Energy efficient vacuum solutions for the food and packaging industry.

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Introduction

“Vacuum equipment represents a significant percentage of the energy used in the food packaging process as well as making a significant contribution to the cost of ownership.

Through the careful selection of the vacuum equipment and consideration for the way in which it is installed, it is possible to achieve significant reductions in the energy consumed, cost of ownership and the cost of installation.”

Contents

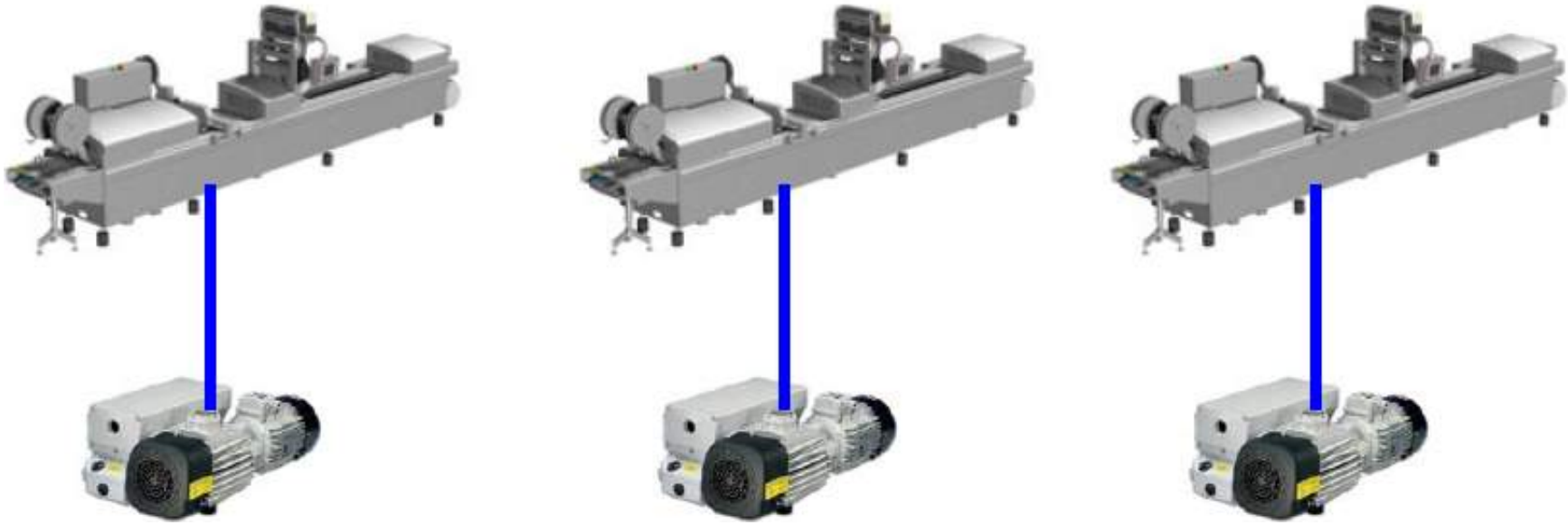
Two parts:

1. **Vacuum solutions for multiple packaging machines**:

2. **Vacuum solutions for individual packaging machines**:

Part 1:

