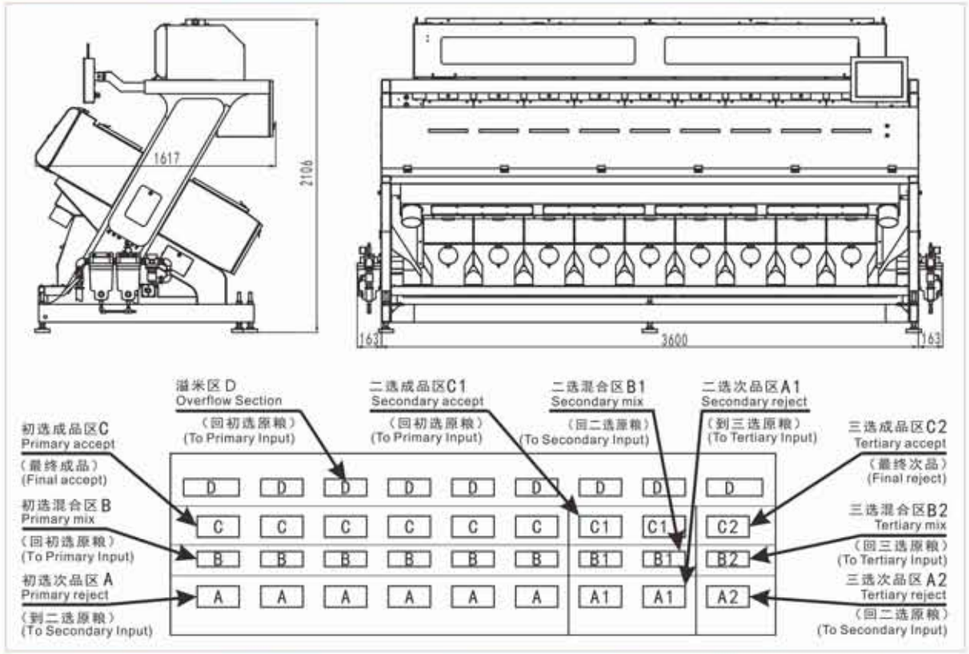
LS9外形尺寸及第三次选反选工艺流程 LS9 OUTLINE DRAWINGS AND TECHNOLOGICAL FLOW(TERTIARY INVERSED)



LS系列激光色选机主要技术参数 TECHNICAL PARAMETERS OF LS SERIES LASER COLOR SORTER

色选机已经跨越了用带出比衡量效果的时代。现在光滑一致的滑槽，稳定均匀的照明，极高的电路信噪比，以及快速响应、干脆利落的电磁阀，配合上三次选反选和物料中心识别这样的智能软件处理，在保证成品质量的前提下，我们已经做到在下脚料中几乎看不到好米。LS系列是模块化设计，可根据需求加减激光或红外模块，也可根据用户要求预装各升级模块的基础部分。

Nowadays, it is hard to describe the rejected fraction by numbers. Now smooth and high quality chutes, stable and consistent illumination, high SNR cameras, and fast response ejectors, together with intelligent algorithms such as tertiary sorting and object center identification, guarantee the high-quality of the final accepted products. Almost no good rice can be found in the final rejected product. The LS series uses a combination of multiple sensor technologies(Camera, Laser and SWIR) and is modularly designed. Laser and SWIR modules are optional according to customer's requirements. It is also possible to pre-install the necessary base parts for future upgrading.

机型 Model	LS4	LS5	LS6	LS7	LS8	LS9
通道数 Number of channels	320	400	480	560	640	720
二次选加工量 Throughput(t/h)(two group)	3.6-9(3:1)	—	4.8-12(4:2)	6-15(5:2)	7.2-18(6:2)	8.4-21(7:2)
三次选加工量 Throughput(t/h)(three group)	—	3.6-9(3:1:1)	—	4.8-12(4:2:1)	6-15(5:2:1)	7.2-18(6:2:1)
主机功率 Main power(kw)	2.3	2.8	3	3.2	3.6	3.9
加热膜功率 Heater power(kw)	1.0	1.3	1.5	1.8	2.0	2.3
电源 Power supply	220V±AC(10%)					
气压 Air supply(Mpa)	0.6-0.8					
气源消耗 Air consumption(m^3/min)	<2.4	<3.0	<3.6	<4.2	<4.8	<5.4
色选精度 Accuracy(%)	>99.99					
最优带出 Rejected fraction(%)	>99.8					
机器重量 Weight(kg)	1330	1480	1590	1760	2050	2270
外形尺寸 长*宽*高 Dimensions(mm)LxWxH	1900X1617X2106	2240X1617X2106	2580X1617X2106	2920X1617X2106	3260X1617X2106	3600X1617X2106

