陆威机械
LUWEI MACHINERY

Bolted-type Powder Silo

(Abbreviation: Bolted silos)

General Installation Manual

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Company Profile

Xiamen LuWei Construction Equipment Co., Ltd is a professional company dealing with all kinds of material treatment equipments and concreting machinery, which integrates research & development, manufacture and sales into a whole. The main products of the company include: powder material silo, dry powder & mortar storage tank, various non-standard steel-frame building and associated equipments. Our company has the particular patent in 'Bolted-type Powder Silo' (Patent NO: 201020649684.5). These kinds of powder silos enjoy high reputation for easy transportation, installation and dismantlement. Our products mainly used in the areas such as construction material, chemical engineering, energy resources, environmental protection and foodstuff.

Under the management principle of 'Getting the client trust by providing high quality product' and the management policy of 'Innovate for development, Honesty to client', our company aims to provide sound pre-sale service, in-sale service and after-sale service for our customers. Up until now our company has supplied high-quality products and considerate services to high-speed railway construction projects such as Beijing-Shanghai Railway and Shijiazhuang-Wuhan Railway as well as many city commercial concrete enterprises, cement companies and new industries like dry powder & mortar. Meanwhile, our business has expanded to various oversea markets with broad good customer evaluation and feedbacks.

Xiamen LuWei Construction Equipment Co., Ltd is set up by the investment of Xiamen Xianghao Industry and trade Co., Ltd which takes a controlling stake of it. Relies on Xianghao Company's economic strength, corporate brands and carries out the modern management mode of XiangHao, LuWei strides forward toward engineering machine specialization and product series. For the strategic objective of developing Xianghao Industry and trade Co., Ltd into a group company, the development of LuWei will lay a solid foundation.

National Patent Certificate for Powder Silo

证书号第1840329号

实用新型专利证书

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2011年06月29日

第1页（共1页）

Chapter one Product description

One product name

LWJX Bolted-type Powder Silo. Abbreviation: ***Bolted silos***

Two product usage

Powdery and granular material storage and matching

For instance: Cement

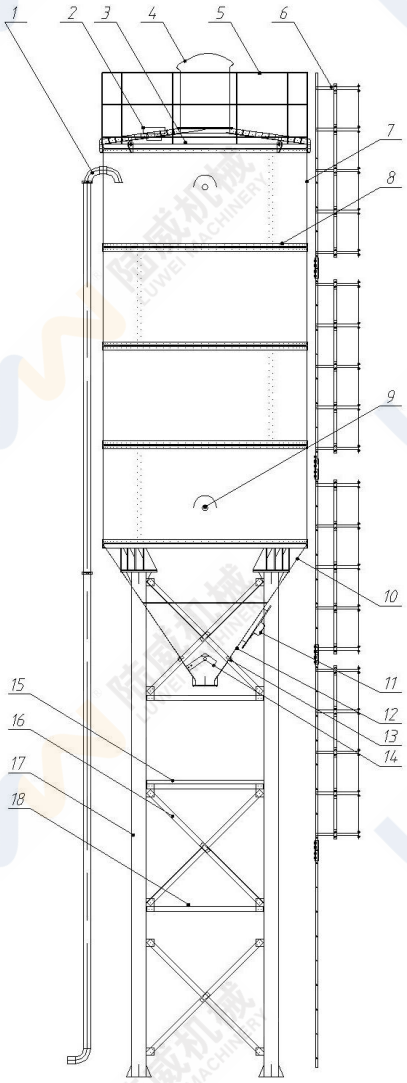
Three Use cases

Industrial equipment materials rate system, Raw material transfer field, Central Sharing Warehouse, Raw material production enterprise and so on.

Four structural characteristics

The products realize factory production; all adopt the high strength bolt connection. They are convenient to transport and install fast.

Five figure



No.	Name
List of compinent	
18	cross brace
17	legs
16	diagonal brace
15	platform
14	decompression device
13	arch breaker
12	small cone
11	access hole
10	large cone
9	level gage
8	flange of T steel
7	warehouse board
6	ladder &guardrail
5	top fence
4	filter
3	warehouse cover
2	Relief valve
1	dust pipe

Typical silo drawing and parts list

Chapter two Preparation before installation

One unloading

Van parked in the pile of goods, untie the goods. Staff should pay attention to whether the component is stable in the process of unloading. If the component is not stable, you should first smoothly pull the component with hook, prevent component injury somebody. Crane goes items according to the location of the goods by the top down order. After the component is bound by shackle, all the staff should back to a safe place then elevate the pothook smoothly. At the first, the command crew members outside in security lines observe whether the component is stable, then Command crane to hang the component to goods area. After the component is totally steady, remove the shackle.

The unloading process should be equipped with two experienced lifting workers, one security officer and one commander; all personnel should strictly follow the command crew guidance. In the process of hoisting, within 2 meters area, the arm rotation radius is strictly prohibited area within stand.

The relevant personnel must wear safety protective equipment; related personnel must posts (all of the following operation processes are required to comply with).

According to the site conditions and the installation process discharge of orderly, pay attention to the following:

1. Can't take up installation site, consider the crane parking position.
2. Consider the area that the crane can cover, had better not remove the crane as far as possible.
3. All objects should be discharged base on the principle of the first used in front.
4. All objects should Place neatly and compact as far as possible. Take up the less space as far as possible.
5. The same or similar components should be put together. It is easy to find or remove when using.
6. Please according to the characteristics and convenient way to put objects in case that the components deformation or difficult to use.
7. Should avoid collision to any other object parts, so as not to scratch or deformation. It is placed on the ground smoothly.

Two Installed base acceptance

According to equipment layout diagram, foundation drawing, silos diagram inspection installation base whether accord with installation requirements, the following key inspection:

1. The Leg distance and standard in the silo figure are in accord?
2. Whether they are qualified based sclerosis?
3. Foundation board elevation (Level height) is consistent?
4. Silo is assembled properly with other objects?
5. The deviation in foundation center will affect the need of security?

Three Best installation site selections

1. Based less distance from the installation, the crane can reach the distance directly.
2. The ground should level off, hard, dry.

3. The size of the space should consider the requirement of handstand of the cans.
4. The electric control cabinet should be placed in the convenient and safe position.
5. without the high tension wires and other barriers above the place.

Four the preparation of installation personnel and equipment

1. Staffing (According to a single tank consideration, if there are more than two cans, all kinds of personnel can increase)

(1) One person in charge of the installation procedures and installation personnel deployment.
(2) two to five assembly workers, grasp the basic mechanical assembly knowledge, can direct the crane, and have a strong sense of security.
(3) One crane worker, have high altitude work operation experience, safety consciousness is extremely strong with the aloft working license;
(4) one to two welding workers have outdoor experience with welding license.
(5) two to five ordinary workers, responsible for wear and installation bolt, with the experience in the construction site, have strong sense of security.

2. Tools and equipment:

A number of crane hoisting, according to the site conditions; two to five electric/air wrench; six Manual wrench; two sets of electric welder; 1 set of gas cutting; a number of iron bars; one safety rope ladder; four Safety rope; one ladders and other necessary tools.

Five Check goods

1. Verify the number and size of bolt and other accessories.
2. Check the number and size of the product components.
3. Verify tools whether are complete.

Six the preparation of Common parts

1. Prepare the number of bolt which will be used on that day (prepare the sub plate).
2. Prepare the number of sealing parts which will be used on that day (cut according to the need).

Seven Particular attention

After the silo is install, the external sprinkler inspection should be carried out, the water should be sprayed on the outside of the silo, and the leaking point should be checked and glued on the inside of the silo

Chapter Three Installation Steps and Notes

Ⅰ Cone assembly

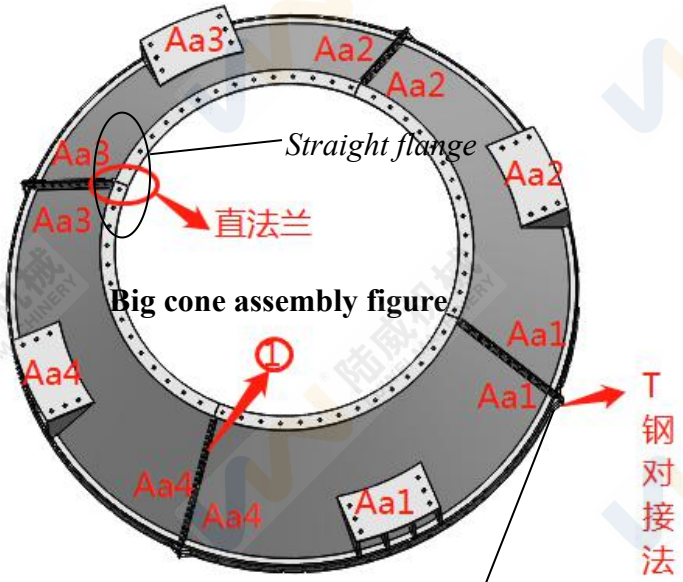
Firstly, reversely buckle the big cone according to the numbers, circle them to a round, connect all the bolts and nuts of straight flange, put silica gel between the two straight flanges, leave 200mm of silica gel on the both sides, align two sides of cone with crowbar, screw two sides of bolts and the rest of bolts.
Installation process must be pay attention to the following items.

Some do have and don'ts are in the following:

1. Level off enough ground;
2. Find out the necessary components (search them according to the numbers of cone);
3. Hang the big cone to the work site and prevent it from leaning with the support of crosstie.
4. Hang the neighbor cone to the side of first cone and surround the straight flange and bolts.
5. Put the article silica gel between the straight flanges, prevent from injury the fingers, align the flange of cone and the cone board with crowbar, and screw the both sides of straight of flange.
6. Put the sealant on the gap of straight flanges.
7. Do not exert yourself with crowbar, pay attention for the power line when use the electric wrench, use both hands with electric wrench.
8. Assemble the rest medium cone with the method of big cone, connect decompression device to the small cone.
9. Two to three installation personnel enter into the medium cone and bring all the tool and materials, squat at edge of internal cone, **make sure all the parts of body is lower than the round flange;** hang the small cone to the medium with the lifting point of flange of discharge hole, spin it until align the top and the bottom cones.
10. Put the bolts on the round flange, pry up the round flange with crowbar and insert the silica gel.
11. Screw the bolts and put the sealant outside of the round flange.
12. Assemble the rest cone using the same method. Note: the installation staff should crawl out from the access hole; enter into the next big cone and squat at the internal cone. The cone can be hung up until the body of the installation staff is lower than the round flange.

