

Requested technologies for Zhejiang Province (P.R. China)

1. Small dose bottle-filling injection piston (gland) link gear

Mainly including main working procedures such as bottle loading, bottle checkup, filling, (interior) cover of glue pressing plug, spiral exterior cover etc, the link gear has the functions such as auto checkup (fill when bottles have been loaded, don't fill when bottles haven't been load), filling (filling quantity is adjustable), automatic glue falling cover, automatic bottles discharge, and is mainly used in industries such as daily chemical industry and pharmacy etc; since there are many types of bottles, pressing interior plug and spiral exterior cover etc, adaptability of the machine must be strong; only a few components need to be changed to pack small bottles. Producing high rate of finished products, the link gear is safe, stable and convenient to maintain.

Basic technical parameters of the machine is as follows:

Filling quantity: 10~30 ml, 20~50 ml. special filling quantity demand can also be satisfied by special manufacture.

Production capacity: 60~80 bottles/ minute

Filling precision: $\geq 99\%$

Power of principal machine: 0.75 KW 220V

2. Optimized electric controlling system of 1450mm single framework six-roller reversible rolling mill

Designed speed of our company's 1450 mm rolling mill is 1000 m/min; transmission agent utilized ABB controller, Siemens ST-300 programmable controller, and upper part connects with three-level computer control; During utilizing process, motors are unstable when rotating at speed beyond 600m/min, often cause belt break, and can't reach the designed speed of 1000 m/min.

After being diagnosed and adjusted by experts, the motor reaches the designed speed of 1000 m/min from 600 m/min.

3. Non-crystalline alloy dry-type triple-post power transformer

For SGRBH11—100~1600 kVA non-crystalline alloy product, iron block structure consists of a three-phase and five-post structure formed with four frames; when the capacity is huge, the product adopts a structure piled with eight iron block frame. In structure, the transformer adopts a basic structure with coil as framework instead of traditional design structure with iron block as main load-carrying structure, thus the iron block don't bear any weight. The tightening of the iron structure uses thin plate or molding structure.

Comparing with SCRBH11 transformer, the non-crystalline dry-type transformer adopting triple-phase and triple-post iron block has more beautiful appearance and stronger capacity, and can save 20% energy. Wastage of the non-crystalline dry-type transformer is low, and its energy saving effect is obvious - comparing with other dry-type transformer with the same capacity, the idle wastage of non-crystalline dry-type transformer reduces 70% ~ 80%.



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4. Coking unit is developed with electric four-way ball valve

Coking unit of refinery adopts four-way ball valve, type: Q946Y-64I, DN200. Working temperature is 530°C, medium is residue oil containing grain-shaped medium. Pre-tightening force of valve base is supplied by Inconel 625. Key technical problems needs to be solved are:

1. Calculation of pre-tightening force of accordion pipe.
2. Design and goods-supplying channel of accordion pipe components.

5. Gas supersonic flowmeter

Integral technical index of gas supersonic flowmeter is as follows:

Precision: Level 0.5; scope of flowing velocity: 0~30m/s; specification: DN50~DN500

Key technical problem: supersonic energy converter technology adopted by gas supersonic flowmeter, time-measuring technology of time difference method, and multi-channel digital model etc.

6. Cutterhead hydrogel coater

Our company develops a new generation of products, including Babu plaster (Babu agent) coater, dressing slicer, dressing packing machine, medical infusion bottle sealing machine, automatic packing machine of would paste etc. Currently, while developing a kind of cutterhead hydrogel coater, our company encounters some technical difficulties, i.e. during the process of transverse cutting, there exists some accumulative error, which makes the size of the product inaccurate, and thickness couldn't be measured automatically during coating process.

7. A kind of grooved wheel intermittent device used on shoe-manufacturing machine

A kind of large-scale disc-shaped sole molding machine, 24 workstations are suspended on $\phi 2\text{m}$ central framework of the machine, which makes the exterior size of the disc-shaped machine reach $\phi 5.6\text{m}$; a grooved wheel intermittent device consisting of common motor, decelerator and grooved wheel device is installed on the central framework of the machine. With a huge size, the device produces great inertia in rotating process which cause inaccurate position setting, thus, the grooved wheel and transmission pin of the grooved wheel intermittent device must be able to automatically decelerate from fast –speed process to low-speed process before position-setting until the revolving plate comes to a standstill; the transmitting inaccuracy between any two workstations is less than 0.5mm. The cost of the machine won't exceed 25,000 RMB yuan.

8. PU-TPU injection molding machine

This is a patented shoe-producing equipment used to produce labor insurance shoes, leisure shoes and mountain-climbing shoes. With this technique, the sole can be completely connected to the shoe sides with an injection; the producing efficiency is high and the quality of the products are stable. Exact demands are:

- a. High-accuracy and high-speed PU material injecting head;

- b. Self-cleaning, high-speed material mixing, few air bubble is produced, fixed-quantity injection at fixed position (within mold);
- c. High-accuracy TPU injection head used to produce transparent TPU material;
- d. Pressure of mold-fixing system is suitable for producing transparent TPU sole with the thickness between 1.0 mm — 1.5 mm and few air bubble.

9. Improve working accuracy of comma scraper

Comma scraper is mainly used to accurately measure coating quantity. However, during long-term utilizing process, comma scraper usually appears some distortion (the longer the scraping roller, the bigger the distorting degree) which affects the complete jumpiness, column degree of the scraping roller, linear degree of blades, and the equality of coating cloth. As key component of coating head, comma scraper needs to be accurate to realize accurate coating.

