

# Sugar Mill



Allbest Creative Development Ltd. (ALLBEST)

# Integrated Sugar Mill (5,000-10,000 T/D)



## 2x2,000 T/D Sugar Mill, Myanmar



Milling house



Press filters of sugar processing house



Vacuum pan of boiling house

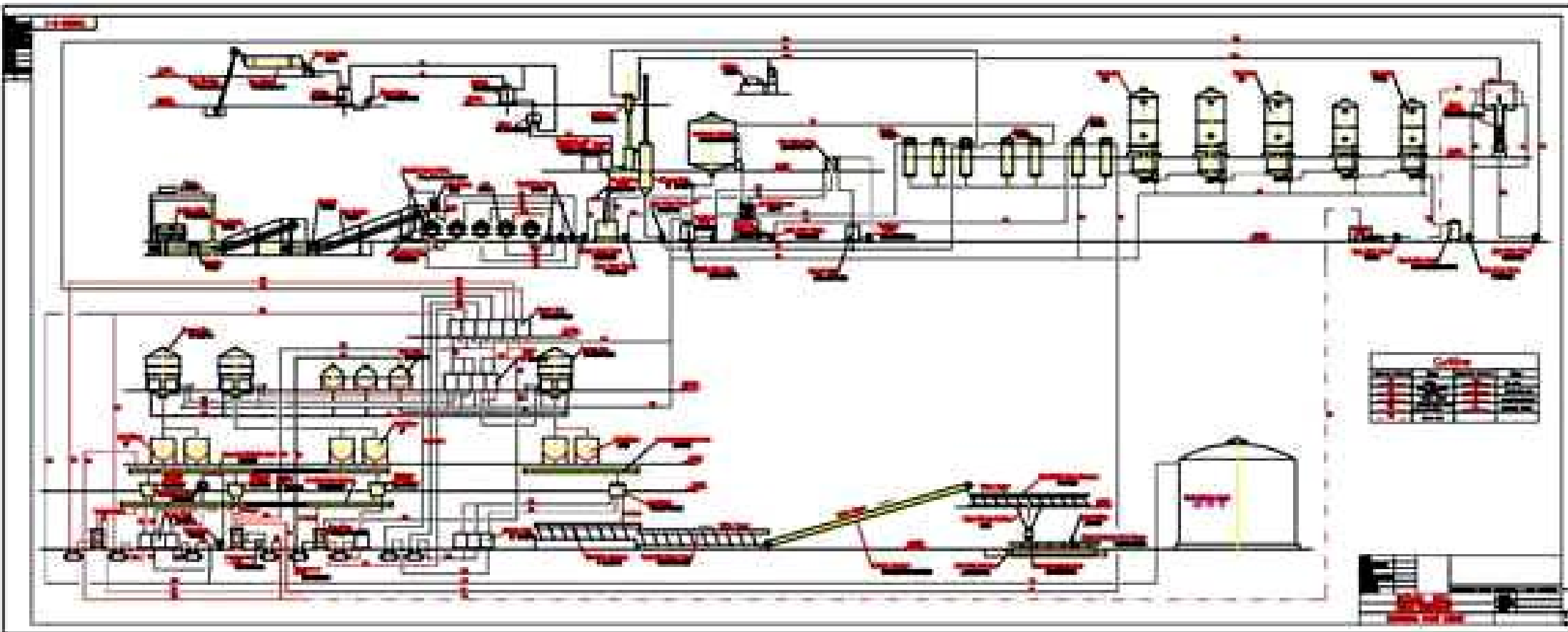


2x1,500 Sugar Mill, Myanmar



Sugar mill, Vietnam

# Typical Material Flow Chart



# Brief Introduction of Equipment



## Sugar cane weighbridge

Sugar cane weighbridge is used to weigh cane and then discharges the weighed sugar cane to the sugar cane feed table. The specification and the number of the equipment can be chosen in accordance with the daily production of the mill. All choices can meet the requirements of the production. It is equipped with a chain-plate type table above and a weighbridge is placed on the ground. The equipment is designed for batch operation: sugar cane is lifted to the table by a crane, and weighed. Then switch on the power to start the motor, sugar cane is discharged to feed table when chain-plate type table runs. And then switch off the power, stop the motor. This operation can be repeated according to the actual work requirement.

It has the characteristics with simple structure, easy operation and mechanization and continuation of weighing of the sugar cane. This equipment is consisted of transmission device, framework, lubrication system, chain-plate and gearbox reducer, etc.



## Sugar cane feed table



This equipment is designed to receive the sugar cane discharged from the crane or weighing platform, and to feed sugar cane to the conveyer evenly. The equipment is chain-tooth style. There are many draw-chains with triangle-shaped steel mounted on the surface of table, of which draws the sugar cane to slide along the surface and discharges it into the conveyer.

It is batch operation. The weighed sugar cane is discharged on the cane feed table. Then start motor, sugar cane is discharged to the cane conveyer when the train runs. Switch off the power to stop the motor. This operation can be repeated according to the actual work requirement.

It has the characteristics with simple structure, easy operation and mechanization and continuation of weighing of the sugar cane. This equipment consists of transmission device, frame, lubrication system, steel chains -plate and gearbox reducer etc.

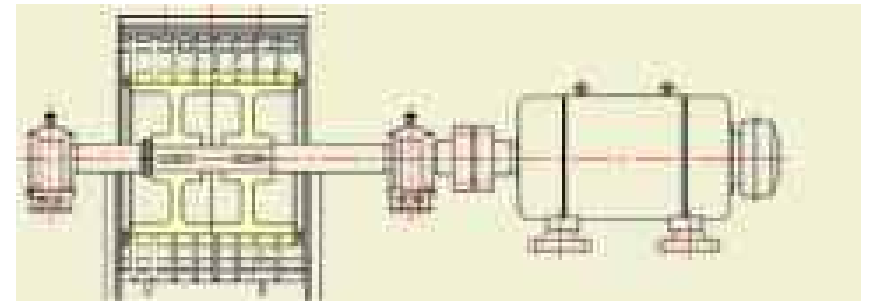
## Sugar cane conveyer



This equipment is designed to continuously convey the sugar cane to the juice extraction section. Cane leveler, cutter, shredder etc. are placed on along the conveyer. There are chain-plate type conveyer and belt conveyer available for customers.

## Leveler, Cutter, Shredder

They are sugar cane pretreatment equipment. The sugar cane is leveled, cut and its fiber of cane is shredded into short pieces and fine chips, and cells of the sugar cane are broken to benefit the extraction of the juice from it. The equipment consists of a drum, a main shaft, knives, bearings and a cover etc. it rotates reversely, it is a new model developed in recent years. It is verified as a good product by both our research, development and manufacture, and the actual use of our customers. Comparing with the former knife-disc type, its efficiency is improved a lot; it has the advantages of high preparation (improved from 70% to 75--80%) and with a good physical-state. So, it is used widely in sugar factory in recent years





## Heavy sugar cane shredder

1. This equipment can shred whole cane without using the sugar cutter for precutting. It can reduce equipment, investment and lower the maintaining fees.
2. This shredder is equipped with two balance drums and one feeding drum to give the best cane feed, which makes it free from the problems of other equipments, such as the choking because of over loading and the poor preparation because of less feeding. Hence the efficiency is improved.
3. Because stable feed can be maintained, the power consumption is stable. Differ from the others that may waste normal production time because the failure of steam turbine or motor caused by the fluctuation of the load, which resulted from poor cane feed.
4. Theoretically, sugar cane pretreatment index is in direct proportion to the tip speed, the higher tip speed, the bigger power consumption, the bigger tear and wear of knife-hammer as well, the higher preparation index. Comparing with the other shredders (which have to add some equipments such as cane cutter etc. before it), on the condition of same power consumption, the pretreatment index of this shredder is higher than others. Given the same conditions in mill house, the extraction is proved to be higher than others.
5. The diameter of heavy sugar cane shredder can be designed according to the customer required preparation index; the width of the machine will be designed according to the existing sugar cane conveyer. Commonly, the designed power of the equipment is 10kw per ton hour, the actual power consumption is 7kw per ton hour (calculated on the basis of the fibre contain of sugar cane is 15%), rotation speed: 1000r/min, the driving power of the feeding drum is 22kw, the first balance drum is 55kw, the second balance drum is 30kw (above is calculated on the basis of processing 250 tons of sugar cane per hour). The transmission part of the shredder can adopt either electromotor or steam turbine.



