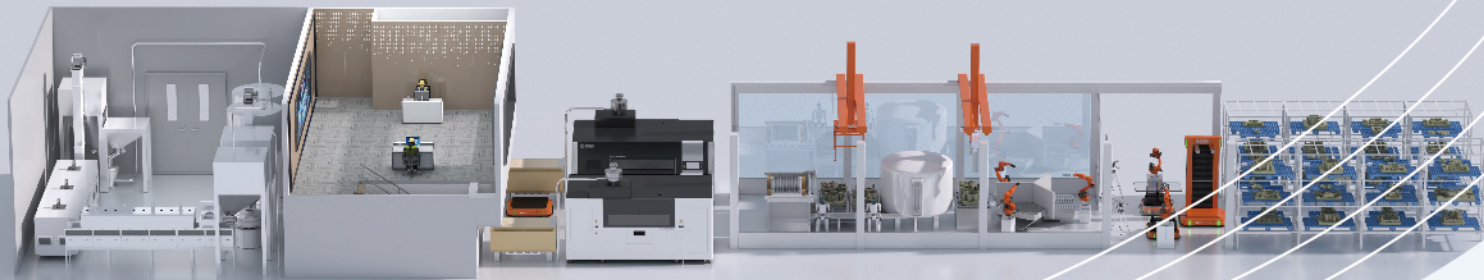


Intelligent Unmanned 3D Printing Sand Mold Manufacturing System



The latest intelligent unmanned 3D printing sand mold manufacturing system launched by Kangshuo Group is an intelligent big-data model system integrating technologies such as intelligent perception, digital acquisition, digital control, digital twin, intelligent printing, image recognition, intelligent logistics, industrial robotics, and aerodynamics.

The system consists of units such as full-line full-process intelligent control management, automatic material supply, recovery and regeneration, intelligent high-efficiency "color printing", one-time automatic core removal for whole-box sand molds, centralized automatic cleaning of whole-box sand molds, automatic sorting of any sand mold in the box, automatic precision cleaning of sand mold undercut areas, automatic sand mold accuracy inspection, and automatic sand mold classification and storage.

Intelligent Process Design Subsystem

According to the requirements of sand mold products imported into the process design system, and using the sand mold printing material process database and digital models of equipment and facilities, the system can quickly and automatically generate digital control processes for the entire production process including material preparation, layout, slicing, printing, core removal, cleaning, inspection, and storage, as well as path planning and motion control for logistics equipment. Then, through full-process production virtual verification planning, the quality and efficiency of sand mold printing process design are greatly improved.

Intelligent Production Management Subsystem

Based on the digital control process and logistics motion planning input from the intelligent process design system, the system can quickly and automatically generate the entire production process operation plan and material consumption quotas. The production plan can be automatically issued to all intelligent equipment and facilities, and efficiently and orderly control the entire production process including production preparation, production equipment, production process, and quality. At the same time, it automatically collects, analyzes, organizes, stores, and manages the data of the entire production process, greatly improving the reliable and orderly operation of the production line and product quality and efficiency in an unmanned production site.





Automatic Material Supply, Recovery and Regeneration Unit

According to the received production operation plan and material consumption quotas, it automatically performs quantitative preparation and automatic supply of multi-material new/used sand and liquid materials, and automatically recovers, regenerates, and reuses materials, significantly reducing production costs and achieving green production with zero emissions of sand and liquid materials.

Intelligent High-Efficiency "Color Printing" Unit

It features intelligent printing functions such as intelligent real-time perception, detection, analysis, judgment, and repair assessment of sand surface conditions, multi-material controllable image color sand laying and printing, and variable layer thickness sand laying printing. It achieves "zero-defect" sand mold printing, leading sand mold 3D printing into the "color printing era", and accelerating the complete replacement of mass-production traditional core making by the sand mold 3D printing industry.

One-time Automatic Core Removal Unit for Whole-box Sand Molds

The intelligent overhead robotic arm automatically identifies the spatial positions of the print job box and the sand mold, achieving complete core removal of the whole-box sand mold within 2 minutes, greatly improving core removal production efficiency.

Centralized Automatic Cleaning Unit for Whole-box Sand Molds

The innovative intelligent controllable variable-voltage variable-flow pulse-acting aerodynamic sand cleaning device covering the entire surface area of the sand mold can achieve rapid cleaning of a whole-box sand mold within 5 minutes, thoroughly solving the "difficulties" and "bottlenecks" of cleaning efficiency for multi-variety, mass-production 3D printed sand molds.

Automatic Sorting Unit for Any Sand Mold in the Box

The integrated collaborative automatic sorting unit consisting of an overhead robotic arm and a humanoid robot can autonomously determine the exact position, specifications, shape, and weight of the sand molds after whole-box cleaning, perform autonomous task allocation and sorting sequence planning, achieving efficient and non-destructive sorting of multi-variety, mass-production sand molds.

Automatic Precision Cleaning Unit for Sand Mold Undercut Areas

It can perform full-surface cleanliness scanning inspection on sand molds after cleaning and sorting, and carry out targeted cleaning on areas where cleanliness issues are found in undercut locations, ensuring full-surface cleanliness of the sand mold.

Automatic Sand Mold Accuracy Inspection Unit

Using a six-axis robotic arm holding a laser scanner and an AGV rotating device, it performs high-precision autonomous inspection of the shape, position, and dimensions of the entire sand mold surface, ensuring sand mold accuracy.

Automatic Sand Mold Classification and Storage Unit

It can autonomously perform sand mold classification, path planning, position recognition, and accurate warehousing, effectively improving the quality and efficiency of sand mold storage.

The intelligent unmanned 3D printing sand mold manufacturing system innovatively developed by Kangshuo Group disrupts single-material 3D printing sand mold technology, breaks through the "bottleneck" of sand mold post-processing efficiency, and features a highly leading level of intelligence, greenization, and unmanned operation. It leads sand mold 3D printing into an era of high quality, high efficiency, mass production, and low cost, promoting the intelligent transformation and high-quality development of the foundry industry.



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