring, easy to disassemble. Liquid pressed out of the channel top, convenient and efficient



Surface plated with chrome, easy for rubber cleaning

→ Rubber hose production line

The knitting machine developed and manufactured by BAINA. is widely used in both domestic and overseas markets, with its market share having reached over 90% in domestic, which is the best choice to be selected as the equipment for constructing the reinforcement layer of automobile cooling system hoses and turbocharging rubber hoses. After in-depth analysis and study on the impact of knitting structure on the product performance, a system for optimizing the knitting structure is integrated in the control system of the knitting machine, which is able to match the optimum knitting process parameters automatically. Through controlling in conjunction with the dragger developed by our company, optimum design of the knitting structure can be realized. In addition, several practical functions, such as threads lack alarm, threads breaking alarm, threads jumbling alarm and output statistics, are integrated in the system. Meanwhile, with combined use of the automatic detection system for the reinforcement layer, online and real-time inspection on the knitting structure and automatic defect alarm can be realized to ensure the product quality.



Recommended Type Selection Table for Knitting Machine (axial grid size of 3.0±0.5mm)

hole mm	knitting type		suggested OD (mm)	yarn ≤ 4000 Dtex		yarn ≤ 2200 Dtex	
	Max knitting OD mm	needles		spindle	Max r.p.m	spindle	Max r.p.m
15	11	6	7~11				
17.5	13.5	6	10~13	4	600	4	500
20	16	6/8	12~15				
...
50	38	14/16	30~37	6	500	8	500
55	43	16/18	35~42	6	500	8	500
...
90	72	24/26/28	58~68	8	450	8	600
100	82	28/30/32	68~78	8	450	8	600
...

→ Rubber hose production line

The spiraling machine developed and manufactured by BAINA is widely used in both domestic and overseas markets, with its market share having reached over 90% in domestic, which is the first choice to be selected as the equipment for constructing the reinforcement layer of medium-pressure hoses and low-pressure hoses. After in-depth analysis and study on the impact of spiraling structure on the product performance, a system for optimizing the spiraling structure is integrated in the control system of the spiraling machine, which is able to match the optimum spiraling process parameters automatically. Through controlling in conjunction with the dragger developed by our company, optimum design of the spiraling structure can be realized. In addition, several practical functions, such as threads lack alarm, threads breaking alarm, and output statistics, are integrated in the system. Meanwhile, with combined use of the automatic detection system for the reinforcement layer, online and real-time inspection on the spiraling structure and automatic defect alarm can be realized to ensure the product quality.

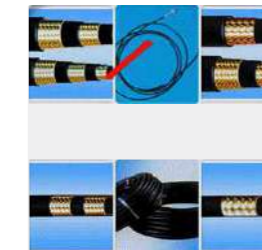


Reference Table for Process Parameters of Coreless spiraling Rubber Hose Structure

