NUEVAS BOMBAS SOPLANTES CON TECNOLOGIA DE LEVITACION MAGNETICA

IAOM COLOMBIA

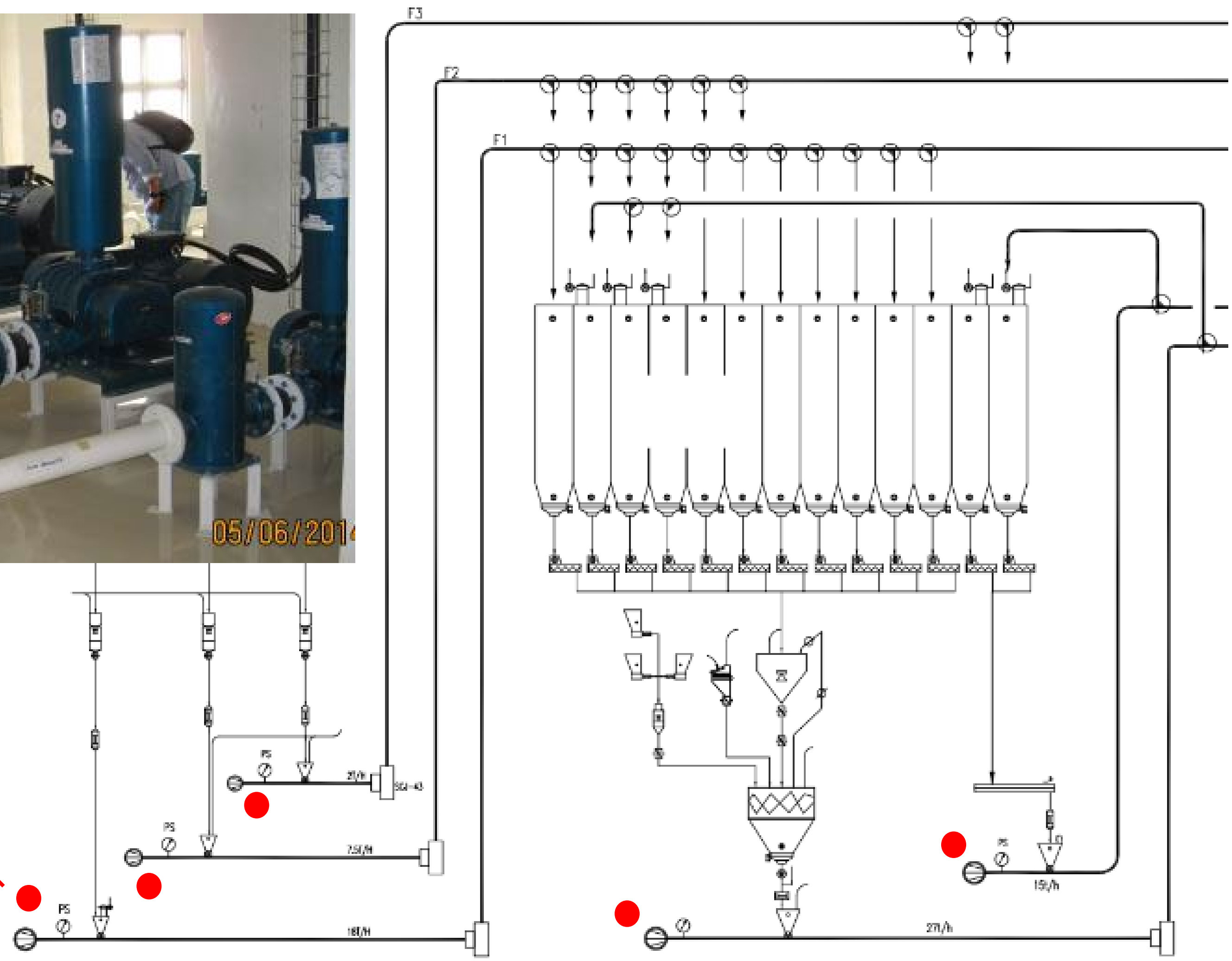
GOLDEN GRAIN

Nelson Rauda

BLOWER TECHNOLOGY TYPICAL

GOLDEN GRAIN

Overview Flour Mill Blower System



Blowers

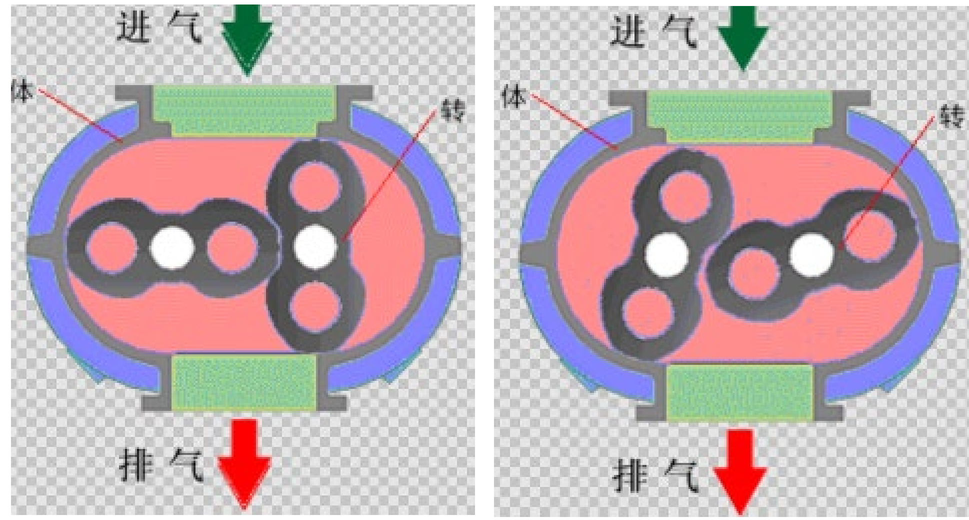
BLOWER TECHNOLOGY TYPICAL

GOLDEN GRAIN

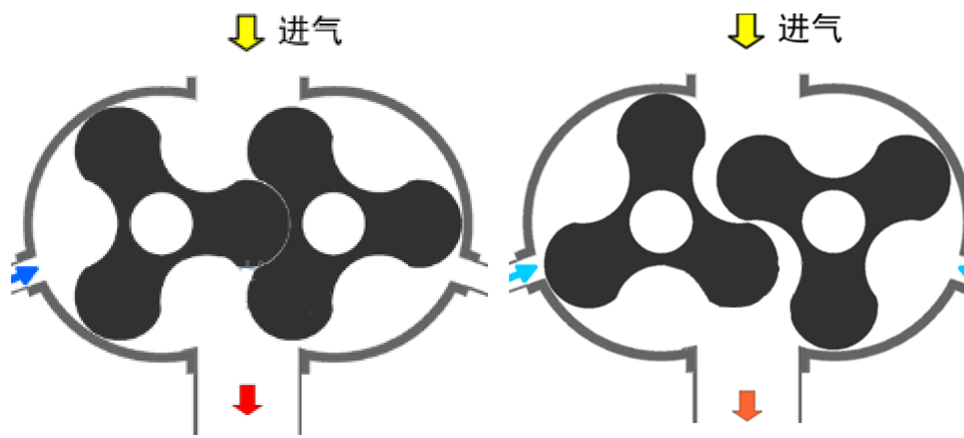
About Roots Blowers

1. Lobes do not contact each other, do not need lubrication, air leakage.
2. Typical pressure 0.6 -1.2 bar.