注：采用坏米中剔除好米作复选的情况下，带出比精度可达到99.8%（基本坏米中没好米）；
色选性能参数以粳米（含杂量为2%，单通道产量为33Kg/h)为例，具体指标因原粮和产量的不同有所变化；
如果含杂过高并且产量过大，有可能因喷阀动作过于频繁（单阀＞400次/秒)导致喷阀处于保护状态，产生漏选影响色选效果，这种情况建议降低产量。

Note: 1. In the case that the good rice is kicked out from the bad rice for secondary selection, the accuracy may be up to 99.9% (there is no good rice in bad rice basically)
2. The polished round-grained rice (impurity content of 2% and single-channel throughput 32kg/h) is taken for example for the color sorting performance parameters in above table and the specific indexes vary with the input and throughput.
3. In case of excessive impurity content and throughput, the ejector may be in the protection state due to frequent action (>400 times/s each ejector), resulting in selection missing and affecting the color sorting effect. (In this case, it is recommended to reduce the throughput)

产品技术参数如有变更恕不另行通知 If technologic data has been changed without further information

E-mail:yongxiangmiji@sohu.com http://www.hbyxlj.com

地址：湖北省安陆市府河大道2号

ADD：2 FUHE AVE.,ANLU CITY,HUBEI,CHINA

电话(TEL)：0712-5254443 5254445 5258762 传真(FAX):0712-5254443 邮编(POSTCODE)：432600

激光 -- 开启大米5G时代

全球首款激光大米色选机

THE FIRST RICE COLOR SORTER IN THE WORLD ARMED WITH LASER

不放过一颗杂质 不冤枉一粒好米

Remove all that you hate *Keep all that you want*

湖北永祥粮食机械股份有限公司

HUBEI YONGXIANG FOOD PROCESSING MACHINE CO.,LTD.

激光器发明58年后来到了大米色选 DECADES AFTER BEING INVENTED, LASER FINALLY REACHES THE RICE SORTING

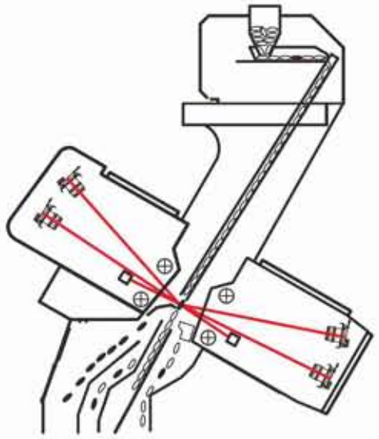
永祥 YONGXIANG

现在已有的大米色选机识别处理和大米颜色、密度相近的恶性杂质（比如塑料、陶瓷、石头、玻璃等）艰难异常，使用激光后就可以很好的解决这个难题。这是由激光的特性决定的，利用激光的特性，经过科学的设计，可以排除其他光谱的干扰，让特定特征的区别最大化，达到很好识别和大米同色、同密度的恶性杂质的效果，比如同色石头、塑料、陶瓷、玻璃等。

在传统的精细化选别方面，LS系列同样出色，除基本的异色、病斑、腹白、晶白等色选模式外，通过对细微颜色的分析和物料形状识别，LS系列在淡水黄、腹白带水黄、芯白、碎米和反选（好米中剔除坏米）等方面有更优异的表现。

It is known that the biggest challenge for nowadays rice color sorters is making the foreign objects whose color, size and density are similar to regular rice distinguishable. Laser has a significant advantage in distinguishing those objects due to its natural characteristics. The specific feature differences are maximized by using Laser illumination and therefore make it possible to recognize the harmful impurities which are similar to rice in color and density, such as white stone, plastic, ceramics, and glass, etc.

LS series is excellent in basic sorting modes(yellow, spot, white-belly, transparent, etc.), in addition, LS series are even better in sorting the color-defect rice, white-belly rice with light-yellow, core-white rice, broken rice due to its significant color analysis and shape identification.