Technical indexes need to meet:

- (1) Width of comma scraper: 1400mm;
- (2) Linear degree of blade: $\leq 0.002\text{mm}$;
- (3) Rigidity: $> \text{HRC}65$;
- (4) Smooth degree: $\text{Ra}0.05$;
- (5) Flatness degree, roundness tolerance and coaxiality etc. of roller surface $< 0.002\text{mm}$.

Give full consideration to high-precision characteristics of scraper and its demand on low and reasonable price, adopt simple designing plan to meet actual production demand of enterprises.

10. Intelligent inspecting system of valves

Test Cv and Kv value of water process valve: the main problem is solving the applicability of tested system, the tested flux needs to be tested is 0.5 t/h ~ 40 t/h.

Test the bursting pressure and recycling pressure of valves: bursting pressure testing equipment can directly reach needed pressure with computer input, the scope is within 4MPa; while connecting 10 products, the pressure of circular pressure testing equipment needs to release the pressure immediately after reaching 1.0MPa from 0 (the pressure maintaining time doesn't exceed 1 second), and resume to $< 0.014\text{MPa}$ before next circulation. The duration from pressure ascending and pressure release shouldn't exceed 5 seconds.

Flux testing system of water treatment valve: be able to test the circulating flux of water treatment valve between 0.1~0.6 MPa, backwash flux, salt absorption flux, water mending flux and normal wash flux, and form pressure — flux curve under each pressure.

Service life testing system of water heating and solar valve: test the service life etc of water heating and solar valve according to relevant standards.

11. Development of numerical control lathe, drill and miller etc specially used for valve process

Our company is planning to develop specially used numerical control hydraulic lathe, realize program actions including fast forward – project forward-project reserve-fast reverse etc; technique innovation of electromechanical integration including lathe, multi-core driller, milling machine needs to be finished urgently.

12. Technology to lengthen service life of mould

Our company uses 1600T friction press mould. The material is :5CrNiMo. The mould needs to be renewed after producing 4000 pieces of products, which can't meet production demand. The service life of the mould needs to be lengthened to reach the production demand of producing 8000-10000 pieces of products with an renewal. Dimension of the mould is: (530*400*130)mm.

13. Design effective, energy-saving and environment-friendly seamless steel tube equipment

Seamless steel tube equipment produced by our company can roll 60-100 times/minute, which lags far behind international advanced level of 200 times/minute. The productivity of our products need to be increased and be more environment friendly.

14. Oil pump cover positioning pinhole processing technique

Main content: adopt common lathe (e.g. desk drill), special processing mold, clamps and knives to realize high precision process of pump body, pump cover and positioning pinhole.

Main technical and economic guidelines: 1. precision of pump body, pump cover positioning pinhole aligning to benchmark hole (axle hole) : position deviation ≤ 0.03 ; 2. exchanging period of wearing part is 5000 pieces; 3. demand of producing tempo: $\leq 30S$;

15. Auxiliary transmitting device of decelerator

Main content:

Technical demand of auxiliary transmitting device of decelerator:

1. don't change original principal transmitting structure, solve structure and conformation problems;
2. independent transmission rather than linkage of principal and auxiliary transmitter;
3. output force moment: 36Nm-75000Nm;
4. Input configuration motor:

Power: 0.18kw-1000kw (thereinto, brake, frequency conversion)

16. Development of solar multi-crystal silicon exclusive super durable ball valve

- 1) the structure format and technical performance of chosen project products should meet the security demands of reliable operation, longer service life, fireproof and explosion protection of solar multi-crystal silicon in stern production condition.
- 2) Main material of adopted project products should be able to completely meet the special



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demand of high temperature, abrasion, erosion, flammability, explosive of raw material and semi-finished products of solar multi-crystal silicon production in stern working condition.

Main technical indexes:

- (1) applicable product: multi-crystal silicon exclusive super durable ball valve
- (2) nominal pressure: Class 150~300
- (3) nominal size: NPS 2~8
- (4) applicable temperature: $\leq 320^{\circ}\text{C}$
- (5) applicable medium: silicon powder, HCl etc.
- (6) inspection standard: GB/T 21385-2008 *Metal Airproof Ball Valve*

17. Large-scale crude oil tank anti-sedimentation mixing system

Crude oil tank mixer can be promoted to use in other industries such as chemical industry and paper making etc, and substitute traditional fixed-angle mixer.

Problems need to be solved immediately include:

- 1) designing and processing craftwork of periodic swaying structure of mixer;
- 2) airproofing problem of rotating parts;
- 3) industrial testing work

18. Development of energy saving technology of baking passages and oven of full automatic glass printer

Infrared baking passage and oven. It can be used extensively, and is applicable to plane printing of all kinds of glass products or industry, agriculture and fishery fields.

The product will consume a large amount of energy. Commonly used stainless heating pipe, glass pipe and iron pipe heating etc consumes much power, the rate of finished product is low, and the speed is low, thus the competing capacity of the product in the market is restricted. Our technical indexes are environment protection and energy saving.

19. Hardening treatment of aluminum alloy surface

Dispose the surface of aluminum alloy and improve the hardness of its surface to make it meet the utilization of substituting stainless steel and bronze alloy etc.

