Masterpiece of Sand-making Process,
VU Series Aggregate Optimization System

混细石的要求
Requirements on Concrete

混凝土泵送现场
Concrete Pumping Site

强度、流动性和耐久性是混凝土的核心性能要求和指标。
Strength, flowability and durability are core indicators of modern concrete performance.

混凝土组成
Composition of Concrete

细骨科（砂）是混凝土的主要原材料，对其性能和配制成本影响显著。
The main raw material of concrete is the fine aggregate (sand). Its performance has a significant influence on the performance and cement-cost of concrete.

传统制砂的问题
Problems with Conventional Sand-making Technique and Equipment

湿法制砂工艺
Wet-progress Sand-making Technique

传统工艺和设备难以调控成品砂的品质，易产生粉尘污染及污水灌溉问题。
The conventional sand-making technique and equipment experience difficulty in controlling the quality of manufactured sand. In addition, they often cause dust pollution. Especially, they lack of capability of effectively handling the waste water and sludge.

传统机制砂问题
Problems of Manufactured Sand using Conventional Technique and Equipments

级配不合理，含泥、含泥量过高，粒型呈扁平、长条状，不满足混凝土要求。
The manufactured sand, due to unreasonable gradation, excessively high filler and clay content, and flat strip shape of particles, does not comply with the requirements on concrete.

世邦的积累和突破
Breakthrough of SBM

世邦机器的实力
Strength of SBM

融合130多个国家的工程经验和30多年破碎、制砂和磨粉行业积累。
Reputation built for more than three decades in the grinding, crushing and sand-making industry and experience gained from projects in more than one hundred countries.

VU系统实验室
Test Site of VU System:

开辟专门的骨料优化实验室，攻克了优化工艺中破、磨、选的难题。
Test site for aggregate optimization is designated. Difficulties in crushing, grinding and separation are overcome for aggregate optimization.

三十多年的破磨行业积累
Reputation Built for More Than Three Decades in Grinding and Crushing Industry

一百多个国家的工程经验
Experience Gained from Projects Located in More than One Hundred Countries
01

高环保，VU系统刷新制砂行业形象
Environmental Protection ---
VU System Polishes Image of Sand-making Industry

工艺环保
Environmental Protection in Technique
- 全封闭输送，生产，以及负压除尘设计，使生产现场无扬尘。
- 全干法生产和筛选工艺，零污水，零废泥排放。
- The fully-closed delivery and production and vacuum-based dust collection ensure no flying dust on the production site.
- The dry-process crushing, grinding and screening technique ensure no waste water or sludge is discharged.

运行环保
Environmental Protection in Operation
- 配备加速搅拌器（可选），保证成品砂含水量合格，不易产生扬尘。
- The moisture content control machine (optional) is provided to ensure the compliance of water content of manufactured sand, removing the possibility of flying dust.
- 粉料储料箱和自动称重配料设计，保证石粉转运过程无溢出。
- The design of automatic monitoring and discharge of powder hopper ensures no filler overflows during transfer.
- 干式粉料洗涤技术，保证石粉的干燥和纯净，易于处理和综合利用。
- The dry-process filler separating technology ensures the filler is both dry and clean, facilitating the collection and utilization.
高效率，VU系统引领制砂革命
High Efficiency ---
VU System Brings about Revolution in the Sand-making Industry

高效生产
High Efficiency in Production

- 通过技术创新，使砂石生产率大幅提升10%以上。
  Innovation in crushing and grinding technologies, greatly raising the sand formation ratio by more than 10%.

- 集成化的干燥筛分技术，使筛分效率大幅提升，筛分面积比传统工艺减少50%以上。
  Integration of dry-process screening technology, greatly raising the screening efficiency while reducing screen area by more than 50% compared to the conventional technology.

- 全智能设备的提升和合理配置，使能耗明显降低，处理能力提高5~10%。
  Improvement in performance of each equipment and reasonable arrangement of processes, greatly reducing the electricity consumption per ton of sand while raising processing capacity by 5% to 10%.