3. Higher the pressure, the larger the air leakage between lobes and the lower the internal efficiency.
4. Utilized for dilute phase blowing, low concentration ratio in the pipeline, (less material and large amount of air), high power consumption, low efficiency.
5. Loud noise, high temperature.

Two-Lobe Blower



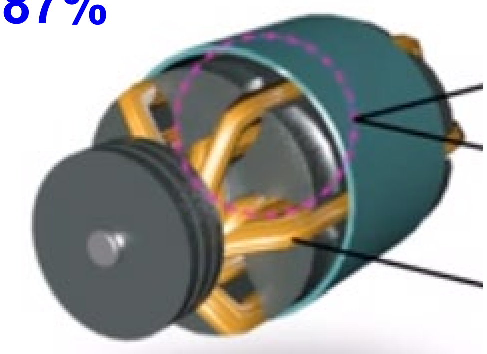
Three-Lobe Blower

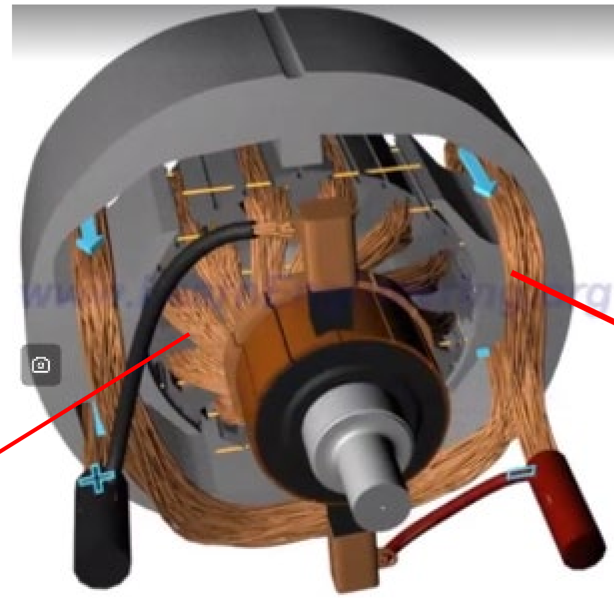


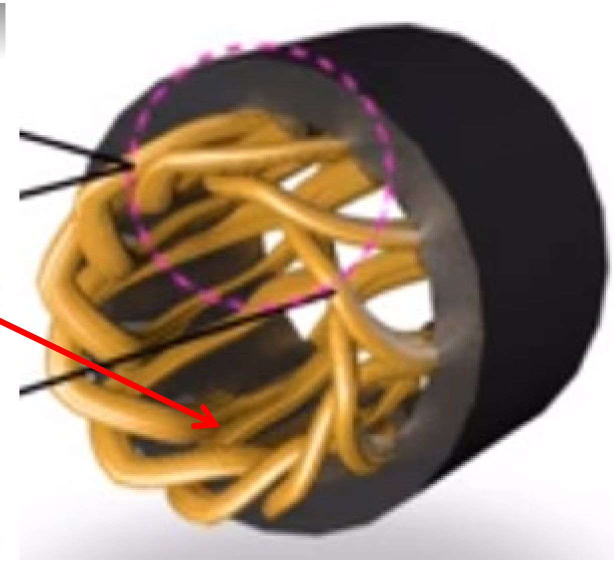
NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Normal Motor：
87%







