

DRY SCREW VACUUM PUMP APPLICATION



Solution For Waste Water Treatment,
Oil Contamination And Energy Waste Problems
Occurring Using Conventional Vacuum Systems
We Recommend For Oil / Water Free Dry Screw Vacuum System

Application of Dry Screw Vacuum Pumping System in
Industrial effluent treatment process based on evaporation technology.



Leaders In Vacuum Technology

DESCRIPTION

Evaporation is a type of vaporization that occurs on the surface of a liquid as it changes into the gas phase after reaching its boiling point. At industrial scale, this process is used to recover water from waste effluent which is reused so that there is no contamination in environment, this phenomenon is also known as ZERO LIQUID DISCHARGE.

In this process, Feed is input to evaporator/Calendria having water and process solids as waste effluent. Steam is used as heating source to heat up the feed. As soon the feed reaches to boiling point, water present in feed start to vaporize, these water vapors contain latent heat which is further used as heating source for next Calendria and so on.

By subsequent evaporation in every Calendria, we get the desired concentrated solid and recovery of water. Vacuum plays important role in evaporation process. Now days, water ring pump (WRP) is used in this process but these vacuum systems require lot of water as sealant fluid that circulate inside pump casing and in every minute process carry over contaminates the sealant water that's why there is need of change of sealant water at regular interval of time. The treatment of waste water generated from WRP becomes difficult to treat that makes process less economical.

Dry screw vacuum pump has been used successfully in this process, No water contamination occurs as no sealing fluid is required that makes the process economical and keeps the environment clean.

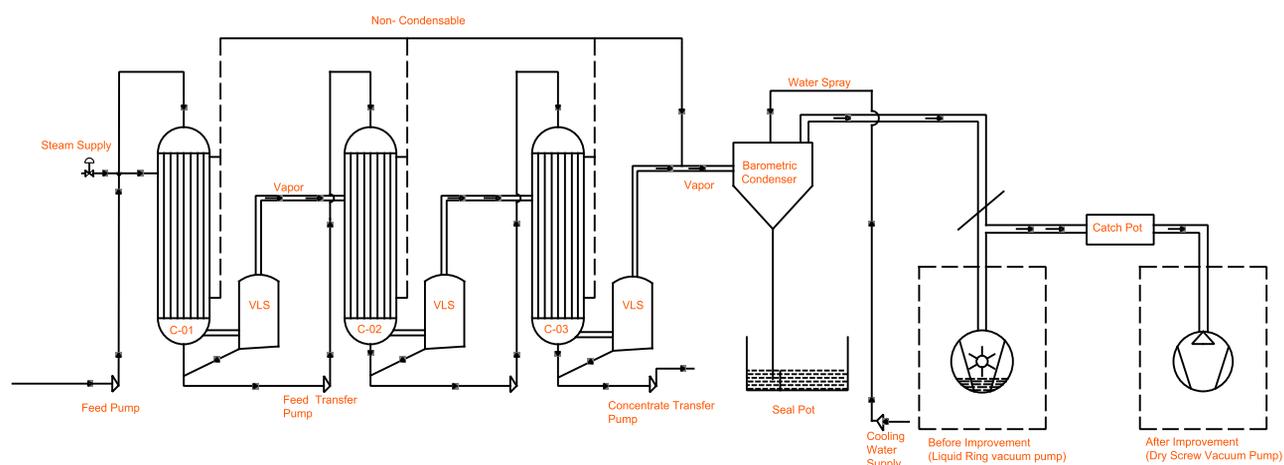
Automatic flushing with suitable solvent is done at regular intervals to make the system maintenance free, hence added values into the system.

APPLICABLE SYSTEM COMPARISON

BEFORE IMPROVEMENT	AFTER IMPROVEMENT
Water Ring Vacuum Pump	Dry Screw Vacuum Pump