高效率
High Efficiency in Operation

- 集约化的模块设计，使占地面积大幅减小，如VU-70系统仅需7.5m × 24m即可完成主机部分的布置。
  The tower design of integration brings great reduction to floor area required. For example, the VU-70 system requires merely a floor area of 7.5m × 24m for the arrangement of its main body.

- 全新的防磨缓设计和材料的升级，使耐磨件寿命显著延长，停机检修时间大幅降低。
  The innovative design of wear resistance and the use of materials of higher performance remarkably extend the service life of wear parts thus greatly reduce the duration of outage for overhaul.

- 集成化的控制系统和在线调节设计，可在运行中调节系统设置，实现成品产量和质量的提高，降低人力需求。
  The integration of control system and the design of online adjustment enable adjustment to the settings while the system is in operation. It improves the quality and output of manufactured sand while cuts the demand for labor force.
High Quality --- VU Sand Complete Complies with the Concrete Standard

**Reasonable Gradation**

- The combination of crushing and grinding with flexible design of screening makes the gradation of manufactured sand continuous and controllable. With ratio of fine sand (0.15-0.6 mm) increased greatly and that of coarse sand (2.36-4.75 mm) decreased, complying with the US standard ASTM C33, the Chinese standard JGJ52 (grading zone II) and the Indian standard IS 383 (grading zone II).

**Smooth and Round Particle Shape**

- The fineness and roundness of the sand meet the requirements of the industry standard IS 3382 and the European standard CEN 13 875. The surface of the VU Sand is smooth and round, with less angles and burrs on the surface.

**Controlable Filler Content**

- Thanks to the use of the dry-process powder-separating technology, the filler (0 to 0.15 mm in size) content in the manufactured sand is stable and controllable within the range of 3% to 15%.

- The dry process ensures the cleanliness of the product, makes it easy to store and use.

- VU Sand is suitable for a wide range of applications, meeting the demands of high-standard applications and maximizing capacity.
High Return on Investment ---
VU System Enhances Comprehensive Competitiveness of Enterprise

Increasing Demand

- Sand is the basic building material, with a large demand in China, with an annual output of over 1 billion tons, exceeding 100 billion, with a market value of over 500 billion yuan.

Sand and stone are the basic construction materials used in large quantities. In China, the annual output of sand and stone exceeds 10 billion tons, and the sand and stone industry is more than RM8 500 billion in scale.

Due to the restrictions in respect of geological distribution, amount and quality, natural sand is unable to fully meet the construction requirements. The manufactured sand from conventional system also fails to meet the performance requirements.

- VU system complies with the standard of sand for concrete and mortar. It is able to satisfy the increasing demand for quality sand on the market.

- The VU system is capable of converting the cheap and readily available chip stone and peastone into quality sand of high value. In China, the gross profit of such quality sand is at the rate of RM830 to 50 per ton.

- The use of VU system manufactured sand in concrete preparation means the substantial saving of cement without degrading the performance of concrete. For example, such sand can cut the cost of Chinese C30 concrete preparation by RM85 to 10 per cubic meter.

- The dry and clean filler can be used as mixture in asphalt, admixture in concrete, desulfurization absorber in power plants and steel plants, or explosion-proof material in coal mines. This indicates its additional value.

Low Investment Cost

- High-efficiency system design, electric consumption reduced by 50-10%, personnel costs reduced by 40% or more.

- Advanced dry process technology, avoids traditional wet process technology's manufacturing process of polluted and severe environmental issues.

- The independently-developed core technology brings the VU system performance to the internationally-advanced level. The VU system is capable of cutting the initial investment by more than 30% compared to any competitor systems.
Perfect Dry-process Sand-making Technique

VU系统，浑然天成的干法制砂工艺

VU系统以最合理的干法工艺，最大程度再现天然砂形成过程中的自然破碎、侵蚀摩擦、自然洗涤等作用，使成品砂性能大幅提升。

Using the most reasonable dry-process technique, the VU system maximizes the reproduction of natural crushing, erosion, friction, washing and separation of natural sand. The result is the considerable improvement in the performance of manufactured sand.