Rotor
（with wire coil）

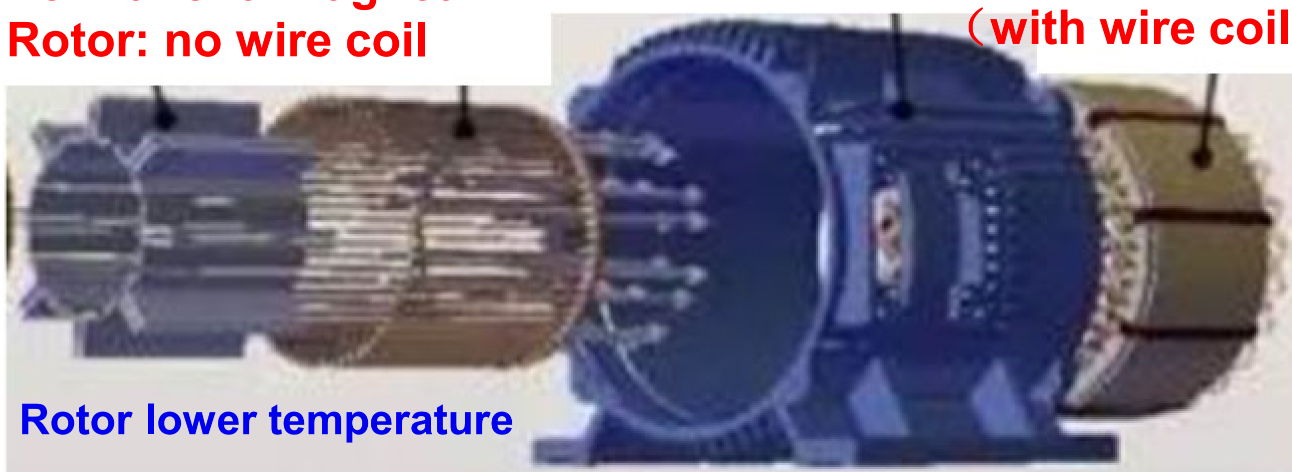
Stator

Permanent Magnetic Motor 97%

Utilized by High Speed trains (Maglev) BIG power savings

Permanent magnet Rotor: no wire coil

Stator （with wire coil）



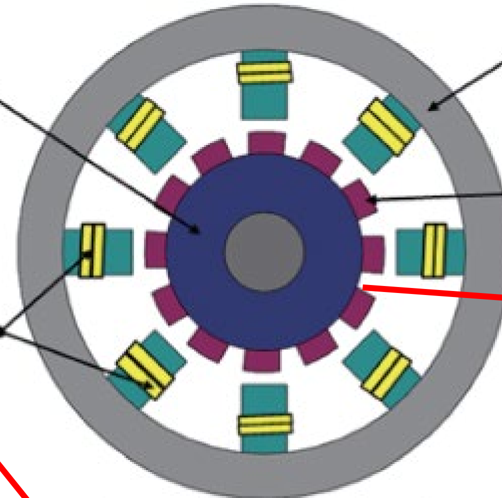
NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Permanent Magnet Motor: Stator without coil, lower temperature, EF 97%

