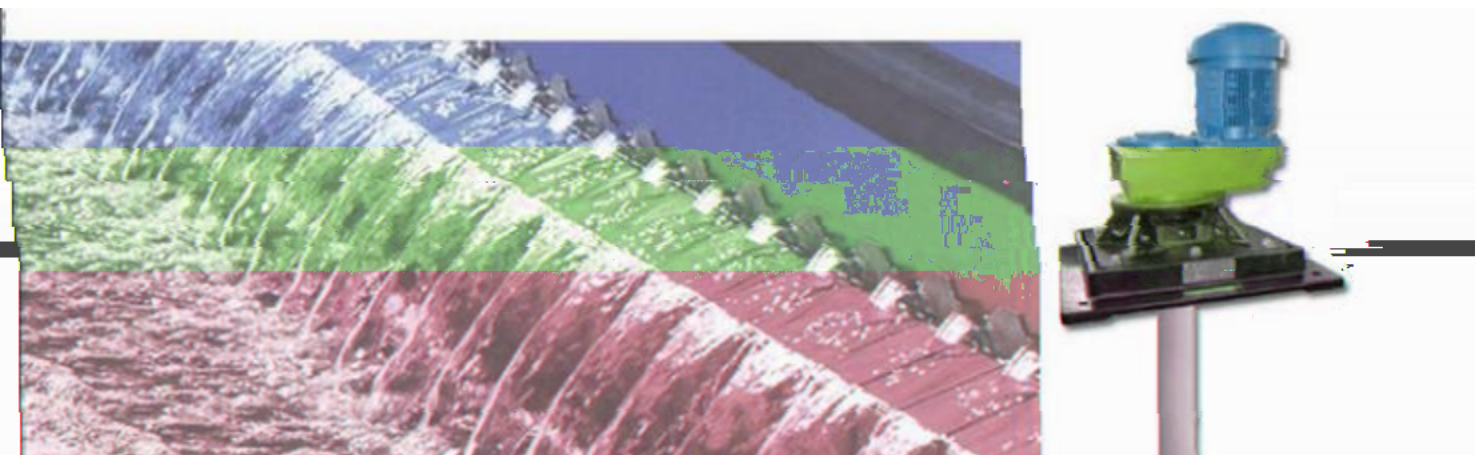


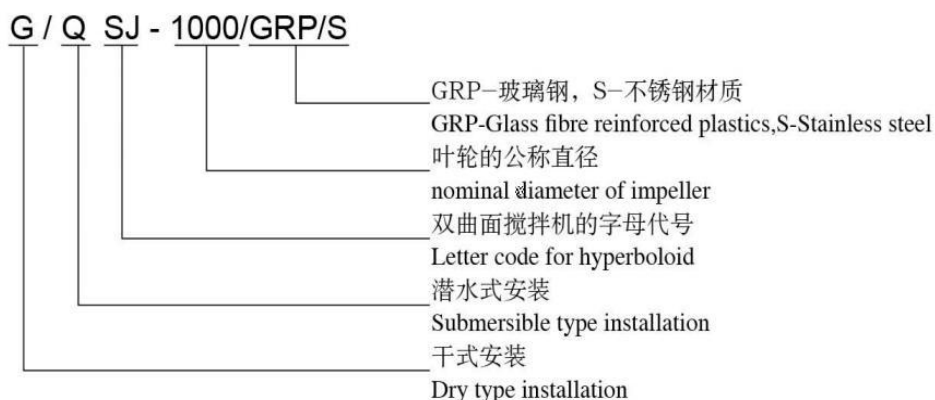


双曲面搅拌机 Hyperboloid Mixer



GSJ/QSJ型双曲面搅拌机 GSJ/QSJ Type Hyperboloid mixer

型号表示 Type Code



应用范围 Application Scope

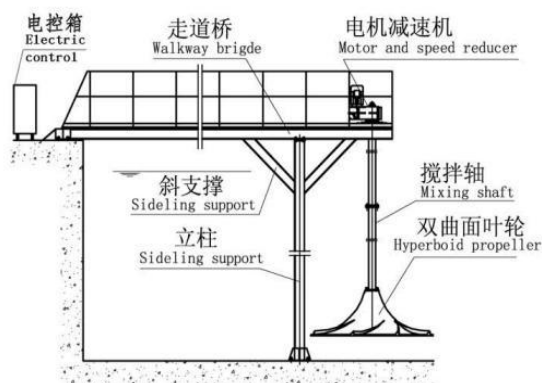
QSJ、GSJ型系列双曲面搅拌机是我公司自主研发的高新技术产品。它广泛运用在环保、化工、能源、轻工等行业需要对液体进行固、液、气搅拌混合的场合，尤其适用在污水处理工艺中的混凝池、调节池、厌氧池、硝化和反硝化池。

QSJ and GSJ series hyperboloid mixers are Independent research and development of high-tech products of our company. They are widely applied in environmental protection, chemistry, energy and light industry where the solid, liquid and gas are interflowing, especially in the sewage treatment process of coagulative precipitation tank, equalization pond, anaerobic pond, nitrification pond, and denitrifying pond.