## Tongaat Cane Shredder

Tongaat cane shredder is a type of firm crusher with a heavy hammer. The exquisitely and patented rotor makes the covering area of hammer stamping is the same as the width of shredder, the unique stagger design of the rotary dish guarantees the firmness of the structure of rotor. The strong side-frame provides reliable support to the rotor bearing. If required, a cane cutter or a feeder can be installed on the top of shredder. So that the feeding of material into shredder can be well distributed. In the case of large and hard impurities mixing into the cane, the railing plate can open out to avoid the damage to the equipment.

For the cane factory, regardless of traditional milling process or diffusion process is adopted for the extraction of can juice, the index of preparation can be stabilized up to 90% when tongat shredder is used. Only the new and original design of the Tongaat may bring about such a high preparation index. It also brings about a high transformation coefficient of energy and the least wear and tear on equipment. This is the unique feature of the Tongaat shredder.



### Main Advantage:

- (1) Due to its high preparation index, the load of mills can be reduced. As a result, the driving power for mill can be also reduced. In addition, because of the high density of the cane fibres, the crushing g capacity can be raised by 10%.
- (2) Due to its high preparation index, the hydraulic pressure of mills can be reduced so as to reduce the wear and tear of the mill rollers and extend the service life of the rollers.
- (3) The equipment enjoys reliable performance, simple maintenance and convenient removal and replacement of the heavy hammer.
- (4) The prepared fibres of bagasse are longer, which is suitable for comprehensive utilization.

### Beveled-adjustment mill

This is a straight triangle- shaped beveled-adjustment mill with 3 rollers and taper pin. The structure of the mill is new and original; the top angle that center of feed roller to the center of top roller and discharge roller is constantly to be 74 degree. the feed and discharge rollers can move up and down along the line of 37 degree. The inlet and outlet of the mill can be adjusted against the wearing of the rollers during the campaign, the trash plate doesn't need placing when it is getting worn out, ensuring the safety operation .The structure of the mill is compact, trash plate is narrow, and power consumption and cost of crushing are low. All the top rollers and the feed roller of first mill and the discharge roller of last mill adopt lotus roller. So, the drainage of juice is more efficient, and effectively reducing the re- absorbability. Due to the unstable quality of the domestic large rolling bearing, we adopt slide bearing, it has the advantages of low cost, copper bush is not easy to be worn, and in case the copper bush is worn, the replacement is easy to take, so as to improve the time efficiency.



Design and the manufacture of the machine follow the latest technology of the mill in the world. It was verified by the Ministry of Light Industry that the extraction of juice reaches 96% or up. This machine has the features of compact structure, easy adjustment, rational force taken, low power consumption, high efficient juice drainage, safe and reliable.



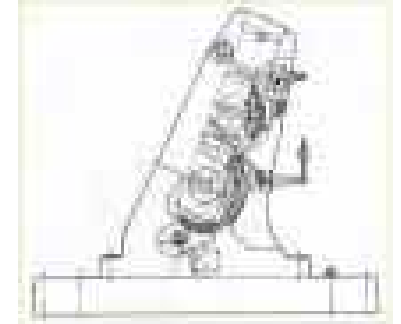
### Constant opening ratio mill

Constant opening ratio beveled- triangle-shaped mill is one of the advanced mill. The ratio of inlet vs outlet is maintained the same during pressing. Its 3 rollers is arranged as beveled triangle shaped, that is the position of feed roller is a little lower than the discharge one, which with a 15 degree forward incline. The frame of the machine is divided into top and bottom parts. The bearings of feed and discharge rollers and trash plate are installed on the bottom part. The top roller and bearings etc. are installed on the top part. The two parts are integrated as a whole by the pivot shaft and the oil cylinder. The pivot shaft as a fulcrum at the top, the bearings of the top roller as a stress point, oil cylinder as force point, it forms a lever structure. The full pressure can be obtained at the top roller by giving half of the stress on cylinder. If a sugar factory with the milling method adopts constant ratio beveled-triangle-shaped mill, the extraction can be improved up to 96--97%, the power consumption can be reduced and the labor intensity can also be declined. The sanitary condition and the working environment can be greatly improved.



## Two rollers mill

The production of the mill is an innovation to the traditional three rollers mill. It is the first Large bottom roller of Double Rollers Mill that self-developed and manufactured in China. The power consumption of this machine is greatly reduced. The saving of the power is up to about 30%. The structure of the mill is compact, there is no need of adjustment of opening ratio and trash plate, the installation and the adjustment are convenient.



## Flat regulation mill



This machine is straight triangle-shaped and horizontal adjustment three rollers mill. The rollers is supported by slide bearings, there are inlet and outlet opening adjustment devices on the bearing of the feed and discharge rollers. The way of adjustment is horizontal adjustment. There are three – stars shaped gears at the end of the shaft of three rollers to drive the rollers running.



## Specialized compound reducer

This specialized reducer is designed, manufactured and developed by our company. There are single-shaft-out type and triple-shaft-out type. It substitutes traditional open transmission plus standard reducer (complex type), with the advantages of compact structure, high transmission efficiency, small land occupation etc. It has been popularly used in sugar factory and been exported to Vietnam, Myanmar etc.

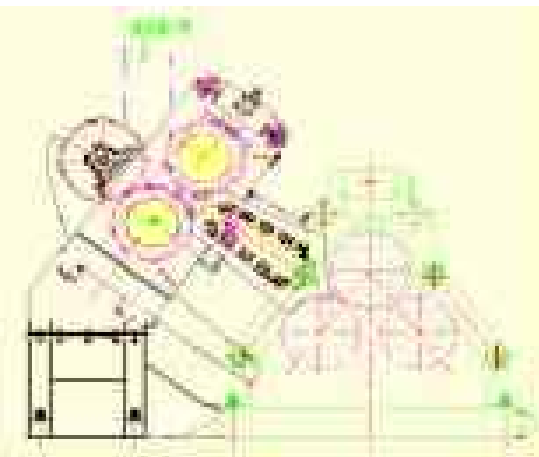


## High efficiency block-free lotus roller

High strength block-free lotus roller is greatly improved on the basis of the high strength lotus roller, especially in way of processing. The inverse taper hole is design to make the squeezed out cane juice smoothly drain out and block-free. It fully solved the problem of drainage holes blocked by the bagasse. It assures the high efficiency of juice drainage, greatly reduces the factor of re-absorbability, assures extraction of crushing, meanwhile, it helps to reduce moisture and power consumption



## Two rollers pressure feeder



(1) There is sealed trough between top roller and the feeder roller, forced canes enters into mill under compressed condition. The feeder roller can press out more juice, improving extraction by 1-2%, reducing moisture by 1-2%, increasing crushing capacity by 30%. The power consumption usually less than 30% of the mill's . The worn disposed roller of the mill can be used as feed roller to save the investment.

(2) It is popularly used by most of sugar refineries in Cuba and Africa. The research and application of the machine was started in 70s domestically. It has been used in Jiexi sugar factory and Zhongshan sugar factory in Guangdong province, Guixiang sugar factory (now, Guitang Group) and Tuolu sugar factory in Guangxi province China. And gains satisfied results

## Inter carrier

This equipment is installed between two mills, used to convey the cane materials. The inter carrier has the types of belt type and rake-teeth type etc.

This equipment is used to carry the bagasses discharged from front mill to back mill in the sugar factory. During the transportation, the bagasse on the belt can be imbibed in the meantime. The machine uses rake-teeth as medium belt for the bagasse conveyance, the bottom of the trough is sealed, so there is no bagasse and juice leaking out from the bottom of the trough, making the place relatively clean and tidy, and easy to maintenance. Because it equipped with feed chute, the feed is greatly improved.



## Juice Extraction

## Cane juice screen

It is consisted of screen mesh and the box body. The screen mesh is composed of wedge shaped copper stick that combines into a big arc surface of the screen. The clearance between the wedge -shaped sticks can be adjusted by the copper washer. The stick can be made of copper or stainless steel to meet the requirements of filtering the mixed liquid, which contains many different impurities. Mixed liquid flows from the top juice tank of screen to pass through a round overflow weir then enters surface of the screen with a waterfall shape, the filtered liquid drains out under the screen, the impurities slide along with the surface of the screen and fall into the collection chute.