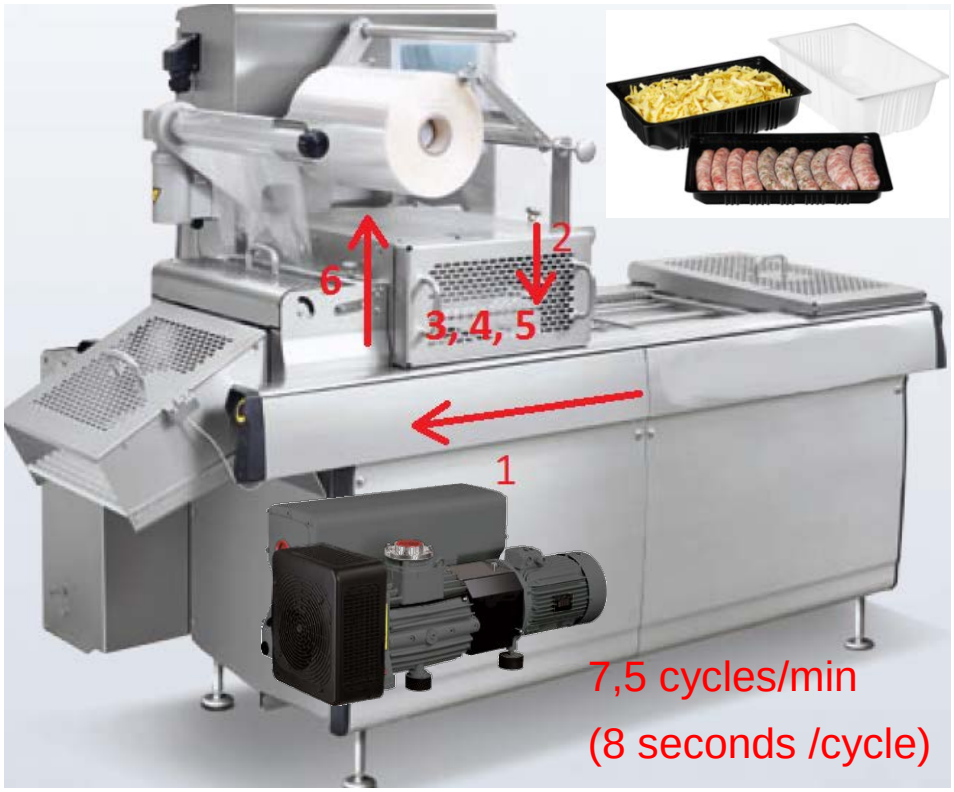
Vacuum solutions for multiple packaging machines



The Challenge

- Consider the running cycle of a **tray sealing packaging machine**

Step	Operation	Time in secs
1	Conveyor move (loading)	1,5
2	Tray sealing tool closed	1
3	Pumping down	1,5
4	Gas reinjection	1
5	Heat sealing (welding)	1
6	Seal release and tray sealing tool open	2
	TOTAL CYCLE TIME	**8**



➔ The pump is needed for less than 20% of the cycle time !

➔ You need a vacuum pump 5 times smaller if the pumping down could be spread over the whole cycle!!!

Solution

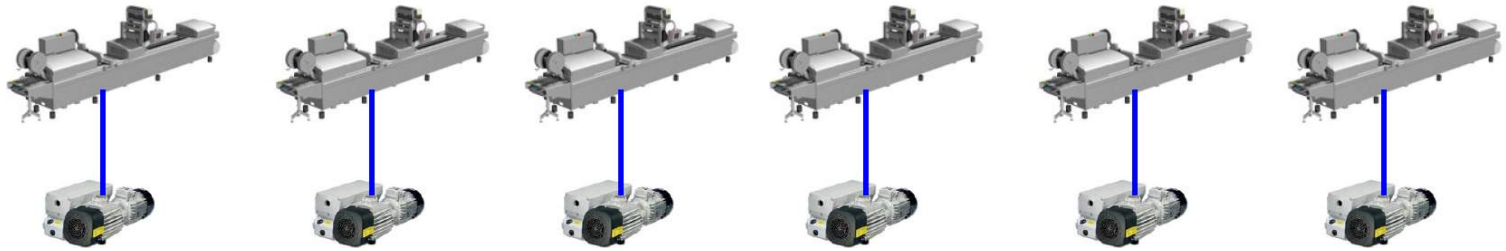
SHARE A PUMP WITH OTHER MACHINES >>> CENTRAL VACUUM SYSTEMS

What is a Central Vacuum System? (CVS)

- A CVS is a vacuum system which supplies vacuum to all the production machines within a plant.
- At the heart of the CVS system are the vacuum pumps.
- A control system allows the chamber to stay around the target working pressure.
- From the CVS, pipes go to all the production machines requiring the vacuum.
- Sharing pumps between machines reduces the energy consumption when the pump would otherwise be idle.
- Sharing pumps also reduces the maintenance costs.