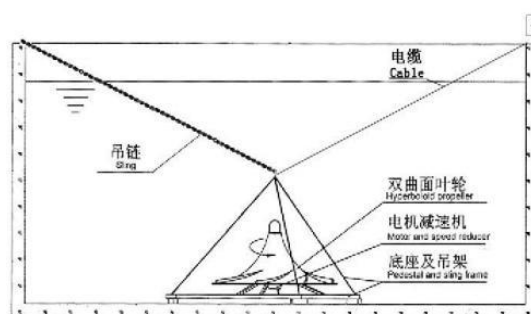
结构简介 Structure Brief

双曲面搅拌机由传动部件、叶轮、底座、吊装系统及电控组成。见图：

The hyperboloid mixer is composed of transmission part, impeller, base, hoisting system and electric control. Please see drawing:



GSJ系列 GSJ series



QSJ系列 QSJ series



GSJ系列 GSJ series

工作特性 Operating Features

这是一台可以创建大容积流量的搅拌装置，并能以较小的动力获得大面积循环、柔和的水流。

This mixing equipment can hold a large capacity flow, and can get a big area circulating and gradual water flow.

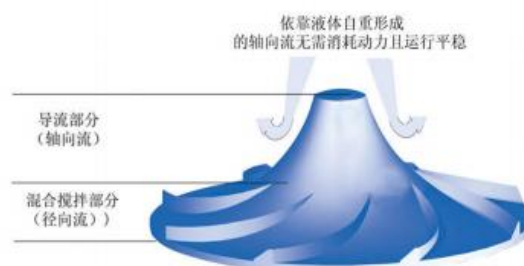
独特的叶轮结构设计，最大限度地将流体特性与机械运动完美地结合。双曲面叶轮的曲面是方程为 $xy=b$ 曲线沿y轴旋转而构成的曲面体；为了迎合水体流动，设计从叶轮的中心进水，这一方面减少了进水紊流，另一方面保证了液体对叶轮表面的压力均匀，从而保证整机在运动状态下的平衡。

The unique impeller design perfectly combines the fluid features and mechanical movement to the maximum degree.

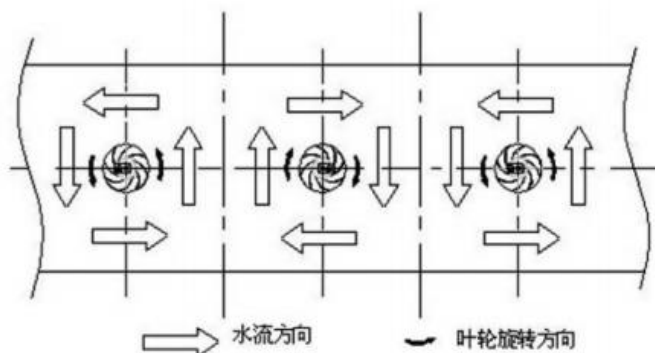
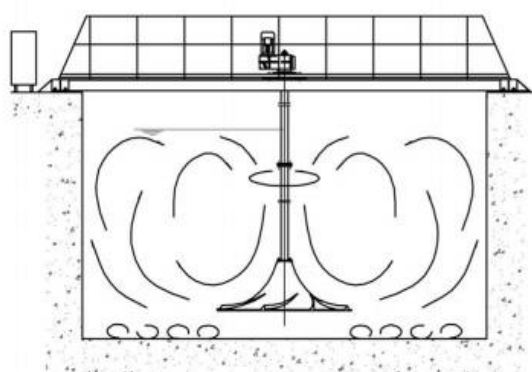


The curved surface of hyperboloid impeller is shaped by the curve of formula $xy=b$ rotating around y axis; in order to cater to the water flowing, the impeller is designed to feed water from the center, on one hand, the turbulent flow is reduced, on the other hand, the pressure of the liquid on the impeller surface is equal and even, therefore the machine will be balanceable in the movement status.