20. Hydraulic closing door speed regulating gemel temperature control self-regulating device

Structure and principle of temperature control self-regulating device satisfies the flux of self-regulating hydraulic fuel when temperature changes, make the speed, action and time of closing door constant; the structure should be able to put into 40mm ϕ 20 pipe.

21. Betterment of grinding head of terminal face knife grinder

Key technique:

1. During grinding process, knife blades are often pasted, which influence the quality and



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service of blades; in addition, cooling water and grinding powder are often thrown out that influence the working unit.

2. When materials are different, the cooling effect is often uneven, in particular for blades of imported machine.

Technical indexes:

Grinding length ≥ 1600 ; movement amount along principal axis of grinding head; maximum width of grinding blade in $22^\circ \leq 300$; linear degree of knife blade $\leq 0.10/100$; temperature raise of bearing $\leq 35^\circ\text{C}$; noise of machine $\leq 80\text{dB(A)}$.

22. High or medium pressure rotating feeder used to transfer solid material and gas

Key technique:

1. In internal cavity of large-diameter rotator, airproofing of medium mixing gas and solid powers (dry airproofing);
2. Decrease crack and distortion when materials pass rotating feeder in structure.
3. Control of leakage. During the process of transferring air force, the lower part of rotating feeder is high-pressure zone. When the feeder is rotating, control the gas amount leaked above the rotating feeder.

Technical indexes:

When the rotor is rotating at the speed of 0.5m/s, from pressure scope between 0.6-3.5bar, the efficiency utilized should reach $85-70 \pm 3\%$. Granule medium whose diameter is bigger than 8mm and smaller than 15mm is applicable.

23. Online checking system of transformer oil

1. Adopt special high-performance permeable membrane, only penetrate small molecule malfunctioned gas in capturing oil; realize integral design of gas chamber, realize complete separation of dissolved gas and oil vapor, solve the technical difficulty of gas vapor pollutes chromatographic column and sensors in online supervising system, ensure the sensitivity and service life of chromatographic column and sensors.
2. There isn't rotating components in the whole system, optimize loop of compact system, avoid gas leakage and oil leakage of transformer's oil chromatogram online supervising system in on-spot utilizing process, effectively improve the operation reliability of the system.
3. Complete intelligent expert diagnosing system, automatic capture summit, automatic increment, realize threshold comparison of real-time data.
4. Unique design of exclusive chromatogram column, sensor and controlling component, combining automatic gaining function of management software, improve inspecting precision of system, inspecting sensitivity of C_2H_2 should reach 0.3mL/L.

24. Application of remote sensing technique in communication industry

Acquire space information by remote sensing technique and be able to apply tightly integrated utility system with products of our company. High-degree integration of



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systematic data, software and hardware. Space data acquire systematic technique, acquire product technique such as equipment with PDA and integral data of mobile communication components. Support application platform and portable terminal products based on position service function.

Detailed key technique needs to be solved:

1. Compiling thought and codes of system platform software;
2. Construction and applying technique of system database;
3. Hardware technique of relevant system terminal;
4. Packaging technique of relevant chip;
5. Uniform communication agreement technique.

25. Network transmission of image information

1. Transmission and records of multi-way network vidicon image information;
2. Network transmission and display of signal of digital TV;
3. Project argumentation and realization of multimedia system on train;

26. High-power super thin (mini) type loudhailer

Our company professionally develops all kinds of police equipment; however, among all the equipment, loudhailer isn't ideal, such as large in size, small power, low transforming efficiency; structure and appearance isn't novelty, innovation capacity isn't strong; voice voltage level is low, transmission bands is narrow, transmission distance is short; cost is high, structure is simple etc.

27. Telephone fare bill inquiring machine based on embedded system

Technical demand:

With embedded computer as hardware, the inquiring machine can access websites of communication company (such website of China Mobile), display and print communication fare bill.

Main technical indexes of the product:

1. Hardware adopts ARM9 embedded system, processor is 400MHz;
2. Offer 10Mbps Ethernet.
3. Flash: 32M; memory: 64M;
4. Adopt TFT colorful LCD, displayed color: 18 bits (262144 colors);
5. Possess abundant interface resource: serial port, parallel port (printing port), keyboard port, mouse port, U disk port, network port etc.
6. Support WindowsCE.net operating system;

28. Foreign currency detecting technique of note counter

Main content: develop detecting technique aiming at Euro and US dollar.

Main technical indexes of products:



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1. Wrong detecting rate $\leq 1/10000$
2. Wrong counting rate $\leq 1/50000$
3. Detecting speed ≥ 1000 pieces/min
4. Temperature of working environment: 0-45°C, humidity: 20%Rh-90%Rh
5. With sum accumulative function

29. Note detecting and counting machine based on light array sensor

With light array sensor as the core, absorbing and reflecting capacity of different wavelength lights of various currency as researching emphasis; judge the surface of notes and interior paper quality and improve discriminating rate of layer connecting currency by reflection and transmission examination of various wavelength. Meanwhile, effectively check and recognize special hidden optical symbol of various currency with the sensor.

30. Coin discriminating machine

Research technique to machines to discriminate coins of different countries.

Main technical indexes:

1. Check and discriminate many kinds of coins such as US dollar coins and Euro coins.
2. Par value discriminating function;
3. Reliable discriminating capacity, stable work, correct rate is above 99.9%.
4. With low cost and compact structure, the discriminating type is convenient and easy.