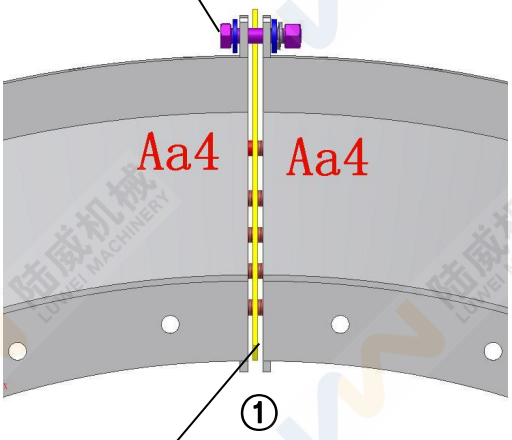
Ⅱ Cone quarter assembly by diagram

1. Circle the big and medium cones according to the numbers shown on the graph...
2. Put the bolts and nuts on the *straight flange* but not screw.
3. Insert the silica gel between the straight flanges. Note: article silica gel is inside of bolts.
4. Screw slightly the top and the down bolts make sure the silica gel is in the right position, align the cone with crowbar with the standard of the edge of the T steel and the round flange.
5. Screw tightly all the bolts and paint the glass cement on the gap of straight flange to protect the article silica gel.
6. Fix the *reducing valve* to the small cone



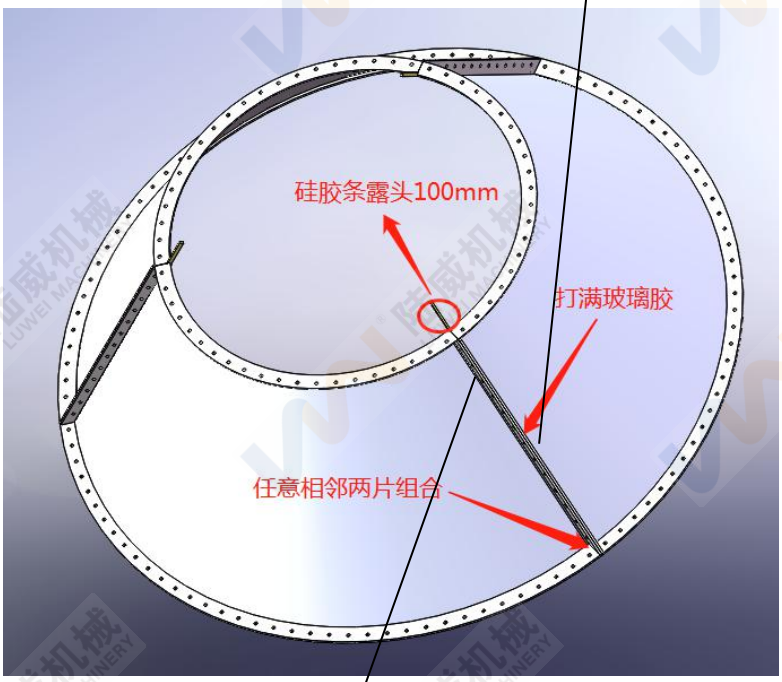
T steel of connecting board

Put the bolts and nuts on the straight flange but not screw



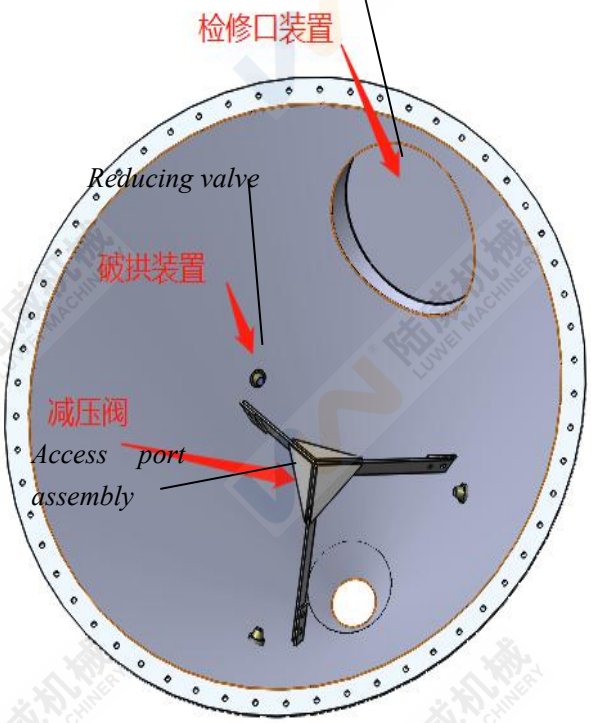
Insert the silica gel between the *straight flanges*，outcrops 200mm

Paint the glass cement on the gap of straight



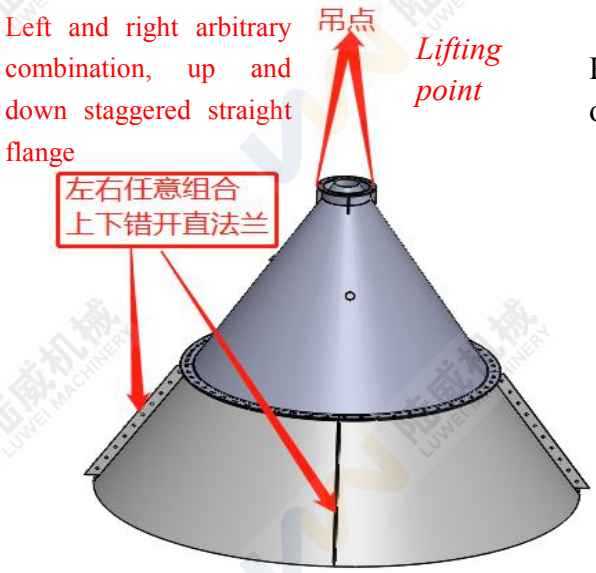
Any combination, silica gel strip outcrop 100mm

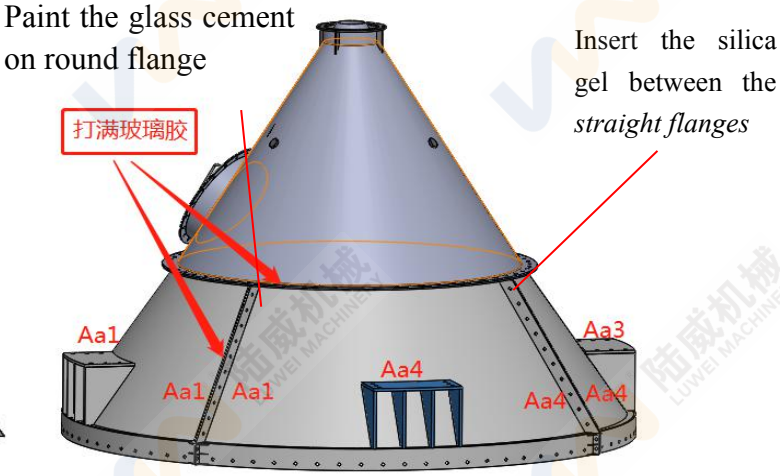
Relief valve assembly



Ⅲ Cone assembly by diagram

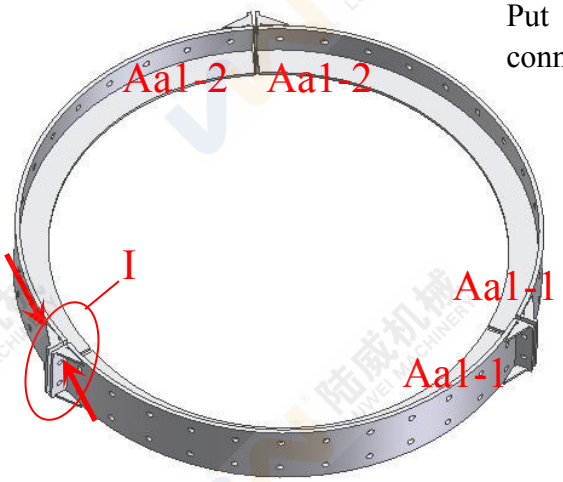
1. The personnel, the first in the cone, ducks, any part of the body should be less than all round flange, prevent not to be injury by cone parts.
2. Hang the small cone over the medium cone according to the *lifting point* shown on the diagram, align the mark and put on the bolts and nuts but not screw.
3. Insert the article silica gel after pry up the round flange. Note: article silica gel is intside of bolts.
4. Screw all the bolts and paint the glass cement on the gap of round flange to protect the article silica gel.
5. Retreat all the personnel from access hole and enter to the next cone, ducks, any part of the body should be less than all round flange, prevent not to be injury by cone parts.
6. Use the same method to connect all the cones.

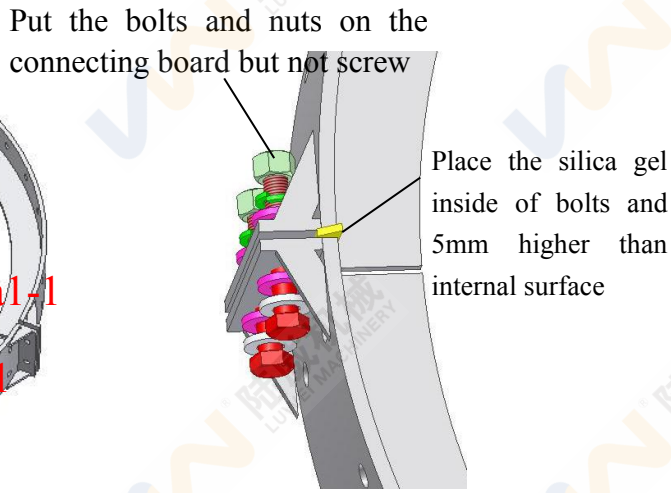




Ⅳ T steel flange assembly

1. Circle the flange of T steel which is in the same group.
2. Put the bolts and nuts on the T steel of connecting board but not screw.
3. Insert the silica gel between the connecting boards, screw tightly the bolts. Note: place the silica gel inside of bolts and 5mm higher than internal surface.

