



BALANCE GRAN

高速混合机



研发
R&D



生产
Production



销售
Sales



售后
After sales

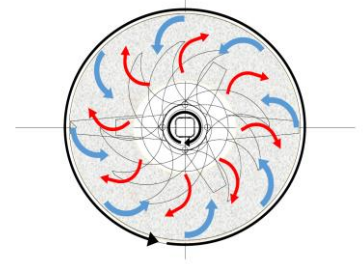


设备原理 Equipment principle



双重搅拌轴，内侧轴正转、外侧轴反转的机构可在短时间内完成均匀混合分散。

The stirring shaft becomes a double structure, the inner shaft is turned positively, The outer shaft is reversed to make the mechanism. It can be mixed and dispersed evenly in a short time.



设备名：高速混合机

用途：原材料的混合·精密分散·混练·造粒·表面包覆

Equipment name: High speed mixer

Facility Function: Mixing of raw materials Precision dispersion
Blending Granulation Surface coating

【应用领域】

电池材料 化学品 食品 医药品 化妆品

【Application】

Battery Materials Chemicals Food Pharmaceuticals Cosmetics

涡流作用

刮刀的旋转带来旋涡效应，原料由外周被卷向中心

Vortex effect

By rotating the squeegee, the raw material starts from the outer circumference and then rolls up to the center like a vortex.

剪断作用

切刀与搅拌刀相互旋转下，从中心流出的原料被剪切、揉搓

Shearing effect

The raw material flowing from the center is cutter and stirring knife. Rotate in the direction of each other to produce the effect of shearing and kneading.

对流作用

搅拌刮刀反转材料，通过对流效应瞬间分散

Convective effect

Inversion of the material by means of a stirring scraper. Instantaneous dispersion by convection effect.

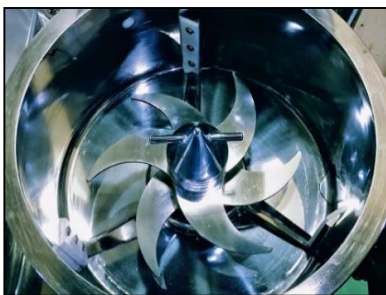
揉捏作用(浆料)

通过更换特殊的切刀组可以来进行冶炼、包覆

Kneading effect (slurry)

By changing the special cutter set it is possible to smelting and cladding.

设备结构 Equipment structure



采用了多片大面积旋翼式高速切割刀片，极大的增加了切割的效率和粉末接触面积。当底部搅拌刀在不断把粉末逆时针方向推进时，底部较重的大颗粒在离心作用下由内而外、由下而上翻起，进入上方切割区域。旋翼式刀片在高速顺时针方向不断切割大颗粒使之成为小颗粒。在两把刀片互相配合下，大颗粒不断变成小颗粒，小颗粒在与缸体内壁旋翼式刀片表面不断滚动，表面的棱角会逐渐消失，越来越接近球形。最终形成均匀的圆球形颗粒。

Adopted multiple large area rotary wing type high speed cutting blades.

Greatly increase the efficiency of cutting and powder contact area.

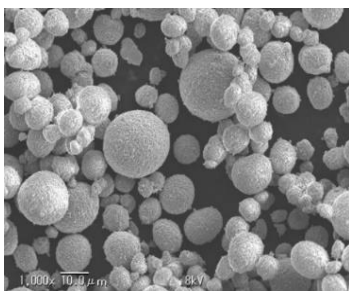
When the bottom stirring knife is constantly pushing the powder in the counter clockwise direction, the heavy particles at the bottom are centrifuged from the inside out and from the bottom to the top to turn up, into the upper cutting area.

Rotating blade in the high-speed clockwise direction constantly cutting large particles, so that they become small particles.

The rotating blades continuously cut the large particles in the clockwise direction at high speed, making them into small particles.

In the two blades with each other, the big particles become small particles continuously, and the small particles are cut into small particles on the inner wall of the cylinder.

The surface of the rotor blade keeps rolling, the angles of the surface will gradually disappear and more and more close to the sphere. Eventually form a uniform spherical particles.