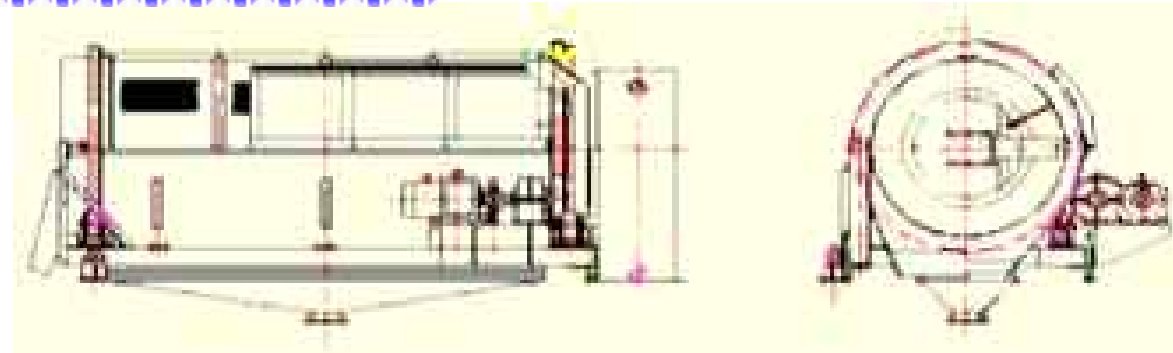
The features are:

- a. Because there is no moving component, the process utilizes gravity, so there is no power consumption of the equipment itself.
- b. It is simple structure. safety and reliability and convenient maintenance.



## Roller screen

Roller screen is newly developed equipment for cane juice filtering in recent years. The main component is columnar screen. The screen can be made by copper or stainless steel to meet the requirement of filtering different impurities in the mixing liquid.



The rotation of the screen is driven by the big gear outside the screen columnar. Making the impurities rolling in the columnar, the impurities driven forward by the pushing plates in the screen . It is discharged by the discharge-ring in the end. The liquid flows out from the clearance of the screen, and drained out from bucket at the end of the equipment.

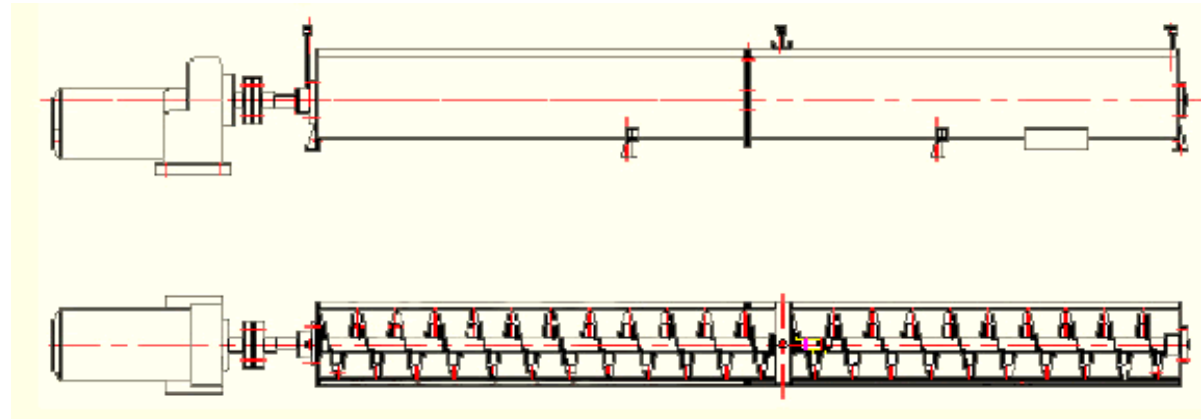
Main features

- (1). Big capacity of treatment, and can adapt the instantaneous fluctuation of big volume of the coming mixed juice.
- (2). Liquid drainage, and bagasse discharge is continuous and automatic, clean operation environment, simple and convenient operation.
- (3). High efficiency of filtering, the impurities rolling forward in the screen columnar, longer residence time in the screen, low moisture of the filtered cane fibre..



## Screw conveyer

The product is consisted of trough, motor and screw device. The trough is U-shape opening storage tank. Jointing structure. The screw device is consisted of screw shaft, and screw lamina. It is driven by motor with a reducer, and driving the screw vane to convey the sugar materials.



## Bagasse packer



Bagasse baler is used to press loose bagasse from mill into a quadrate bundle for convenient storage and transportation. Normally, there are two types, vertical and horizontal. It also can be classified into two types, mechanical and hydraulic, according to the transmission way. Horizontal baler is designed as a continuous unit, the bagasse is feeded from the top of the baling room, the driven by crank gear, press head press out the bagasse continuously. The baling room is made of steel. The pressing force of packing balances with the friction force between the inner wall of the packing room and the bagasse, simultaneously, the rope can be pulled on during the process of pushing bagasse in the room. The pressing force required for packing the bagasse can be received by adjusting the pressing distance between the up and down cross beams on the outlet of the packing room. Horizontal packer has high efficiency and easy to operation, it is the main developing packer type.

## Heater

Heater is the heating equipment that using the steam as the source of heat in sugar factory. It is multi-procedure vertical tubebank heater with fixed tube plate. It is mainly consisted of cylinder, top cover and down cover. Utilizing the principle of balance, the up and down covers is connected with connecting rod, which is easy to open and close.

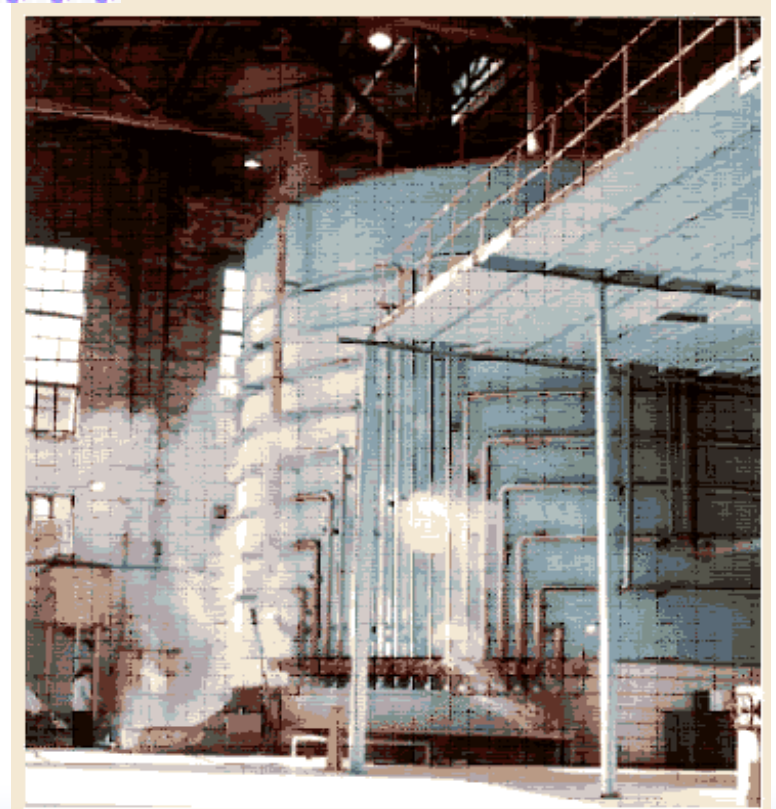
The heater and the tube plate is swell fixed (when using stainless steel tube, the fixing is made by welding), it is easy to maintenance and replacement, the seamless steel pipe, copper pipe and stainless steel pipe can be adopted to produce the heater according to the choice of the customers.

The customer shall supply the position of the pipe orifice of the equipment when placing order.



## Constant subsider

Constant subsider is used to separate clean juice and slurry in sugar factory. It is multi-layer constant subsider with agitation and sleeve pipe shaft. Juice entrance tunnel and slurry flow tunnel is separated by the sleeve pipe to avoid mixing; the clean juice is comparatively clear. The mud degree of the slurry is relatively high. The exit of the clean juice is changed from overflow type to discharge valve. It increases the flexibility of the production, which can adapt the characteristic of unequal juice coming in sugar factory.





