

# 铸造用树脂砂再生生产线

## Regeneration Line of Casting Resin Sand

### 产品介绍:

设备具有技术先进,性能可靠,结构合理,布置灵活,使用维护方便等特点,并采用PLC控制实现了机电一体化。目前公司的树脂砂、水玻璃砂成套设备有16个系列80多种产品,能够满足铸造行业树脂砂、水玻璃砂工艺生产厂(车间)年产1000-30000吨的需要。

### Product Introduction

The features of the equipment are advanced technology, reliable performance, rational structure, flexible layout, simple application and maintenance. The PLC control system is applied to realize mechatronics integration system. At present, there are 16 series, more than 80 kinds of production for the regeneration production line of resin sand sodium silicate sand and meet the demand of annual 100030000 tons of resin sand and sodium silicate-bonded sand.

### 主要设备 Main Equipment

#### 1. Y335D 带式输送机 Y335D Belt conveyor

该机是根据铸造车间使用特点而设计的一种新型带式输送机,主要用于铸造车间输送新砂、旧砂、型砂、焦炭、石灰石等物料,也可用于建材、化工、粮食加工等行业输送无腐蚀低温的块、粒状散性物料。

This conveyor is a new type designed according to the special application of casting plant. It is mainly used for conveying the new sand, used sand, molding sand, coat and lime stone as well as the construction material, chemical industry and food processing for all granular or block shape material.

- 带宽 Width of belt: 500mm
- 带速 Conveying speed: 1m/s
- 平行输送量 Parallel transfer volume: 50m<sup>3</sup>/h
- 电机功率 Power of motor: 1.5kW

#### 2. S561 多功能振动再生机 S561 Multi-function vibration regenerator

该系列再生机主要用于树脂砂和水玻璃砂的旧砂再生。它是以振动挫擦再生为主,集落砂破碎、筛分、脱模多功能于一体。属典型的软再生设备。再生后的砂子粒度集中度显著提高,粒型更加圆整。

This regeneration machine is designed for the resin sand or silicate bonded sand regeneration. The main mode is vibration and friction regeneration, also the function of breaking sand shakeout, sieving, demold.

- 生产率 Production rate: 1-3 t/h
- 电机功率 Power of motor: 2\*1.5kW

#### 3. Y3715 斗式提升机 Y3715 Bucket elevator

该机在机械化铸造车间中是一种普遍采用的垂直输送设备,主要用于提升旧砂、废砂、新砂、清理铁丸等散材料。它同带式输送机等设备配合,可以布置成多种形式的输送系统。它具有外形尺寸小、占地面积少、提升高度大的特点,使系统的布置更为紧凑。

This machine is a vertical transferring machine which is applied in mechanical casting plant. It is mainly used for elevating the used sand, waste sand, new sand, cleaning iron shot, etc. Combined with the belt conveyor and other devices, we can design many kind of transferring system. The features are small external size, less volume and higher elevation level so that the layout drawing will be compact.

- 生产率 Production rate: 3-8 t/h
- 电机功率 Power of motor: 1.5kW



#### 4.S522II 离心再生机S522II Centrifugal regenerator

该系列再生设备是采用干法离心式再生的原理，主要用于树脂砂旧砂的再生。工作时旧砂在高速回转叶轮的作用下，抛向耐磨衬圈，通过沙粒与粒圈、叶轮与机盒、砂粒与砂粒之间的相互碰撞和摩擦，去除砂粒表面的树脂惰性膜。根据旧砂不同的工艺要求，可调整砂子在该机中的再生循环次数，达到满足工艺要求的再生砂。

The centrifugal machine adopts the principle of dry-process centrifugal regeneration. It is mainly used for used resin sand regeneration. The used sand will be thrown to wear-resisting lining by the high speed rotating blade. And the inert cover on the surface of resin sand will be removed by the rub and collision process between the sand articles, blade and box. According to the process requirement, the process will be repeated for many times till the target achieved.

- 生产率 Production rate: 3-5 t/h
- 电机功率 Power of motor: 2\*3kW

#### 5.S562III 风选器S562III air-float separator

本机主要用于树脂砂和水玻璃砂系统的砂粒与微粉的分离，能使再生砂中的微粉彻底去除，能使再生砂子达到工艺要求。

The separator is mainly used for separating the powder from the sand of resin sand and sodium silicate sand. The powder should be completely removed from regenerating sand, so that the regenerating sand may meet the process requirement.

- 生产率 Production rate: 3-5 t/h

#### 6.S255T 双臂树脂砂混砂机S255T Double-arm sand mixer

本系列双臂混砂机主要用于树脂砂自硬砂，水玻璃砂的混制。粘结剂供给系统采用先进的齿轮泵、隔膜泵、液体检测仪，测量准确，混砂时间短，无头尾砂损失，双臂回转灵活，作业面积大。全开式混砂搅笼壁，便于叶片清理或调整。在混砂机的一级二级衔接处及二级出料口处增加了除尘祛味系统，降低了砂中的微粉含量，减少了粘结气味在空气中的含量。电气采用PLC控制，制约保护充分，模拟屏显示，工作稳定可靠。

The machine is applied to mix the resin sand and silicate bonded sand. The adhesive feeding system consisted of the gear pump, membrane pump and liquid detector so the measurement is accurate, the mixing period is short and the loss of first and last round sand is less. The double-arm of machine rotates flexibly and the available working area is large. The open type sand mixing stir cage is advantage for cleaning or adjusting the blade. The dust collection and deflavour system are combined in the primary and secondary connection as well as the secondary outlet, in order to reduce the content of powder and binder air in the sand. The electric control system is PLC controlled and completely restricting protection. The information displayed by mimic board with reliable operation.