粒子设计

Particulate Design



设备类型 Equipment type

搅拌缸容量从2升到4,000升

Mixer capacity from 2 liters to 4,000 liters



BG-2L



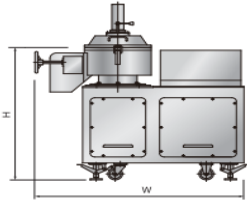
BG-5L



BG-25L



BG-2000L



BG-50L



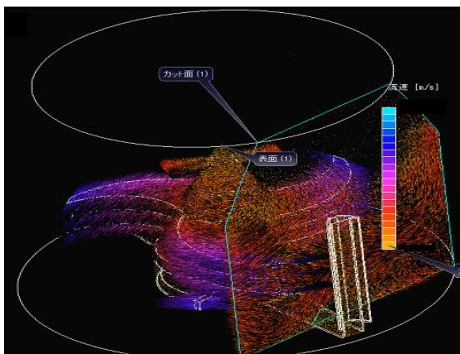
BG-600L

型号	BG-2L	BG-5L	BG-25L	BG-50L	BG-100L	BG-200L	BG-400L	BG-600L	BG-1,000L	BG-2,000L	BG-3,000L	BG-4,000L
搅拌缸容量	2ℓ	5ℓ	25ℓ	50ℓ	100ℓ	200ℓ	400ℓ	600ℓ	1,000ℓ	2,000ℓ	3,000ℓ	4,000ℓ
原料投入容量	0.6~1.4ℓ	1.5~3.5ℓ	7.5~17.5ℓ	15~35ℓ	30~70ℓ	60~140ℓ	120~280ℓ	180~420ℓ	300~700ℓ	600~1,400ℓ	900~2,100ℓ	1,200~2,800ℓ
切刀轴动力	0.75kW	0.75~1.5kW	3.7~11kW	7.5~18.5kW	15~22kW	22~37kW	37~75kW	55~90kW	75~110kW	75~110kW	75~110kW	90~110kW
刮刀轴动力	0.2kW	0.2~0.4kW	0.4~0.75kW	0.75~1.5kW	2.2~3.7kW	3.7~5.5kW	5.5~11kW	11~15kW	15~18.5kW	15~18.5kW	18.5~22kW	22~35kW
W	1,500mm	1,500mm	1,800mm	1,900mm	2,100mm	2,400mm	2,700mm	2,900mm	3,200mm	3,500mm	3,800mm	3,800mm
D	600mm	600mm	700mm	780mm	860mm	980mm	1,100mm	1,100mm	1,250mm	1,900mm	1,450mm	1,450mm
H	550mm	600mm	1,120mm	1,230mm	1,360mm	1,540mm	1,860mm	2,000mm	2,250mm	2,500mm	2,650mm	3,600mm
设备重量	130kg	150kg	500kg	700kg	1,300kg	1,600kg	2,600kg	3,800kg	5,500kg	7,000kg	9,500kg	11,000kg

设备优势 Advantage of equipment

被全球多家锂行业大企业采用!

Adopted by many of the world's large enterprises in the lithium industry!



- ❖ 锂电池正负极材料的性能提升!
- ❖ 超级电容EDLC以及锂电电容LIC的性能提升!
- ❖ 电极浆料包覆液的分散包覆性能提升!
- ❖ 涂布机之前搅拌时间减少8h→1h!
- ❖ 活性物质、导电剂、溶剂添加物搅拌的电池性能提升!
- ❖ 正负极材料的短时间混合!
- ❖ 处理时间缩短到同类产品的1/10!

【应用领域】

正极材料

NCM (NiCoMn)
NCA (NiCoAl)
钴酸锂 (LiCoO₂)
镍酸锂 (LiNiO₂)
锰酸锂 (LiMn₂O₄)
磷酸铁锂 (LiFeO₄)

负极材料

钛酸锂 (LiTi₅O₁₂)
氧化硅 (SiO)
石墨 (C)

- ❖ Performance improvement of Cathode and Anode electrode materials for Li-ion batteries!
- ❖ Performance improvement of super capacitor EDLC and Li-ion capacitor LIC!
- ❖ Electrode slurry coating solution's dispersion and coating performance improvement!
- ❖ Reduced stirring time before coating machine by 8h→1h!
- ❖ Improvement of battery performance by stirring of active substance, conductive agent, and solvent additive!
- ❖ Short time mixing of Cathode and Anode materials!
- ❖ Processing time reduced to 1/10 of similar products!

高速混合机和业界其他同类设备的对比 Comparison of high-speed mixers with other similar equipment in the industry

物料附着少的构造

来自于刮刀和旋涡流的作用!

侧面·上盖的附着物非常少!

Structure with less adhering materials

Due to scraper and vortex flow!

Side and cover have very little adhering material!

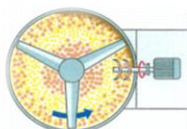
腔体内原料附着量少,残料为约1%的成绩!

短时间处理高粘度液体的分散!

Low adhesion of raw materials in the chamber,
residual material is about 1% of the performance!

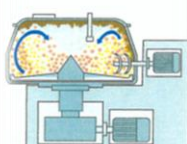
Dispersion of high viscosity liquids in a short time!

同类产品



中心部和外圈的转速不一
中心部容易产生团块

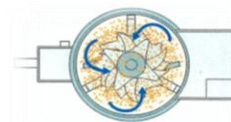
Different rotational speeds at the center and periphery.
The center part tends to produce clumps.