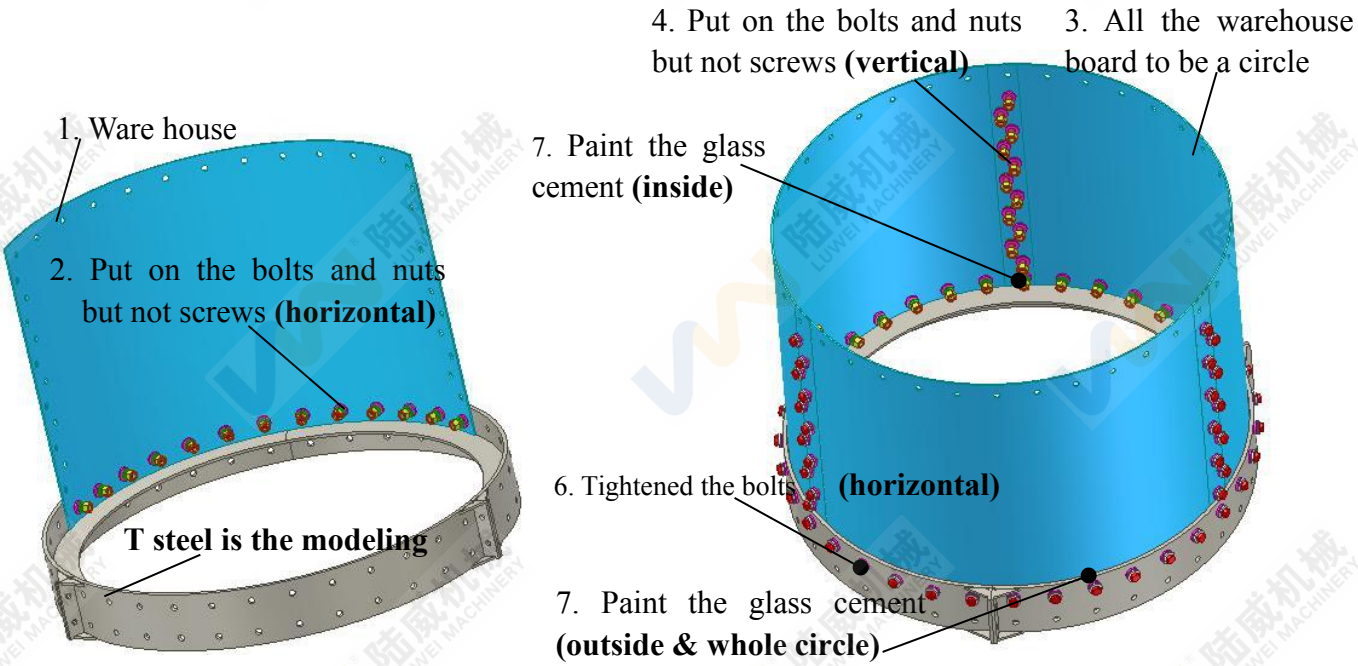




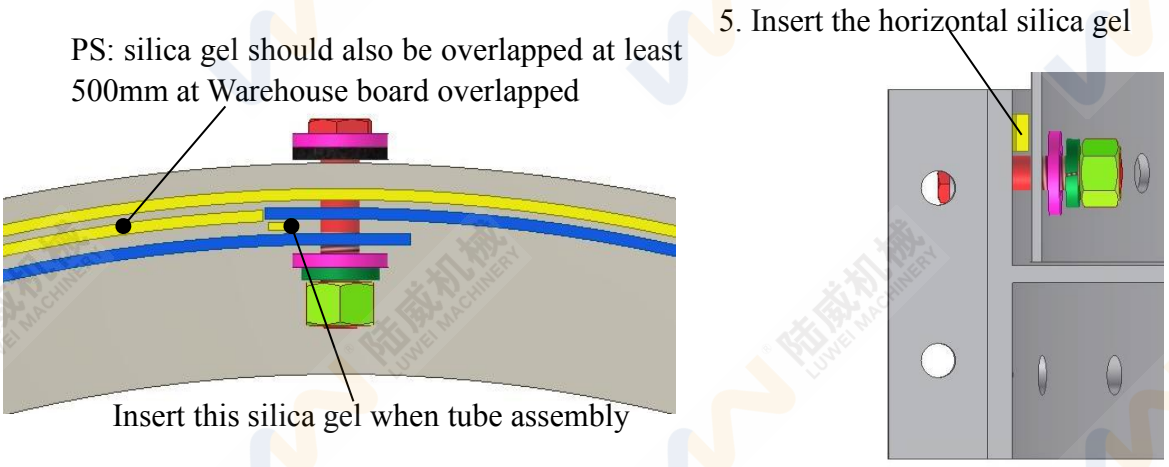
V Tube body unit assembly

1. Put the assembly T steel on the ground for modeling, hangs up the first warehouse board and put on the bolts and nuts but not screws. Note: make the head of bolts outward and the process is bolt-flat gasket-rubber blanket-T steel- warehouse board-flat gasket-nut.
2. Hang up the second warehouse board, put on the bolts and nuts but not screw.
3. Hang up the rest warehouse board in turn until all the warehouse board is to be a circle, put on the bolts and nuts but not screw. Note: the slot hole of warehouse board is inside of round hole of warehouse board to prevent from leaking.
4. Insert the article silica gel between the T steel and the warehouse boards, screw the crosswise bolts and put the glass cement according to the diagram.
5. Assemble the unit of tube body for all the warehouse boards and T steel in accordance with the procedure one to four. Some parts can be assembled first if there is not enough space.

Ps: Leave the first warehouse board which is close to the warehouse cover according to the thickness which is shown on the silo diagram.



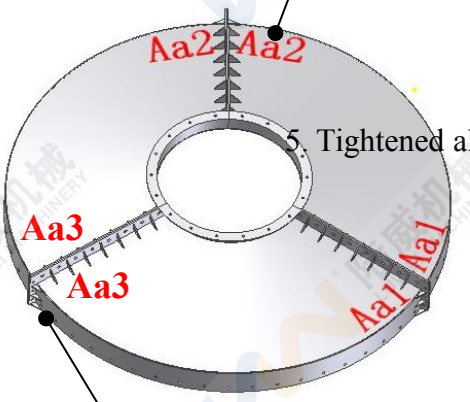
PS: When the gap is too large, the silicone strip can be repeatedly overlapped



Ⅵ Warehouse cover assembly

1. Circle the warehouse cover according to the numbers as shown on the graph.
2. Put bolts and nuts to the straight flange but not screw.
3. Insert the silica gel between the straight flanges. Note: article silica gel put intside the bolt...
4. Screw slightly the top and down bolts, make sure the article silica gel are in the right position, aligning the T steel with crowbar.
5. Tighten all bolts.
6. Turn the warehouse cover on the ground, fix the warehouse cover with support, and make sure the flange of dust-collecting fan is higher than the ground.
7. Connect the first warehouse plate with flange of T steel of warehouse cover according to the method of assembly tube unit as shown on the graph.
8. Place the glass cement on the inside of warehouse cover to protect the article silica gel.

1. Let the warehouse cover to be circle

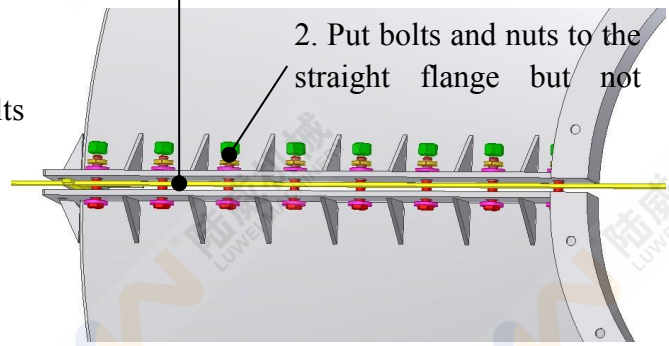


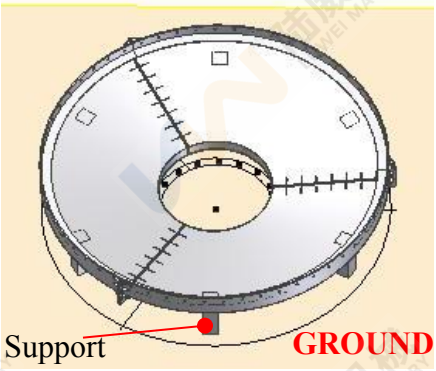
5. Tightened all the bolts

4. Aligned the T steel with crowbar

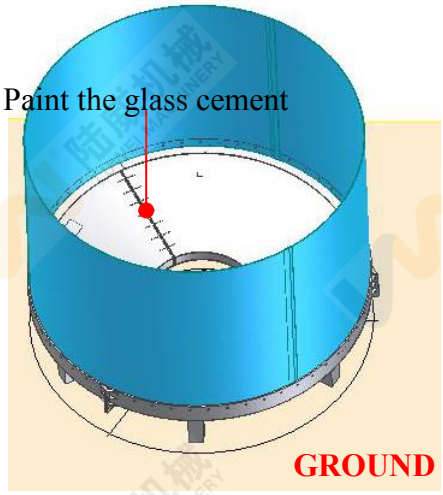
3. Insert the silica gel and the head and tail of two bolts fastening slightly

2. Put bolts and nuts to the straight flange but not





Paint the glass cement



Ⅶ A leg frame assembled

SEC A Some explanations about a leg frame assemble:

1. Check the distribution of the numbers on the already assembled cone unit, as shown below.
2. Assemble the legs to a leg frame according to the actual distribution of the numbers on the legs. As shown on the graph, pay attention to the correspondence of dash dotted, do not make mistake with them in case that there are some problems in the subsequent.
3. A leg frame of assembly as shown on SEC B

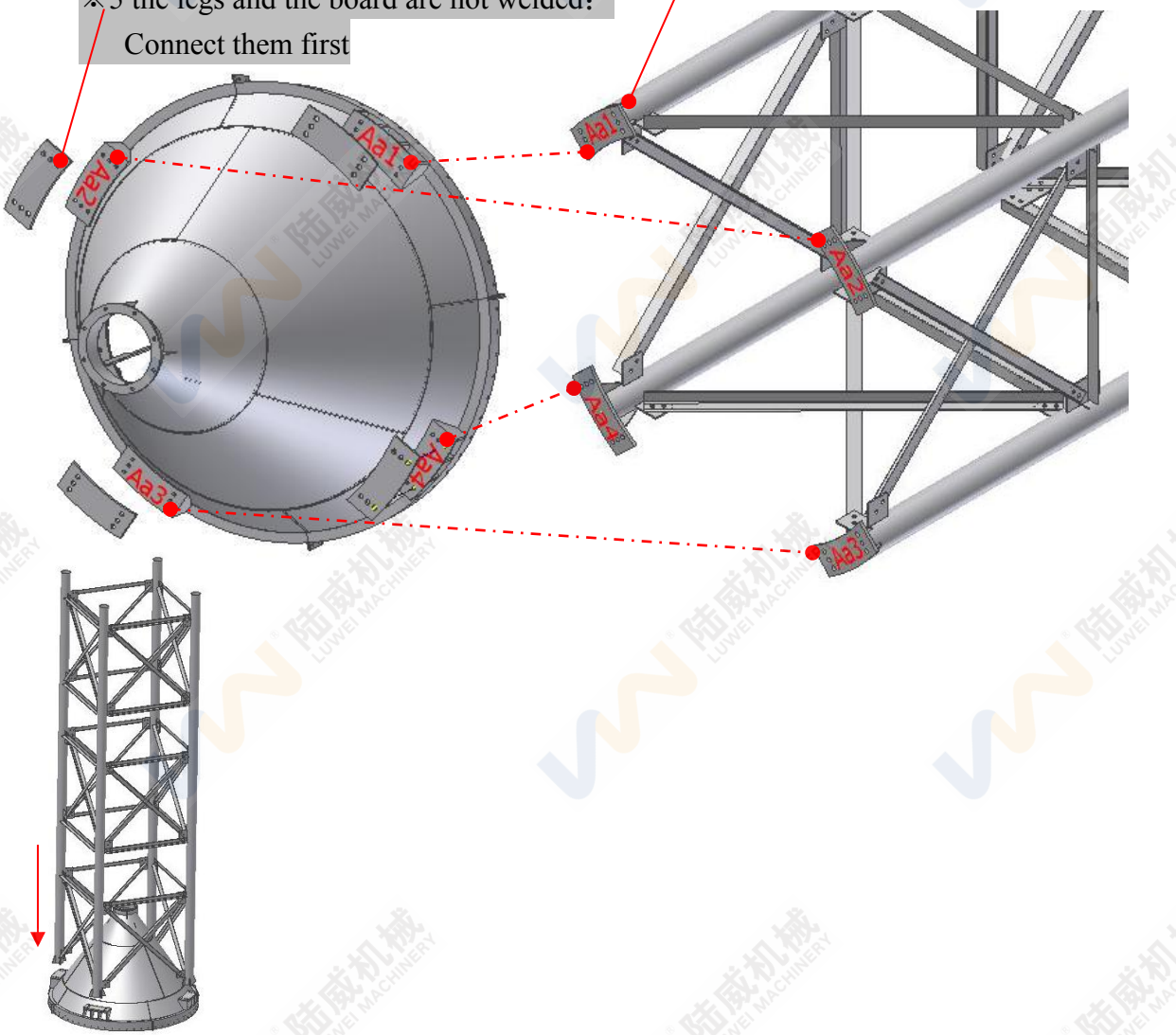
※4. Directly assemble the leg frame if the legs and the board have been welded. Put the leg frame on the cone as shown on the graph. Connect the wrap to the leg frame.

※5. Connect the end plate to wrapper sheet of the cone with bolts, then put the leg frame on the end plate, weld the legs to the end plate if the legs and the board have not been welded.

※6. Connect the cone to the leg frame according the length of leg frame and the practical situation, it can be removed to the ground before the cone and the tube body has been assembled. Please make your own choice.