Rotor （no wire coil）

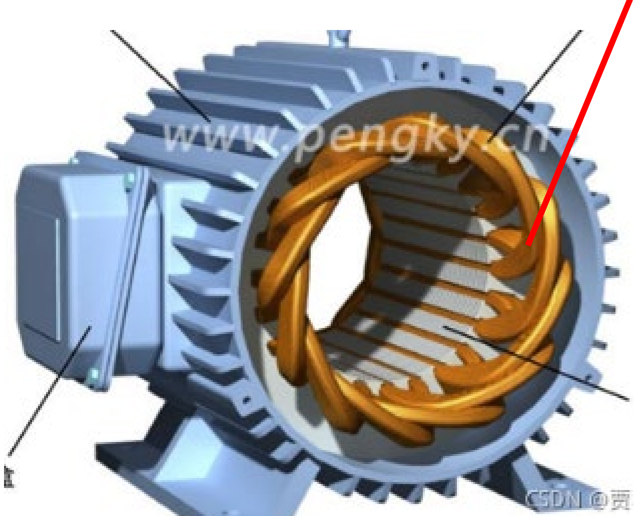
Stator

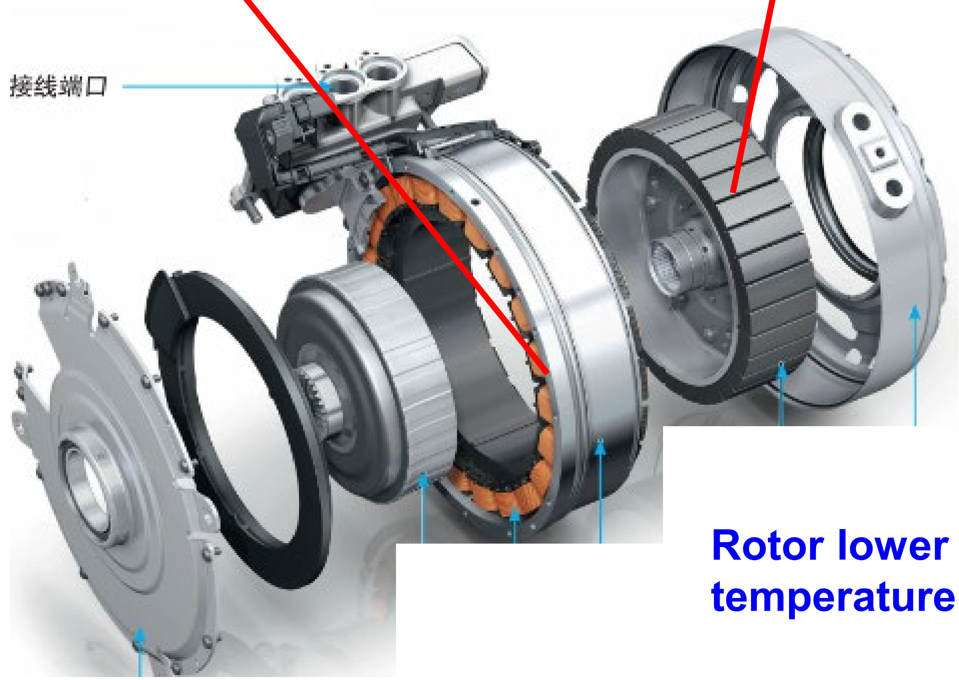


永磁同步电动机构造示意图

Permanent Magnet rotor

Stator（with coil）



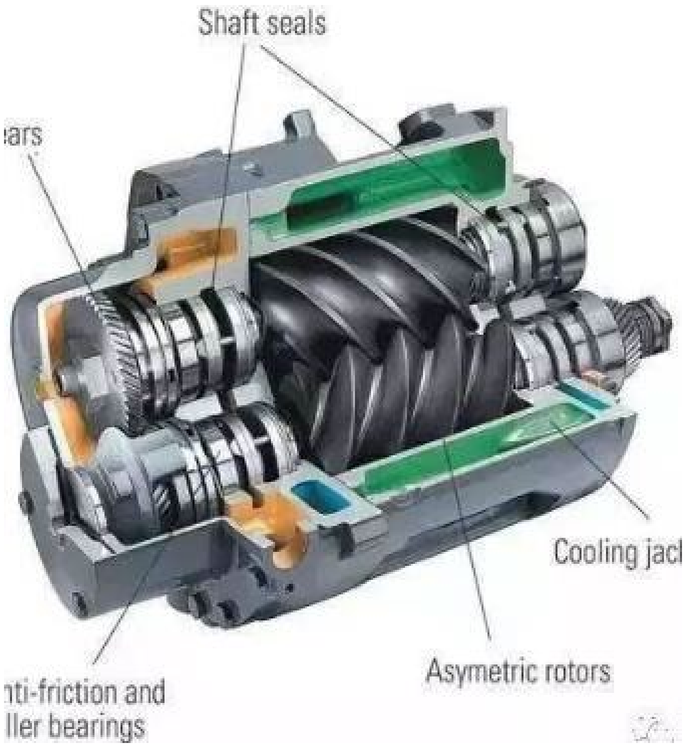


Rotor lower temperature

Twin Screw Blower (Medium-lower pressure): 0.6-2.5 bar

(Screw air compressor (High pressure type): upto 8-10 bar)

1. Rotor blade clearance is very small, almost no air leakage, internal efficiency is higher than that of Roots blower.
2. Power consumption is lower than Roots blower, up to 15% power savings, 0.8-1.5 bar, higher concentration ratio in the pipeline.
3. Generally, the twin screw blower rotors is oilless Medium-lower pressure type air compressor.
4. Complicated structure, many components.



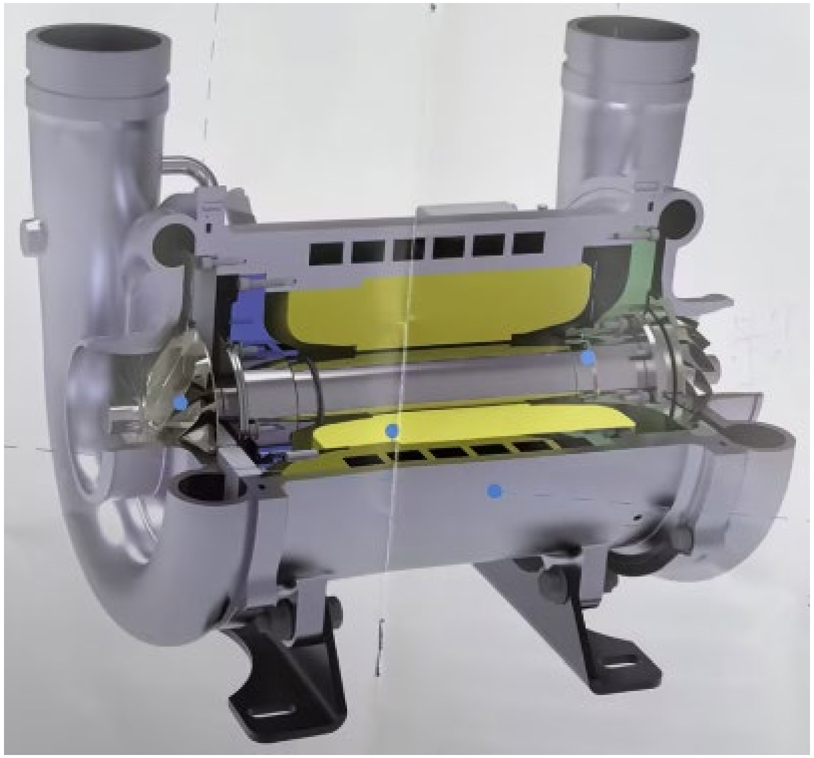
NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Maglev Turbo Blower - Superspeed Centrifugal Fan