在渐开双弧面上均布有八条导流叶片，借助液体自重压力作补充进水获得的势能与叶轮旋转时产生的离心力形成动能，液体在重力加速度的条件下沿叶轮圆周方向作切线运动，在池壁的反射作用下，形成自下而上地循环水流，故可获得在轴向（y）和径向（x）方向的交叉水流。正是由于双曲面搅拌机叶轮的结构特性和接近池底安装的特点，决定了它在工作中可获得理想的搅拌效果，能有效地消除搅拌死角。见如下流场分析图

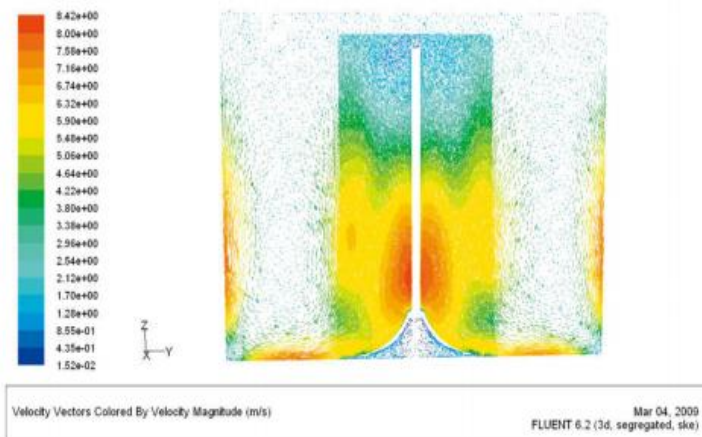


总结：贝特公司专利双曲面叶轮，分轴向导流部分和径向搅拌部分，更容易获得立体循环搅拌流量，效率更高，搅拌效果更好。



流态图 Flow field

Eight guide vanes are equally distributed on the involute dual cambered surface. The kinetic energy is created with help of the potential energy from the supplementary water fed by the deadweight pressure of the fluid and the centrifugal force by the impeller rotating; the fluid will move along the tangent of the impeller circumference under the condition of acceleration of gravity, with reflection of the pond wall, a circulating water flow is formed from bottom to top, therefore the cross-water flow is formed in the direction of axial Y and radial X. The structure features and special installation mode (in the bottom of the pond) of the hyperboloid mixer impeller decided the ideal mixing effectiveness, and effectively avoids mixing dead spots. Please see following drawing:



流场分析图
Flow field analysis diagram

产品特点 Product Characteristics

- 1、立体螺旋式水流，无搅拌死角—高效
- 2、大比表面积叶轮，配备功率小—节能
- 3、安装灵活，维护方便—便捷

- 1、Three-dimensional spiral flow, without mixing dead spot---high efficiency.
- 2、Big surface area impeller, equipped with small power---saving energy
- 3、Flexible installation and facile maintenance---for maximum convenience



性能参数 Performance Parameters

型号 Type	叶轮直径(mm) Impeller diameter (mm)	转速(r/min) Rotate speed (r/min)	功率(kW) Power (kW)	服务范围(m) service area(m)	重量(kg) Weight (kg)
GSJ/QSJ	500	80 - 200	0.75 - 1.5	1 - 3	300/320
	1000	50 - 70	1.1 - 2.2	2 - 5	480/710
	1500	30 - 50	1.5 - 3	3 - 6	510/850
	2000	20 - 36	2.2 - 5.5	6 - 14	560/1050
	2500	20 - 32	3 - 15	10 - 18	640/1150
	2800	22 - 36	4 - 22	12 - 22	860/1180
	3000	22 - 36	5.5 - 30	14 - 24	920/1240

注：1. 叶轮材质：玻璃钢-GRP，不锈钢-S 搅拌轴材质：不锈钢-S，玻璃钢-GRP

Material of propeller : GRP-Glass fibre reinforced plastics, S-Stainless steel

Material of mixer shat: S-Stainless steel, GRP-Glass fibre reinforced plastics

2. 以上参数适用于常规市政污水条件

The parameter is suitable for the conventional municipal administration sewage

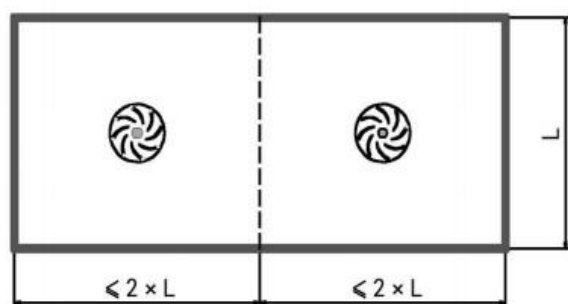
应用选型 Application Type Selection

QJS与GSJ的选型完全一致，两者仅是安装方式不同。和所有搅拌机械的选型一样，双曲面搅拌机的选型与现场的池形、容积、液体浓度、介质温度和PH等有关。

Except for the different installation mode, the type selection of QJS and GSJ are completely the same. As the type selection of all mixing mechanism, the type selection of hyperboloid mixer is related to the field pond shape, cubage, liquid concentration, medium temperature and PH etc.