31. Notes distinction machine

Currently, most of the machine are imported. With the innovation of China's RMB managing system and continuous improvement of the demand on note quality, the machine will become an indispensable financial device for banks in three years.

32. Point of sales (POS)

Point of sales is a kind of device placed in cashier of shops to handle bank cards. When consumers buy commodities, they can pay their bills with bank card instead of cash. Shops can open an account in a bank to accept payment with bank cards, money of all transactions of the POS will be transferred into the account within one working day. This is a great way to avoid fake notes, and makes financing very simple and convenient. the types of POS is as follows:

- 1) Consumption POS, with functions such as consumption, pre-authorized rights, inquire stop payment list etc, mainly used by contracted shops to handle consumption with peony cards.
- 2) Transfer POS, with functions such as financial transfer and transfer between cards, mainly used by finance departments of companies.

33. Automatic Teller Machine (ATM)

With functions such as withdrawal, account inquiry, transfer, password revision, receipt and



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settle accounts bill printing etc. Demand strong fake notes discriminating capacity, high accurate rate of note accounting, strong capacity of safeguarding data; currently, most of such machines in China are imported. So far, there are 639 ATM and some automatic depositing machine in Wenzhou. In developed countries, every 80 persons have an ATM in average; there is a huge market for ATM in developing countries such as China. Our company is planning introducing foreign technique and organize a team to tackle key problems, and set a key project in this field.

34. Multimedia information inquiring machine

With this machine, banks can offer all round multimedia inquiring service to customers by touching screen, bank cards reader, thermo-sensitive printer and service phone number etc. it can offer financial information such as video, voice, picture and characters etc and print inquired result. Different from ATM and CDM dealing with cash business, on the one hand, multimedia information inquiring system is a necessary complementation, sharing non-cash transactions such as inquiry and transfer etc, thus gives ATM and CDM more time to handle cash transaction; on the other hand, it can handle the increasing counter consulting business, such as interest rate, exchange rate, quoteprice inquiry, bank business, network introduction, latest news distribution, personal financial service, yield comparison, accumulation fund and social insurance inquiry etc.

35. Gas quality flowmeter

Main technical indexes:

Caliber: DN15~300, measuring scope: 1~15000 m³/h (in standard state), response time: 10 ms, measurement range ratio: above 100 : 1, precision: better than $\pm 1\%$, anti-explosion and anti-erosion, multi-gas selection, don't need re-verification (with display), dynamic number display. Total technique reaches domestic advanced level.

36. Long-distance multimedia transmission reliability technique

- 1) Construction of long-distance video conference, including video transmission, voice synchronization, non-distortion of images etc.
- 2) Court digital trial system quoting information collection, how to realize control in court.
- 3) How to realize stadium integral integrated video supervision, exterior invasion, regional protection, and target protection.

37. Research and development of main controller of project excavator

Main controller of project excavator collect and handle all kinds of sensor signal, and issue instructing action to all executing institutes.

Key technique needed: centralized treatment and controlling technique of all kinds of sensor signal.

38. Improve detecting precision of infrared customer flux sensor

Customer flux sensor developed by our company is used to produce a very small facula to increase illuminating energy of facula infrared by focalizing infrared radiated by infrared



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transmitting tube with lens. However, in actual utilization process, halo phenomenon produced during focalizing process affected inspecting precision.

We require non-spherical lens design meeting our standards and manufacturing technique to solve facula problem of lens, improve actual testing precision of sensor and overcome working blind zone of sensor.

39. HDI high-density multi-level printing breadboard manufacturing craftwork

Key technique:

1. For the manufacture of high-density exterior circuit (wire width/wire interval) 3□4 mil/3□4 mil (1 mil = 0.0254 mm), equality degree of plating should reach above 95%, equality deviation of etching on upper and lower sides should be within 3% to guarantee equality degree of chemical etching.
2. Minimum diameter of blind hole is 0.1mm;
3. For four-layer pressing craftwork, alignment precision between interior layers, and interior layer and exterior layer should be within 2mil; separation phenomenon won't happen in high temperature effect, and form even thickness within the whole plate;

Technical indexes:

High-density exterior circuit (wire width/wire interval): 3-4 mil/3-4 mil (1 mil=0.0254 mm); minimum diameter of blind hole: 0.1 mm.

40. High speed infrared sensing technique

How to utilize infrared technique on electric thermometric indicator, make product measurement convenient and fast, and precision reach high standard demand. In technique process, there are still problems such as CUP microprocessor chip, overcome problems of deferent current demand on circuit board.

41. Development of troponin, cystatin C in vitro diagnosis reagent

Clinically, immunity intensified turbidity comparison method is mainly adopted to test the content of troponin and cystatin C in blood serum. So, the key technique is to develop highly specific anti- troponin monoclonal antibody and anti- cystatin C monoclonal antibody, and carry out packaging treatment with latex solution. Then make Latex Agglutination antibody into reagent.

Performance requirement of troponin diagnostic reagent box: sensitivity: 0.3μg/L; linearity: 0.3-25μg/L; veracity: result of tested quality controlling article should fall between the reference value scope of quality controlling article. Precision within batches above 95%, precision between batches above 95%. Can be reserved for 12 months at 2-8°C airproofing environment.