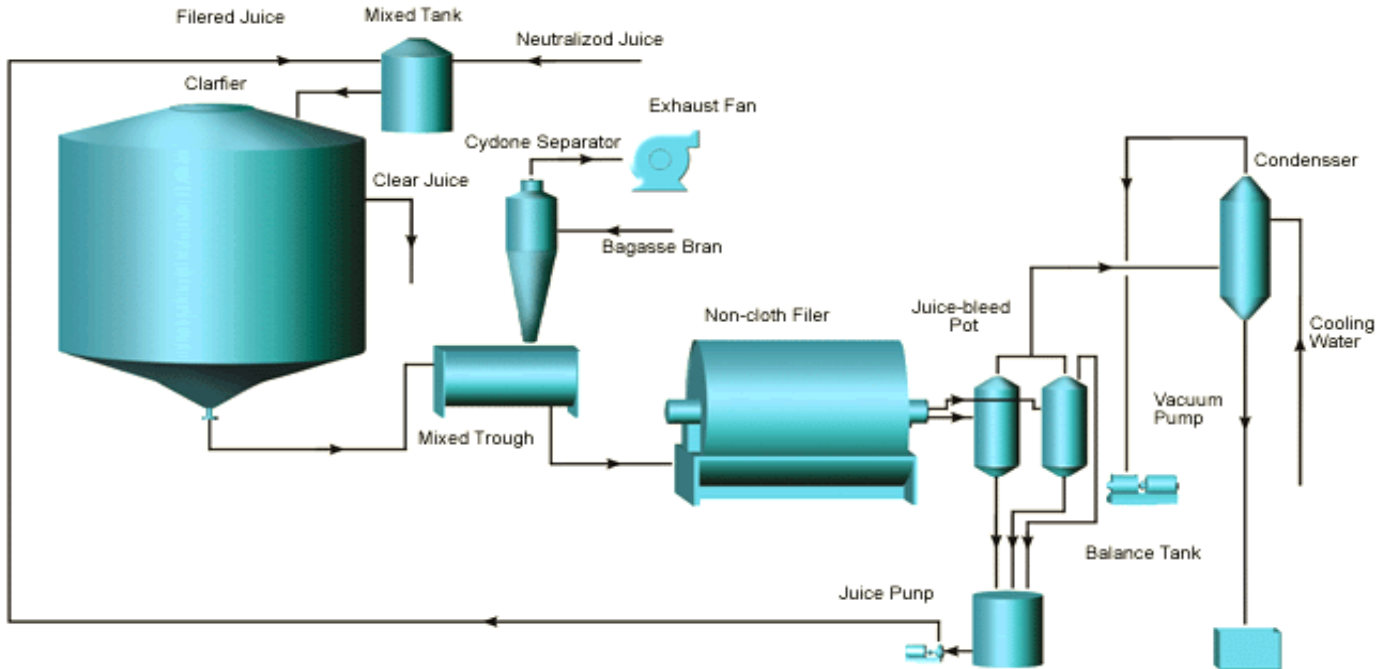
# Non-Cloth Vacuum Filter

Simple structure, easy maintenance, low cost for checking and repairing. The material of the touching materials is stainless steel, so it is durable in use, sanitary and good look.

Continuous, automatic and easy operation, large capacity and high efficiency with few operators. The capacity of handling mud juice is twice more than the same specification of vacuum filter with cloth and it realizes energy and resource saving.

**The speed** of drum can be adjusted continuously, so the suitable thickness of filtrate mud can be kept with high vacuum degree and rather low moisture of filtrate mud (65%~75%). When amount of injecting water is 100%~150% of the filtrate mud, the pol of dry filtrate mud can reach 3%.

The equipment has no filter cloth so that it saves water of washing cloth and results in no discharge of waste water in operation. It is a type of environmental protection equipment.



## Automatic press filter

Heater is the heating equipment that using the steam as the source of heat in sugar factory. It is multi-procedure vertical tubebank heater with fixed tube plate. It is mainly consisted of cylinder, top cover and down cover. Utilizing the principle of balance, the up and down covers is connected with connecting rod, which is easy to open and close.

The heater and the tube plate is swell fixed (when using stainless steel tube, the fixing is made by welding), it is easy to maintenance and replacement, the seamless steel pipe, copper pipe and stainless steel pipe can be adopted to produce the heater according to the choice of the customers.

The customer shall supply the position of the pipe orifice of the equipment when placing order. This equipment is consisted of tightness device, hydraulic draw back device, oil supply system and its matched microprocessor, electrical control equipments etc. the working process of this machine includes the tightness of the plates before filter, the draw back of the plates after filter and conveniently mud discharge. The tightness and draw back is driven and finished by oil cylinder, oil pressure motor and mechanical arm.



## Evaporator



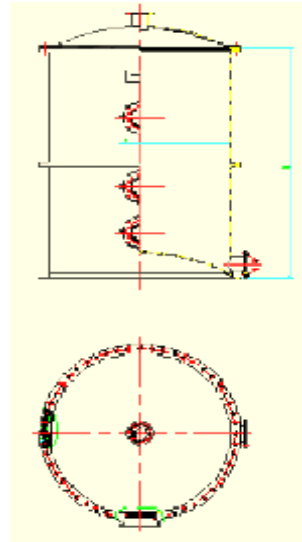
The evaporator is vertical tubebank type, which is consisted of juice steam room, heater, jar body etc. there is inertial juice capture device at the top of the juice steam room. The heater is plate tubebank type. There are downcomer inside and sugar juice circulation tube outside in the evaporator. The swell fixation is adopted when the heating tube is made of carbon steel. It is easy to maintain and replace. When the material of tube is stainless steel, the tube will be welted with the plate. The customers should supply the position of pipe orifice for the equipment when placing order.

Main features

- Compact structure, simple, easy to manufacture, reliable operation, the tough dirt is easy to cleanout.
- The steam entered into the juice steam room is well distributed; the exhaust of non-condensable gas is complete.
- The heat transmission coefficient is high.

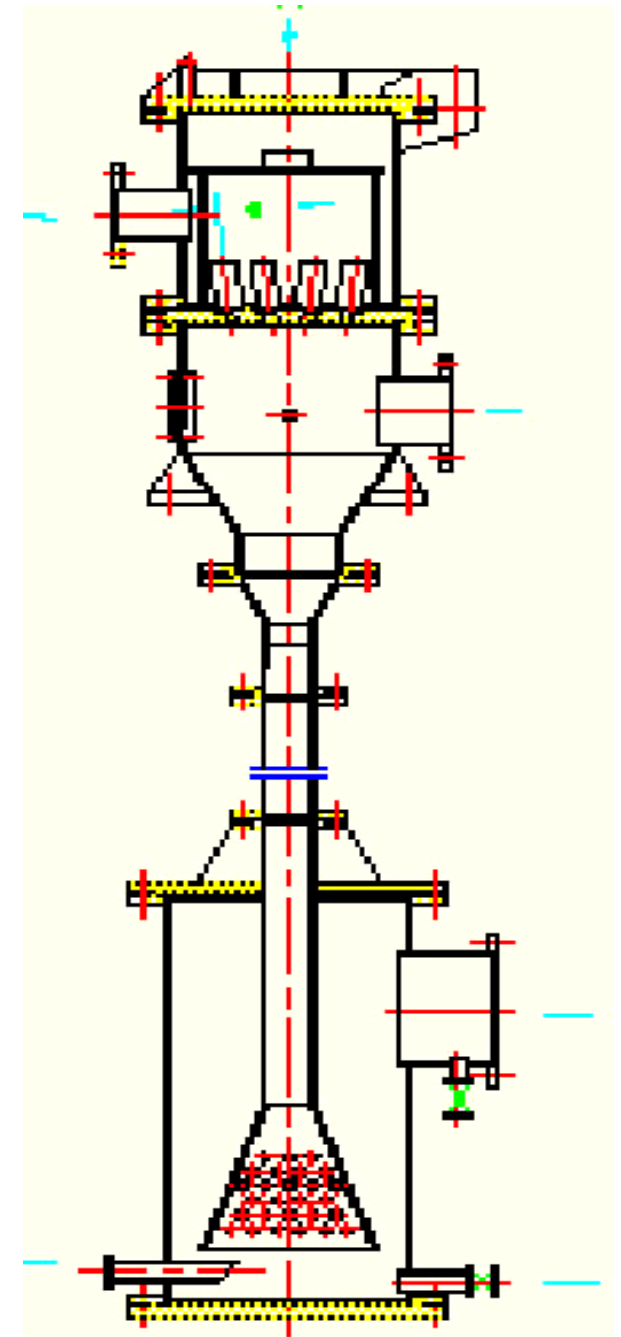
## Balance jar (box)

The jar is a sealed cylinder vessel with vertical body, which is consisted of end plate, jar body and level gage. The adapter in the middle of the jar is connected with the condensation water tube of evaporation jar, the adapter at the end of the jar is used to discharge the condensation water. The end plate adapter connects with the top part of the heating room of evaporation jar. Solidified water flows into balance jar upon itself gravity. Keeping certain water level in the jar through an automatic controlled discharge valve, which forms a water seal.



