

# DRY SCREW VACUUM PUMP OPERATING COST COMPARISON: DRY SCREW VACUUM PUMP VS STEAM JET EJECTORS

RELIABLE | LOW MAINTENANCE | DURABLE | INDIGENOUS | COST EFFICIENT

S.N	DESCRIPTION	UOM	STEAMJET	DRY SCREW VACUUM PUMP		
<b>1 SPECIFICATIONS</b>						
a	Heat Capacity	ton	25	No. of Modules	1	Nos.
b	Minutes/ heat	minutes	25	Cost of Steam	2	Rs./Kg
c	Avg. No. of heats in a Days	Nos	24	Cost of compressed air	2	Rs/ m3
d	Avg. No. of Working Days	Days	300	Cost of Nitrogen	8	Rs/ m3
e	No of heats in a Year	Nos	7,200.00	Cost of Cooling water	3.5	Rs/m3
f	Total ton of steel melt/ Year	ton	1,80,000.00	Cost of Electricity	10	Rs/kWh
g	Vacuum system running Hours/year	Hrs.	3,000.00	Cost of 50PPM more Purity of steel	100	Rs/ Ton
<b>2 VACUUM GENERATION</b>						
a	"Total Steam Consumption/ heat"	Kg	1750			Nos.
b	Minutes/ heat	minutes	25	Cost of Steam	2	Rs./Kg
c	"Avg. No. of heats in a day"	Kg/hr	70	Cost of compressed air		Rs/ m3
d	"Connected Power (Water Pumps + Aux.)"	kWh	45	122		Rs/ m3
e	Consumed Power	kWh	40.5	85.4		Rs/m3
	<b>Total Savings (1)</b>	<b>Rs./Yr</b>	<b>2,64,15,000.00</b>	<b>25,62,000.00</b>		<b>2,38,53,000.00</b>
<b>3 UTILITY COST</b>						
a	CW Consumption	m3/hr	112	6		
b	Nitrogen Consumption	m3/hr	0	1.2		
c	"Compressed Air Consumption"	m3/hr	0	1		
	<b>Total Savings (2)</b>	<b>RS/YR</b>	<b>11,76,000.00</b>	<b>97,800.00</b>		<b>10,78,200.00</b>
<b>4 PURITY OF MELT STEEL</b>						
a	Level of Hydrogen & other impurities	< PPM	1.5	1		
	<b>Total Savings (1)</b>	<b>Rs./Yr</b>	<b>2,64,15,000.00</b>	<b>25,62,000.00</b>		<b>2,38,53,000.00</b>
<b>5 MAINTENANCE &amp; CONSUMABLES SPARES</b>						
a	Current Monthly Maintenance(Equipment)	Rs./Mo.	10,000.00		1	Nos.
b	Current Monthly Maintenance(Auxiliary)	Rs./Mo.	15,000.00		2	Rs./Kg
c	Dry System Maintenance/Consumable	Rs./Mo.		20,000.00	2	Rs/ m3
d	Dry System AMC Cost	Rs./Mo.		10,000.00	8	Rs/ m3
	<b>Total Expenditure (4)</b>	<b>Rs/Yr</b>	<b>3,00,000.00</b>	<b>3,60,000.00</b>		<b>-60,000.00</b>
	<b>GROSS ANNUAL SAVING</b>					<b>3,38,71,200.00</b>

## EVEREST PRODUCT RANGE

OPERATIONAL SAVINGS / TON		
PERTON % SAVINGS	INR/TON	INR/TON
Technology	Steam Jet Ejector (WET)	Dry Pumping System (DRY)
Vacuum Generation Power	146.8	14.2
Utility	6.5	0.5
Spares/ Maintenance	1.7	2.0
Total	155.0	16.8
Savings%	0.0%	89.2%