Performance requirement of cystatin C diagnostic reagent box: sensitivity: 0.2 μg/L; linearity: 0.2-8.0 μg/L; veracity: result of tested quality controlling article should fall between the reference value scope of quality controlling article. Precision within batches above 90%, precision between batches above 90%. Can be reserved for 60 day at 2-8°C open air environment and 12 months at 2-8°C airproofing environment.



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42. CT, low radiation dosage digital X-ray machine

1. Multi-row CT machine technique
2. How radiation dosage digital X-ray machine can acquire and handle diagnostic medical X-ray imaging under the condition of multi low radiation patient dosage.

Advantages: reduce radiation dosage by 30-100 times, be able to swiftly reach computer archive material without fire risk, improve diagnosis possibility, and transmit images by electric network, without X-ray film etc.

43. D-galactose producing, separating and purifying technique

Amylose exists in plant source, including D-galactose, many kinds of coupling sugar can be acquired after hydrolyzation; Currently, separation of the hydrolyzation liquid has disadvantages of low yield, high cost and complicated separating method etc. Our company is seeking efficient separating and purifying technique to realize large-scale production of D-galactose.

Technique and economic indexes: calculated according to Arabia glue, the yield is above 40%, content of finished products is above 98%, material cost is lower than 200 RMB yuan/kg.

44. Albendazole composing technique

With ortho-nitraniline as raw material, react with sodium sulfocyanate to manufacture 2-nitryl -4- aniline-p-thiocyanate, then react with bromopropane to acquire 2-nitryl -4-propylthio aniline, don't separate it, directly mixed with methyl carbamate to acquire Albendazole. Total yield will exceed 65%.

45. Fluroxypyr composing technique

With pentachloropyridine as raw material, acquire finished product after fluorination, amination and esterification. Total yield will exceed 70%, product content will exceed 97.5%.

46. Harmonic wave computation and harmonic wave analysis in electric network

On the basis of utilizing mainstream measuring chip, calculate electric quantity of harmonic wave (at most 31 times), can accurately analyze voltage at each phase, content of current harmonic wave (at most 31 times), and calculate voltage and currency distortion factor.

Technical indexes: inaccuracy of harmonic wave computation <0.2%

47. Heat radiation and optical design of LED encapsulation and lamps

1. With eutectic welding technique in high-power LED encasing process, voidage after welding is lower than 95%;
2. In integrated packing technique of high-power LED, series-parallel connection of single electrode, total heat resistance of LED is less than 5W/°C;
3. For circular heat pipe (copper T1) and radiator (aluminum 6063-T5) welding equipment, how to guarantee the solidity of the welding plan (100% bigger than parent material),



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and heat conductivity after welding (above 180 w/m.k).

4. Solution of heat radiating material, many large-scale street lamps adopt die-casting aluminum, but the heat conductivity and intensity of die-casting aluminum can hardly match No.6 and No.7 aluminum. A kind of material with above 230 w/m.k heat conductivity, 25°C MPa extension strength, hardness 500 kg, power 10 mm and good plasticity (length 900 mm, width 400 mm T = 1.5 mm product molding) to solve die-casting and molding problems.

48. Development of flame-retarded nylon series products without halogen and red phosphorus

Key technique: selection of flame-retarded agent

Influence of dispersing effect of flame-retarded agent in nylon on flame-retarded performance

Good processing capacity, including material preparation and product molding

Technical indexes: intensity $\leq 1.17 \text{ g/cm}^3$
 breaking elongation percentage $\geq 7 \%$
 extension intensity $\geq 70 \text{ MPa}$
 bending intensity $\geq 100 \text{ MPa}$
 bending module $\geq 280 \text{ 0MPa}$
 notch impact strength $\geq 7 \text{ KJ/m}^2$
 flame resistivity (vertical 3.2~0.8 mm) V-0 level

Cost requirement: cost of assistant agent $\leq 6000 \text{ RMB yuan/ton}$

49. Supervision of mechanical failure of high-voltage motor

Diagnose mechanical failure by librating signal of motor.

50. Development and application of AC LED

AC LED illuminating technique adopts alternating current to directly drive lighting of LED chip, rectification transformer isn't needed; matched with solid heat guidance and hot replaceable technique. Besides compatible with traditional illumination, AC LED illuminating technique greatly reduces heat radiating problem of traditional LED, and completely change traditional design and utilizing method of high-power LED package; according to primary estimation, 15%-30% power consumption of traditional LED during AC and DC switch.. AC LED illuminating technique not only saves energy, reduces discharge, but also improve illuminating efficiency of LED.

51. Plating and welding technique of automobile oil transferring pump

1. Metal components surface treatment: level 8 salt mist experiment 96 hours after plating;
2. EGR external flow cooler spiral coil welding, can endure temperature above 1100°C;

52. Design and manufacture of electromagnetic valve used on automobiles

Design and manufacture of highly sensitive electromagnetic valve: induction quantity of magnet: $210\mu\text{H}\pm 10\mu\text{H}$; direct current resistance: $0.3\Omega\text{-}0.4\Omega$; dielectric strength 1000V-2S.

53. Automobile engine management electric controlling unit (ECU)

Relevant technique of automobile engine management electric controlling unit (ECU)

Development and controlling parameter marking technique of automobile engine management electric controlling unit (ECU) aiming at domestically produced engines.