- 生产率 Productivity: 3-5t/h
- 一级回转半径 Primary rotating radius: 2.75m 回转范围 Rotary scope: 120°
- 电机功率 Power of motor: 2.2kW
- 二级回转半径 Secondary rotating radius: 1.75m (可变 flexible) 回转范围 Rotary scope: 270°
- 电机功率 Power of motor: 4kW



### 7.S524IV 砂温调节器S524IV Sand temperature regulator

砂温调节器的主要原理为：砂子从上部进入调温器，有水管外面流过，冷却水（热水）连续通过装有散热片的多级冷却水管内，热砂（冷砂）经过冷却水管与冷却水（热水）热交换热量降温（升温），温控器测量达到规定温度后，开启阀，出砂，完成砂温调节。

The main principle of sand temperature regulator: The sand is conveyed to sand temperature regulator from the top of sand temperature regulator and there are water pipes in the sand temperature regulator. The cooling water or hot water continuously flow in the heat sink which assembled with multilevel cooling pipes. Hot sand or cold sand is conveyed to from the water pipes for heating exchange. The sand will be conveyed out when reach the set temperature.

- 生产率Production rate: 3-5 t/h

### 8.HD8980 布袋除尘器HD8980 Bag-type dust collector

该系列单机除尘器是专为水泥厂库顶、库底、皮带输送及局部除尘而设计的，也可用于铸造机械加工、冶金、陶瓷、玻璃、化工制品、粮食加工的行业的除尘。具有面积小、处理风量大、结构紧凑、使用方便、可靠等优点。该产品对比重大的金属切屑、铸造用砂和中等比重的粉尘，均有良好的除尘效果。

The series of bag-type dust collector is specially designed for dedusting at the roof or bottom of cement plant storeroom, belt conveyer and collecting dust in a small area and it is also used for dedusting in the industry of casting machinery processing, metallurgy, ceramics, glass, heavy chemicals and food processing. The advantages of dust collector are little volume, large amount of air processing, compact structure, convenient application, strong reliability and so on. This equipment has a good dust collecting performance for large proportion of metal borings, sand for casting and medium proportion of powder.

- 处理风量Processing air volume: 5200-6000m<sup>3</sup>/h
- 过滤面积Filter area: 40m<sup>2</sup>
- 风机功率Rated power of fan: 15kW

## 方案实例 Case Project

### 1. 用户要求 User requirement

根据公司的生产纲领、车间格局和技术要求，该线设计采用以碱性酚醛树脂和有机脂作粘结剂，应用常温固化的树脂砂造型工艺，用于生产耐热钢。

According to the production program, workshop structure and technical requirements, the alkaline phenolic resin and organic material are applied as binder, adopt normal temperature cured resin sand molding process to manufacture heat resistant steel.

- 生产能力：年产铸件1000吨 Productivity: Steel casting parts 1000ton per year
- 旧砂再生能力：Regeneration capacity of used sand: 1-3t/h
- 旧砂回收率：Recovery rate of used sand:  $\geq 95\%$
- 再生砂脱模率：Regeneration sand demold rate:  $\geq 26\%$
- 再生砂灼减量：Ignition loss of regenerated sand:  $\leq 3.5\%$
- 再生砂微粉含量：Powder content of regenerated sand:  $\leq 0.8\%$
- 混砂能力：The capacity of mixing sand: 5t/h
- 除尘效率：The efficiency of removing dust:  $\geq 98\%$



## 2. 设备配置 The configuration of equipment

No	型号 Model	设备名称 Equipment name	数量 Qty	功率 Power (kW)	备注 Remark
1	DK	电控 (Electric control)	1		
2	Y335D	皮带机 (Belt conveyor)	1	1.5	含永磁头轮(Permanent magnet head pulley is included)
3	S561I-A	多功能振动再生机 (Multi-function vibration regenerator)	1	2x1.5	
4	Y3715	斗式提升机 (Bucket elevator)	1	1.5	H=8500mm
5	S562III	风选器 (Air-float separator)	1		
6	S522II	离心再生机 (Centrifugal regenerator)	1	2x3	
7	Y3715	斗式提升机 (Bucket elevator)	1	1.5	H=7000mm
8	C181	料位计 (Charge level indicator)	6		
9	Y5610B	砂定量器 (Sand quantitative device)	1		
10	S255T	双臂树脂砂混砂机 (Double-arm resin sand mixer)	1	4	进口隔膜泵 (Imported membrane pump)
11	HD8980	布袋除尘器 (Bag-type dust collector)	1	15	含15kW风机 (Included 15kW draught fan)
12	XLP/B-9.4	旋风除尘器 (Cyclone dust extractor)	1		
13	S524IV	Y5620	1		
14	Y3715	斗式提升机 (Bucket elevator)	1	1.5	H=7500mm
15		新旧砂比例调节器 (Used and new sand ratio regulator)	1		
16	Y3712	斗式提升机 (Bucket elevator)	1	1.5	H=7500mm For hoisting new sand (用于提升新砂)
17	L123T	震动落砂机 (Vibration shakeout machine)	1	2x3.7	可选 (Optional)
18	S995	永磁分离机 (Permanent magnetic separator)	1	1.5	可选 (Optional)
19	S564II	沸腾冷却床 (Boiling and cooling bed)	1	18.5	可选 (Optional)

# Resin sand regeneration production line