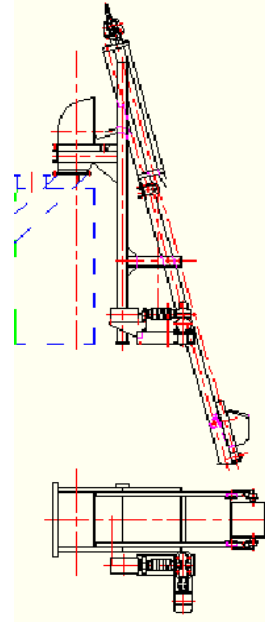
## Neutralization sulphur smoking device

The device is used to bleach sugar juice (or syrup) and to subside of impurities. The sugar juice (or syrup) under a certain pressure sprays through spray nozzle and jets through a venturi at where forming a negative pressure to inhale sulphur dioxide gas; which is absorbed in the tail pipe, then enters into neutralization box where adding lime milk to finalize the process of neutralization of sulphur smoking.



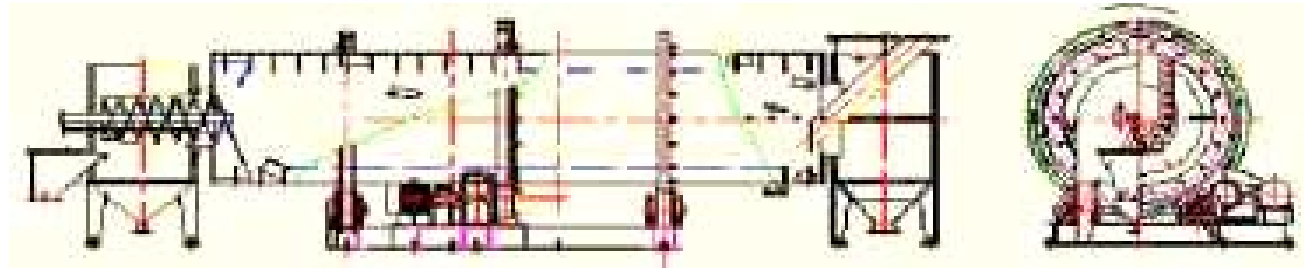
## Lime elevator

This elevator is used to convey lime to the slaker. Driven by electromotor, reducer drives the steel wire rope moving to drag the ladles moving along the rail, and conveying the lime to the slaker.



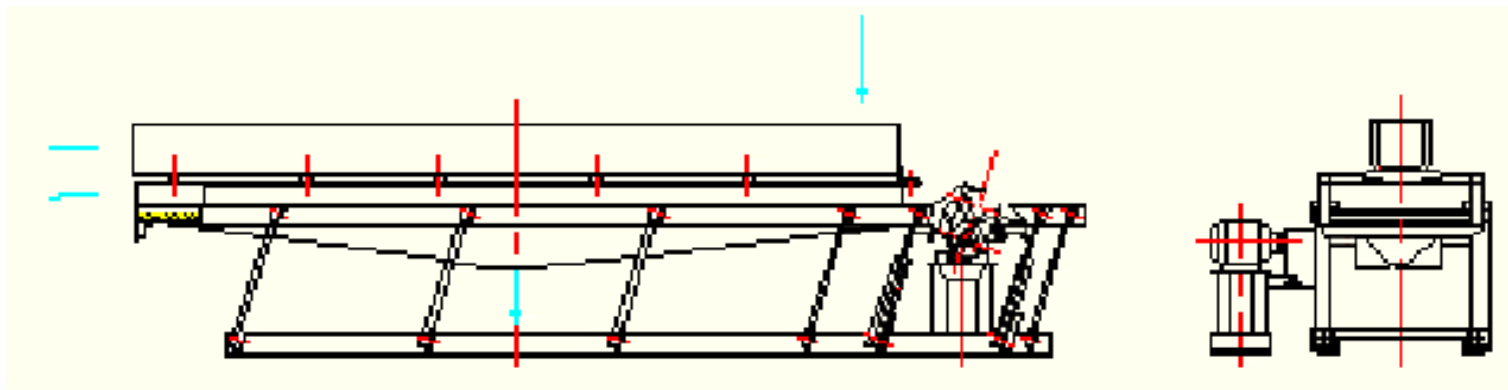
## Lime slaker

This machine is used to slake lime. It is driven by electromotor. Lime moves along with the moving of the screw plate in the slaker. Lime is slaked into lime milk by adding water.



## Sand catcher of lime mil

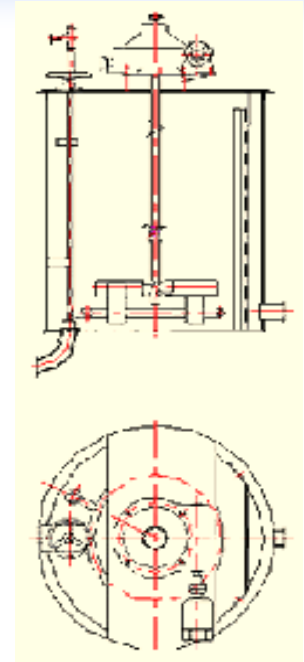
It is used to remove sand from lime milk. Driven by electromotor, the double-shaft adjustable double-sector eccentric-block that is used in high-frequency vibrator, turning synchronically in reverse direction, which creates a certain frequency shaking force to apply to groove body and to transmit to the spring arm, of which is generated the same frequency and relevant amplitude; because the installation of spring arm is inclined on the groove, the material in the groove is thrown up forward with a incline angle. There is screen mesh on the groove, which makes the material be conveyed and screened.



**Clarification and evaporation**

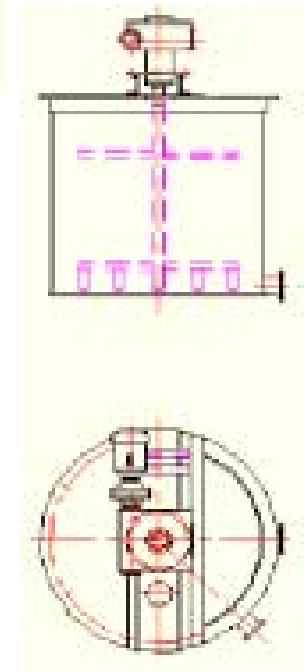
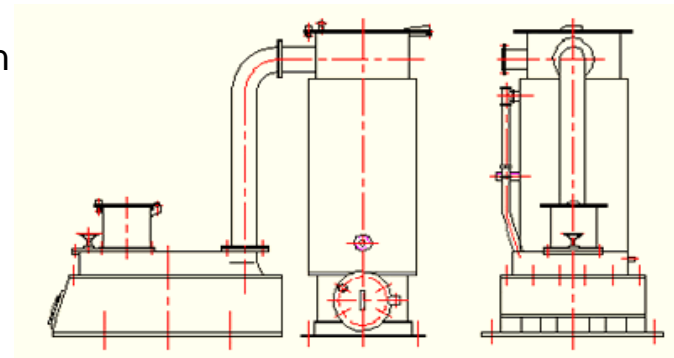
## Lime milk agitator

This machine is used to agitate lime milk. Driven by motor, speed reduced by worm wheel reducer, driving the transmission shaft to make the agitator running, keeping the lime milk stored in the agitator out of sediment.



## Sulphur burning furnace

It is used to produce  $\text{SO}_2$  by burning sulphur. Liquid sulphur is burned in the combustion plate. The heat generated by combustion melts solid sulphur on the melt-plate to liquid one. The entering quantity of sulphur into the combustion plate can be adjusted by needle valve. The  $\text{SO}_2$  generated by combustion is exhausted through cooler. The furnace body is in sandwich structure. The temperature inside furnace can be reduced and the sublimation can be lowered by input water flow into the interlayer.