双曲面搅拌机的选型是依据每台双曲面搅拌机的有效服务面积来确定，并按照池长宽比不超过二倍的原则，将长方形池划分为相等的工作单元，以此确定搅拌机的数量，如下图。

The type selection of hyperboloid mixer is confirmed according to the effective service area of each hyperboloid mixer, see drawing 1, and according to the principle of length: width not over 2:1, the rectangle pond will be equally divided into working cells, so as to confirm the mixers' quantity. See follow drawing



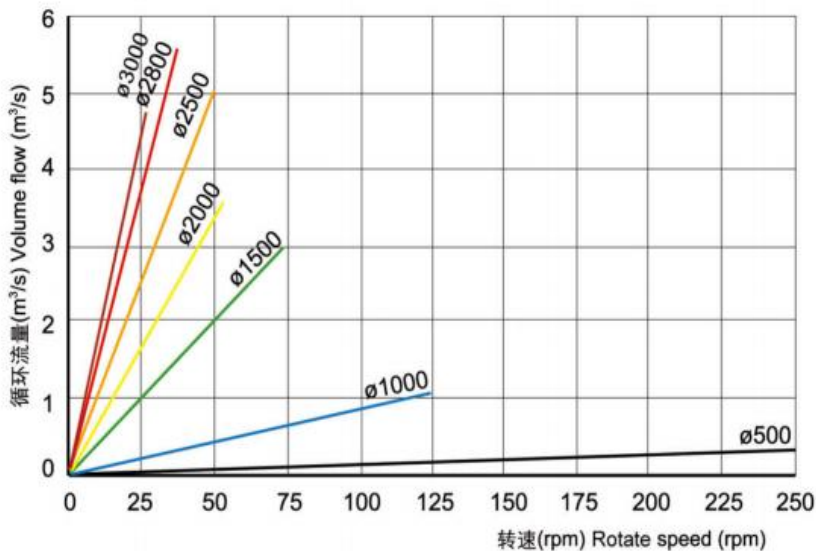
矩形单元 Rectangular cell



方形单元 Square cell



转速与循环流量曲线
The curve of rotational speed and volume flow



此外对于水深超过8米或液体浓度超过规定的，在选型时应考虑加大功率或提高搅拌机的工作转速，以确保在大容量和高浓度液体中的搅拌效果；一般在常规工况条件下可选用QSJ系列，在高温、高腐蚀、磨蚀性的恶劣环境下可选用GSJ系列。我公司可协助用户在特殊环境下的选型。

Furthermore, when the water depth is more than 8 meters or the fluid concentration is bigger than 1%, the type selection shall consider increasing the power or improving the rotation speed of the mixer, to ensure the mixing effectiveness in big cubage and high concentration liquid, usually QSJ series is selected in the normal working condition, while GSJ series is selected in the atrocious environment such as high temperature, high corrosion, and erosion. We can assist the users to select the type in a special environment.

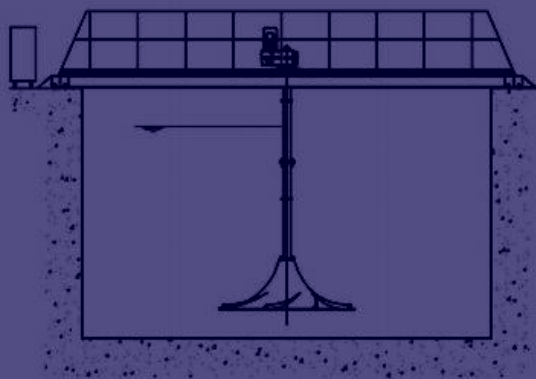


安装方式 Installation Mode

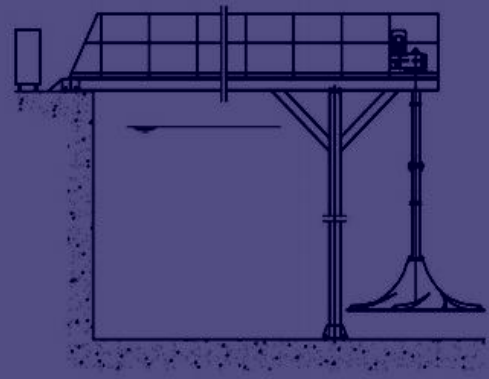
1、GSJ安装方式: Installation Mode of GSJ Type:

利用桥架(全桥或半桥)定位,采用干式电机减速机作为动力,叶轮具有自动纠偏功能,运行较平稳,维护方便。

Which use of bridge (full bridge or half bridge) position, using dry motor reducer as power, impeller with automatic correction function, run more smoothly and easy maintenance.