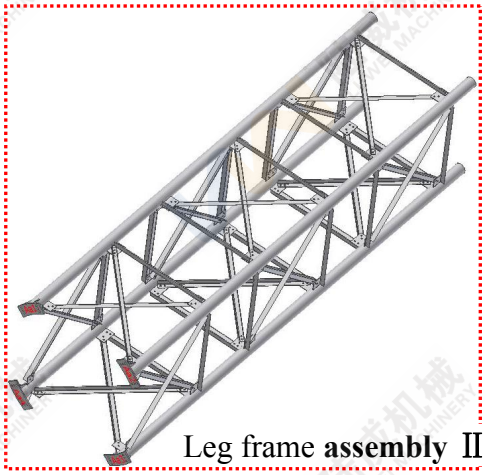
※5 the legs and the board are not welded:
Connect them first

※4 the legs and the board have been welded

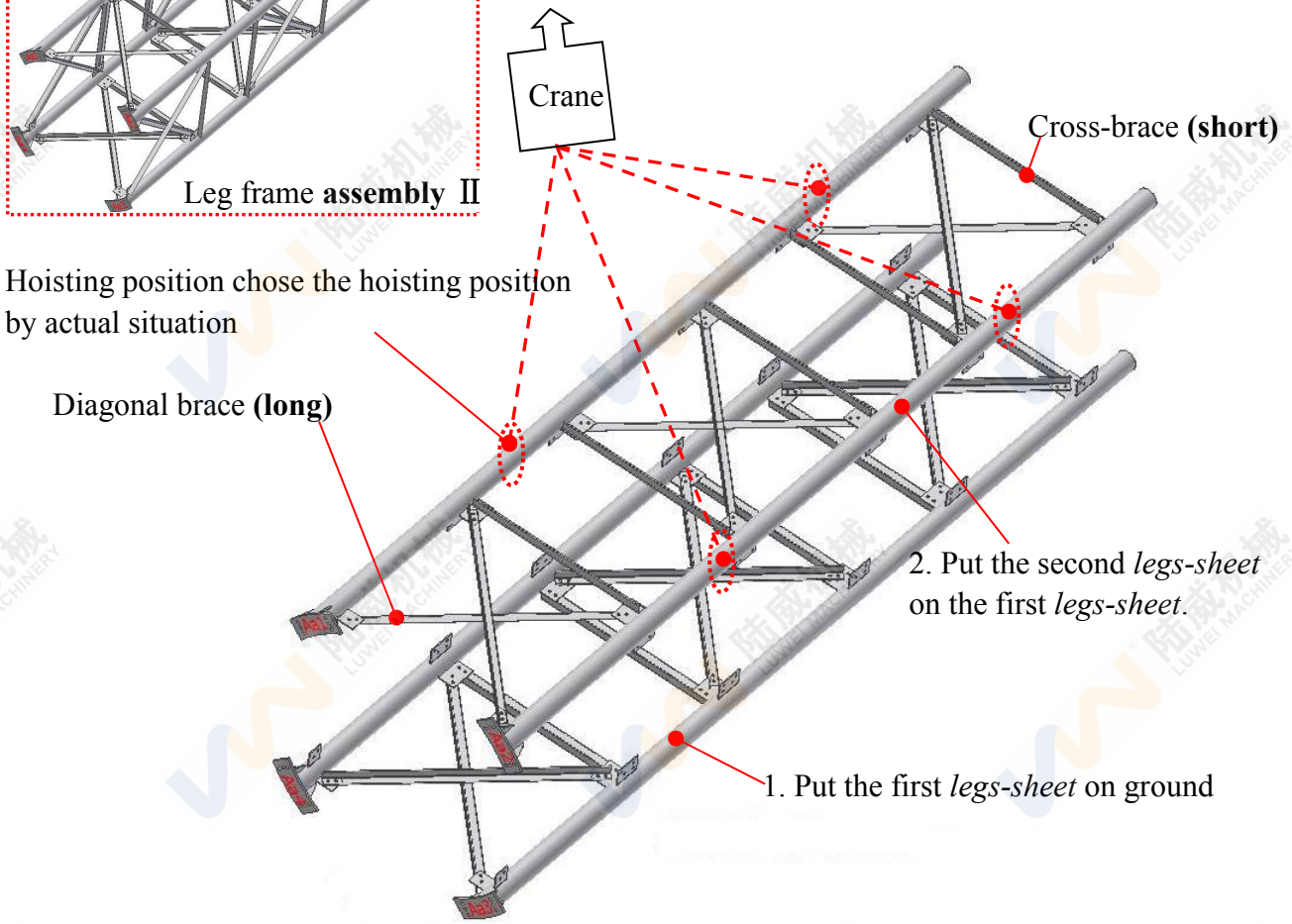


SEC B A leg frame assembly:

1. Connect each two of the legs through the way of cross-brace and diagonal bracing according to the numbers. Called *legs-sheet*
2. Put one of the piece on the ground, hang the other piece over the first piece with crane, the distance approximate equal the distance of legs shown on the graph, such as the graph one of a leg frame assembly.
3. Connect two pieces through the way of cross-brace and diagonal bracing.
4. Re-check the distance of legs with the number of graph.



Leg frame **assembly** Ⅱ

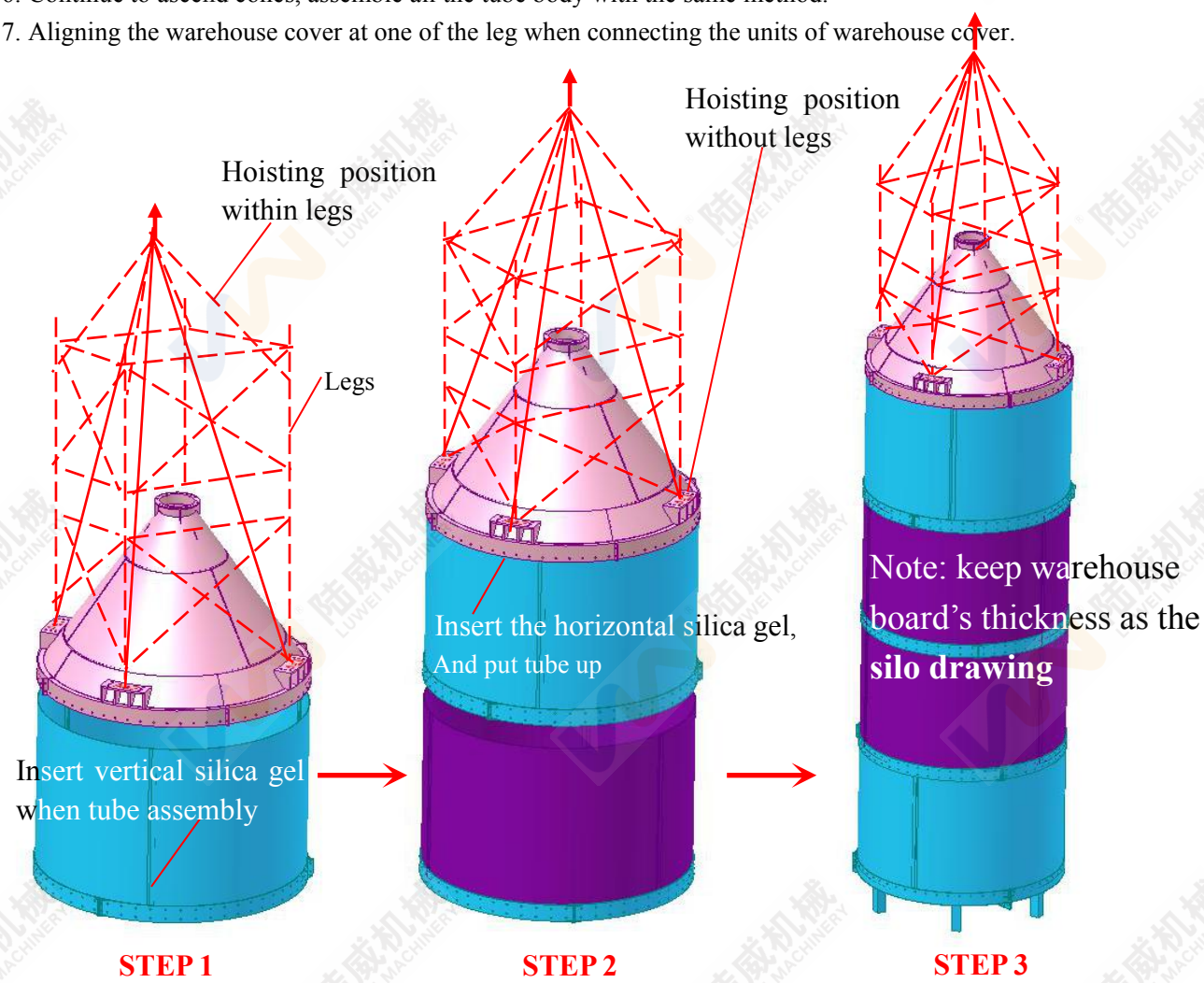


Ⅷ Tube body assembly

1. As shown on the steps, according to the actual situation of assembling the legs, look for the position

depends on whether the legs and the cone are connected.

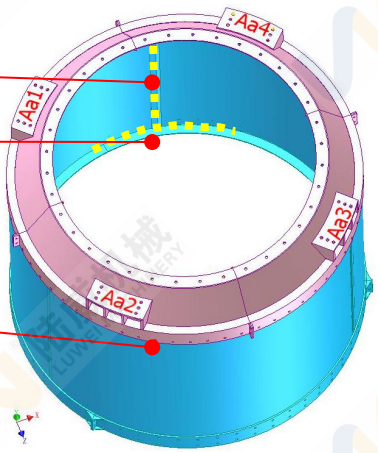
2. Hang the cone over the assembly tube body
3. Align the warehouse plate and the T steel of the cone, put on a bolt but not screw.
4. Insert the vertical article silica gel in the connection of warehouse board, specific position article reference tube body unit assembly. Screw slightly the top and the down bolts, make sure the article silica gels are in the right position, and insert the crosswise article silica.
5. Screw all the bolts, and put the glass cement as shown on the graphical representation.
6. Continue to ascend cones, assemble all the tube body with the same method.
7. Aligning the warehouse cover at one of the leg when connecting the units of warehouse cover.



Paint the glass cement at the lapping place inside (vertical)

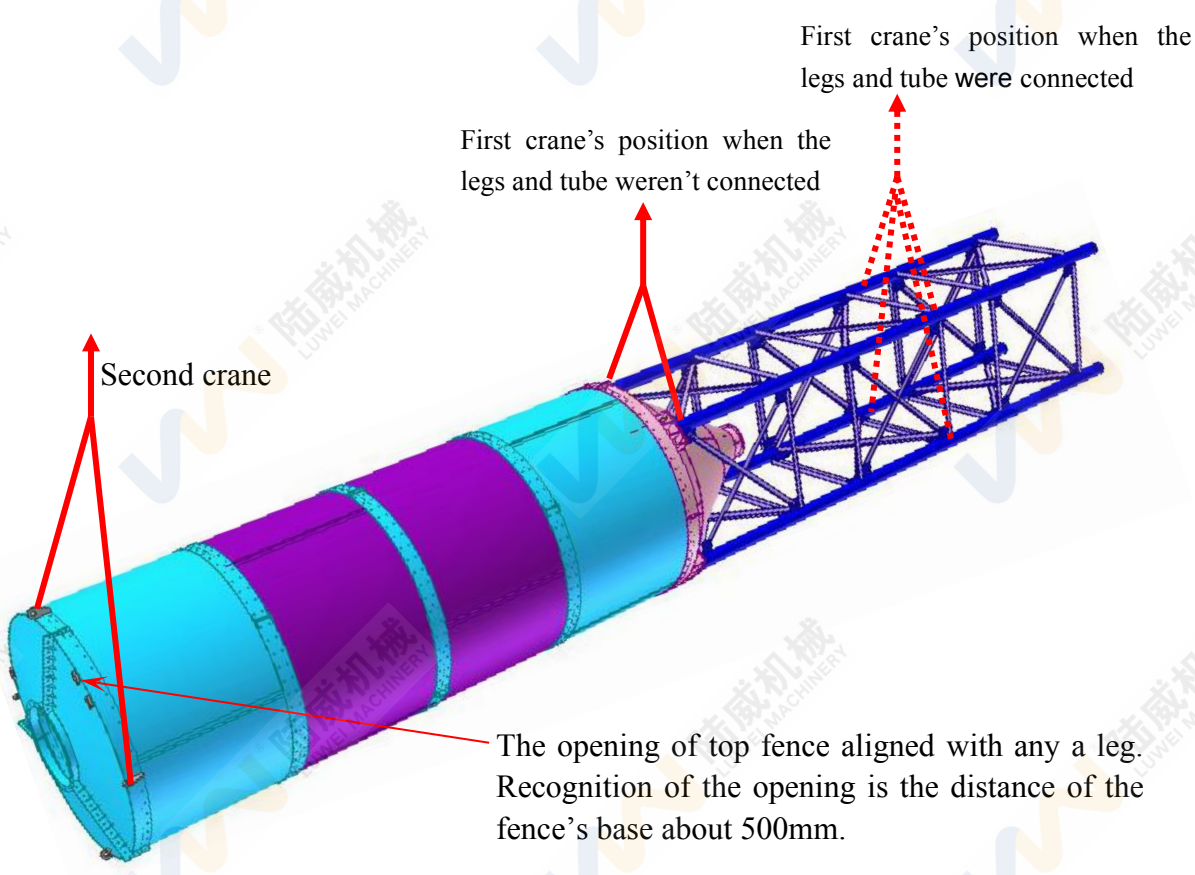
Paint the glass cement at the lapping place inside **(Horizontal, 1000mm)**

Paint the glass cement at the lapping place outside **(Horizontal, T steel and warehouse board)**



Ⅸ Reverse the tank (*A leg frame and tube body docking)

1. The first crane hangs the tank two meters from the ground, then the second crane on the position. Two of the cranes coordinate to put the tank on the ground.
2. If the leg is not connected to the tank, then hang the legs to the wrapper sheet of legs of cone, connect the wrapper sheet of cone to the end plate of legs.
3. Cushion the tank with strip bar when it starts to reverse the tank, avoid the deformation of flange of the T steel directly touch the ground, reverse the tank with two cranes in tandem, make sure there is deformation of the tank and it hit the ground.
4. Make sure the opening of the fence direct to the sky or vertical to the ground, it is convenient to install the accessory later, must not make the opening toward the ground.