Single impeller fan

Twin impeller fan

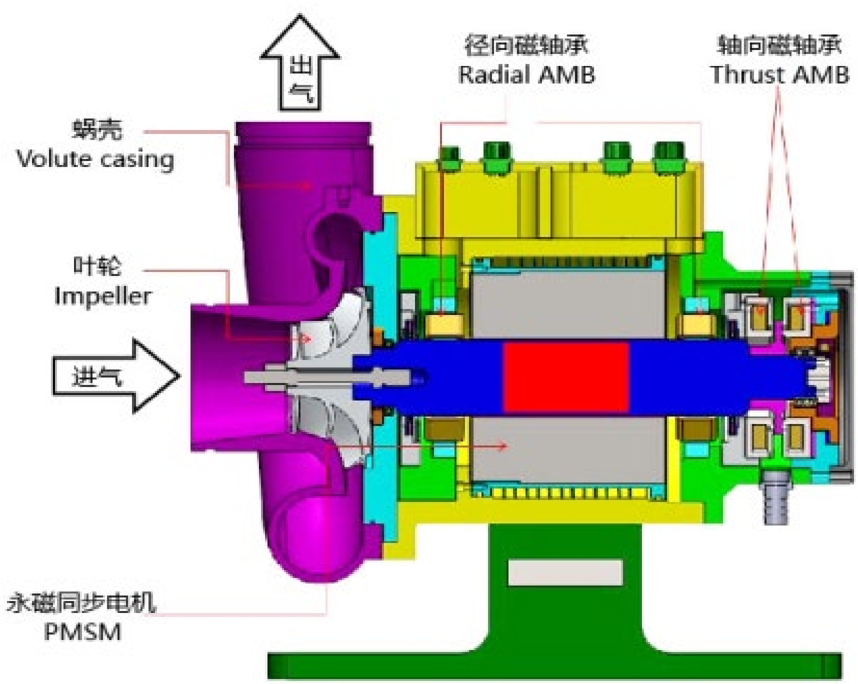


NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Maglev Turbo Blower Structure and working principle

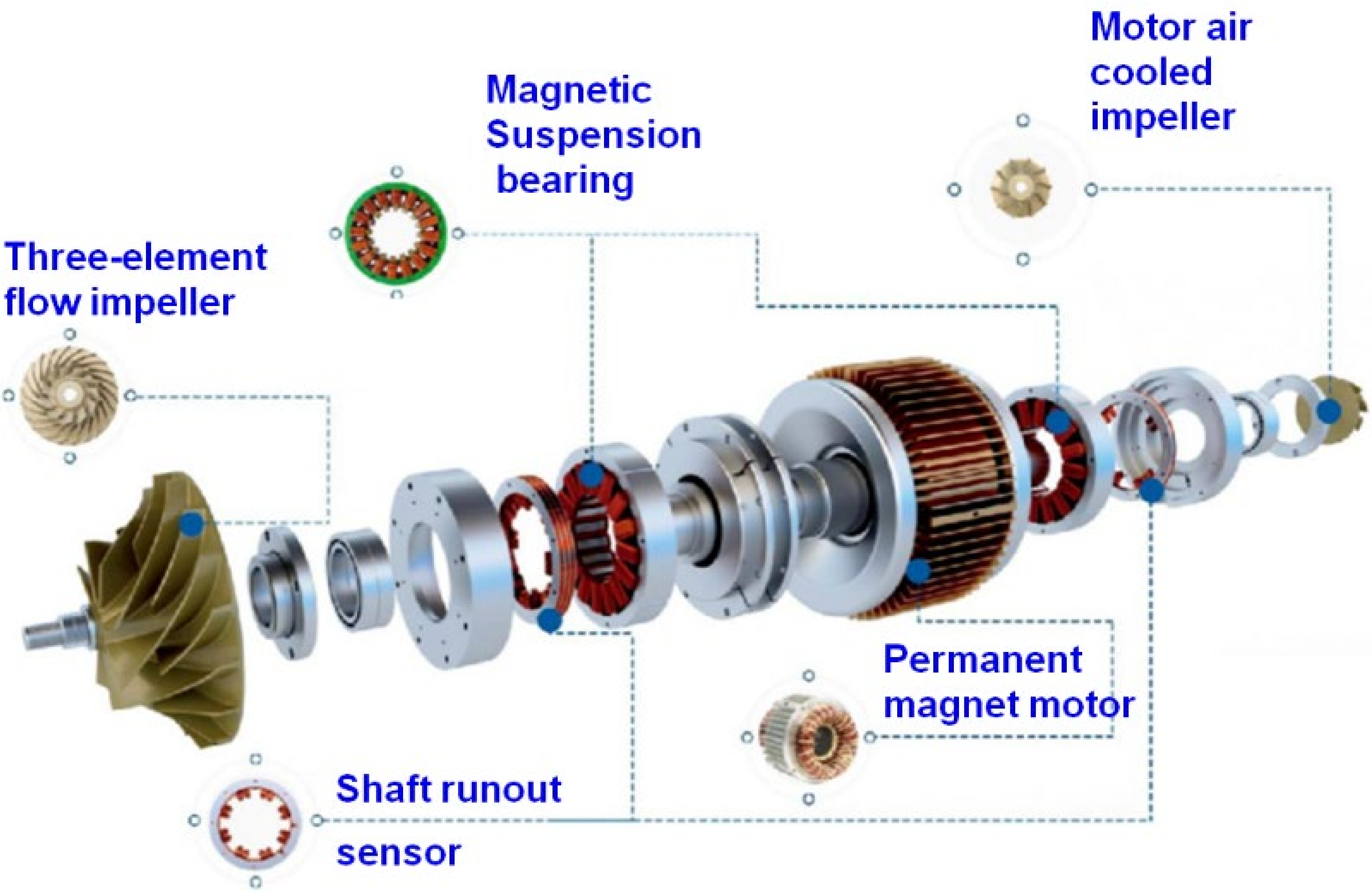
1. **Superspeed.**
2. **Lower noise and vibration.**
3. **High efficiency and power saving 30-45%.**



NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

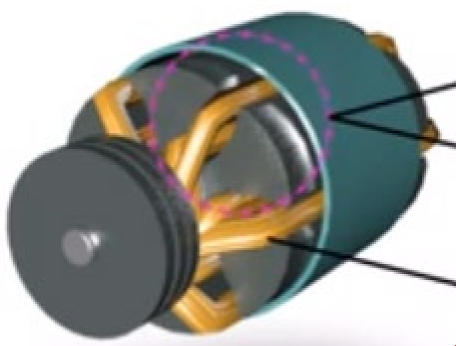
Rare earth processing technology.

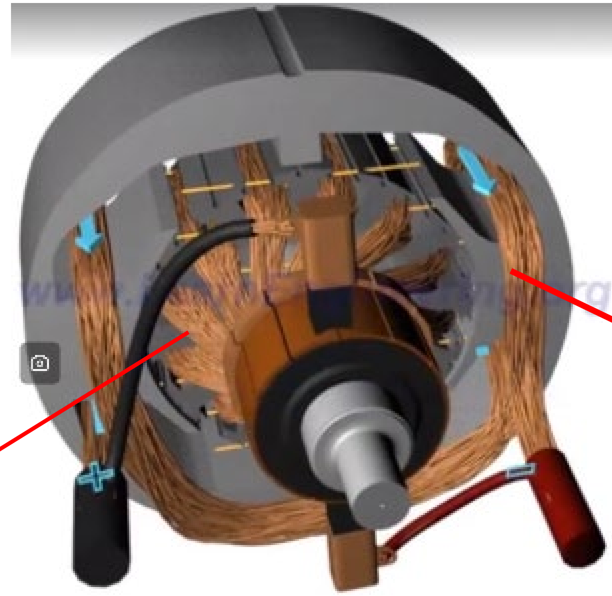


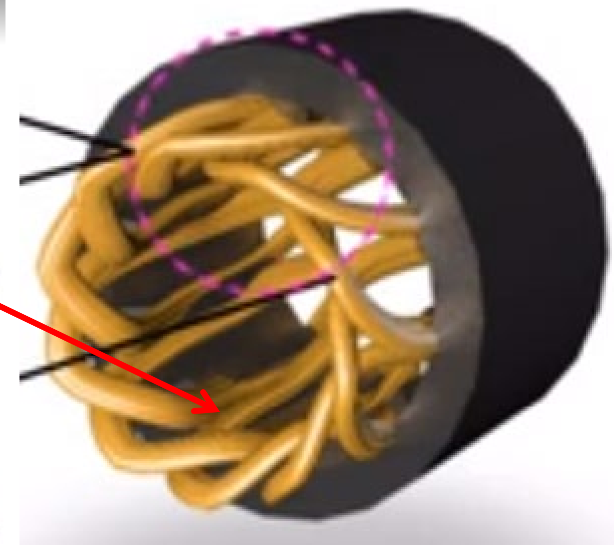
NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Normal Motor：
87%