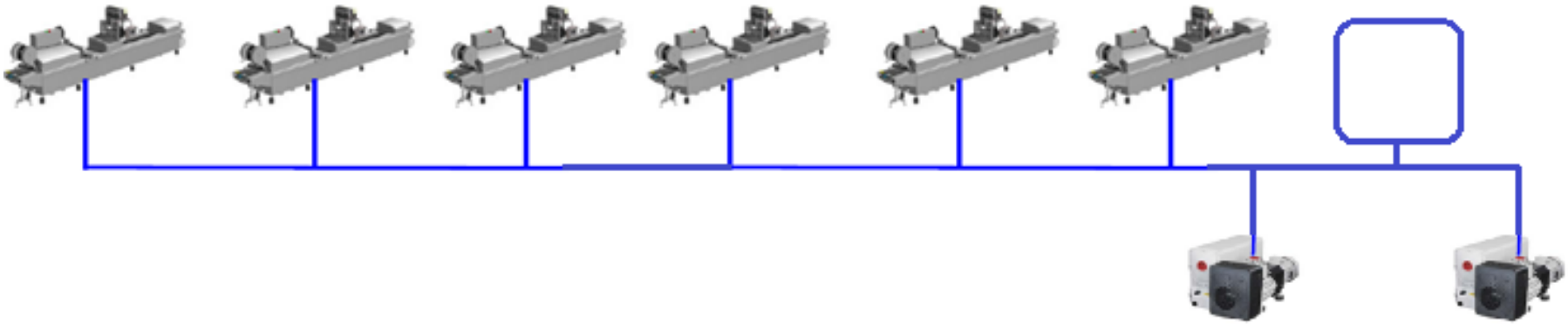
CVS SYSTEMS SUPPORTS MANY PACKAGING MACHINES TO REDUCE POWER CONSUMPTION BY UP TO 30%.

Principle of the Central Vacuum System



Vacuum

« Centralisation »



Example of central vacuum system 1

Meat slaughtering and processing plant (pig/cattle) – France

Several CVS for:

- Thermoforming
- Tray sealing
- Slaughtering line by-products conveying
- Tumbling

More that 100 SV630A/B + Roots WAU 2001 on 5 production sites !

Example of central vacuum system 2

Meat processing plant – France

This customer is one of the biggest meat processors in France (pork meat and poultry). They operate several production sites.

They have a CVS with eight oil sealed rotary vanes pumps - Sogevac SV630B that supply 10 packaging lines.

- 2 x SV630B for the forming network (pressure 100-150 mbar)
- 6 x SV630B for the welding network (pressure 10-20 mbar)

Central Vacuum Systems - Summary

Ideal for multi machine applications.

