INGERSOLL RAND WHITE PAPER

Oil-Free Air Compressors : The Indisputable Solution for the Chemical Industry

Ingersoll Rand

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What's Inside

Criticality of Oil-Free Air Compressors in the Chemical Industry

This paper is created to address the crucial role that oil-free air compressors play in the chemical industry. Reliability is the foundation on which this industry runs and hence the process, machinery and people behind it must offer air tight and error free solutions. This paper provides readers with crucial information on what constitutes that reliability and what companies must do to fulfill the needs of their customers.

Introduction

Compressed air is an important energy source in the production process in every industry. However, when it comes to the chemical industry it is imperative that this compressed air is 100% contamination-free. The presence of particles, condensation, oil and oil vapour in a compressed air system can lead to downtime, product spoilage, recall, damage to your brand reputation, or worst, harmed consumers and product liability.

Applications of Compressed Air within the Chemical Industry

Compressed air systems are designed to be reliable and assure safety in the chemical industry. Different applications call for different types of air compressors, such as oil-lubricated and oil-free compressors. Some of the most common applications of the air compressors are:

Gas compression

Gases must be compressed before they can be pumped through pipelines for further use. In many cases, this compression is also necessary in order to reduce the volume of storage space required.

Air curtains

Compressed air is used as a curtain to create a safe and clean area.

Instrument air for control valves and cylinders

Compressed air is used for operating printing pumps and equipment. As air is non-explosive, it is safe and reliable.

Material handling and pneumatic conveying

Compressed air operated fluid pumping systems are used in volatile environments without the risk of explosion. Moreover, chemicals can be conveyed safely and economically with stand-alone compressors or vacuum pumps and central systems.

Nitrogen generation

Compressed air is filtered via a membrane to produce nitrogen used in a variety of chemical applications.

Process air

Compressed air is used as a curtain to create a safe and clean area.

Air separation

Compressed air supplies the air for separation in PSA plants. Class 0 100% oil-free air prevents oil from being deposited on the expensive membranes used to separate the nitrogen and oxygen to ensure the separated gases are pure.

PET production

Compressed air is used to produce and transport PET resin beads. Oil contamination in the air will contaminate the resin and affect the composition of the end product when the beads are sintered. Class 0 100% oil-free air eliminates this risk.

Fermentation and aeration

Compressed air supplies oxygen to bacteria during fermentation and for oxidation. Class 0 100% oil-free air protects the bacteria from being killed by traces of oil in the air and ensures that the oxidation process is not altered by the oil contamination.

Critical factors Influencing Purchase Decision

Major factors influencing a customer's decision in purchasing oil-free air compressors are :

It is critical then that these factors are being fulfilled by brands manufacturing oil-free air compressors.

Enhanced performance - Eliminating risk of contamination

Companies in the chemical industry deal with toxic and combustible gases regularly. They constantly face the challenge of having to maintain high-quality standards while fulfilling sustainability requirements. The end products are used mostly as raw materials and ingredients.

The risks associated with contamination can seriously damage a brand's reputation. Problems that can be caused by contaminated compressed air are:

- Damaged instrument
- Rust
- Unsafe working conditions
- Corrosion
- High maintenance
- Reduced life of the equipment
- Premature wearing
- Low product quality
- Product recalls
- Shutdown

Quality - Compliant with stringent International Standards

ISO has come up with standards for air quality so that the end products are safe and pure for users. ISO 8573 specifies purity classes of compressed air concerning particles, water and oil, independent of the location in the compressed air system. Class 0 is the most stringent air class defined by ISO 8573, Part 1.

ISO 8573-1 Air Quality Classes	
Quality Class	Oil & oil vapor mg/m³
0	< 0.01
1	0.01
2	0.1
3	1
4	5

Durability - Driven towards sustainability

With increasing focus on sustainability, reducing carbon footprint, and following United Nations Sustainability Development Goals, companies in the industry are showing greater interest in complying with the International standards.