GSJ全桥安装方式
GSJ whole bridge installation



GSJ半桥安装方式
GSJ half bridge installation

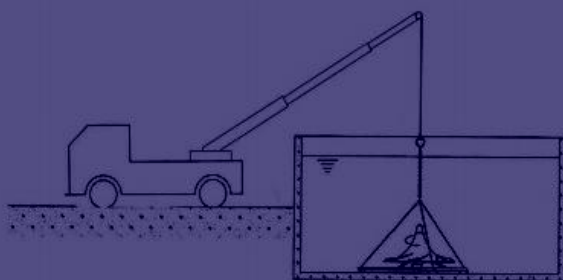
2、QJS型安装方式: Installation mode for QJS type:

图一是通过长臂汽车吊直接将搅拌机吊入指定位置。

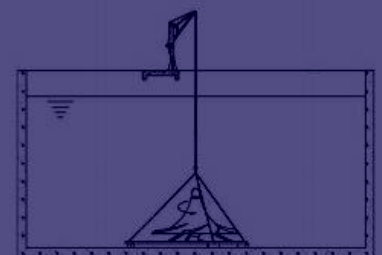
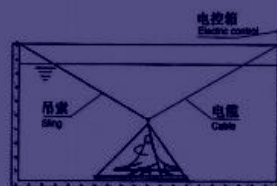
In drawing 1, mixing is lifted to the pointed position directly by a long-arm truck crane.

图二是通过池边设定的走道桥利用手动卷扬吊装。

In drawing 2, use the walking bridge fixed on the pond, and use a winch to lift by hand.



图一 Fig.1



图二 Fig.2

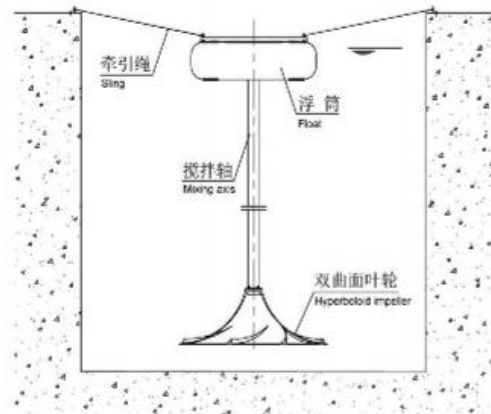
以上两种方式均是直接吊装、靠设备自重定位。

The two methods above are both direct hoist, and positioned by deadweight of the equipment.

3、浮筒型安装方式 Install by buoy

双曲面搅拌机也可采用浮筒方式安装，主要适用于一些无坚固、平整池底，同时也不便设置桥架的场所。

Hyperboloid mixer can be used also install by buoy, Mainly applicable to a number of place with non-rigid, flat bottom, and not have to set bridge.



浮筒安装方式 Install by buoy

注意事项 Cautions

a、安装前要有一名合格电工检查电机、电器并确定转向，叶轮离池底的最小工作距离 $\leq 250\text{mm}$ ，且池底平整、结实，池内无建筑垃圾。

b、如果长时间不运行，重新启动时要防止淤积造成叶轮堵塞而烧毁马达。

c、在封闭池中要考虑到叶轮的进出口安装尺寸。

d、注意水下电缆要固定，防止磨损。

e、使用前请详细阅读产品安装、保养和维修说明书。

a、 Before launching water, the motor, electric apparatus shall be examined and the rotation direction shall be confirmed by a qualified electrician, the smallest working distance between the impeller and the ground is 250mm, and the pond bottom shall be level and solid.

b、 If it has not been running for a long time, check if the impeller is blocked by silt and avoid the engine burning while restarting.

c、 The outlet and inlet installation dimension of the impeller shall be considered in the close

d、 Notice the underwater electric cable that shall be fixed and avoid abrasion.

e、 Please reads the explanation of the installment, the maintenance and the service in detail before the use.





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