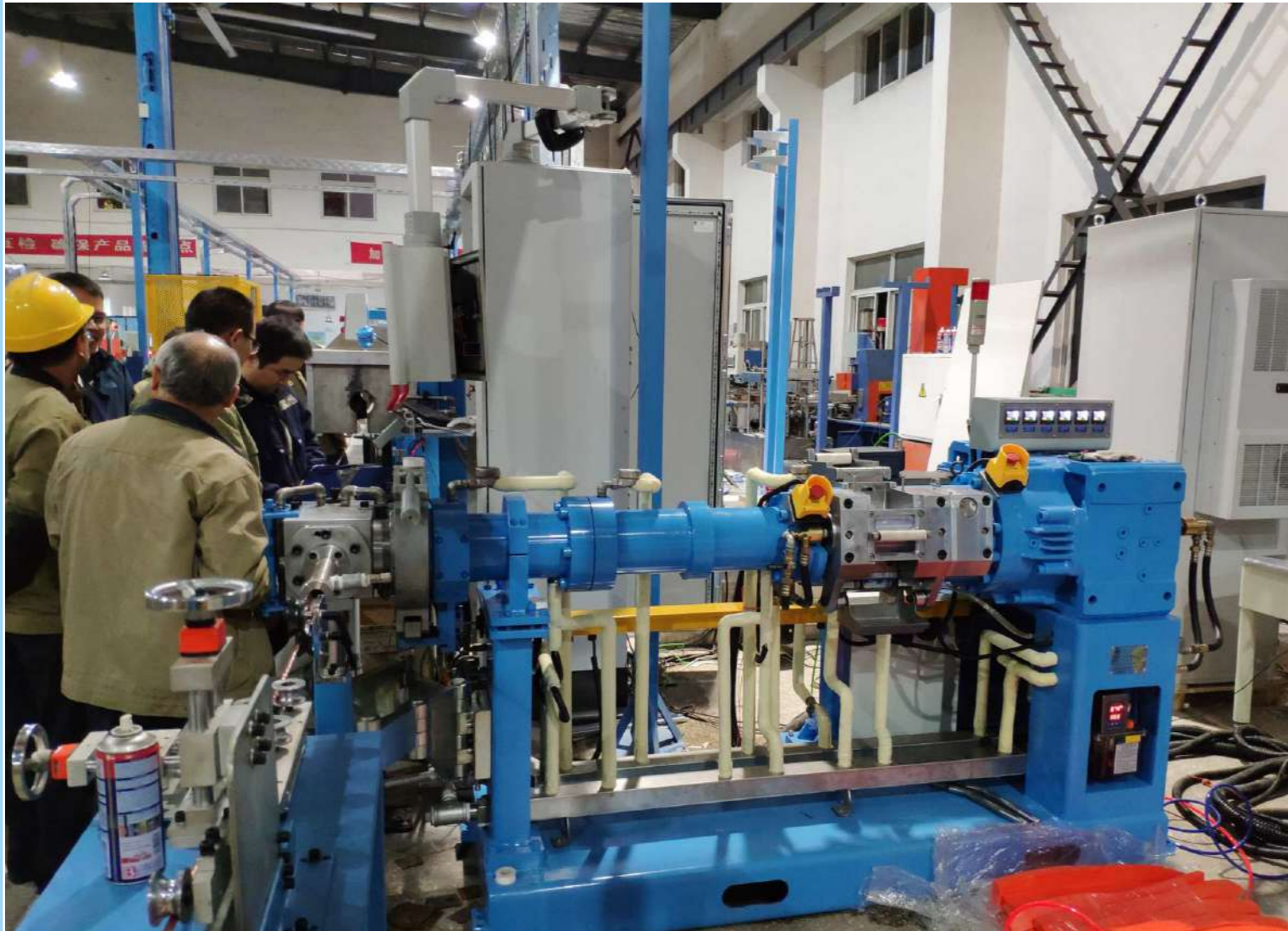
hose size	Max speed (m/min)	Max sprial machine (r.p.m)	Max burst pressure (Mpa)	Mark
φ 10x4mm	15m/min	500	11.5	spindle:48 yarn: 1000D poly spiral rate 17.1%
φ13x4mm	18m/min	500	8	spindle:48 yarn:1000D poly spiral rate14.1%
φ16x4mm	20m/min	500	7.5	spindle:48 yarn:1500D poly spial rate:18%
φ20x4mm	25m/min	500	7	spindle:64 yarn:1500D poly spiral rate:20%
...

- 1、 Proper spiraling structures can be designed according to different bursting pressure requirements;
- 2、 The maximum bursting pressure shown in the table refers to the maximum value that the rubber hose can achieve under coreless production process conditions.

→ Rubber hose making machine and technology/kintting(spiral) rubber hose production line and process technology



→ Silicone rubber vulcanization production line and process technology.



→ Silicone horizontal vulcanization



silicone extruder



→ Butyl tape(sheet)co- extrusion production line

1、 With outstanding aging resistance, antioxidant performance is more than 10 times higher than that of unsaturated rubber, such as natural rubber. It can be exposed to sunlight and air for a long time and is not easy to oxidize. It is resistant to low temperature -40 and high temperature 120.