54. Reduce the distortion of ball passage of interior Rzeppa after quencher

- 1) Ball passage of interior Rzeppa that can move along axis will distort greatly after quencher (medium frequency), the distortion needs to be avoided or reduced.
- 2) Research and design new structure for constant-velocity universal joint to cancel dust hood (latex) etc, meanwhile, align with whole automobile currently in the market to lengthen service life and reduce cost of the product.

55. Digital electric gasoline injection valve

Key technique:

1. Build hydrokinetics simulation model, calculate the injecting process of electric gasoline injection valve, as so to find the influence rule of electric circuit, magnetic circuit and structure parameter etc on the opening and closing process of needle valve.
2. Research and develop parameter testing system based on coil current curve, develop electric gasoline injection valve dynamic performance testing platform, realize accurate measurement of key parameters such as flux characteristics, needle valve opening and closing delay time of needle valve etc.
3. Improve the structure of traditional electric gasoline injection valve, finish product design of new electric gasoline injection valve with digital designing technique, and establish relevant processing craftwork.
4. Sample trial-manufacture, reliability experiment, platform experiment and comprehensive performance evaluation of electric gasoline injection valve.

Technical indexes:

1. The delay time from electrifying electric gasoline injection valve to complete opening is less than 1.2ms, and the delay time from power supply suspension to complete closedown is less than 0.5ms; Linear relevant coefficient of electric gasoline injection value flux characteristics curve exceeds 0.9999.
2. Electric gasoline injection valve can endure 500 million times of impulse reliability experiment with the period of 5ms; after experiment, the static flux deviation is within 3% and the dynamic flux deviation is within 5%.
3. Other performance of electric gasoline injection valve, such as heat durability, impact resistance, intensity, vibration, leakage and climate, meet the demands regulated in relevant standards.



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56. Solve color change technique for cans and dehydrated vegetables

1. Shelf life of fruits and vegetables in cans, such as mustard and bamboo shoot is short. Some mustard and bamboo shoot turn black and soft after being stored for 2-3 months.
2. Shelf life of dried fruits and vegetables, such as green sword bean and evergreen is short (generally 5-6 months), the main problem is their color changes.
3. The color change problem of cans and dehydrated vegetables needs to be solved.

57. Porphyra haihanensis breeding technique in -2~-10 shallow sea

- 1) Breeding rafts or plan with strong capacity against wind and wave, exactly speaking, can bear the influence of 10-11 level gust for three days in a row.
- 2) Drying time is longer than 2 hours a day.

58. Tea-shaped Porphyra haihanensis (dry) processing technique

After being processed into the shape of tea, Porphyra haihanensis (dry) will shrink with the ratio of 1: 5.

59. High-strength anti-wave plastic buoy (cylindrical) producing technique

Producing technique of high-strength anti-wave plastic buoy (cylindrical) used as Porphyra haihanensis breeding rafts.

- 1) The plastic buoy should be strong performance of antifricition and anti-impact, and be able to endure 80-100kg/m pressure for 150 days;
- 2) Material mixing, recipe creation, process and molding technique.

60. Purple seaweed harvesting system

- 1) Normal operation in 8 level gust;
- 2) Normal harvesting speed is 10m breeding shade/minute

61. Distill of tea fibre

Change tea fill into tea fiber filling, the weight reduced from 2 kg to 1kg, and its degree of hardness is basic the same to that of common cotton fiber.

62. The removing method of formaldehyde aquatic products processing course

- 1) Formaldehyde is an important factor of influencing the security the aquatic products, our company urgently needs technique to remove formaldehyde from aquatic products, so as to make our products meet agricultural standards NY5073 *Pollution-free food Limiting Standard of Harmful Substance in Aquatic Products*
- 2) Our company is planning to strengthen research and development of meat essence and condiment (chicken flavor, beef flavor and cooked meat flavor), but our capacity in this regard is weak, so we need support of experts in this regard.

Cooperating style: not limited



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63. Full-floating purple seaweed breeding drying operation

Full-floating purple seaweed breeding drying operation is not easy because the working intensity is great, stability is insufficient in drying process and operating time is long. We need a small machine with the characteristics of small working intensity, great stability and easy to operate.

64. Storing, packaging, quality maintaining and preservative technique in kelp processing course

- 1) Storing technique of fresh kelp;
- 2) quality and freshness preserving technique of constant kelp package

65. Under-mine carbon molecule sift nitrogen air treatment

In order to guarantee attachment of sift, carry out drying treatment of air source before entering absorption tower, reduce temperature of exposed air source to -20°C in order to reduce contained water; however, limited by safety demands on coal mine, we don't have licensed cooling machine to use.

66. Virescene garbage pollutant-free consumption and recycling technology

1. Introduce in self-propelled tree crushing machine to crush branches and leaves and carry out green belt covering experiment with organic material.
2. Aerobic fermentation of branches, leaves and lawn to create high-quality organic fertilizer.
3. High-temperature sterilization of Manila and ryegrass powder, mechanical compression, process grass powder to make feeding stuff for grass-eating animal.

Main technical and economic indexes:

1. Turn garbage into treasure, the investment on self-propelling tree crushing machine can be acquired within one year, the second year will yield more than 100,000 RMB yuan economic benefit.
2. The processed feeding stuff grass should comply with sanitary and security standards for animals.