VACUUM  
MECHANICAL VACUUM BOOSTERS  
DRY SCREW VACUUM PUMPS  
SUPERVAC  
ROTARY VANE VACUUM PUMP  
SUPERVANE  
VACUUM SYSTEMS (WET)  
ENGINEERED VACUUM SYSTEMS  
MECHANICAL VAPOUR RECOMPRESSOR (MVR/MVC)  
LOW-TEMPERATURE THERMAL EVAPORATOR (LTTE)

PRESSURE  
TWIN LOBE ROOTS BLOWERS  
TRI-LOBE ROOTS BLOWERS  
CENTRIFUGAL BLOWERS  
TURBO BLOWERS  
BLOWER PACKAGES

ON A TYPICAL VD PLANT PROCESSING 300,000 TONNES OF STEEL PER YEAR, THE OPERATING COSTS OF A MODULAR DRY PUMP SYSTEM CAN BE LESS THAN 10% OF THE EQUIVALENT STEAM EJECTOR SYSTEM.

**INDUSTRIES SERVED**

### CHEMICAL & PHARMACEUTICAL

Degassers  
Vacuum Distillation  
Evaporators  
Crystallizers  
Vacuum Filters  
Vacuum Dryers

### VACUUM FURNACE INDUSTRY

Heat Treatment  
Hardening  
Optical Coating  
Metallizing  
Degreasers in Furnace

### ELECTRICAL INDUSTRY

Transformer Vacuum Impregnation  
Transformer Oil Purifier  
Vapour Phase Drying

### INDUSTRIAL PROCESSING

Impregnating Windings  
Drying Textiles Mills  
Sterilizing re-circulation through  
Ethylene Dioxide  
Incandescent CFL and  
Tube Light Manufacturing  
TV Tubes Manufacture

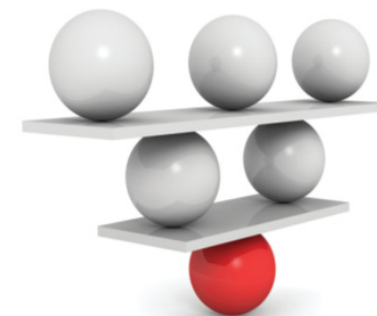
### FOOD PROCESSING INDUSTRY

Vacuum Packaging-Fresh & Cooked  
Meats Freeze Drying  
Deodorization of Vegetable Oil  
(FFA Distillation)  
Sugar Refining  
Vacuum Evaporative Cooling  
Vacuum Tray Drying  
Flash Drying

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.



sales@everestvacuum.com | www.everestvacuum.com  
+91 9818742743



*Innovative Engineering Solutions*

## MECHANICAL VACUUM SYSTEM FOR STEEL DEGASSING

EverestVacuum forwarded the steps in vacuum for secondary metallurgy by an innovative solution provider. Our leading market position is built on our understanding of customers' processes and our expertise in providing vacuum solutions for VD, VOD, and RH processes.

Everest Vacuum has been able to secure for itself a strong pole position in becoming the only successful Indian manufacturer of Dry Screw Vacuum Pumps & the largest manufacturer (in nos.) for Mechanical Vacuum Boosters in India. Everest Vacuum has made a mark in the industry for its cutting-edge craftsmanship, ingenious design, top-notch quality & high volumetric efficiency.



Everest Vacuum pumps can be easily integrated into existing systems, with as much or as little technical support as you need. Everest Vacuum has a full fledged team to support in commissioning and start-up phase onsite. We can assist with the integration of controls into the customer's device management system, fine-tuned to the particular process. And we offer a comprehensive range of options for after-sales service, maintenance, and repair.

### OUR EXPERTISE IS YOUR ADVANTAGE

Our expertise is in vacuum technology, we have been in the business since 1980 and our knowledge & experience runs deep. We design, develop and manufacture vacuum equipment to the very highest standards.