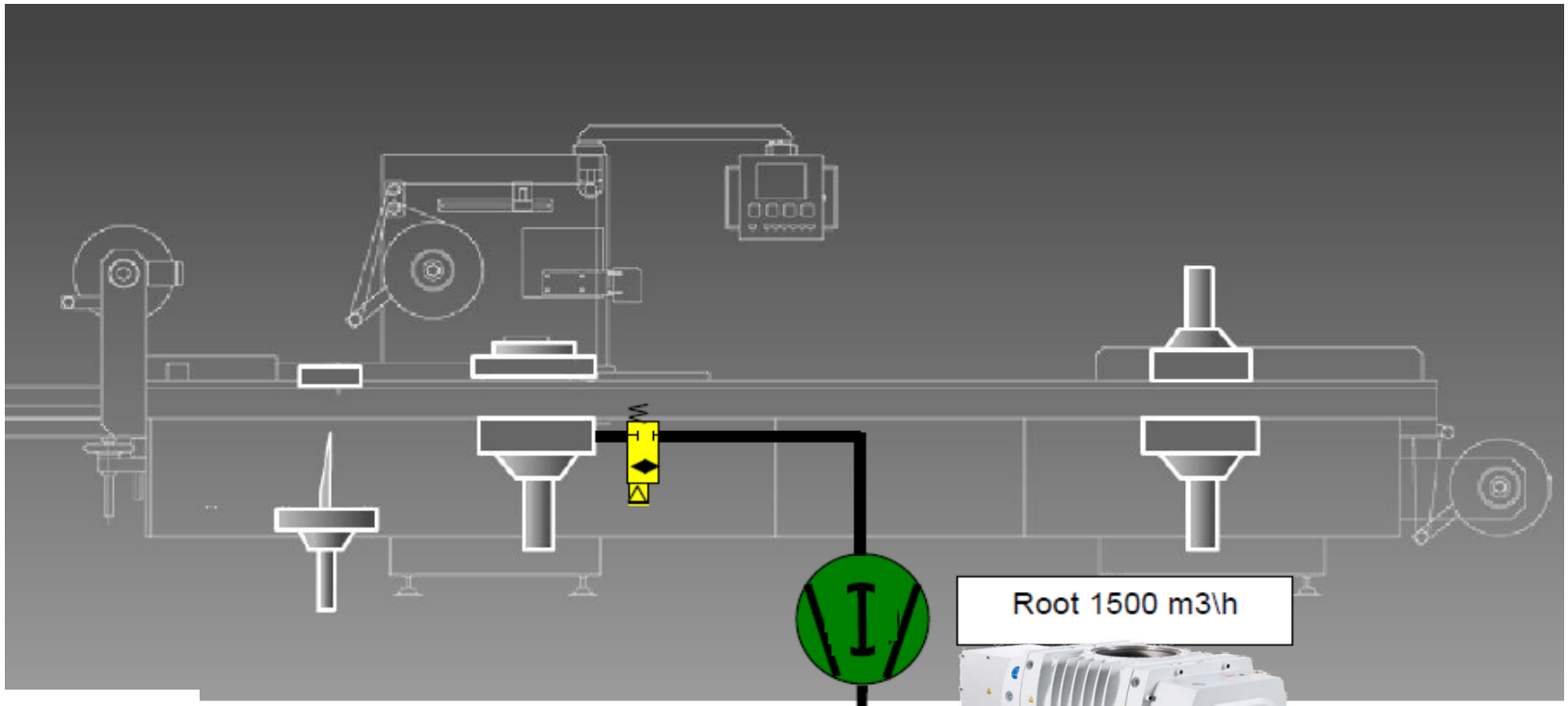
Saves energy.

Saves maintenance costs.

Part 2:

Vacuum solutions for individual packaging machines

Typical layout of a vacuum system of a thermoforming machine



High pipework cost - €6000 [Typical].

High maintenance cost – 2 pumps.

High power cost – 2 pumps.

Requires space in pump room.

Dryvac pumps

Latest generation of dry vacuum pumps are:

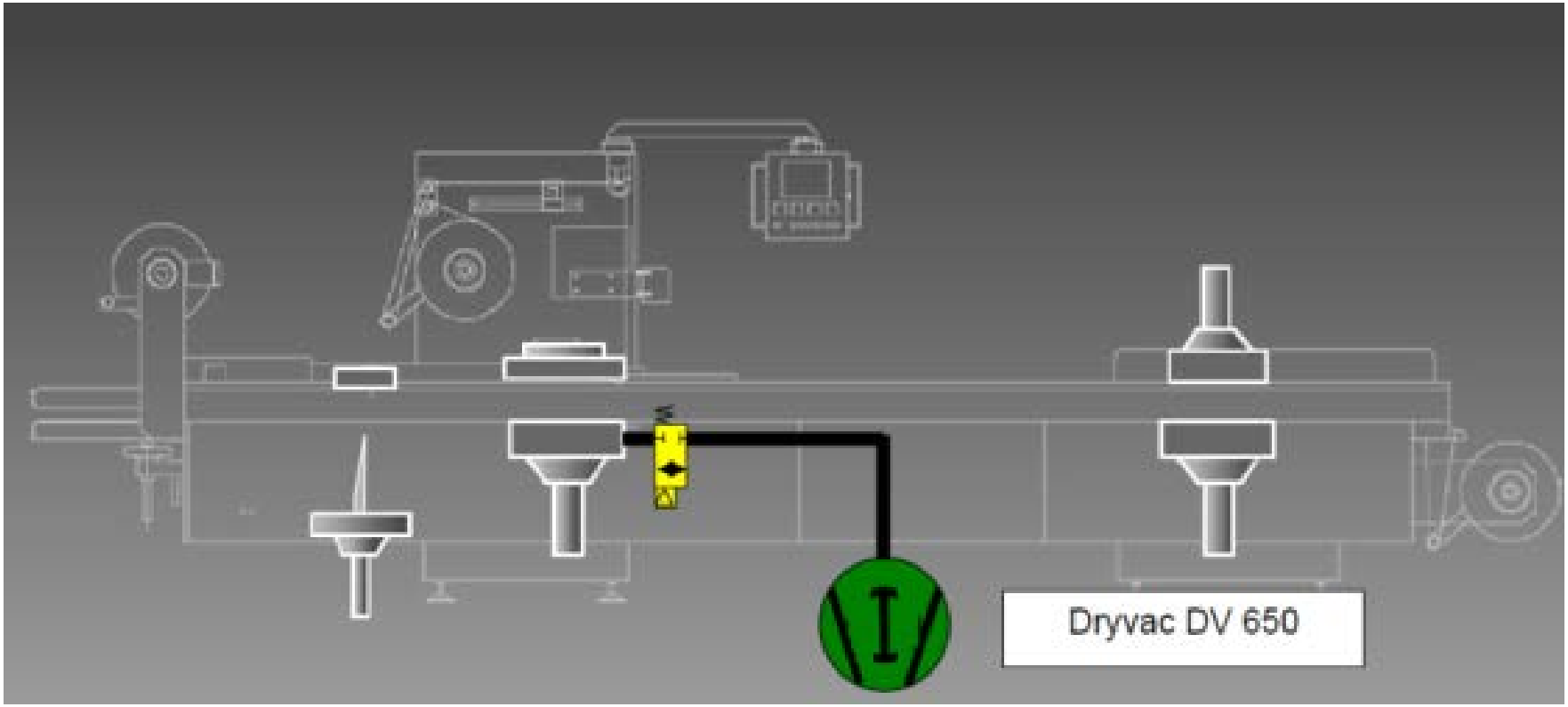
- Quiet
- Very low vibration
- Cool running
- Low maintenance
- Energy efficient
- Compact
- Flexible

Flexibility, Compactness, Low installation cost.

Side inlet port >>> low profile

Less than 600mm high

Improved layout of a vacuum.



Better performance: >20% improvement in pumping speed.

Energy saving: 4kW less power needed. >35%

Installation saving – No foreline. Several T€ saving

Space saving – no pump room needed.

Lower cost of ownership: 36% saving

Energy saving.

Typical layout of a vacuum system:

Pump	Installed power	Average consumption
RVP 630 m3/h:	18.5 kW	9 kW
1500m3/h booster	4 kW	2 kW
Total	22.5 kW	11 kW

Improved layout of a vacuum system.

Pump	Installed power	Average consumption
DV650	11 kW	7 kW

Saving: >35% [€2569pa]

€0.08 kW/h

24/7 operation for 11 months

Cost of Ownership / Payback

	DV650	RVP 630 m3/h
Total cost of power / year [€]	4108.00	6372.00
Maintenance / year [€]	110.00	1610.00
Overhaul, divided per year	1110.00	1600.00
Total cost for 1 year	5328.00	8382.00
Total cost for 7 years	37288.00	58874.00
Typical pump purchase price	19000.00	10000.00

Typical total cost of ownership saving: €3000pa or 36%

3 year pay back just based on wet to dry pump swap

Individual packaging machines - Summary

- Use just one dry pump located at the machine.
  - Low noise, Low vibration, Low heat, Compact.
- Eliminate the foreline to save installation cost and need for a booster pump.
- Compared to a wet pump, a dry pump has a 36% lower cost of ownership.

The Energy Efficient Solution

Thank you.

Backup