67. Manufacturing craftwork of cleaning polyurethane

1. Reclaim and utilization of castoff produced during the process of manufacturing polyurethane, reduce cost by 200 RMB yuan/ton;
2. Reclaim and utilization of, save cost of water 100 RMB yuan/ ton;
3. Density of product $0.35\text{-}0.38\text{g/cm}^3$
4. Tensile-strength $\text{Mpa} \geq 10$
5. We are intended to purchase invention patent of polyurethane.

68. Pesticide cleanliness producing technique



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Since CS₂ is utilized during the process of compounding contrasting thiazolidone (F), strong odor is produced and waste water is difficult to dispose.

5-(4-chlorophenyl)-4-cymene-2- thiazolidone (contrasting thiazolidone for short)

Requirement: (1) Better not use it in composing process

(2) 1000 kgD raw material produces 720kgF (content is above 95%)

2-amino-1-(4-chlorophenyl) propanol hydrochloride (hydramine hydrochloride for short)

69. Soft coal molding technique

1. Molding technique of deferent types of soft coals can be used in gas coal after molding;
2. All kinds of capability such as mechanical intensity equals that of lump coal;
3. The molding cost of 1 ton of coal should be controlled within 100 RMB yuan.

70. Research and development of pesticide watercraft reagent

1. Substitute the research and development of pesticide emulsifiable solution such as water emulsion, micro-emulsion and suspending emulsion etc;
2. Low toxicity, highly efficient and safe;
3. Fluidity, frost resistance and great adhesive property;
4. Cost is lower than emulsifiable solution products, and raw material is convenient to purchase.

71. High-performance ink recipe and pen head producing technology

Water recipe of board pen, night righter pen, top grade mark pen and ink and ink for many special pens (such as ink for glass pen, metal pen, CD pen and film pen etc.)

72. Manufacturing method of teflon artificial blood vessel

Our company is intended to develop teflon (PTIE) artificial blood vessel, the main developing content include:

1. Bring forward the technical course for researching teflon (PTIE) artificial blood vessel;
2. Bring forward the manufacturing craftwork of teflon (PTIE) artificial blood vessel;
3. Bring forward detailed technical indexes and checking method etc for researching teflon (PTIE) artificial blood vessel.

73. Forming method of teflon positive ripple soft pipe

Currently, domestic enterprises can only produce teflon screw thread soft pipe, and can't produce Teflon positive ripple soft pipe, which can be used as anticorrosive lining of metal positive ripple soft pipe.

Since this technique is very difficult, if it can be formed together with metal soft pipe, there will be a huge potential market, and have great purpose in petrification, nonferrous metal refining, medication and fertilizer fields etc.



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74. Physics method (metallurgy method) multi-crystal silicon producing method

While producing multi-crystal silicon with physics method (metallurgy method), the purity demand is 6N (99.9999%), and the cost of production should be controlled within 15 US\$ /kg (including raw material fee, fuel and impetus fee, wage fee and depreciation expense of capital assets etc.)

75. E-1 level urea formaldehyde resin glue producing technique

E1 level urea formaldehyde resin glue used in roll-in medium density fiber board; the requirements are controlling its cost within 300 RMB yuan above the cost of E2 level urea formaldehyde resin glue, suitable for roll-in producing craftwork and all physical indexes meet international standards.

76. Flame-retarded nylon series products without halogen and red phosphorus

Key technique:	selection of flame-retarded agent	
	Influence of dispersing effect of flame-retarded agent in nylon on flame-retarded performance	
	Good processing capacity, including material preparation and product molding	
Technical indexes:	intensity	$\leq 1.17 \text{ g/cm}^3$
	breaking elongation percentage	$\geq 7 \%$
	extension intensity	$\geq 70 \text{ MPa}$
	bending intensity	$\geq 100 \text{ MPa}$
	bending module	$\geq 280 \text{ 0MPa}$
	notch impact strength	$\geq 7 \text{ KJ/m}^2$
	flame resistivity (vertical 3.2 ~ 0.8mm)	V-0 level
Cost requirement:	cost of assistant agent $\leq 6000 \text{ RMB yuan/ton}$	

77. Static electricity and rust prevention of entertainment establishment

Eliminate or reduce static electricity phenomenon of entertainment establishment during utilizing process

Rust prevention technique of entertainment establishment

78. Uneven graph and insufficient brightness of spherical raster

When plastic sheet material is squeezed out, uneven graph and insufficient brightness on stabilizing roller influence visual effect . Current glossiness (60°) of lens raster film is about 95%, we hope it will reach 98%.

79. Meridional resistance rate equality of monocrystalline silicon mixing gallium

- 1) Realized length $\geq 1200 \text{ mm}$ perfect crystal preparation, diameter 156 mm, feeding material 60 kg/ furnace
- 2) Service life $\geq 10 \mu\text{s}$



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- 3) Uneven degree of meridional resistance $\leq 5\%$
- 4) After mixing gallium, hit rate of target resistance $\geq 95\%$
- 5) Finished product rate $\geq 68\%$

Cost requirement: Appropriate expense of cost is all right

80. Bamboo carbon prilling (round) connecting technique

Currently, the project has successfully created 2 cm-3 cm gain; however, after molding, the grain is loose. Originally, the project uses inorganic glue instead of organic glue. If using organic glue, the adsorbing function of nanometer level carbon powder will be influenced, so inorganic glue must be used to solve the problem.

81. Bottom solidifying problem of colorful dope

Bottom solidifying of colorful dope and color adjustment of painting (nitrate paint) are difficult, technical problem such as abnormal attachment capacity of painting in printing process.