All these factors are driving the industry towards oil-free air compressors that offer value and benefits. These compressors increase the overall durability of the compressed air system and reduce the Mean Time Between Failure (MTBF). Improved energy efficiency, low maintenance costs, reduced risk of operational downtime, and a guarantee of increased lifetime value is what separates the best air compressors from the rest.

Holistic solution - A systems approach

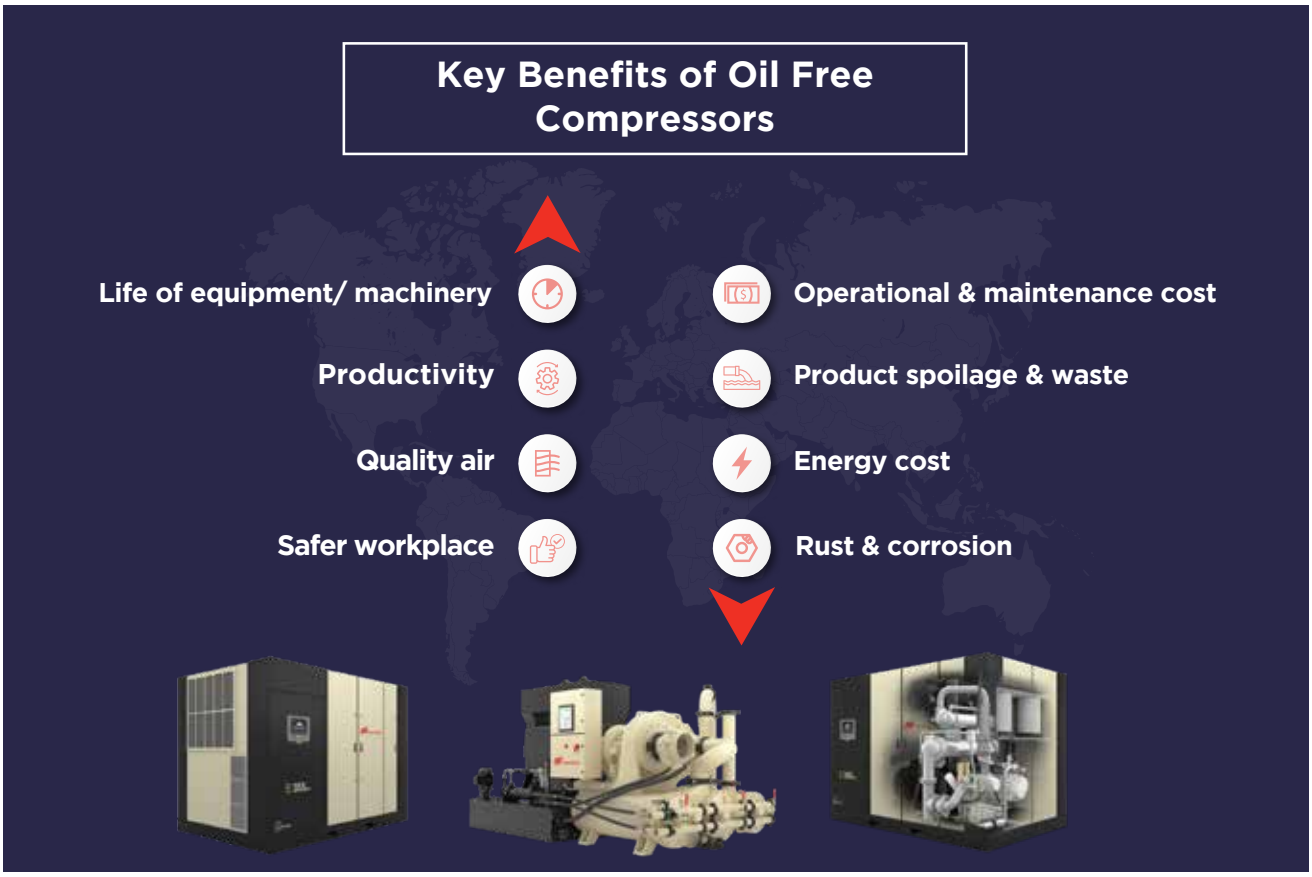
A winning philosophy for a consumer-driven company starts from a deep understanding of the customer's process specification and the real needs. The process should start with an in-depth audit and feasibility study of the compressed air system with the objective of identifying areas of concern. The performance of the equipment, compressed air system leaks or pressure drops across system components should be looked into and analyzed at length.