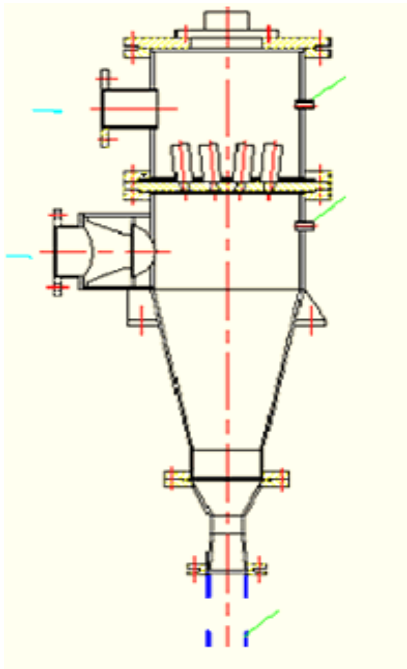
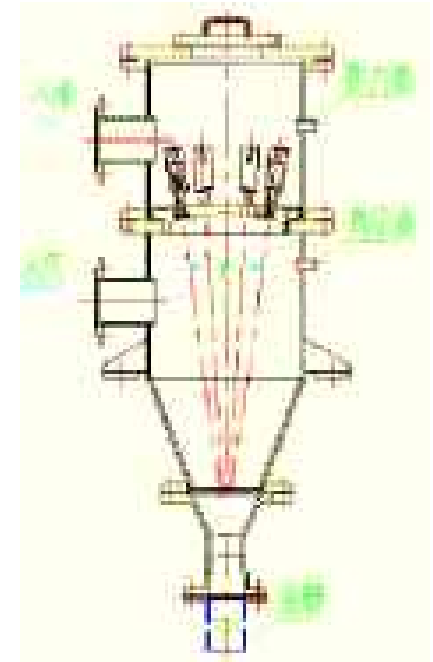


## Phosphoric acid agitator

This product is used to dilute phosphoric acid. Driven by motor, speed reduced by worm wheel reducer, driving the transmission shaft to make agitator run

## Exhauster

**This** equipment is mainly used to exhaust air to form vacuum, and also can be used to condensate steam as well. It is mainly applied to vacuum filter, juice drawing device and keeping vacuum condition. The vacuum is obtained by spray out many rays of high speed water flows through equal spread symmetric arranged nozzles, which condensates, brings, mixes and compresses the steam, and then exhausted into the air through the tail pipe on the throat



## Condenser

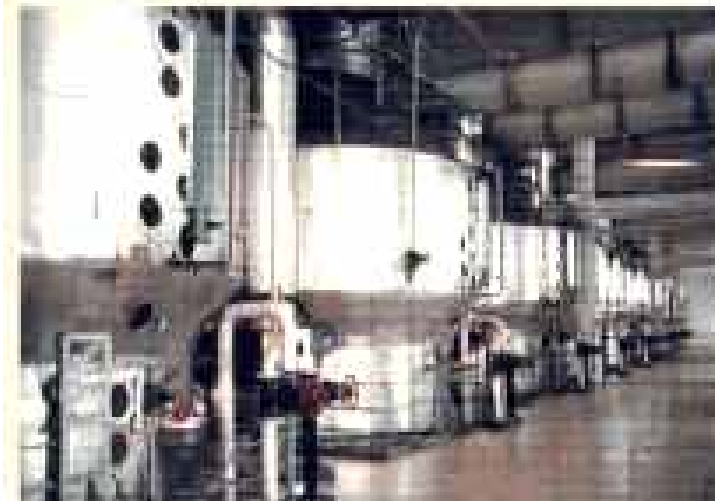
**The** equipment is a matching equipment with the evaporation, sugar boiling vacuum system in sugar factory. It is mainly used to condensation and exhausts minor incondensable gas. Utilized to evaporate, condensate steam of sugar boiling and keep vacuum.

## Crystallizer

Crystallizer is consisted of tube bank heating room, juice and steam room, bottom cover and juice capture device etc. heating room is suspending drum type, using supporting member to suspend the heating room on the wall of the jar. The circular liquid descendent channel is formed between the heating room and the wall of jar. The central downcomer makes the massecuite, which raised by the heating in the heating pipe is divided into inner circulation branch and external circulation branch on the tube plate. The heating room of the crystallizer uses the structure of incline tube plate. Up and down tube plate adopts the same angle of inclination. The bottom cover is taper one, using the electric valve to discharge materials. The diameter of the juice and steam room is bigger than the heating room; it can reduce the liquid level of the tube in down tube plate when boiling massecuite at same volume so as to reduce the effect of static pressure and strengthen the circulation of the massecuite. There is mechanical agitator installed in the forced circulation crystallizer. Driving the massecuite to make forced circulation in the container so as to improve the heat-transfer coefficient and evaporation intensity, and increase the speed of crystallization. The agitator has top placing type and middle placing type.

Main features:

- It owns relatively big liquid-descend cross section, its circulation rate (the heating section divide by descend section) reaches 2. So the convection circulation is good.
- Sugar is easy to discharge
- Condensation water can be discharged fully
- Forced circulation crystallizer improves heat-transfer coefficient and evaporation intensity, increases speed of crystallization.





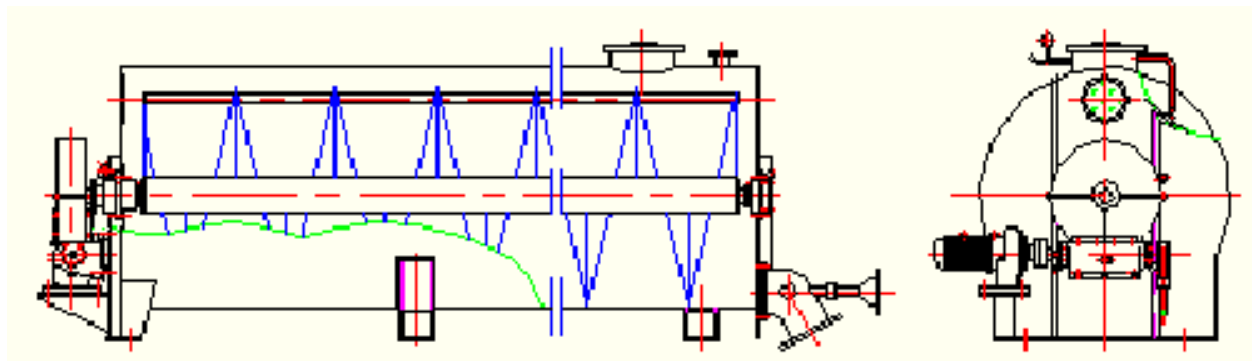
## Constant sugar boiling jar

- (1) **The** horizontal placed round jar is divided into many locelluses by the longitudinal and transverse placed dampers. Masecuite is forwarded along the locelluses, passing one locellus to another through a series holes on lower part of the damper.
- (2) **Transverse** placed heating pipe column are arranged in vertical rows. The end of the pipe is connected with the wall of the jar and sealed with the patented seal device that can make the pipe swelling freely. Pipe extends into the steam tank; the cover of the tank is closely seal by the bolts; the steam flows through the pipe.
- (3) **The** circulation rout of the masecuite in the jar is, raising between the transversely placed tubebank, and descending along the space between the out shell and the pipe column. For producing a forced agitation, the noncondensing gas is drawn from the steam tank and sprayed into the bottom of the jar by the steam sprayer.
- (4) **Every** locellus is connected with syrup or molasses taking device. Juice vapor is exhausted from the top of jar (with juice capture device). Masecuite is drawn out through the overflow device at the end locellus and discharged from the bottom of the jar. All the process is autocontrolled.
- (5) **Constant** sugar boiling jar has the features of heat quantity saving, full autocontrolling, shortening sugar boiling time, improving the quality of masecuite, homogenizing the crystal etc. it can reduce labor intensity, save labor, improve work environment, lower investment and reduce maintenance fee.



## Vacuum seeds tank

**This** equipment is used to store seeds for sugar boiling purpose. It is consisted of tank body, transmission device, agitator, discharging valve etc. The structure of the tank body is sealed horizontal cylinder type. Agitator is driven by the speed reducing motor through the worm wheel reducer. It keeps the crystal seeds stored in the tank out of precipitation.





## Vertical crystallizer

This equipment is consisted of cylinder, cooling device, agitator, transmission device etc. it can be installed in open-air, reducing the infrastructure cost. Moving components are installed on the center vertical shaft which rotates among the heat exchange tubes, agitating massecuite and cleaning the cooling surface. The connector of the cooling pipe is placed out of the vessel to avoid the cooling water leaking into massecuite. It is especially suitable crystallizing the C massecuite. Pumping massecuite from the bottom or top of the crystallizer (according to the requirement of the customer) , conveying into the cylinder, stay for about 30 hours, then overflowing from the top or bottom exit (according to the requirement of the customer) to enter into the massecuite distribution box. There are multilayer cooling snake tube in the machine and equipped with agitator, of which improved the cooling speed rate of C massecuite. So the generating of pseudo-crystal is avoided. The specification of the equipment is 100m<sup>3</sup>-350m<sup>3</sup>, among it, 150m<sup>3</sup> vertical constant crystallizer adapts to the sugar factory with a capacity of 2000-2500t/d to substitute the traditional water cooling crystallizer.