X Mounting accessories

Platform installation

1. Raise the platform and enter into between two legs, place on the cross ties below flange of the material mouth and welding them firmly.

Ladder installation

2. Hanging the top of ladder onto the silo, directly to the opening of guardrail, make sure there is 1200mm beyond the lid, welding firmly the fixed block of ladder and the horizontal T steel of silo.
3. Hanging the middle of ladder onto the silo, place the middle and top of ladder into a straight line with ladder's connections, welding firmly the fixed block and the T steel. Using the same method finish the rest of ladder.
4. Combine the cross-bar of arc guardrail and ladder, and then combine the vertical stem of straight guardrail and cross-bar through the part of linking piece.

Dust pipe installation

5. A hole with a diameter slightly larger than that of the ash pipe is cut on the cover 300mm from the side of the ladder and 340mm from the edge of the cover.
6. Insert the top of dust pipe into the hole.
7. Connect the dust pipe with pipe clamp along the direction of ladder, welding the toggle and T steel of cylindrical shell portion in each connection.
8. Finally, welding the top of dust pipe and the warehouse board in the cutting hole. Pay attention to the solder skips and air hole and stop leakage ash.

Level gage installation

9. Cut a hole which diameter is a little larger than the whorl of level gage on the warehouse board which is 300mm from the other side of ladder and 600mm below the warehouse cover.
10. Cut a hole which diameter is a little larger than the whorl of level gage on the warehouse board which is 300mm from the same side of ladder and 600mm above the cone.
11. Insert the whorl of level gage into the hole, pay attention to the direction of whorl and make sure that the level gage can be screwed in from the outside of cylindrical shell portion.
12. Weld the whorl and warehouse board. Don't to the solder skips and gas pore and stop leakage ash.

Relief valve installation

13. Cut a hole which diameter is a little larger than the safety valve on the warehouse board which is far from the dust pipe and 340mm from the edge of warehouse board.
14. Insert the relief valve into the hole, and weld it to the warehouse board. Be careful not to the solder skips and air hole and stop leakage ash.
15. This step also can be delayed after the tube body is established.

Filter installation

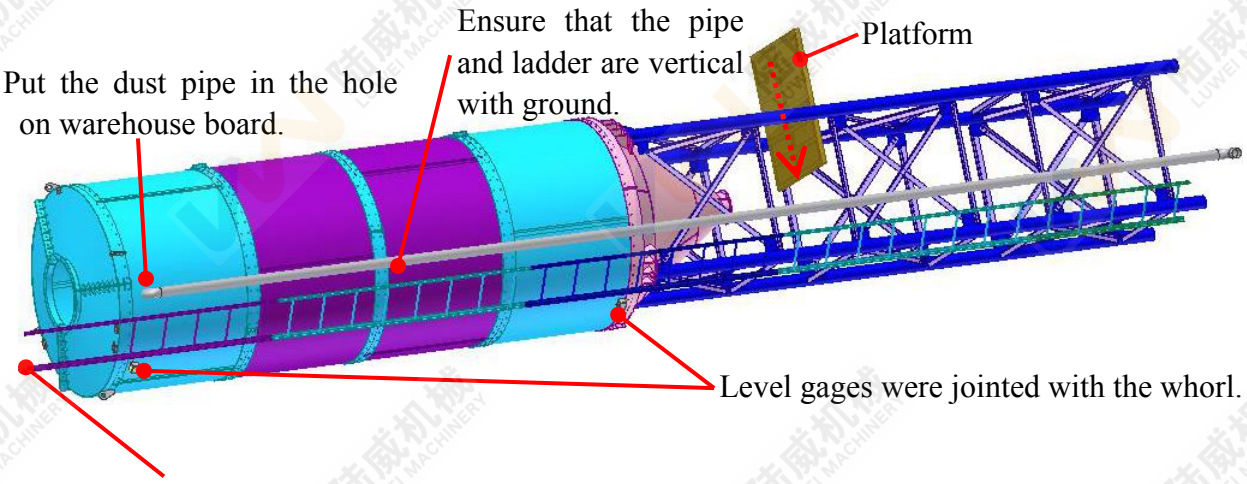
16. Weld the flange of filter and filter. Be careful not to the solder skips and air hole and stop leakage ash.
17. Connect the round flange of warehouse board and filter through the bolt, insert the article silica gel when is connecting. Be careful not to leakage ash.
18. This step also can be delayed after the tube body is established.

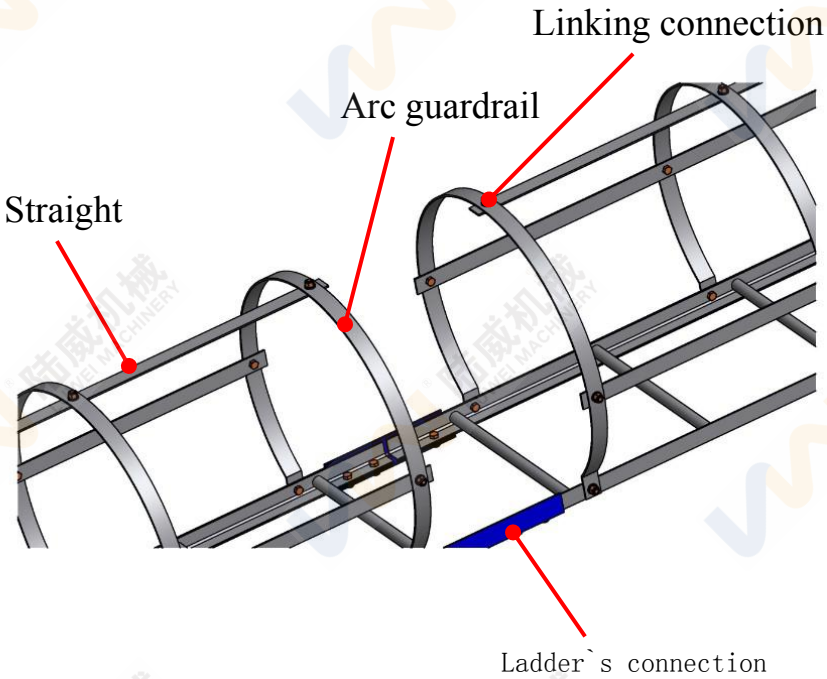
Top fence installation

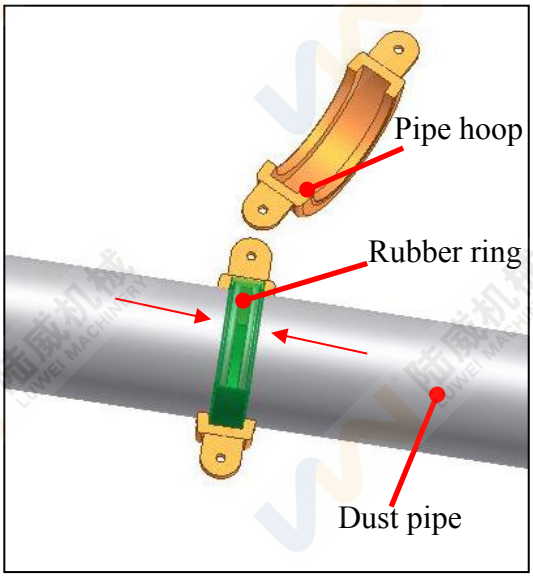
19. Circle the top fence according to the numbers, and put on the bolts and screw down.
20. Align the stand column's base of top fence and the fence's base of warehouse board, and put on the bolts and screw down. Start the aligning from the opening of fence.
21. This step also can be delayed after the tube body is established.

Arch breaker installation

22. Screw the effuse of arch breaker into the welding whorl of cone.
23. This step also can be delayed after the tube body is established.







XI Set up the tanks

1. Tie up the tail of tank inside the cross-brace around the landing leg with steel wire rope, connect the lifting eye and steel wire rope trough the shackle on the top of tank, connect two ending of tank to two cranes;
2. At the same time, two cranes hoisting. When slinging the tube body two meters from the ground, the top ending's crane rise and the other ending fall down, make the tank stand up on the ground;
3. The top ending' crane tensioning while the other one relaxing, take of the steel wire rope from the ending's crane;
4. Adjust the powder tank vertical degree, the top's eccentric≦30 MM, weld the landing leg and the board, and also weld the ribbed slab of landing legs.
5. Installation personnel climb to powder tank cover from the ladder, bring your seat belts which be tied up to the flange of filter remove the lifting rope from the warehouse board.
6. Switch on the circle of filter, level meter, and alarm to the circuit control box.
7. Switch the arch breaking to the connector on the platform, lead the gas circuit to the air compressor.
8. Debugging gas path, circuit to work properly;
9. Paint the outside of powder tank according to owner's specified demand by professional painter or make paint repair;
10. Apply for acceptance.

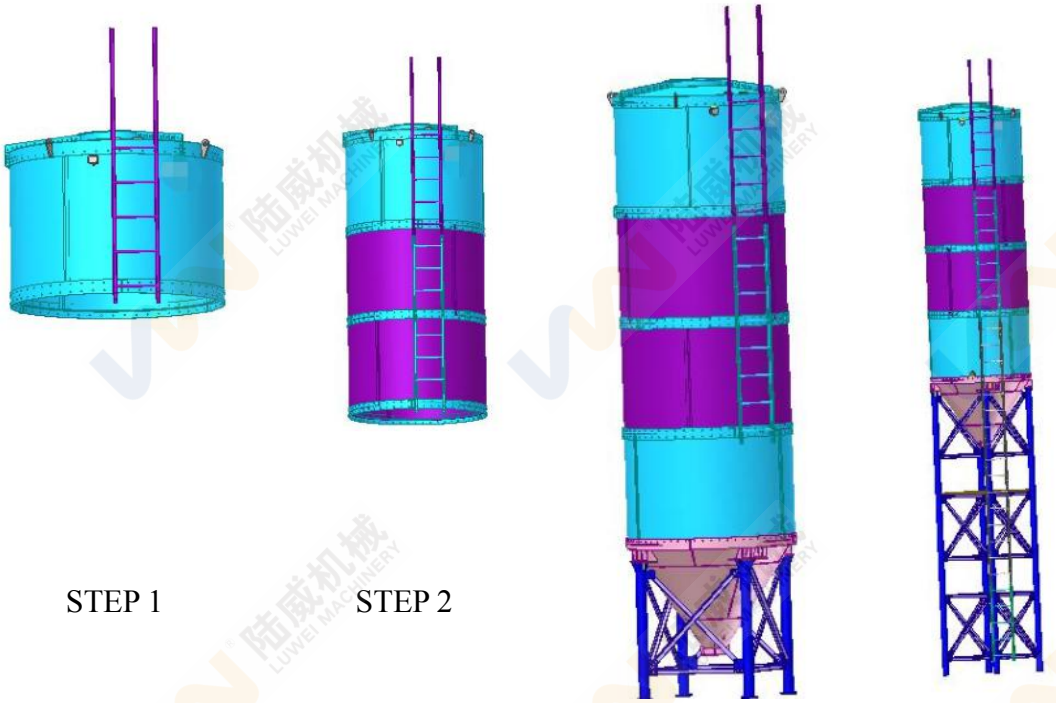
XII Another installation method

Due to the various kinds of factors such as location, cranes, etc. we divide a leg into two segments and Combine them through the flange of legs. The installation of this kind of structure can totally make it according to the above method or it can take another method. This paper is only on one of them to a more rational and fast method, a reference for installation description.