The analysis and the consultation at this stage should come at no cost to the customer. This should be followed by recommendations, a sustainable implementation plan and a partnership for the future that covers consultation and maintenance.

Moreover, insights into the demand & supply pattern, the importance of redundancy, and the pressure dewpoint help form an energy-efficient and cost-effective architecture that enables the implementation of a complete compressed air system design. This data-driven analysis approach and an optimised solution help maximise profitability, reduce environmental impact and more.

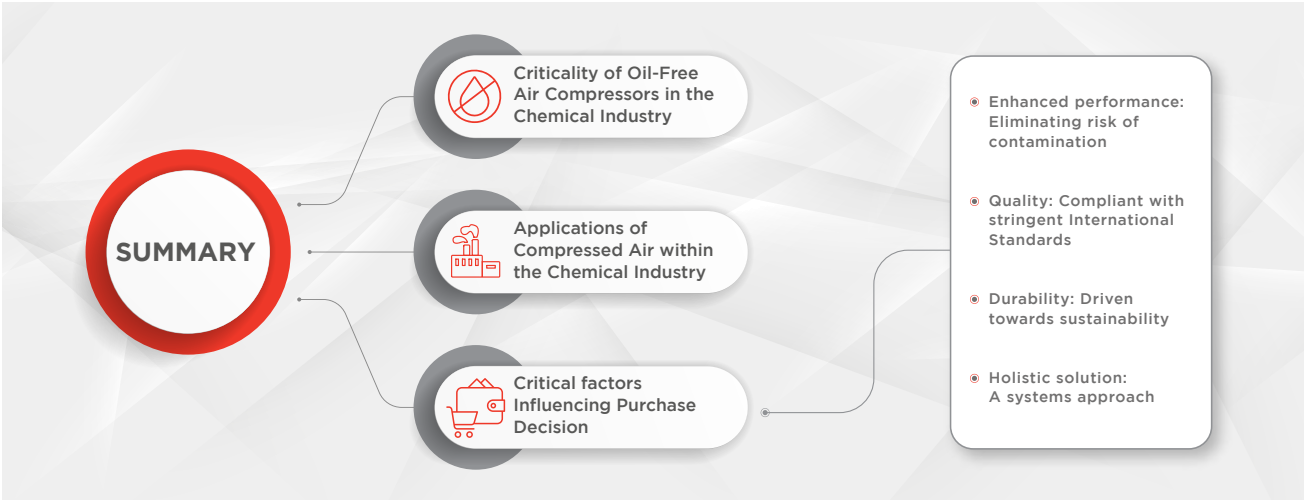
Ways to transform the perfomance of a compressed air system

- Manufacturers must ensure reliability with robust products and system design that delivers top quality air while protecting sensitive downstream equipment, lowering maintenance and extending equipment life
- Increase productivity by using an oil-free Class 0 certified compressor that guarantees contamination-free air, eliminating the risk of product spoilage and waste
- Lower the cost of ownership by lowering operational and maintenance costs over a system's life to maintain the highest air quality. This, in turn, will offset higher initial costs borne by the customer
- Make serviceability a priority with oil-free equipment designed specifically to make maintenance easy with clear access to consumable components



Conclusion

Oil-free air compressors offer the perfect solution along with multiple benefits that lead to sustainable, effective, reliable and efficient production without compromising on quality. Ingersoll Rand understands that each company has different requirements and undertakes a proper assessment to propose the best suited oil-free air compressor. With no stone left unturned, the company guarantees that a compressor system delivers only the absolute highest quality air, reliability, and efficiency for chemical companies' critical applications and processes.



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