2、 has the best air tightness and watertightness. Its air permeability is about 1/20 of natural rubber. It has excellent acid and alkali resistance and excellent insulation performance. It is a special product used in underground waterproofing works.

3、 A environment-friendly product, no pollution, no flammable, especially suitable for colored steel tiles, color steel sheet waterproof and other metal roofing waterproof, old roof maintenance, the original waterproof layer need not be dismantled

4、 one of the best waterproof materials at present, and it has been used for over 10 years.

This product can be applied on any dry and firm base surface. It is suitable for roofing, underground, kitchen and bath, subway engineering, bridge culvert, water proofing, waterproofing, waterproofing of color steel tiles and all kinds of old roofing.



→ Rubber extruded pre-form strips of car's wiper production line



→ Rubber extrusion Pre-form production line



Rubber vulcanization flue gas Plasma-purification system



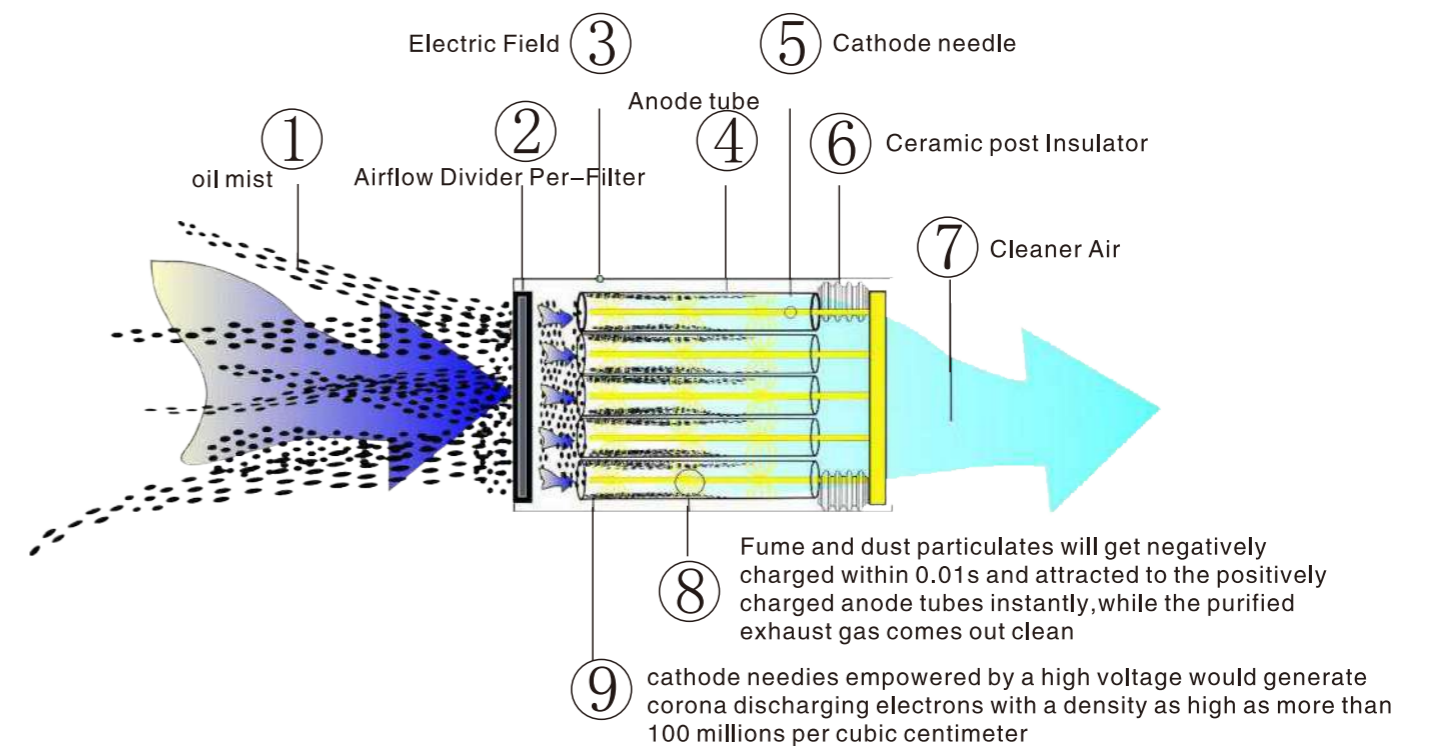
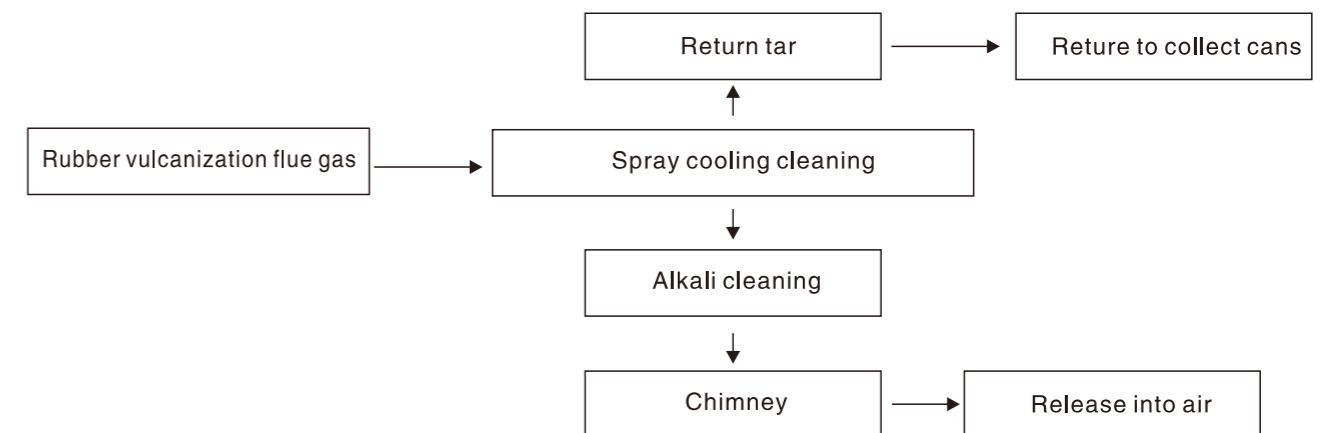
Rubber smoke treatment device