-15 mm的原料（可以是石屑、瓜米石等廉价易得的原料）经过VU系统合理高效的处理后，产出级配合理、粒型圆润、含粉量可控的成品砂，以及干燥洁净、可进行统一回收利用的高附加值石粉（根据原料决定可应用范围）。

Owing to the reasonable and highly-efficient processing in the VU system, the raw materials less than 15 mm in size (for example, the cheap and readily available chip stone and peastone) are converted into the manufactured sand with reasonable gradation, smooth and round particle shape and controllable filler content, as well as the dry and clean filler that is of high added-value and can be collected and utilized (the application of powder depends on the raw material).
Key Technologies

VU系统，六大核心模块

VU冲击破，
高效制砂机的
再度极致提升

VU Sand-making Crusher —
Vast Improvement from the
High-efficiency Sand-making
Machine

制砂效率高
基于中国第一品牌VSI制砂机，结合
首创的高威“石打石”和“物料云”
研磨技术，推出新一代VU冲击破，
成砂率和成品率较VSI冲击破提高
10%以上。

成砂粒型好
新型冲击破内全新的研磨和整形作
用，可有效消除针片状物料，去除
砂粒中尖锐的棱角，使成品砂粒型
大幅改善。

High Sand-making
Efficiency
The new-generation VU
sand-making crusher is
developed by referring to
the VSI sand-making
machine, the most popular
brand in China, and
creating the high frequency
“stone-on-stone” and
“material cloud” grinding
technology. Its sand
formation ratio and fine
sand ratio can be increased
by more than 10% compared
to the VSI sand-making
machine.

Ideal Particle Shape
The innovative grinding and
shaping of the new-type
sand-making crusher can
effectively remove the
elongated and flaky
materials and the sharp
edges and angles of sand
particles. The outcome is
the great improvement in
the particle shape of
manufactured sand.

VU模控筛，
筛选完美结合
细度模数可控

VU FM Control Screen —
Perfect Combination of
Screening and Separation
and Control over Fineness
Module

效率高
结合成熟的破碎筛分和磨机选粉的
理念，在全封闭、负压筛粉、均布
筛分等设计的基础上，将在一个设备
中出色地完成筛粉和石粉去除的任务，极大提高生产效率，
且无细粉和粉尘处理等传统湿法
筛选的问题。

可调可控
通过改变风量和流速，实现在线精
确调节，无需更换筛网和部件，且
可连续调节，使成品砂细度模数可
以随时调节，例如2.5~3.5，而含
粉量可在3~15%之间调节。

High Efficiency
The proven philosophy of
crushing, screening and
separating is employed. The
design includes the
fully-closed layout, vacuum
filler separating, and
uniform screening. The
material screening and filler
separating can be
wonderfully completed
within the same equipment.
This greatly raises
production efficiency, and
causes no sludge or flying
dust, as presented to the
conventional wet-process
technique.

Accuracy Adjustment
The air flow and path can be
changed to achieve accurate
online adjustment, without
replacing any screen or
component. In addition,
continuous adjustment is
available, which enables
adjustment at any time to
the fineness module of
manufactured sand, for
example, F.M. 2.5 to 3.5. And
the filler content is
adjustable within the range
of 3% to 15%.

加湿搅拌器（可选）
Moisture Content Control
Machine (Optional)

Ensuring High Quality of
Manufactured Sand
The automatic control
design ensures stable
moisture content. The
manufactured sand has
compliant water content, and
is homogeneous
without segregation.
Key Technologies

VU系统，六大核心模块

除尘集粉模块
Dust Separating and Filler Collecting Module

VU粒优机，世界首创的高效粒型优化技术
VU Particle Shape Optimization Machine – Internationally Innovative High-efficiency Particle Shape Optimization Technology

Environmental Protection
The vacuum dust collector is used. All the procedures, from storage in filler hopper to conveyance by the tank truck, are conducted in closed manner. This ensures no flying on the site, and compliance with the national environmental protection standard.