The features of this machine:

- (1). Homogenized cooling down, technical performance is stable and reliable. The average cooling temperature different is about 2°C/h.
- (2). It can be placed outdoor, reducing the area of construction. Land occupation is small; cost of construction is low.
- (3). Big capacity of production, under the same crystallizing time, constant vertical crystallizer can reduces the purity of waste molasses about 4% comparing with horizontal interval crystallizer, improved the ratio of recovery for the sugar.



## Water-cooling crystallizer

The series machines are interval water-cooling crystallizer, it is an equipment for cooling and crystallizing of the massecuite, which used in refinery workshop of the cane sugar factory. It is suitable for crystallizing of C massecuite.

The machine is consisted of U shaped body, agitator, cooling system, transmission device etc. there are inclined elliptic rings on the shaft of agitation, and every ring fits with water tube. The water outflow and inflow of the tube passes through the hollow shaft. Motor drives agitation shaft rotation at a speed of 0.5 r/min through worm wheel reducer, which cools the massecuite by turning over of it up and down, to make the sugar crystallizing.



## Air-cooling crystallizer

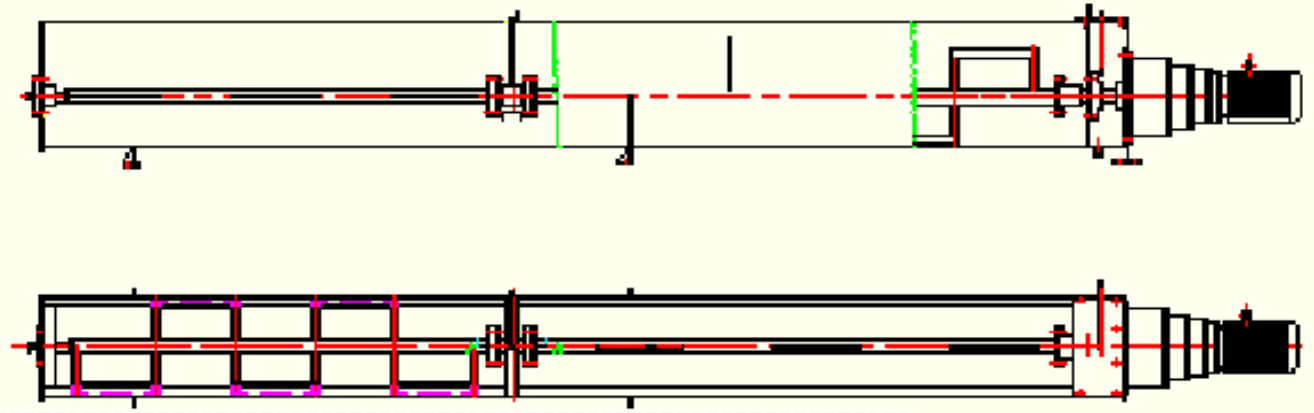


This is a kind of air-cooling crystallizer among the interval crystallizer series. It is crystallizing equipment for cooling and crystallizing of the massecuite, which is used in refinery workshop of the cane sugar factory. It is suitable to be a storage container for A massecuite before separating or for crystallizing of C massecuite.

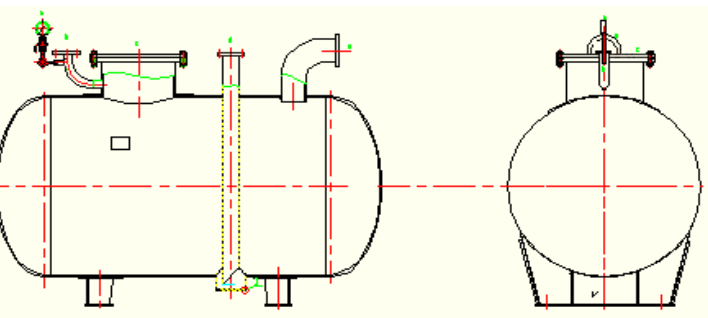
This equipment is consisted of U shaped body, agitator, transmission device etc. There are symmetrical left and right agitation plates that are installed on the long horizontal shaft, which prevents crystal grain from sediment. The agitator turning is driven by electromotor through the worm wheel reducer, Massecuite releases heat into air by continuously contacting with surface of metal shell, and cooling through the surface of the massecuite, which is exposed in the air, to reach the purpose of crystallizing.

### Massecuite distribution groove

This equipment is used to distribute various massecuite into the centrifugal, which is consisted of groove body, transmission device and agitator. The transmission device is speed-reducing electromotor that drives shaft of agitator turning, pushing the rectangular agitation leaves to move, promoting the convection and distribution of the stored massecuite.



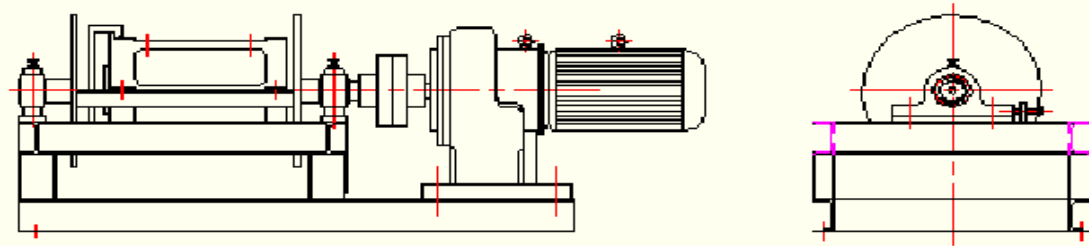
### Pneumatic conveyance jar



The equipment is mainly used to convey the fluid through pressed air, which can substitute sugar juice pump. There are vertical and horizontal types, which is consisted of manhole, air inlet, material inlet and outlet, safety device and pressure indicator. Furthermore, there are back valve on the feeding inlet, when the material enters into the jar and reaches a certain level, the air supply started manually, the material inlet back valve closed, the material is conveyed out from the outlet under the pressure of the air. When the level of material descended to a certain height, air supply is stopped, to open the back valve and start to supply material.

### Ball mill

This equipment is used to grind white granulated sugar into the sugar powder. The operation of the mill is driven by electromotor through shaft coupling. White granulated sugar and alcohol is grinded into powder by the grinding body in the ball mill, which is used to initiate the crystallization



## Full Automatic Batch Centrifugal

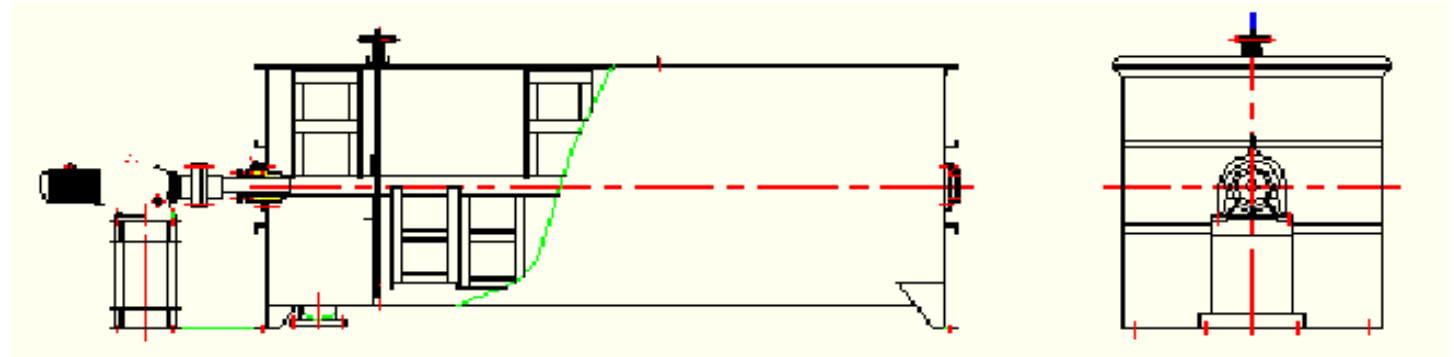
The TBS full automatic batch centrifugal is produced cooperatively by Thomas Broadbent & Sons Ltd. **The** driving motor creates three phases of synchronous speeds. The production cycle is controlled by a Programmable Logic Controller (PLC), which will indicate and verify the presetting parameters and monitor fault status. The centrifugal is equipped with many kinds of interlocks in safe and fault in order to protect the damage to operators or other equipment when the operation is failed. The material is fed into the rotary screen basket and distributed around the inside wall by the centrifugal action. The molasses can be washed off by the washing piping system inside the centrifugal . After rotating at high speed, the basket speed is getting slow and a plough scraper operated by pneumatic advice will scrap the material on inside wall to fall down, and the material is discharged by discharge valve to a conveyor from the middle of centrifugal bottom.