原料从外圈移动到上部
因此上盖部容易产生团块

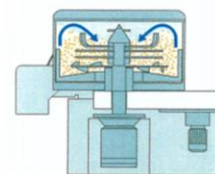
Material moves from the outer part to the upper part.
Therefore, lumps are easily created in the cover section.

高速混合机



利用涡流对流原理使
槽内物料均匀分散

Use the vortex convection principle
to make the material in the tank is
evenly dispersed.

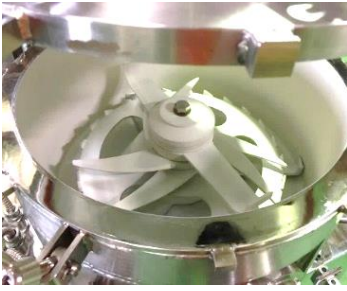


原料从外圈移动到中心部
因此上盖部无原料附着

The material moves from the
peripheral part to the central
part. Therefore, no material is
attached to the cover.

搅拌缸内面白氧化铝溶射

White alumina thermal spraying on material contact area



WC碳化钨 WC/10Cr/4Co

WC Tungsten Carbide WC/10Cr/4Co



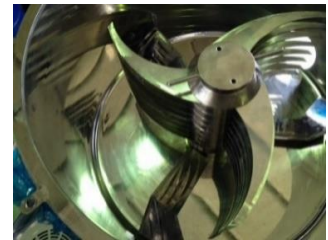
接粉部材料可选!

The material of the part in contact with the material is optional!

防金属异物混入!!
Anti-metal foreign objects mixed!

不锈钢SUS316

Stainless steel SUS316

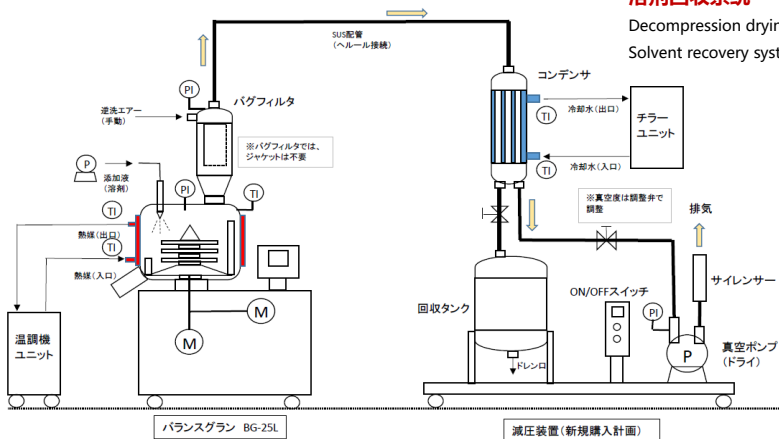


新开发技术 Newly developed technologies

减压干燥技术 Decompression drying technology

减压干燥系统
溶剂回收系统

Decompression drying system
Solvent recovery system



减压干燥的优势

通过减压降低沸点促进干燥。
加热干燥时间短, 有利于容易热变质的物料。
一台机器即可完成混合·干燥·反应·冷却,
还具有将昂贵的有机溶剂回收再利用的功能。

Advantages of Decompression Drying

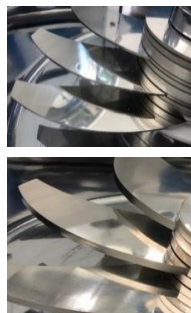
By the boiling point of decomposition falls to low temperature in order to dry forward, It has the advantage of shortening the heating and drying time without giving heat to the raw material. In the mixer, it is also possible to carry out, the advantages of mixing, drying, reaction and cooling processes. It also has the effect of recovering expensive organic solvents.

大范围分配型切刀

Wide range distribution type cutter

阶梯式安装各种切刀。
逐渐改变安装角度, 呈360°圆周分布。
将大的剪力持续给予全部的区域。
最适合的切刀大小·板厚·组装间隙是技术的精髓!

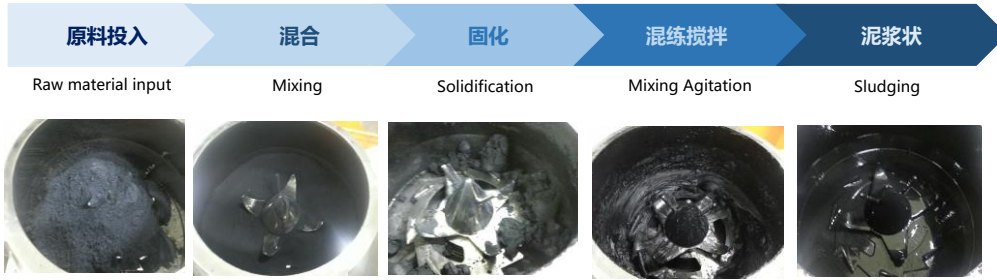
The mounting of various cutters is phased.
The mounting angle is changed less, often on a 360° circumference,
The large shearing force is continuously given to the whole area.
The most suitable cutter size - plate thickness - assembly gap is the essence of technology!