1. Assemble the warehouse plate according to the numbers and weld the safety valve to the warehouse plate.
2. Assemble the unit of cylindrical shell portion by the way that assembly the warehouse plate and T steel, but should pay attention to the last unassembled warehouse plate according to the general drawing of silo and thickness of warehouse plate.
3. Assemble the cone according to the method of assembly cone.
4. Assemble the leg according to the method of assembly leg and connect it to the cone. Break the legs from the leg and plain flange.
5. Weld the legs to the bottom of cone, turn the legs and cone on the ground.
6. Hang up the warehouse plate and weld it to the unit of cylindrical shell portion, finally combine the whole cylindrical shell portion to the last warehouse plate. Insert the whorl of level gage when start the first section of warehouse plate, install the top part of dust tube. Install the ladder and cage after finishing each two units of cylindrical shell portion. Install the whorl of level gage after finishing the last section.
7. Hang the cylindrical shell portion above the cone and combine the warehouse plate to the T steel of

cone. Use the ladder when connecting the outside of silo.

8. Finally, combine the whole silo to the legs.
9. Install the ladders on the surface of legs.
10. Hang the dust pipe while using the crane; fix the dust pipe from top to down.
11. Install the other accessories of silo according the above method.
12. The whole installation process, all the bolts usage, silica gel of sewing etc are article embedded with a way consistent; please make a reference of above method.



STEP 1 STEP 2 STEP 3 STEP 4

STEP 1 1. Installation the warehouse cover;
2. connected one warehouse board;
3. Jointed the top of dust pipe, top level gage, relief valve, top ladder.

STEP 2 Each jointed two warehouse boards; one ladder should be connected to tube.

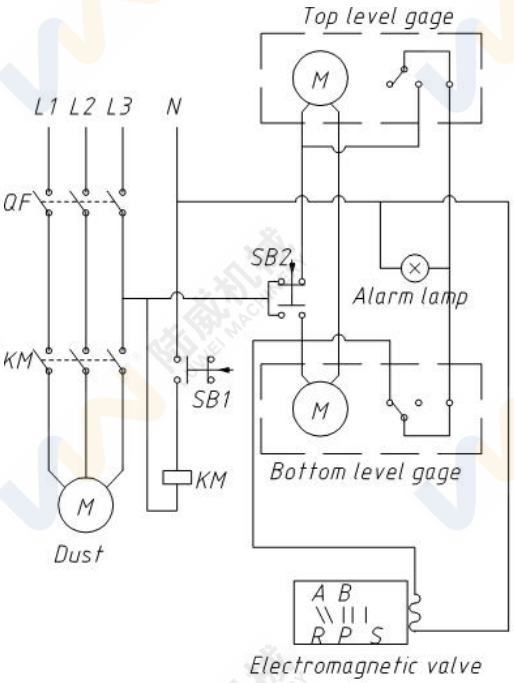
STEP 3 Connect cone with tube body which is assembled.

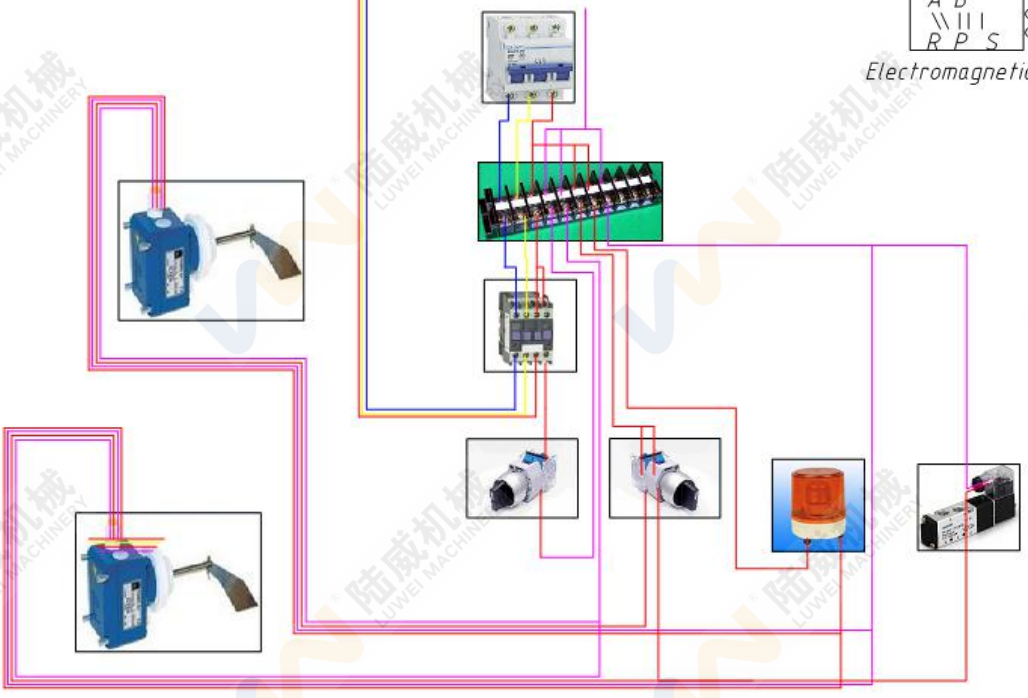
STEP 4 Finally connect to the basement of leg frame.

XIII Circuit

This illustration shows the recommended circuit, but because our customers on the silos of monitoring and control requirements are difference, it can also be made by customers professional electrician to design according to the self demand circuit; In the following, that is the only simple introduction for several loop circuit.

1. When the process for remove ash in the silo, people regularly turn on the SB1, switch off the A.C. contactor and start the vibration motor of ash separator.
2. When the process for remove ash in the silo, keep the switch to the normally off, turn on the motor of level gage, the material is in the place, the level gage will automatically turn off because the blade is blocked, connect the circle of alarm, remind stop playing gray.
3. When the material is discharged from the silo, turn the normally open interlock off, start the motor of level gage while connect the solenoid valve and the return circuit of arch breaking airflow. When the descended material is in the place, start the motor of level gage, turn the normally closed interlock off, connect the circle to the alarm, and remind that it is lack of material.





Appendix one Site management requirements

1.1, the "ban", "no" clause in the silos construction site:

1.1.1, it is strictly prohibited to spread of speech which is damage the image of the company;
1.1.2, no dispute or clashes with user;
1.1.3, it is prohibited for behave which is not connection with the job in the work place.
1.1.4, it is prohibited any material rewards from users;
1.1.5, it is strictly prohibited to the project manager or outsourcing unit staff fight each other;
1.1.6, it is strictly prohibited to bribery, bribery, sacked;
1.1.7, it is prohibited to take family members or close friends into the construction site;
1.1.8, it is prohibited to smoke and make fire in the construction site or controlling room;
1.1.9, it is prohibited to propose the unreasonable demands or excessive demands for users, do not complain to the users about the site conditions;
1.1.10, it must wear a helmet into the construction field work;
1.1.11, it must wear seat belts when do the aerial work;
1.1.12, not in the construction site casting from high above any item;

1.2, the provisions for the spare parts and tools:

1.2.1, the project manager or silos installation personnel must set up the good guidance of safety consciousness, leave after arranging the loading bay and the inspection about all the components and parts everyday;
1.2.2, the project manager or silos installation guidance personnel need check whether there is unusual before going to work every day; If find out something is stolen, large amount of more than 1000 Yuan (should) the first time tell the police and protect the alibi, waiting for the police, and assist investigation with police and reported to the company;
1.2.3 All parts should be put in the order according to the condition, put the similar material together for the convenient search;
1.2.4 the whole installation site must be kept clean and tidy and may not throw the packing paper and wood anywhere, but should be placed together, it is disposal after install the unity;
1.2.5, tools, such as electric welding machine, electric grinding machine need waterproof processing; everyday should make the rain proof measures before going;
1.2.6, should clean up the installation site after the whole project finishing, ensure make the construction site clean and tidy.

Appendix two Security management request

According to the country laws, regulations as " Production Safety Law" "Construction Engineering Safety Production Management Regulations" and "The Production Safety Accident Report, Investigation And Handling Regulations", considering the actual installation situation and past experience and lessons, then work out this production safety request to guide the installation and construction in order to prevent accident to assure production safety.

2.1 Basic rules for installing and constructing silos

2.1.1, Installation principals (captain), part-time security officer must have the safety training and have the level of safety management.

2.1.2, Construction workers in site such as electrician, welder (cutting), lifting driver, cable workers must have the card mount guard, forbid any personnel unlicensed operating;

2.1.3, Banned any dangerous operation contraindication engaged in dangerous operations;

2.1.4, Construction site shall be equipped with completely and have effective protective appliances such as safety helmet, safety belt and safety glasses, etc;

2.1.5, Installation principals (captain), part-time security officer should talk about the safety technique with workers before constructing everyday and do safety inspection the appliances and equipments.

2.1.6, According to the local weather, like wind (including the typhoon), ray (electrical) rain, snow, high temperature (above 35 ℃), frozen and so on, decide to suspend or stop the construction.

2.2 The ban for safety management in site

Ban to appearing any behaviors violated construction site disciplines;

Ban to putting forward any unreasonable request to customers.

Ban to threatening subordinates and outsource construction works.

Ban to going to construction site without safety helmet.

Ban to doing aerial work without safety belt.

Ban to throwing any items form aerial work site.

2.3 Major hazard installation--- identification and safeguard procedures for high operation, air drop.

2.3.1 All height of fall high than 2 meters include 2 meters are called high operation, its main accident harm are fall, serious injury and even die.

2.3.2, Must abide by the following safety technology requests when involving the high operation in installation.

1, before high operation, should wear the antiskid shoes and correctly wear seat belt

2, before high operation, should hung the safety belt in fixed reliable location

3, Safety belt should hang high, but low use.

4 Forbid to hang safety pothook on safety belt directly but on link ring.

2.4 major hazards installations--hot welding, fire and explosion danger and protective measures

2.4.1, hot welding, cutting, use gas cylinders, etc may cause fire, explosion on construction site, its main accident harm are: fire, explosion.

2.4.2, During the installation process, involving to hot welding, cutting, use the cylinders, be sure to keep the following safety technical requirements:

1, Keep a safety distance more than 10 meters between gas cylinder and fire when do hot welding or cutting on site.

2, Keep a safety distance more than 5 meters between gas cylinders when do hot welding or cutting on site.

3, At least equip with one powder fire extinguisher on site when hot welding or cutting.

4, Gas cylinder on site should vertically put or put on the shelf, rather than lie down, roll, crash or expose in hot sun.

5 Forbid to smoking and firing on construction site, dormitory and somewhere stack fuel.

2.5 major hazards installations--electric equipment, electric dangerous and protective measures

2.5.1,On construction site, using electrical equipments will happen electric shock as short circuit overload, insulation damage, electric leakage and so on. Its main harm is electric shock, electric wound, fire, etc.

2.5.2, During installing, be sure to keep the following safety technical requirements when involve using electric equipments.

1, Paste safety alarm mark on electricity box shell on construction site, makes sure who the principal is. Equip with fireproof and waterproof appliances.