Smart Design
The design of automatic monitoring and discharge of filler hopper enables the filler storage and transfer to be operated with just a button. This greatly reduces the labor intensity and operation cost.

成本低
全新的、针对性的破粉碎型技术，使粒优机易使用，易损件寿命长，运营成本低。

粒型优化
多效天然砂形成工艺，采用世界范围内首创的“压能型破碎整粒型技术”和“高压自动磨削技术”，有效地去除成品砂表面的毛刺和锐棱锐角，且可增加0.6mm粒料，实现吸附和粒型的再优化，空隙率降低1%-2%，流动度同样降低5%。

中央控制系统
Central Control System

稳定便利
所有设备的控制和监测集成到中央控制系统中，极大简化了操作控制的流程，保证安全、连续、稳定生产。

效率高
可快速设置并保持最优运行参数，使产品质量稳定，生产能力强，使系统的整体效率保持在最高状态。

High Stability and Convenience
All items of equipment are controlled and tested through the central control system. This greatly simplifies the control and testing operation and safety, continuousness and stability production can be ensured.

High Efficiency
Rapid setting of optimum operation parameters is possible. The product quality is stable. The production capacity is maximized. The overall efficiency of the system is maintained at the highest level.
技术参数

系统布置图 | Layout of VU

VU系统是最先进的干法制砂系统，可作为独立生产线或与其他破碎模块配合，专门解决优质机制砂的生产问题。有关不同物料和生产线配置方案，请咨询世邦玛科技术工程师。

VU system, one of the most advanced dry-process sand-making system, can work as an independent production line or cooperate with other crushing modules, specializing in providing high quality manufactured sand. About different materials and solutions, please consult the technical engineers of SBM.

性能参数 | Specifications:

<table>
<thead>
<tr>
<th>参数名称</th>
<th>Parameter</th>
<th>型号</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>人料粒数</td>
<td>Size of Raw Material (mm)</td>
<td>VU-70</td>
<td>0-15</td>
</tr>
<tr>
<td>鸟料投入量</td>
<td>Feed Rate of Raw Material (t/h)</td>
<td>VU-70</td>
<td>65-70</td>
</tr>
<tr>
<td>制砂产量</td>
<td>Output of Manufactured Sand (t/h)</td>
<td>VU-70</td>
<td>60-65</td>
</tr>
<tr>
<td>石粉含量（可调）</td>
<td>Finer Content (Adjustable)</td>
<td>VU-70</td>
<td>3-15%</td>
</tr>
<tr>
<td>机功率</td>
<td>Installed Power (kw)</td>
<td>VU-70</td>
<td>450</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>主要设备</th>
<th>Main Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>油压机</td>
<td>Particle Shape Optimization Machine</td>
</tr>
<tr>
<td>中央控制系统</td>
<td>Central Control System</td>
</tr>
<tr>
<td>高湿振动器</td>
<td>Moisture Content Control Machine (optional)</td>
</tr>
<tr>
<td>斗式提升机</td>
<td>Bucket Elevator</td>
</tr>
<tr>
<td>辅助设备</td>
<td>Auxiliary Equipment</td>
</tr>
<tr>
<td>皮带机</td>
<td>Belt Conveyor</td>
</tr>
<tr>
<td>连接管</td>
<td>Connecting Pipes</td>
</tr>
<tr>
<td>钢架</td>
<td>Steel Rack</td>
</tr>
</tbody>
</table>

备注：
该表列出的产量等参数和物料性能依据实验室或实际生产。
该参数仅供参考，具体参数可能会有所不同。
有关具体应用下的系统配置和参数问题，请咨询世邦玛科技术工程师。

Note:
The outputs given in the table may vary with the parameters of VU system and the performances of raw material.
The water content of raw material is less than 3%.
No notice will be given should any change is made to the technical parameters.
For the configuration of VU system and the outputs under specific operating conditions, please contact the technology engineering of SBM.
Production site
生产现场
Production site