光路图 Light Path Diagram

已有色选效果 WITHOUT LASER

腹白粒正反选
White-Belly Removal (or Inverse)

黄白同选
Simultaneous Color-Defect and White-Belly Removal

黄精同选
Simultaneous Color-Defect and Transparent Removal

精白粒正反选
Transparent Removal (or Inverse)

异色粒正反选
Color-Defect Removal (or Inverse)

激光色选功能 WITH LASER

陶瓷碎片
Ceramics

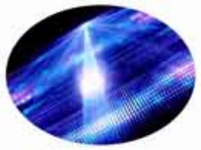
石英砂
White Stone

塑料粒子
Plastics

玻璃碎片
Glass

金属
Metal

技术特点 FEATURES



多光谱系统 高度接近自然光的白光光源，专利技术的恒亮度控制系统，完美呈现出与人眼感受相同的图像品质，同时增加了非可见的短波红外照明和激光光源，利用智能光谱补偿技术，使可见光无法区分的特征也暴露无遗。

多维度信息融合 除基本的 RGB 彩色属性外，机器还从多个其他方面（非可见光响应、大小、形状等）对物料进行检测，获取物料的全方位特征信息，分别对这些特征信息进行分析和标定，再由高层的决策层算法综合判断，得出物料的归类信息。

多模型识别算法 利用更大规模，更高速 FPGA 提供的计算力资源，对这些数据进行检测和分析，选用合适的色彩和空间模型，提取出物料的全方位特征，为物料分级提供依据。

多通道传感器件 本机使用高速高分辨率 CCD 可见光传感器和专用于短波红外波段的InGaAs传感器。二者配合高速、低噪声的驱动和AD采样电路，忠实提供多维度的海量数据。

高效节能 本机电磁阀使用频率可达1800Hz，寿命长，速度快，反应时间短；配合先进的识别和打击算法，极大的减少了良品带出，同条件下耗气量仅为传统盒装阀的 1/2，节能效果显著。

高可靠电路系统 大多数单板均配备了防呆、容错、保护、自检和报警反馈系统，整机采用以太网组网通信，总线传输可靠，实现了真正的实时监控，实时看得见的色选。遍布机器的温度和电压电流传感器，能及时发现环境异常，并采取必要措施。

超简洁人机界面 一键自动调整，实现了类似汽车“自动挡”的操作，用户只需要掌控方向盘（选别效果）和车速（产量），其他所有复杂设置均由软件自动完成。一键自动调整过程中零流出（传统的自动调整过程需要下米，容易让需剔除的物料流出）杜绝不良品混入成品。

高智能系统 软件自动进行亮度一致性和颜色白平衡校正，长期跟踪 LED亮度衰减情况，智能调整驱动电流进行补偿。通过大数据分析和自学习方法，为客户提供优化的选别方案。如果遇到特殊物料或者特殊需求，机器可通过云服务向有经验的工程师提供详细数据和图像，由工程师量身定制色选方案。此外，接入云的机器可以及时获取软件升级信息，持续提高色选机性能。

Multi-spectral illumination: The high-brightness, long-lasting LED lighting, driven by patented constant brightness control system, meets the requirements of the high-accuracy and large-output color sorter and reduces the cost, it assures cameras of getting same quality images as human eyes do. Besides, SWIR and Laser illumination are introduced as spectral compensation to distinguish those defects which cannot be seen under visible light.

Multi-dimensional fusion: The materials are detected and analyzed from various aspects such as spectrum, color ,shape, and the full characteristics of every aspect are presented.

Multi-model recognition: The computing resource provided by large-scale, high-speed FPGA is utilized to analyze the data from cameras. Meanwhile, appropriate color and space models are introduced when extracting specific characteristics of the materials to provide the basis for classification.

Multi-channel sensors: High-speed, high-resolution full-color CCD sensors and professional SWIR InGaAs sensors, together with high-speed, low-noise drive and AD sampling circuit, provide massive data in multiple dimensions and aspects.

High-speed and Energy-efficient Ejector: The Ejector of this machine is designed and tested for fast switching(up to 1800Hz), continuous working, long life, and easy maintenance. With the help of advanced recognition and striking algorithm, make a good result in precisely removing the defect objects, besides, the air consumption is only a half compared to the boxed-ejector. That makes a significant energy saving.

Super Robust Hardware: Most boards are equipped with foolproof, fault-tolerant, self-protective, self-testing and alarm-feedback systems. The com-munication between boards is based on Ethernet which has been proved fast and reliable. There are temperature, voltage and current sensors throughout the machine helping user monitor machine and environment status in time, furthermore, automatic actions can be taken when necessary.

Extreme Easy Operation: Simple, clear, user-friendly, easy-learning GUI makes operation extremely easy. With the "ne key auto"operation, the machine will set all parameters automatically after the user enters Mode, Sensitivity, and Capacity.

Intelligent Software: A mechanism of long-term tracking of LED intensity is established to ensure the consistency. Correction of non-consistence between different LEDs and white-balance of RGB are made automatically. Cloud service allows the machine be accessed from all over the world. It' easy keeping the software up-to-date to continuously improve the performance. In addition, our experienced engineer will help customers for particular materials or requirements over the internet.