

# THE APPLICATION OF NEW DRY-TYPE IODIZATION DEVICE IN XIANGHENG SALT

Tang Shijian

Hunan xiangheng salt hengyanghunan 421006

**Abstract:** This paper introduces the application of new dry-type iodization device in xiangheng salt, the structure characteristics of the dry-type iodization and economic benefits of new dry-type iodization device.

**Key words:** new dry-type iodization device. Structure characteristics, application

## 1. INTRODUCTION

Xiangheng salt mine has made big transformation to the distribution system during the Operation of Salt and Sodium Sulfate with yearly production of 600,000 tons salt. In order to benefit the management of production and order of logistics, change had been made in the iodization method; considering the rebuilding of the original small package workshop, it has decided to consider the whole process of the iodine salt production.

## 2. THE REASONS FOR SELECTING THE NEW DRY-TYPE IODIZATION DEVICE

The iodized salt production of Xiangheng salt mine mainly adds the iodine before the dry bed. If the large-scale system produces the non-iodized salt, the small packing production, adds the iodine alone. The original iodine adding method exists following question:

1. iodine waste, because adding the iodine before the dry bed, some liquid iodine volatilized by the high temperature on one hand, some iodine is carried away by the salt powder on the other hand, the iodine content of the powder salt is generally 110~180mmg/kg and the average reaches 140mmg/kg.

2. The change time of the salt species

during the production is long, and there are so much difficulties to package, keep and sell transition salt. It may easily cause troubles because of so many steps and poor connection.

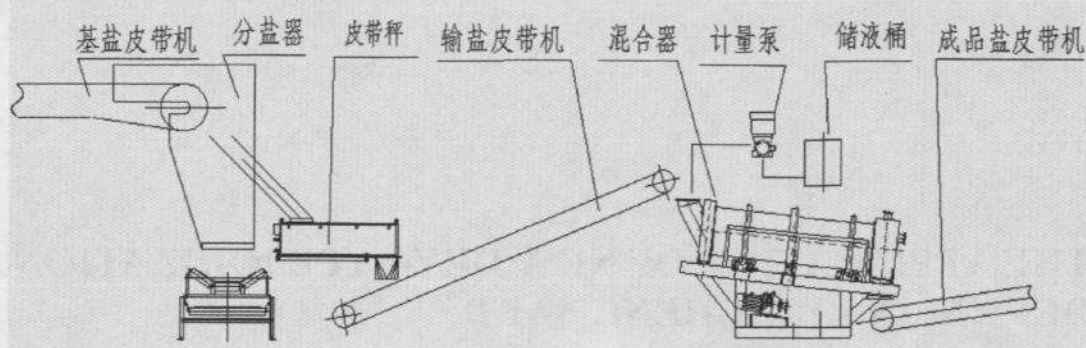
3. The original method to add iodine to small package used the spiral mixed conveyer, it has the problems of large land area taking, inaccurate measurement and much fluctuate when add the iodine. the spiral conveyer need much maintenance after many years' use. After many times' deliberation with the Wuhan Keheng.LTD, a new iodine adding method was developed. The technical process of this method is simple and convenient to operate, it can achieve wholly automatical control by connecting with the DCS system.

## 3. THE TECHNOLOGY OF NEW DRY-TYPE IODIZATION

### 3.1 introduction of the technology

Brief introduction of the new dry-type iodization process: Salt coming from the salt separation machine enters the salt transportation belt after being measured by the electronic belt weight meter; then enters the iodization mixer from the forehead funnel and add iodine in the mixer through the nozzle by the system to control the metering pump simultaneously, the salt and iodine would be sended to enters the bunkers through the salt

product belt after intensive mixing in the mixer. As the following shows:



### 3.2 The service condition of major facilities

The key parts of the iodization device are strap measurer, measure pump, the store and mix tub for the liquid iodine, rotate mix machine.

The belt measure weighing the coming material and then transporting the coming material to the DOS system. The belt measure is made of LCXK-IIIIGA meter, and the precision come up to 0.5%; it's a good basis for supply the iodine exactly.

The metering pump operate with the machinery actuation diaphragm method, electrical machinery is controlled by the transducer, and the system is controlled by adjust transducer so that the measure pump gate can be control freely. The runoff of the pump can reached 500L/hr; pressure reached 12bar. And the special design can decrease the pulse degree and pressure remarkably, the stable precision can come up to  $\pm 2\%$  and the runoff range is 10%-100%, so that it can ensure the precision of the iodization.

The liquid iodine store and distribute buckets are two stainless steel, one is used to mix and another one is used to store, so that can keep the stable confecting of the iodine. There is mixing equipment and heating pipe which can keep the liquid iodine from riming and blocking the tube during the production.

The diameter of the rotate mixing machine is 800mm, and it's the key part in the whole equipment, the technical product produced by the KeHeng Company. The mixing machine continuous rotating by the power of chain wheel, and the foundation salt is throw up and down continuous by the rotating and make it mixed up absolutely, the engine's rotating speed of the mixing machine can be adjusted by adjusting the

transducer so that it can fit different volume 's production, in order to ensure the production. The mixing machine also have heating pipe, fan, leading fan to ensure the foundation salt with high water content or ensure that the salt product is healthy and when the ratio of iodine to fluid is quite low.

### 3.3 the control of iodization and target quantity

Weighing the potassium iodine according to the water volume of the mix bucket while adding iodine, to the best fixing the iodine's ration, keep the finished iodine in the storing bucket after finished mixing, and judge whether turn on the heating machine or not according to the heating device. Then turn on the mixing machine, electric trap measure, measuring pump, adding pump and so on. System adjust the measure's open degree automatically according to the amount of salt transferred by the trap, this time, all of the salt with iodine flow into tailing warehouse, sampling inspection after about 5-10 minutes, it will transfer salt to each material warehouse by parting salt device and as the iodine salt product if passes. Or the salt will be transferred to tailing warehouse, and will handle this salt as another salt product, and in the meantime adjusting the measure pump's open degree by hand according to the inspection result. Till the result is up to the grade. From several month production in XiangHeng, the water content of salt with iodine less than 0.15%, and the concentration of iodine reach up to the criterion range with biases of  $\pm 5\text{mmg}$ .



#### 4. TECHNICAL AND ECONOMIC ANALYSIS OF THE NEW DRY-TYPE IODIZATION

Before the transforming of XiangHeng salt mine, it produced 250 thousand tons of iodine salt a year, and a ton of salt cost 0.0773 Kg iodine. After the transformation, each ton of salt only cost 0.060 Kg iodine. 0.0173 Kg of iodine was saved producing one ton of salt, if the price of the iodine is 135,000RMB per ton, 2.34 RMB can be saved each ton of salt, and 585,000RMB can be saved each year.

4.2 Producing iodine salt with this method can reduce transition salt by 15,000 tons each year, and can increase 450,000RMB if the price differences between the iodine salt and the common salt is 30RMB.

4.3 The structure of new dry-type iodization facilities is quit simple, and can

save maintenance fees for 15,000RMB each year.

4.4 Each year can get profit of 1.05 million of RMB if 250 thousand tons of iodine salt was produced each year.

#### 5. CONCLUSION

It is can be seen from the monthly operation situation of new dry iodine adding device that the equipment posses following characteristics: big production capacity of iodine salt, Arbitrary control of iodine content, stable quantity of iodine adding and stable product quality. The economic efficiency is obvious and it has good promote value.

Author: Tang Shijian (1979-); male; born in Shaoyang, Hunan; works in science and technical department of XiangHeng salt mine.