**The** motor has the elaborate design for professional three-speed or changing speed of frequency conversion so that the centrifugal has simple structure, small volume, bigger power and lower energy consuming. The thermometer in the coil can suitably and effectively protect the motor against high temperature and furthest prolong its using life. The patent technology of the holistic rotational shaft gets rid of the conventional backrest wheel so that the centrifugal arrives at the unique, more effective and safer power effect. The special shockproof facility will cushion the shock and swing because of the centrifugal operation. Adding the inner shaking detector and swing monitor, we can fully ensure the safety and stability of centrifugal during running. The perfect automatic control system can connect with the DCS(data control system) of factory so that the operator can control the centrifugal's working status according to actual process condition of the factory in computer terminal or using a finger to touch a screen. The safe and stable screen basket possesses bigger loading capacity and lighter weight so that it effectively reduces the braking load of the motor and increases the running safety and life of the equipment. The unique automatic washing can evenly spray the water to every place of the basket in the shortest time. So it ensures that the customers can get the even and high quality product and increases the reclaiming sugar rate of the centrifugal. The outstanding feeding and discharging no material to be leaked so that the product has no any effect coming from the leaky material during the separating and discharging treatments. The downwards discharging valve and elaborate manufacture of plough scraper can completely discharge all material of the basket and do not destroy the screen to avoid the troubles of the screen blocking and excessive crystal coming back to the previous process. Therefore it will increase the working efficiency of the centrifugal and whole process flow.



## Sugar paste mixer (re-solution)

**This** machine is consisted of box body, agitator, transmission device etc. the box is U shaped open groove, weld component. The agitator is consisted of agitation shaft and agitation leaves. Transmission device is consisted of speed-reducing electromotor and transmission gear. The speed-reducing motor drives agitator moving through the transmission gear that reduces speed.



**This** machine is used to formulate the B massecuite and the syrup into the sugar paste. It can also used for re-solution of low purity sugar.



## Vibration conveyer

**This** equipment is used to convey the white granulated sugar that purged from centrifugal to the dryer. It is consisted of groove body, transmission device, connection rod, spring arm and housing etc. The groove is welded by stainless steel. The spring arm is the structure of wood board cramping spring steel plate. The connection rod is made of wood. The housing is welded by channel steel. Driven by electromotor, speed is reduced by pulley, the vibration of the groove is caused by reciprocation of connection rod, which impelled by the crank shaft. Materials form into a incline angle under the acting force of the vibration of the groove, the materials is up thrown moving forward and constantly turning over during the conveyance, it makes material distributed and discharged homogenously.

## Fluidizing bed dry cooler

Fluidizing bed granulate sugar dry cooler is an equipment used in drying and cooling of the crystal grain material.

Main features

- (1). This equipment can finish the drying and cooling process in a device simultaneously. There is no transmission part in the structure of this machine, reliable operation, easy to operation and maintenance.
- (2). There are special holes on the distribution plate of the machine. So, the speed of airflow is relatively low, the treatment to the materials is soft. It fairly keeps out-shape and brilliancy of crystal grain in a good condition, the tear and wear of the crystal grain is minute.
- (3). The height of fluidizing layer of the materials is high, about 300-400mm. So, the dry air and cooling air can fully contact with the crystal grain material. The transmission of the heat and material is intensively. The drying and cooling speed of the materials is quickly, and production efficiency is high.
- (4). The temperature of the material is relatively low; it is convenient for the packing and storage of the goods.
- (5). The equipment is with high automation, there are inspection and automatic controller, and the flow rate of cool and heat air and steam can be automatically controlled. It makes the drying and cooling of the material in a best condition.
- (6). This structure of the machine is whole sealed, the inside state of this machine is in negative pressure. So, it is impossible for the material to leak out from the holes. The operation environment is clean and the condition of sanitary is good.





## Vibration fluid dryer

Vibration fluid dryer is another kind of crystal material dryer, which is researched and developed by our company.

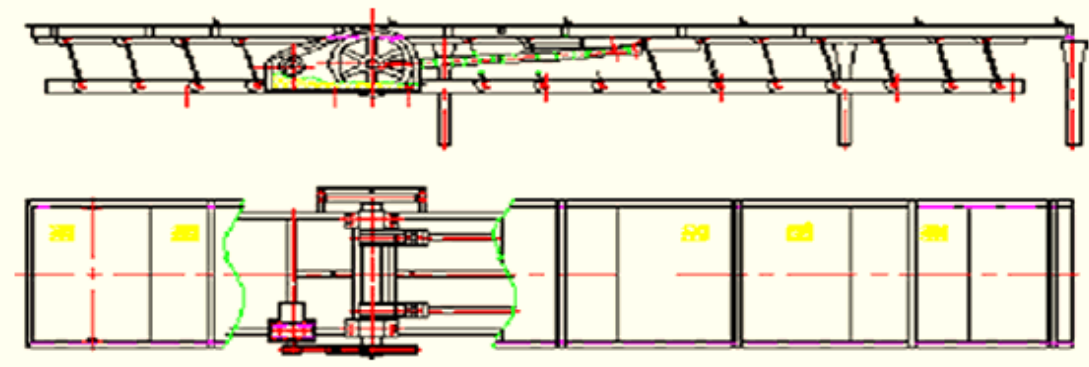
Features of the product

- (1). Material jumping moves along the horizontal bed, fully contacting with the warm wind, with high heat efficiency, without partly over-heat and dis-homogenized drying phenomena.
- (2). Specialized screen mesh design, the hole opening rate is much higher than round hole screen mesh (normally more than one time), and the hole opening rate can be adjusted according to the requirement of the different materials, due to the thickness of the mesh is much higher than normal ones, it can sustain relatively higher duty so as to extend the lifetime of the screen mesh.
- (3). Whole sealed structure guarantees the sanitary of the product and the cleaning of the environment.
- (4). Small volume, lightweight, easy maintenance, high production capability.
- (5). The frequency of the high-frequency vibration dryer is high (960 times / min), its amplitude is low, only about 1-2.5mm, and the moving speed and condition can be changed against the changing of the shock force of the vibration motor. It makes this machine adapt of drying various materials.
- (6). The frequency of the middle-frequency vibration fluid dryer is low (480 times / min), it can greatly reduce the vibration duty of the equipment to ensure the operation safety of the equipment. It can well scatter the materials, helping them to fluidize, increasing the speed of drying and cooling; low wind rate (2kg air / kg material) makes the wind rate and the power consumption of the fan in the system greatly reduced, and the tear and wear between the material crystals reduced. The treatment of the waste gas is simplified.
- (7). Utilizing the outdoor clear air, simplifying equipment and saving the energy.



# Granulate sugar screener

This machine is mainly consisted of four parts such as supporting bracket, groove body, screen mesh and transmission device etc. the screen mesh is install in the machine body, the groove body and supporting bracket is connected with spring arm device. Motor drives eccentric shaft, making the push rod drive groove to reciprocation so as to screen and eliminate the sugar block and the sugar powder.



# Control System





# Overseas Projects

We exported sugar plant to the following countries:

Thailand

Vietnam

Myanmar

Bangladesh

Togo

Madagascar

Mali

Malaysia

Indonesia

Others



# Service

- **Advanced and reliable technology & engineering**
- **Procurement, manufacture, and delivery of the goods**
- **Project management**
- **Construction, installation, and commissioning**
- **Technical service**
- **Training program**
- **Service after completion of the project**
- **Financing assistance and export credit**
- **Other services and functions upon request**

**HIGH-CLASS PRODUCTS AND SERVICES AT COMPETITIVE CHINA PRICES**



# **CREATE THE FUTURE**



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