Typical Installation of Dry Screw Vacuum Pump in Evaporation Process

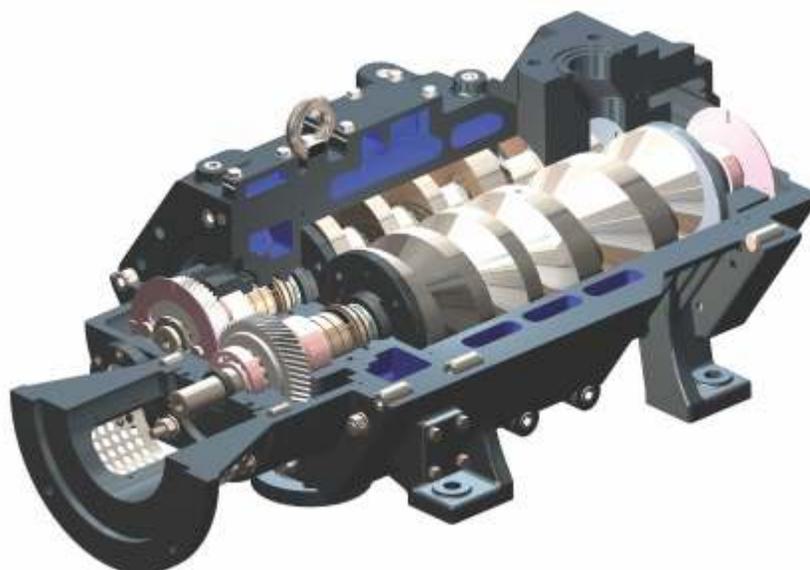


PROCESS PARAMETERS

- Feed Rate: 3000 kg/hr
- Evaporation Rate : ~2500 kg/hr
- Solid concentrated from 3% to 28%.
- Water ring pump is replaced with Dry screw vacuum pump.
- Specially Designed KOP is installed at suction of vacuum pump to protect from Process contamination.

APPLICATION

DESCRIPTION	APPLICATION PLANT	END USER
Oil Ring Vacuum Pump	Effluent treatment using Evaporation process	SVR Labs



RESULTS

Before Improvement (Wet Type)	After Improvement (Dry Type)
Sealant water contamination with process carryover	No contamination of oil as it works on dry technology.
Operational cost is very high as power and cooling water consumption is high.	Less power and cooling water operational cost
Unstable vacuum due to sealing fluid temperature variation	Constant vacuum level as no sealing fluid is required.
Vacuum fluctuation increases process operation cycle	Shorten process cycle due to constant vacuum level throughout process.
Mean time between failure (MTBF) is less	MTBF is very much high.
Environment contamination due to water disposal frequently.	Saves environment as no need of sealing fluid
High noise level caused by cavitations	Contact free Dry operation eliminates cavitations
Severe corrosion by contact with process gases	Internal coating eliminates corrosion problem
Large installation space	Small installation space



OPERATION COST COMPARISON

Description		Before Improvement (Water Ring vacuum pump)	After Improvement (Everest Dry Vacuum Pump)
Basic Specification		Process Cycle : Continuous (~2500 kg/hr) Vacuum : 50 torr Vacuum Pump : Water ring Pump	Process Cycle : Continuous (~2500 kg/hr) Vacuum : 50 torr Vacuum Pump : Dry Screw vacuum Pump
Gear oil	Consumption	None	Gear oil replacement after 1000 hrs. Cost - INR 1500 /month
	Yearly		INR 18000
Cooling Water	Consumption	1.5 m ³ /hr x 20 hrs x 250 day =7500 m ³	(Cooling water for Jacket) 1m ³ /hr
	Yearly	(Cooling water) 7500 m ³ x INR 1/m ³ =INR 7500 (Waste Water Treatment) 7500 m ³ x INR 10/m ³ = INR 75000	1m ³ /hr, (Recycle, No cost)
Power	Consumption	Water Ring vacuum Pump: 10 kW 10 kW x 20hrs x 250 days : 50000 kW	6 kW * 20 hrs * 250 Days : 30000 kW
	Yearly	50000 kW x INR 5 = INR 250000	30000 kW x INR 5 = INR 150000
Service and Maintenance	Yearly	INR 50000	INR 20000
Total Cost	Yearly	INR 382500	INR 188000
Direct Cost Saving	Yearly	INR 194500	
Indirect Cost Saving		Pollution and Water Control	





Everest Blower Systems Pvt. Ltd. is an ISO 9001:2015 certified manufacturer of Mechanical Vacuum Boosters, Dry Screw Vacuum Pumps, Industrial Vacuum Systems & Roots Type Mechanical Vapour Recompessors. Everest Group was established in 1980 & is a pioneer in design and manufacturing of Positive Displacement Blowers with over 1,50,000 installation till date. Blowers are manufactured under name and style of Everest Blowers Pvt. Ltd. - Pressure Division of Everest Group. Everest Blower Systems Pvt. Ltd. is a sister concern of Everest Blowers Pvt. Ltd. and designated as Vacuum Division of Everest Group. EBSPL was established in 2007 and is your one stop shop of all solutions related to vacuum.

EBSPL is established in HSIIDC Industrial Area at Bahadurgarh, Haryana, India spread over 40,000 Sq. Ft. and employees over 140 people including 40 graduate engineers. Facilities include in-house design & development, manufacturing, assembly & testing of high end vacuum pumps and systems. This facility also houses a DSIR approved R&D center which has won national award for energy efficient vacuum pumps.



For Energy Efficient Pumps and Research & Development



We don't just offer Blowers, Boosters and Systems we offer SOLUTIONS !!

Our technology is so flexible, we can custom manufacture **Special Blowers, Vacuum Pumps & Systems** by alloying and cross linking diverse designs to suit individual requirements and import substitutes.