2, the cable draw from the electricity cabinet on site should be built on stilts in order to avoid damaging the insulation.

3, Temporary using electricity require "three-phase five line system, level 3 distribution level 3 protection, just one brake one machine one leakage protection"

2.6 Major hazards installations-- other dangerous and protective measures on construction site

2.6.1, There are lots cross work and the environment is bad on construction site, beside the dangerous above, there are some other dangerous elements. If haven't control these elements on site, they also will cause serious accidents on site. The main harm is injury by trip, high falling, vehicle hurting, collapsing, and machine hurting, ECT.

2.6.2, During the installation process, must obey the following safety technology requests in order to avoid the other main dangerous elements:

1, At least 2 people for limited space work, one work one guard, if any unusual, timely deal with.

2, At least 2 people if there are bamboo flexible ladder on site, one work one guard and fix ladder.

3 Forbid to throwing down items when operating.

4, for lifting operation area, shall set up warning belt, banned the irrelevant personnel go into the lifting work on site

5, Person in charge of the construction site, should regularly do workers security education training,

strengthening their safety consciousness.

Appendix three the emergency and first-aid treatment

3.1 Basic treatment process for industrial injury and accident

3.1.1 Treatment process for minor injury and accident

Treatment in site, near- treatment----report to the company leadership or projects leadership.

3.1.2 Treatment process for serious accident

Call 120 emergency calls for help---the first aid in site and keep---- report to the company leadership or projects leadership ---assign a special people to attend the wounded--- report new situation at any time

3.2 Basic treatment process for fire

3.2.1 Treatment process for slight fire accident

Put out the fire with near extinguisher - - -restore the site--- report to the company leadership or projects leadership

3.2.2 Treatment process for serious accident treatment process

Call 119 emergency calls for help---isolate combustible, evacuate the crowd--- report to the company leadership or projects leadership

3.3 Common sense for all kinds of accidents emergency aid

3.3.1 Electric shock emergency aid

Quickly cut off power supply, if the switch is far away, pick to open wire by dry sticks, rope, board, pliers, dry towel, insulated sticks and so on, also can try to cut off the wire by some tools with insulated handle, if none of the above conditions but with the hand, the rescuer must pull the dry clothes which not near the people's skin who contact with the electric wire by stand on a dry board to separate him from the power supply.

Let the people lie flat, untie the belt and collar, pat the shoulder, call his name, observe whether appearing reaction, ban to shake his head, if just slight injury, let him rest for 1 hour or so, then send to hospital to inspect;

If the people is serious injury, unconscious, try to find ice bag then put it under the head, armpit, and belly to slow down the body metabolism to promote brain recovery;

If no breathing , let him lie flat, clear the mouth ,give mouth to mouth artificial respiration, give a mouth to nose artificial respiration when his mouth injury. If no heartbeat, should make continuous outside chest press when send to hospital.

3.3.2 Fracture emergency aid

Preliminary exanimate the explosion wound. If the wound is bleeding, first stop bleeding, and then bind up. Properly fix. Fixed can use the board, magazines, cartons or wood umbrella as upholder. Don't try to twist or reset by yourself. Splinting should support the whole wounded limb.

Make quickly and steady transfer. If fracture the key part as spinal column ,must keep the patient's body horizontal move, can not bend or twist waist, keep the patient lie flat on a hard board then send to hospital by a large ambulance rather then the canvas, ropes or soft stretcher. If mishandled, can cause spinal cord nerve damage, lead to paraplegic, then consequence is unimaginable.

3.3.3 Trauma emergency aid

1 Cutting injury

If a few bleeding, can bind up by band-aid or sterilized gauze.

If the wound is deep, the bleed is bright red and flow fast or even spray, it's maybe the arteriorrhagia, so we should press the vessel means press the artery which is closer to heart than wound to stop bleeding.

If cutting instrument is not clean, it would be best to hospital to take the tetanus shot and antibiotic to prevent wound infection.

If a finger or toe was cut off, should press the injury to stop bleeding. Bind up the wound with sterile gauze or clean cotton cloth. The fracture of the fingers, toes also should be bind up, and then send to hospital for immediately surgery. The amputation should be put in ice barrel to escort in summer; amputation shouldn't contact the ice directly to prevent to frostbite. The amputation is banned to be soaked in any water or soup in order to avoid replanting.

2 Hemostasis

Transfer to the quiet place, then inspect, make sure which type it is, arteriorrhagia phleborrhagia or capillary hemorrhage.

Can adopt press the bleeding wound or arterial blood-supply by finger to stop bleeding. For limbs bleeding, should bind up the 1\3 part of arm or the middle leg to stop bleeding by belt, tie, ribbon, wide cloth strip, scarves or strip tore by your clothes.

3 Penetrating

After penetrated by iron nails or sharp, it will be infected, even cause sepsis or tetanus with improper handle. So no matter how small penetrating should be handling with the sterilized pincer rather than hastily pull out by nail.

Stabbed deep, May injury nerve or viscera, the penetrated can't be pulling out at will. If the viscera such as intestinal tube prolepses, reset in site is not permitted. Send to hospital immediately after bonded up by clean bowl or basin covered.

3.3.4 Fire accident emergency aid

Timely dial the call box after find the fire .Tell clearly what is on fire, where fire, your name and telephone number when call the police. Assign a people to the door or crossing to wait the fire trunk after called the police.

Fire just happens, first time extinguish while the fire is small meanwhile call the police rather than follow the crowd blindly. Run toward the bright and open place when evacuating. Evacuate back on to the firework when the passageway were blocked.

When clothes catch on fire, it would be best to take off or lie down, cover face by hand and roll or jump to the near pool to extinguish the flam.

If hazy, use a wet towel to cover mouth and nose to breath, reduce posture, and crawl along the wall to escape.

Appendix Four Common Faults and Maintenance

1. Filter

1.1 Clean the filter cartridge in every three month

1.2 Start the filter on the procedure of inputting material.

1.3 Still start the filter after inputting material for three to five minutes to counter blowing or shake off the floating dust from the filter cartridge.

1.4 Overhaul the motor of filter and electric circuit in every six month.

2. Relief Valve

The reasons for spraying dust from relief valve: 1. the filter cartridge is blocked by floating dust, you should check whether the filter is working or not; you should check vibrator's motor of filter and electric circuit. 2. the valve plate of relief valve is blocked so that the valve plate can not automatically close and seal on the normal pressure; open the head cover of relief valve to check that: whether there is unusual stuff on the valve plate; whether the valve plate can open and close with freedom; whether the screw nuts on the pressure spring of valve plate are loose.

3. Level Gage

3.1 The high level gage is open all the time when inputting material. Stop inputting material when the warning light alarms to prevent too much material on the silos.

3.2 The low level gage is open all the time when inputting material. Start to input the material when the warning light alarms to prevent there is no material on the silos.

3.3 Check the eclectic circle of level gage and rotating motor in every six month.

4. Arch Breaker

4.1 Open the gas path's electromagnetic valve of arch breaker when output the material to prevent the bulging of powder in the silos.

4.2 When start the arch breaker, the procedure of outputting the material is influent, you should check whether the electromagnetic valve is working and the gas path is damage or not.

5. Butterfly Valve

5.1 Rotate the driving handle after installing the butterfly valve to make sure the fluency of opening it.

5.2 The reasons that the butterfly valve can not be opened: 1. the unclean welding slag, welding tumor and other unusual convex stuff block the opening of silos and the opening of spiral machine. On that case, you can adjust the direction of butterfly valve to avoid or remove the unusual stuff. 2. Some part of powder is agglomerate and it blocks the valve plate, you should scatter the piece of powder in time.

6. Sealing Silos

6.1 After installing the silos, you should re-check at lease 20% of bolts on the warehouse cover and cone to make sure all the bolts have been screwed tightly. It prevents the accident that bolts and nuts aren't screwed.

6.2After the silo is install, the external sprinkler inspection should be carried out, the water should be sprayed on the outside of the silo, and the leaking point should be checked and glued on the inside of the silo

6.3 After completely installing the silos or the silo is non-occupation, the butterfly valve should be open to prevent moisture condensation inside the silo.

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Maintenance Instruction

No	Item	Inspection Cotent	Maintenance Menthod	Inspection Frequency
1	Silo appearance	Paint integrity	If it is found that the paint was scratched and is not complete, it should be re painted	Every 12 months
2	Silo sealing	Material leakage	After installation of silo, fill the ash to test and observe every joints to see whether there is ash out phenomenon; if there is, re-do the sealing job on where is ash leakage.	Every 12 months
3	Dust tube	Pipe hoop	When filling ash, observe the pipe hoop to see whether there is ash out phenomenon; if there is, re-do the sealing job on where is ash leakage.	Every 12 months
4		Elbow	When filling ash, observe the pipe elbow to see whether there is ash out phenomenon; if there is, do the plate welding job.	Every 12 months
5	Safety valve	Sealing	When filling ash, observe safety valve to see whether there is ash out phenomenon; if there is, open the cover, and clear the accumulated ash.	Every 6 months
6	Dust collector	Filter element	Open the dust collector cover, remove the cartridge, shake off the dust, and observe the surface whether there is damage case or not, if there is, replace it.	Every 6 months
7	Arch breaker	Air circuit	Check the air circuit is smooth or not, if the pressure is little or no airflow, clear the air circuit or replace it.	Every 12 months
8		Wear and permeability	Remove the arch breaker, and check whether the surface is worn or blocked by powder bonding, if there is, scrape fouling ash or replace it.	Every 12 months
9	Manual butterfly valve	Sensitivity switch	Pull the handle, check whether there is smooth opening and closing; if not to be smooth, remove it when the silo is empty, and check whether there is other mateiral or not, if yes, pls remove them.	Every 3 months
10	Higher level indicator	Effectiveness	When the silo is empty, remove the level indicators, inspect the paddle through electrical detection to see it is normal rotation or not, and use hand to be material to block the paddle to see the feedback signal is normal or not; If there are problems, replace level indicator.	Every 12 months
11	Lower level indicator	Effectiveness		Every 12 months
12	Legs support frame	Horizontal and crossed braces	Check the horizontal and cross baraces connection condition, if there is loose bolt, re-tighten the bolt.	Every 12 months
13		Integrity	Check whether the supporting legs have the impact of the collision or not, if there is, assess its security, and make the appropriate measures.	Every 12 months

BOLTED TYPE POWDER SILO

(abbreviation Bolted Silo)

Commonly Used Installation Tool

Xiamen Luwei Construction Equipment Co., Ltd.
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Website: Http://www.xmlwjx.com

1、The electric tools are normally from Shanghai

tiger brand.