试验案例 Experimental cases

正极&负极材料从混合匀浆实验效果分析

Analysis of the effect of Cathode and Anode electrode materials from mixing - homogenization experiments



双层电容器EDLC以及,锂电超级电容LIC的性能提升!
可以混合~浆料化...电池特性也超过过去的产品的浆料制造!
与各种制造EDLC正负极材料的传统设备相比,
处理时间缩短至1/10!

The performance of EDLC and Li-ion supercapacitor LIC is improved!
It is possible to mix and slurry - the battery characteristics also exceed the slurry manufacturing of past products!
Compared with conventional equipment for various EDLC cathode and anode materials, the processing time is reduced to 1/10 of the same product!



工程	运行设备条件 (社)			バランスグラフ	
	主翼回転数 rpm	従翼回転数 rpm	時間 Hr/min	主翼回転数 rpm	時間 min
Raw Material LiMnO ₂ Supp-P Timical	30		2 Hr	1,500	10 min
				1,500	10 min
Blinder PVDF	30		1 Hr	1,500	5 min
				1,700	5 min
PVDF	30		30 min	1,700	5 min
				1,700	5 min
NMP	45		50 min	1,700	5 min
				1,700	10 min
NMP	45	2,500	2 Hr 40 min		
Viscosity Adjust NMP	45	2,500	1 Hr		
NMP	45	2,500	1 Hr		
			540 min (9 Hr)	10.8 : 1	50 min

试验案例 Experimental cases

NCA-(X)kg+TiO₂-(X)kg 混合效果 Mixing effect

切 刀 Shear blades : 300~500r/min
搅拌刀 Agitator blades : 80~120r/min

正极材料SEM报告

负极材料SEM报告

3分钟取样

3 minutes sampling

5分钟取样

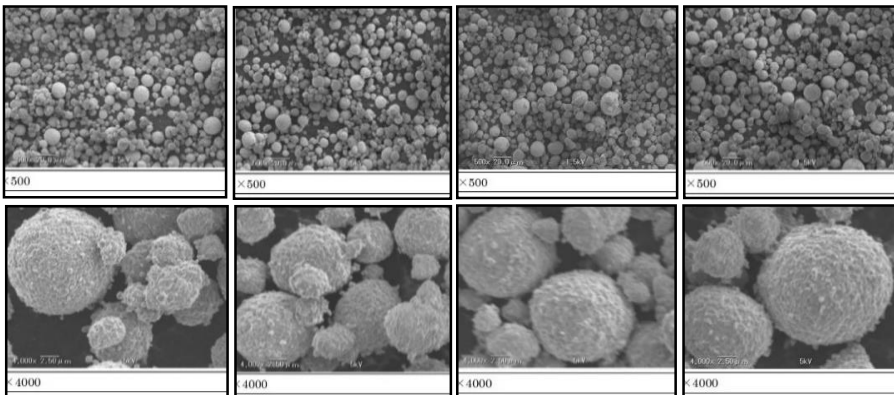
5 minutes sampling

10分钟取样

10 minutes sampling

15分钟取样

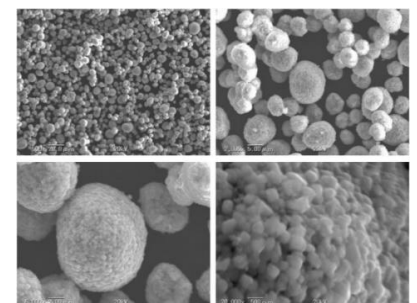
15 minutes sampling



SiO+Pitch
石墨+Pitch
钛酸锂 LTO Li₄Ti₅O₁₂



造粒试验照片 Images of granulation test





高新技术企业
High-tech enterprise



高新技术产品认定
High-tech product identification



中国科学院苏州纳米研究所产学研基地
Suzhou Institute of Nanotechnology, Chinese Academy of Sciences, Designation of Joint Research Centers



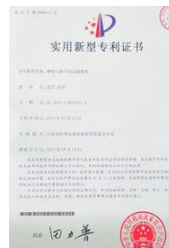
中南大学合作设立博士生工作站
Collaboration with Central South University to establish a doctoral internship



ISO9001认证
ISO9001 certification



ISO14001认证
ISO14001 certification



专利证书
Patent certificate



欧洲CE认证
CE certification in Europe



韩国KCs认证
KCs certification in Korea



进出口业务许可证
License of import and export business



防爆设备安装认证
Explosion-proof equipment installation certification



防爆设备维护认证
Explosion-proof equipment maintenance certification

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锂电设备 粉体机器