82. Cold waiting static pressing method matching teflon powder technique and products.

Common pressure of general matching PTFE powder ≤ 15 Mpa. Since the pressure is insufficient, PTFE powder can't be pressed tightly in inner wall of steel tube, which leads to high contraction rate after agglomeration and defects such as crack, bubble and leakage of lining.

Technical indexes:

Diameter of tube:	$300 \text{ mm} \leq \Phi \leq 600 \text{ mm}$
Wall thickness :	$t \geq 15 \text{ mm}$
Density:	2.0-2.3 g/cm
Anti-extension intensity:	15 Mpa
Extension rate upon cracking:	$\leq 30\%$
Hydraulic pressure test: for 0.5h without leakage	1.5 times of designed pressure, maintaining pressure

83. Nanometer improved super-thin low – temperature fixing powder dope

Key technique:

1. Construction performance: improve electric performance with nanometer material, make the resistance of powder maintain $10^{12}\Omega$, increase first power feeding rate, and overcome defect caused by “faraday effect”, not influenced by shape and structure of components being coated;
2. Improve physical performance of coating layer, increase intensity of coating layer by utilizing strong surface combining power between nanometer and resin. Since the powder has long stability in storage, the surface of coating film has great smoothness and brightness after being stored for one year.
3. Products of the project can be solidified under $140^{\circ}\text{C} / 15\text{min}$ solidifying condition, film



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thickness of powder coating material is 25 μm ~35 μm .

Technical indexes: solidifying condition: 140 $^{\circ}\text{C}$ /15 min; diameter of grain:15 μm ~20 μm ; coating film:25 μm ~35 μm ; Dashing out intensity: 90 kg/cm^2 ; rigidity of pencil: 3H.

84. Development of titanium material fastening pieces

At present, our company utilizes titanium material valve-used fastening pieces processed with TC4, TA2. Since the friction coefficient is big and the pieces are often overdriven, it is difficult to install the valve. We are intended to improve the processing technique of titanium material fastening pieces and its performance.

85. Development of antibiosis healthcare drygoods

With a kind of hypertension curing technique, the product is used on pillows. On the one hand, it has auxiliary curing effect by improving sleeping with pillows; on the other hand, a blood pressure testing device is installed on the equipment, the device will alarm when blood pressure is too high, which make the service of paramedic convenient.

The product adopts a skin disease auxiliary curing technique. On the one hand, it helps curing skin disease by physical therapy; on the other hand, the product adopts techniques such as antibiosis to realize the effect of auxiliary physical therapy.

86. Technical development of top grade wooden leather shoe box that can lengthen the service life of leather shoes

New wooden products for developer to pack top grade leather shoe, mainly functions are as follows:

- 1) can effectively avoid leather hardening problem, thus lengthen the service life of leather shoes;
- 2) can effectively avoid undesirable odor, insects, and going moldy of leather shoe, better have certain effect for curing dermatophytosis;
- 3) Convenient to place in home, occupy as few space as possible; convenient to take at trip.

87. Automatic puller installing device of plastic film zipper bag

Automatic puller installing device

Plastic film zipper bags are extensively used in fields such as communications and office work etc. However, with the increase of automatic degree, traditional manual puller can't meet the continuously developing industrial demand, so a device to automatically install puller is urgently needed to improve productivity.

88. Multi-head compound non-weaving cloth making equipment

Key technique:

Adopt double M heads to improve obstructing performance of products. When M content of compound products is identical, filtration, obstruction of double M compound product is better than that of single M compound product; thus applicable scope of the product is



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extended.

Stable and high-speed rotation of connected machines. Adopt even pressure design for thermal rolling machine, stable tension design for high-speed automatic disconnection of winding machine and splitting machine, net curtain anti-deviation design for high-speed web forming machine.

Technical indexes: multi-level compound: (four and more layers), product specification: (15-100)g/m²; breadth: 3200 mm, 2400 mm; economic index: productivity \geq 7000t/a;

89. CAD/CAM automatic cutter of natural leather vamp

Collection and processing technique of data of natural leather line graph is vital for success of the machine, so how to collect these out-of-order graph data and data processing technique becomes the key of successfully develop this machine.

Technical guideline:

1. adopted precision of graph data: ± 1 mm;
2. cutting thickness: ≤ 4 mm;
3. cutting speed: 50-80 cm/s;
4. leather positioning style: vacuum negative pressure adsorption;
5. cutting precision: ± 0.25 mm;
6. area of workbench: 1600 \times 1000 mm

Cost requirement: 1.10 million RMB yuan

90. Deviation rectificatin of automatic hull machine, research of vacuum board transferring framework

Key technique:

Design deviation rectifying and positioning device of hard paper, make its inaccuracy of relative position is less than 0.05mm. Deviation rectifying device can accurately place hard paper (or inner paper) on tissue, eradicate the inaccuracy caused by deviation of tissue, improve taste of hull machine, quality of finished product and work efficiency. Design vacuum three-circuit recycling board transferring institute, realize inhale, release and placement of hard paper by negative pressure sucker.

Technical indexes:

Speed of transferring board:	20~30 times/minute;
Maximum size of hard paper:	500 \times 700mm;
Minimum size of hard paper:	150 \times 200mm;
Thickness of hard paper:	1.5~3.0mm;
Quality of tissue:	100~200g/ m ² ;
Power of whole machine:	13.5kw/380v