2、 Standard bolts and the sleeve (wrench) specification table

M12-18MM

M14-21MM

M16-24MM

M18-27MM

M20-30MM

M22-34MM

M24-36MM

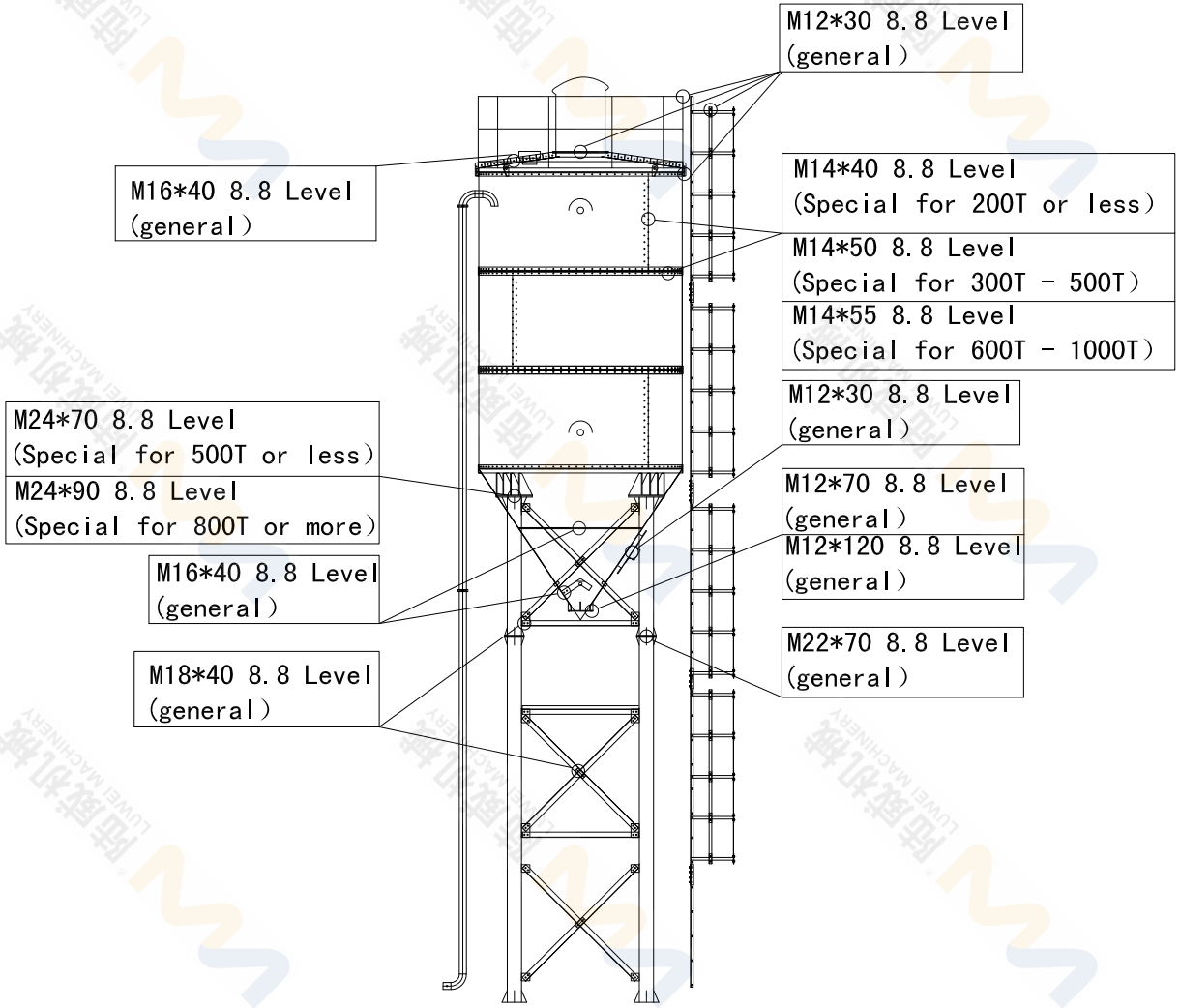
3、 Electric wrench E16 one set is mainly used to lock ladder and roof rail bolts, specification is M12, corresponding supporting sleeve, plum, open wrench, hereinafter the same;

4、 Electric wrench 24C one set is mainly used to lock the silo plate thickness less than 5MM M14 bolts). At the same time it is used to pre-lock the bolts of M14、M16、M18、M20, and then use 30C to fix;

5、 Electric wrench 30C one set is mainly used to lock the silo plate and silo cone thickness more than 4MM. Gimbals need about 3 units to install the cone opening sleeve, plum, while supporting the

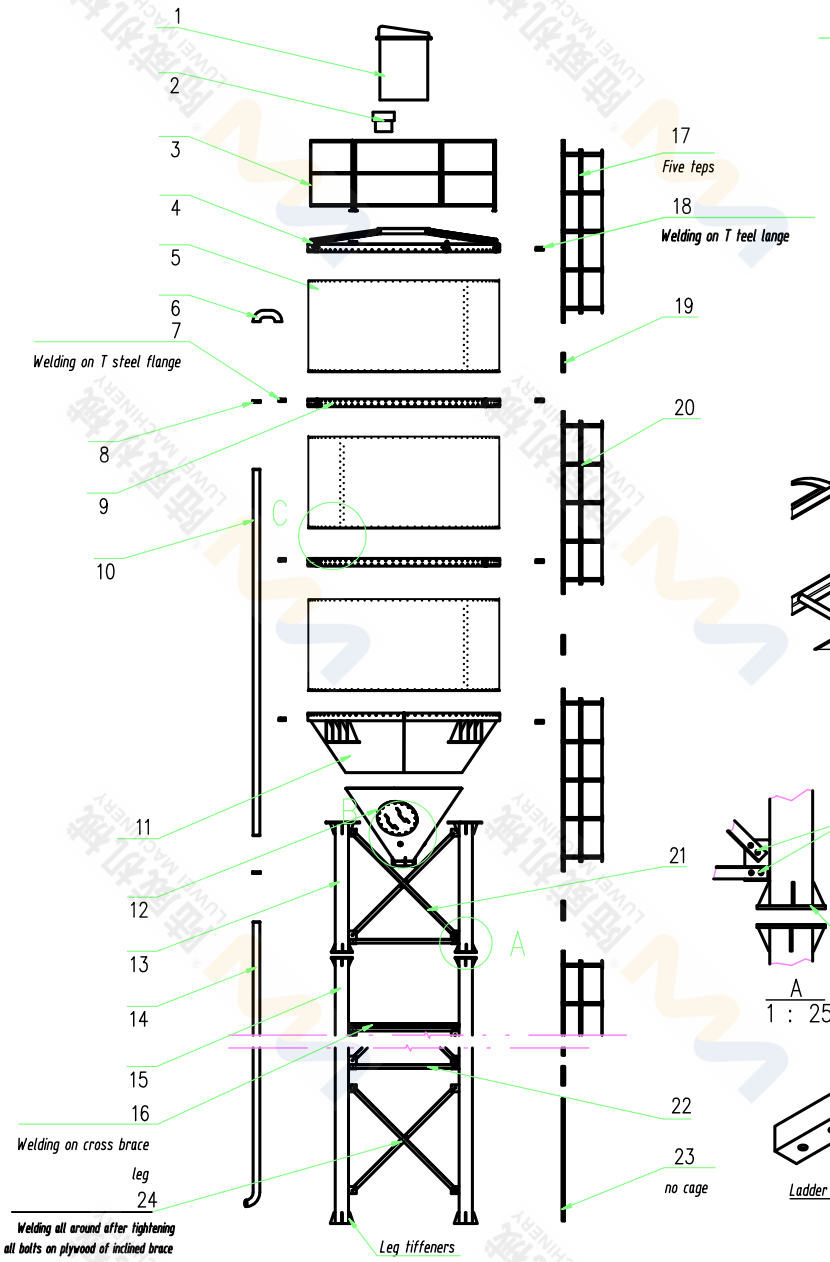
corresponding specification. It is used to lock bolts specification M14(silo plate)、M16(cone, assemble gimbals at roof during installation)、M18、M20 (braces)、M22、M24 (the connection parts between cone and legs) .

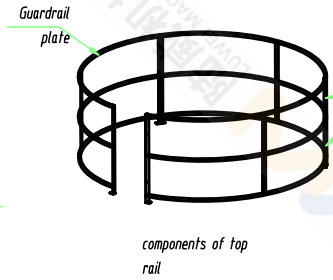
6、 Crowbar several (with product standard).



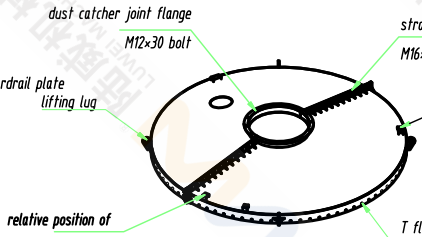
Size of bolt and screw	rank	usage
M12*30	8.8 level	To connect with flange of dust collector,to connect with flange of access hole, to connect with top fence, to connection with ladder, to connect with junction plate of T steel
M14*40	8.8 level	To connect with silo body board, to connect with silo board and T steel flange
M16*40	8.8 level	To connect with straight flange of silo cover, to connect with round and straight flange, toconnect with decompression device
M18*40	8.8 level	To connect with legs and horizontal bracing or junction plate of diagonal bracing
M22*70	8.8 level	To connect with flange of legs
M24*70	8.8 level	To connect with plate of legs
M12*70	8.8 level	Diameter changes cone
M12*120	8.8 level	Butterfly gate
M14*50	8.8 level	To connect with silo board, silo board and T steel, junction plate of T steel (the thickness of silo board from 5mm to 8mm)
M24*90	8.8 level	Connect with leg plate(the thickness of leg plate is from 16mm to 20mm)
M14*55	8.8 level	Connect with silo body plate, silo body plate with T steel flange, junction plate of T steel, (thickness of silo body plate is above or equal to 8mm)

制图单位	厦门陆威工程机械有限公司	项目	签字	日期	数量	单重
图纸名称	BOLT USAGE LIST	制图				
图纸编号		校正			共 页	第 页

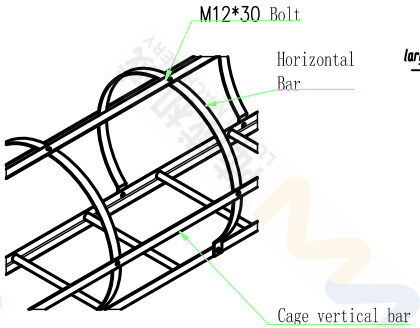




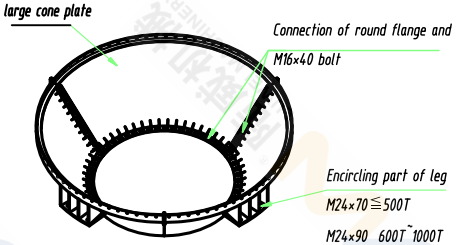
components of top rail



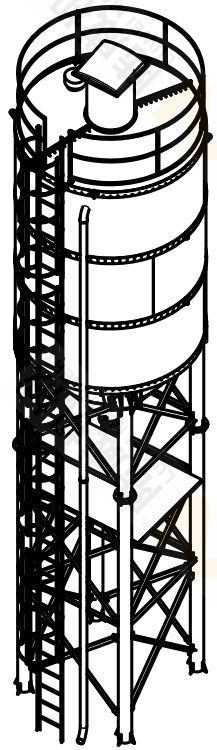
components of warehouse cover



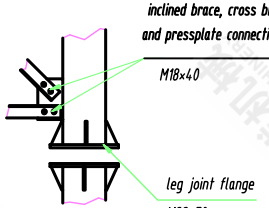
components of ladder



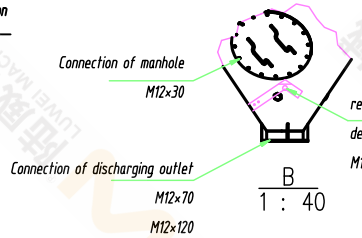
components of large cone



axonometric view image of powder silo



A
1 : 25



B
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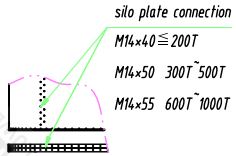

C
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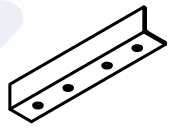

Ladder connection part

Ladder fixing part

Plywood of inclined brace

Guard cage pressplate

Feeding tube fixing parts

1、Dust catcher 2、Relief valve 3、Roof rail 4、Warehouse cover 5、Silo plate 6、Double elbows feeding tube 7、Feeding tube fixing parts 8、pipe hoop 9、T steel anchor ear 10、Straight reach of feeding tube 11、Large cone 12、Small cone 13、Upper section of leg 14、Lower section of feeding pipe 15、Lower section of leg 16、Repairing platform 17、Top section of ladder 18、Ladder fixing part 19、Ladder connection part 20、Middle ladder 21、Inclined brace 22、cross brace 23、Lower section of ladder 24、Plywood of inclined brace

标记	处数	更改文件号	签字	日期			
设计		标准化			图样标记	重量	比例
							1:60
审核							
工艺		日期			共 页	第 页	

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描 图
校 描
旧底图总号
签 字
日 期