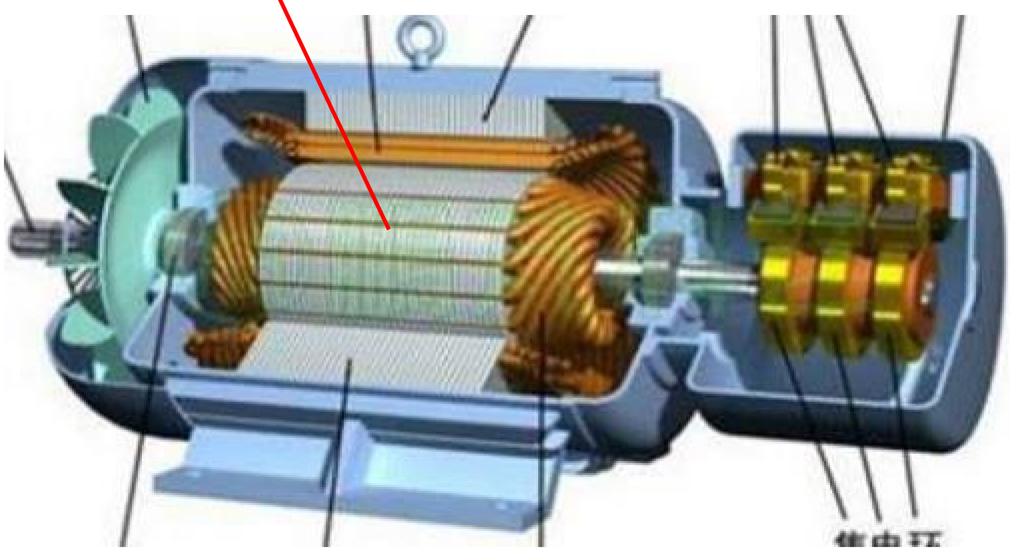






Rotor
（with wire coil）

Stator



NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

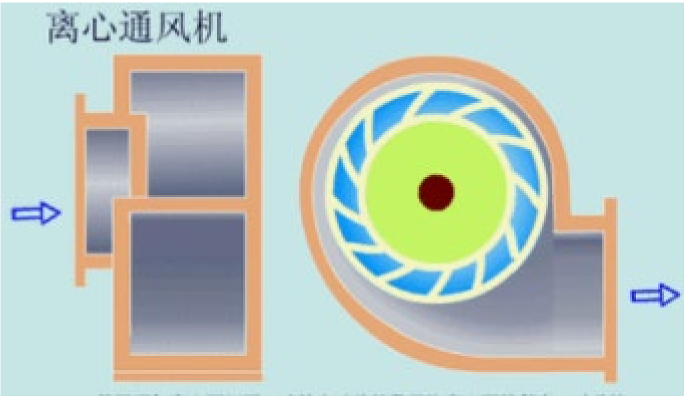
Three-element flow design impeller

1. Alloy integrated impeller, high strength and long life (20 years).
2. Three-element flow impeller, less airflow vortex loss and higher efficiency.

Maglev Turbo Blower impeller

Centrifugal Fan

Airflow 90 degree turn, vortex loss large



NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Maglev Turbo Blower Parameter

型号	类型	电机功率		流量	压力	出口直径	外形尺寸(mm)			重量
		(HP)	(KW)	(m^3/min)	(Kpa)	DN	W	L	H	(kg)
ZCXFC30-04-SYS-V01		30	22	28	40	150	850	1750	1640	735
ZCXFC30-06-SYS-V01				20	60					
ZCXFC30-08-SYS-V01				17	80					
ZCXFC50-04-SYS-V01		50	37	48	40	150	850	1750	1640	735
ZCXFC50-06-SYS-V01				34	60					
ZCXFC50-08-SYS-V01				28	80					
ZCXFC50-10-SYS-V01				22	100					
ZCXFC50-12-SYS-V01				19	12					
ZCXFC75-04-SYS-V01		75	55	75	40	200	950	1830	1740	967
ZCXFC75-06-SYS-V01				51	60					
ZCXFC75-08-SYS-V01				42	80					
ZCXFC75-10-SYS-V01				33	100					
ZCXFC75-12-SYS-V01				29	120					
ZCXFC100-04-SYS-V01		100	75	100	40	200	950	1830	1740	967
ZCXFC100-06-SYS-V01				70	60					
ZCXFC100-08-SYS-V01				55	80					
ZCXFC100-10-SYS-V01				45	100					
ZCXFC100-12-SYS-V01				40	120					
ZCXFC125-04-SYS-V01		125	95	125	40	250	1100	1950	1870	1040
ZCXFC125-06-SYS-V01				82	60					
ZCXFC125-08-SYS-V01				70	80					
ZCXFC125-10-SYS-V01				58	100					
ZCXFC125-12-SYS-V01				50	120					
ZCXFC150-04-SYS-V01		150	110	150	40	250	1100	1950	1870	1040
ZCXFC150-06-SYS-V01				105	60					
ZCXFC150-08-SYS-V01				84	80					
ZCXFC150-10-SYS-V01				66	100					
ZCXFC150-12-SYS-V01				53	120					

NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Maglev Turbo Blower Parameter

型号	类型	电机功率		流量	压力	出口直径	外形尺寸(mm)			重量
		(HP)	(KW)	(m^3/min)	(Kpa)	DN	W	L	H	(kg)
ZCXFC200-04-SYS-V01	单叶轮	200	150	200	40	300	850	1750	1640	735
ZCXFC200-06-SYS-V01				140	60					
ZCXFC200-10-SYS-V01				110	80					
ZCXFC200-12-SYS-V01				90	100					
ZCXFC200-20-SYS-V01				80	120					
ZCXFC200-20-SYS-V01				60	200		1250	2350	2160	1900
ZCXFC250-04-SYS-V01		250	185	245	40	500	1305	2380	2580	1450
ZCXFC250-06-SYS-V01				160	60					
ZCXFC250-08-SYS-V01				135	80	400				
ZCXFC250-10-SYS-V01				105	100					
ZCXFC250-12-SYS-V01				98	120					
ZCXFC300-04-SYS-V01		300	220	290	40	400	1305	2380	2580	1600
ZCXFC300-06-SYS-V01				190	60					
ZCXFC300-08-SYS-V01				146	80					
ZCXFC300-10-SYS-V01				124	100					
ZCXFC250-12-SYS-V01				110	120	400	1305	2480	2670	1600
ZCXFC400-04-SYS-V01	双叶轮	400	300	400	40	400	1305	2480	2670	1800
ZCXFC400-06-SYS-V01				260	60					
ZCXFC400-08-SYS-V01				170	80					
ZCXFC400-10-SYS-V01				150	100					
ZCXFC400-12-SYS-V01				110	120					
ZCXFC400-12-SYS-V01				80	300	300	1450	3010	2600	2000

NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Maglev Turbo blower case study

NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Application

改造前:110KW罗茨风机　　改造后：75KW磁悬浮风机

能耗数据

气力输送系统改造前后电耗对比		
类别	罗茨风机	磁悬浮精准输送系统
配粉总量/吨	1011.90	1912.70
耗电总量/度	2779.03	2580.08
平均吨耗/度	2.75	1.35

配粉效率提升:
改造前出仓绞龙下料频率在40-43HZ
改造后出仓绞龙下料频率在48-50HZ

Before/after fan change:		Root Blower 110kW	Maglev Blower 75kW
Flour.	ton:	1,011.09	1,912.7
Total power consumption.	kWh:	2,779.03	2,580.8
Power consumption / ton.	kWh/ton	2.75	1.35

NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Case study

管道出口温度降低:
改造前罗茨风机出口温度80.7 ℃
改造后磁悬浮风机出风口温度63.6 ℃

现场噪音下降:
改造前罗茨风机噪音102.8dB
改造后设备噪音84.8dB

维护简化:
改造前罗茨风机维护点位多
改造后磁悬浮风机只更换滤棉

Outlet pipe temperature	Noise	Maintenance
Rootes blower: 80.7°C	102.8 dB	
Maglev blower: 63.6°C	84.8 dB	Change filter cloth

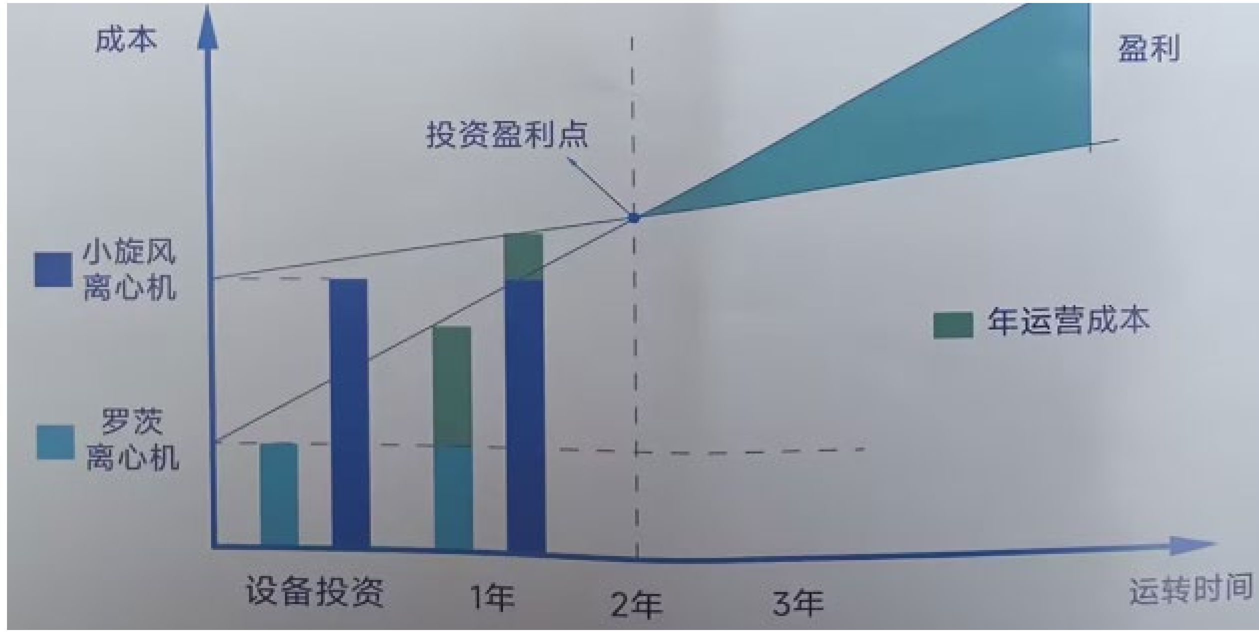
NEW BLOWER TECHNOLOGY

GOLDEN GRAIN

Case study

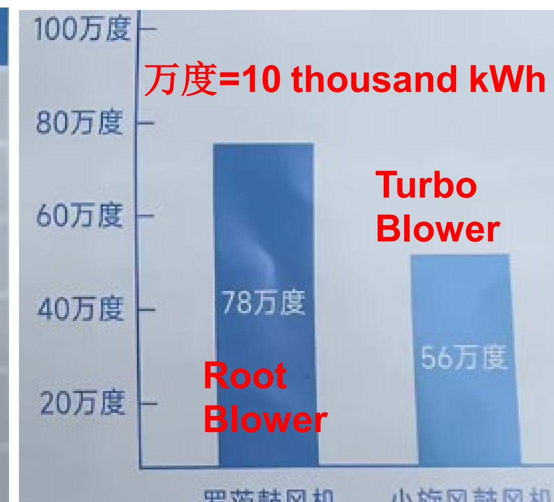
Payback:

1.5-2 years



Application Example :

	比较项 compare	小旋风鼓风机 Turbo blower	罗茨鼓风机 Root blower
Pressure:	风压出口压力	68.6kPa	68.6kPa
Airflow:	风机进口流量	52m³/min	50m³/min
Motor Kw:	风机输入功率	65kW	90kW
Running /day:	每日运行时间	24h	24h
kWh /year:	每年功率耗费	560,000kW·h	780,000kW·h
Save 220,000kWh /year:	单台小旋风鼓风机每年可节电22万度		



CONCLUSIONS

GOLDEN GRAIN

Maglev Turbo Blower Advantage

1. Permanent magnet motor (no stator coil), rotor temperature lower, efficiency up to 97% compared with normal motor.
2. Three-element flow impeller design, small vortex loss, high efficiency.
3. No bearings at both ends of the motor shaft, magnetic suspension without contact to support the rotating shaft, no need for lubrication.
4. No bearings, lower vibration.
5. Noise is lower than Root Blower 15-20dB.
6. Low outlet airflow temperature with Roots blower 10-20 degrees, lower moisture loss.
7. Power savings up to 15%.

THANK YOU