But it's not just the technology. With a global installed more than 5000 pumps, we understand how vacuum pumps and systems perform in real life. We know how to get the best from our products, whatever the application. We know how to look after them. That's why a large section of our expert workforce is dedicated to service and support.

We don't just supply vacuum pumps. We provide solutions and the system that's right for you.



ENGINEERING | EVALUATION | DESIGNING MANUFACTURING  
TESTING | EXECUTION | POST SALES AND SERVICE

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



**VD & VOD PROCESSES**

Processes in the growing secondary metallurgy sector depend on several vacuum-based treatments: Vacuum Degassing (VD) for alloy steels, Vacuum Oxygen Decarburization (VOD) for stainless steels, and combinations of both treatments, for example, Vacuum Degassing Oxygen Blowing (VDOB) and Vacuum Carbon Decarburizing (VCD), for low and ultra-low carbon steels.

These processes operate at varying vacuum levels, with different process gas loads, and in differing types of vacuum vessels, including tank, lid, ladle to ladle, stream and designs.

Everest Vacuum systems have been successfully applied to all of these secondary metallurgy processes at production facilities around the world. Modular system design enables degassing and decarburizing melt sizes up to 200 tonnes in electric steel-making facilities (mini-mills).

There are different types of systems available: the latest development for ladle sizes up to 50 tons is the systems that allow optimized adjustment to the very particular suction speed requirements in applications for foundries. For all ladle sizes, the 'Sport' steel degassing modules have proven reliability with many years in the field.

**RH PROCESSES**

In large integrated steelmaking facilities, typically equipped with basic oxygen converters, secondary metallurgical processing is carried out mainly in Ruhrstahl Heraeus (RH) systems.

These facilities process steels in ladle sizes of over 400 tonnes and require much larger pumping capacities – up to 1,000,000 m3/hr or more. Until a few years ago, RH plants were considered too large for dry mechanical pumping systems. But technological advances and successful installations mean that the huge advantage of dry pump technology in this process is now being recognized.

Everest has developed a 'SUPER' degasser module to address the high-volume flow rates needed to successfully degas and decarburize steel products, using multiple high volumetric flow boosters in parallel to handle the gas loads produced, while optimizing the total number of system elements required.

Whether you are planning a new installation at a Greenfield site or upgrading/replacing an existing installation, Everest can be your preferred partner of choice.

**WHICH VACUUM TECHNOLOGY DO YOU CHOOSE WHEN YOU'RE BUILDING A NEW STEEL DEGASSER OR UPGRADING AN EXISTING SYSTEM?**

Dry mechanical pumps or steam ejectors? It's a key decision.

For VD, VOD and RH processes, the smart money is on dry technology. Increasingly, mechanical dry pumps are replacing traditional steam ejectors as the vacuum technology of choice for new installations, and the trend is accelerating. It is not hard to choose a Dry Mechanism in vacuum pumps today.

Lower running costs and improved productivity are just two of the reasons. Dry pumps have been proven to reduce energy costs by as much as 97% compared to steam ejectors for large capacities.

High reliability and dependable performance are also key factors, given the exceptional demands that secondary metallurgy processes can make on vacuum equipment.

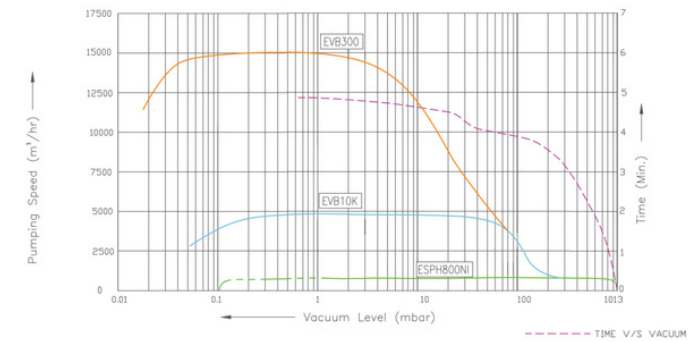
Higher pumping speeds, lower ultimate vacuum, minimal maintenance and lower environmental impact all lend further weight to the case for mechanical dry pumps.



