SUTUAN PIPE SYSTEM

---- Ming Ye

Conclusion: There are 7 pipe systems in total, there are Steam Piping Systems, Mould Cooling Water Systems, Vacuum Cooling Water Systems, High Pressure Air Systems, Low Pressure Air Systems, Vacuum Systems, Drainage Systems respectively.

1. Steam Pipe System

The steam pressure into the plant steam storage tank should be controlled to fluctuate within 5-6 kg and make sure the machines connected with main steam pipeline be 5 - 6 kg stably. Because a stable steam pressure supply is the basis for stable machine heating control. Every shape moulding machine's steam pipeline will equip a steam pressure relief valve that make 5 - 6 kg pressure low to 3 - 3.5 kg. To match the low pressure moulding type of machines now. The lower pressure can have a more accurately heating control and reduce cost of steam energy consumption effectively. To achieve high-efficiency energy-saving performance.

In order to stable steam pressure, reduce the floating of steam which can be lower that lower than 1 kg tolerance while manufacturing. (Referenced by 15 sets of shape moulding machine)We usually adopt DN300 national standard seamless steel pipe. Associated with a $10m^3$ steam storage tank. If outside steam pressure was too high than 5 - 6kg, it's essential that relief pressure by pressure relief valve before into steam storage tank. The outside steam temperature is too high, it need to be cooling to ruin products by high temperature.

There are automatic steam trap valve and manual drain valve on the bottom of steam storage tank and end of steam piping. The automatic trap is used to automatically discharge excess water from steam tanks and piping, preventing high steam moisture content from causing difficulties in forming products with high moisture content. The manual drain valve is opened each time the plant is shut down to remove stains and water from the steam pipe and piping.

2. Mould Cooling Water Systems & Vacuum Cooling Water Systems

Nowadays, typical shape moulding technology is low pressure moulding, instead of water cooling by vacuum cooling. In this way, can keep sure high temperature when de-moulding that over 80 ℃. Less steam consumption with high productivity and short moulding cycle time. 3kg pressure is required for mould cooling, it ensures that the water is sprayed out in mist. Rapid cooling of the mould cavity to a temperature of 90° C or less, using minimal water in the shortest possible time and with full exposure to water. And the vacuum will take extra heat away.

The mould cooling pumps and vacuum cooling pumps are all installed as dual pumps, all with back-ups in case of damage, so that the whole plant can be switched over without affecting production.

3. High Pressure Air Systems & Low Pressure Air Systems

We separate high pressure and low pressure for a more stably running, which Prevents the valve response and opening from being affected by a momentary lack of air flow in the pipeline when a large volume of air is used. high pressure be in charged in solenoid valve what controls filling. Low pressure be charged in barrel pressure and demould. According to our High energy-saving

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shape moulding machine's requirement are high pressure (5-6kg), low pressure (4kg around). The suggested pipe size will be DN200 at least. The suggestion of situation that prepare a spare compressor in case of compressor issues. The air needs to be drained before it can be used in the workshop. Clean and dry air is the only way to ensure that the machine works reliably and reliably for a long time.

A manual drain valve should be installed at the bottom of end of each of the high and low pressure air piping to ensure cleanliness by opening the valve each time the machine is shut down to remove water and impurities from the ducts. The piping to the machine must also be connected to the machine through a hole in the upper part of the main pipe to reduce the amount of moisture and impurities being introduced into the machine.

4. Vacuum Systems

The most featured point of EPS products manufacturing is shape moulding with low pressure, demould with high temperature. The remaining excess heat is extracted by vacuum, so the stability and goodness of the vacuum system directly affects the cycle time and quality of the product.

So that, it's important for a set of vacuum system. But it's difficult for vacuum requirements if high temperature. Although a good solution can be achieved by having a set of Condensing barrels each machine.But it's costly for installation and maintenance. That's why we adopted central vacuum system and central vacuum condensing system.

A. Central vacuum system was assembled by Central vacuum piping, Centralized vacuum pump, Central vacuum compressed air tank, Central vacuum condensing tank and Central vacuum drainage system.

B. The central vacuum pipe should be DN500, it can be -0.7 MPA during running. That match the requirement of large flow, make sure the floating degree of vacuum to be stable under 1 kg same as air storage tank.

C. Central vacuum pump was adopted with 2 - 4 set of 11KW water ring vacuum pumps. Automatic controlled by system. Intelligent assign each pump's working time and order.

D. Central vacuum storage tank should be 10m ^{3} normally, the larger tank can ensure more stability of vacuum performance.

The central vacuum condensate tank is connected to the central vacuum piping and the cold 17 SUTUAN 18 The condensation tank is connected to the central vacuum storage tank, which is connected to the central vacuum pump.

The central vacuum condensing tank is connected to the central vacuum piping, the condensing tank to the central vacuum storage tank and the storage tank to the central vacuum pump. The central vacuum condensation tank is usually a small diameter (around 1.2m) and high height (5m) tank, with vacuum in and out, filled with customised filling material and cooling water (below 35°C, the lower the better) sprayed from the top of the tank to fully complete the heat exchange and take away the excess heat left in the product from the machine due to heating, thus achieving a cooling effect of the vacuum system and a better vacuum effect. Higher negative pressure and easier to achieve stable vacuum performance.

The central vacuum drainage system is connected to the central vacuum storage and condensation tanks and intelligently drains the water from the storage and condensation tanks due to the cooling of the central vacuum by means of an automatic control of the water level

meter. The drainage system can be carried out in two ways, by a drain pump or by a drain bucket. The drain pump has no influence on the stability of the vacuum, but requires a power supply. The drainage bucket has a certain impact on the stability of the vacuum and has more valves, which makes maintenance difficult and costly at a later stage.

5. Drainage Systems

a. The main drainage pipe to drain air produced by heating and water coursed by cooling. Although the stay-water will be rare by nowadays technology, but it will still affect machine performance by returned air due to small size of pipe. That's why main drainage pipe will be DN500 at least, and a DN100 air outlet on main drainage pipe of machine to vent normally. Main drainage piping need to be connected with high temperature pool.

b. There are three pools that recycle pool(high temperature pool), middle warm pool (mould cooling water) and low temperature pool(vacuum cooling water). Three water poll need to be separate nearby. The water from the high temperature pool is cooled by the cooling tower back down to the medium temperature pool, which can be returned to the high temperature pool when it is full. The water from the medium temperature pool is cooled by a cooling tower and returned to the low temperature pool, which can be returned to the medium temperature pool when it is full. The water used for production needs to be treated with water to achieve the effect of not forming limescale and not blocking the air plugs of the moulds, the water in the pool should be cleaned after a period of time to ensure that the water is clean to prevent contamination of the products.

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