Working principle

Rubber vulcanization flue gas mainly exists in the form of 0.1-1.0 um tar fine mist particles. Its purification and treatment is to capture as many of these fine particles as possible, decompose gaseous polycyclic aromatic hydrocarbons such as benzopyrene, benzoanthracene, carbazole, decompose and absorb harmful substances such as hydrogen sulfide, sulfur dioxide and so on, so that the flue gas emissions meet relevant standards and do not form secondary pollution.

Relevant standards without causing secondary pollution.

Rubber vulcanization flue gas → Cooling → Plasma lampblack purification → Plasma gas odor purification → Alkali absorption → Environmental emissions



BAINA rubber technical experts and designers aim at customer interests, cooperate closely, work together, continue to carry out technological innovation, and introduce one technology and equipment to produce high quality and high quality products with high quality and high efficiency.

According to the special conditions and requirements of customers, we can tailor the single machine and turn key project.

The technical department of BAINA plays a very important role in the success of the company. In its department, it is equipped with necessary equipment to provide customers with a large number of new rubber formulations, products and components testing, so as to optimize production equipment and production lines.

BAINA has the technical expertise to benefit the customers, the potential of continuous innovation, reliable technology and high quality equipment, prolonging the service life of the machine, and serving the customer as the goal. The strength of BAINA is demonstrated throughout the world.

BAINA is an expert in the following aspects:

- Rubber extruder
- Rubber continuous curing line, feed and subsequent equipment
- Rubber technology and turn-key project

To us, the social responsibility is not just about making personal profits,taking personal duty and developing personal business career, the social responsibility to us is the source of the development, innovation and competitive enhancement of the enterprise.

→ CERTIFICATIONS