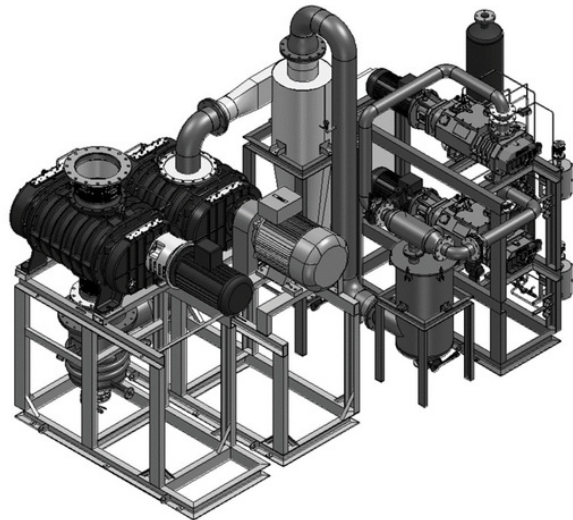
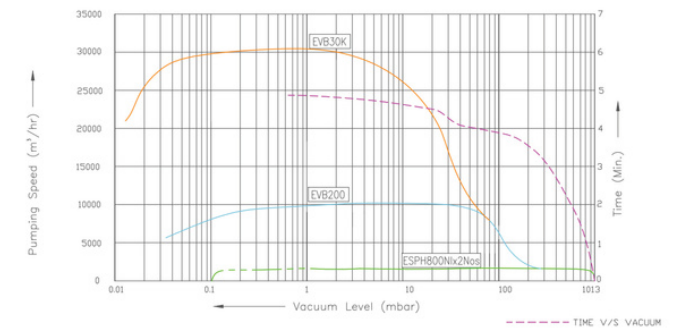
**MECHANICAL VACUUM PUMPING SYSTEMS – FOR STEEL DEGASSING**

Furnace Capacity	Vacuum Pumping Capacity	Ultimate Vacuum	Power (Kw)	
			Connected	Consumed
12 TON	15000 m3/hr	0.001 mbar	59	38.35
25	30000	0.001	122	79.5
45	55000	0.001	244	158.6
70	85000	0.001	366	237.9
100	115000	0.001	488	317.2

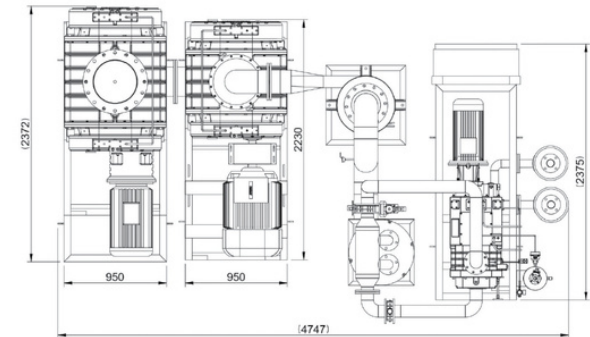
**-SUPERVAC 30000**



**-SUPERVAC 15000**



**DIMENSIONS -**



ENGINEERING | EVALUATION | DESIGNING MANUFACTURING TESTING | EXECUTION | POST SALES AND SERVICE



ENGINEERING | EVALUATION | DESIGNING MANUFACTURING TESTING | EXECUTION | POST SALES AND SERVICE

**EVEREST ADVANTAGE**

EVEREST HAS THE SKILL, EXPERTISE, KNOWLEDGE AND CAPABILITY THAT IT HAS ACQUIRED OVER THE YEARS TO CUSTOM DESIGN VACUUM SYSTEMS FOR SPECIFIC CUSTOMER REQUIREMENTS AND DELIVER GUARANTEED RESULTS.