



11 Beryllium Street, Alrode Extension 14, Alberton, 1449

P.O. Box 167173, Brackendowns, 1454

TEL: 011 908 4169
 FAX: 011 864 1588
 SMS: 083 703 1291

Email: info@are.co.za
 Web: www.are.co.za



ARTHUR RUSHMER ENGINEERING ENT CC (A.R.E.) - COMPANY PROFILE

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INTRODUCTION TO A.R.E.

	<p>Arthur Rushmer Engineering Ent. cc, (ARE) was established in 1997 and is a major player in the modern compressor market. The organisation maintains Utility Aircontracts, Rental Services & exclusively provides services on all Mattei Rotary Vane Compressors supplied through the organization.</p> <p>We became part of the ISO 9001:2000 family in April 2008 certified by Lloyd's Register Quality Assurance.</p> <p>www.are.co.za</p>
	<p>Our subsidiary, Air Bank Corporation (ABC), was established for the purpose of managing:</p> <ul style="list-style-type: none"> • UTILITY AIRCONTRACT AGREEMENTS • AIRCONTRACTS • RENTAL AGREEMENTS <p>and includes full servicing facilities, condition monitoring systems and maintenance plans in accordance with the ART quality management system.</p> <p>www.airbankcorp.co.za</p>
	<p>Compressed Air Aluminium Smelter Team, CAAST, is a division of A.R.E. that specialises in products and services, specifically for the Aluminium Smelting Industry. Although A.R.E. has been involved with various smelters locally and abroad, the CAAST team has been formed in order to carry out and monitor current services as well as develop, improve and prototype Aluminium Smelter compressed air requirements.</p>

ARE has a full range of products to offer, in both the Compressed Air & Power Generation markets.





We focus on the Mattei Brand of Rotary Vane Compressors and are able to supply, install & maintain products ranging from small standalone compressors to large compressed air networking, management & monitoring solutions.

We have sole distribution of Mattei Rotary Vane Compressors in South Africa.

ARE runs on state of the art technology and accredited Quality system for its basic day to day, back office and customer focused solutions:

- ART System (Arthur Rushmer Toolbox) – Full Online ISO 9001:2000 System
- Customer Relationship Management (CRM)
- Microsoft SharePoint Services
- Document Management Solutions
- Full Network Remote Access and Monitoring
- DIG ITC 2008 (Digital Image Gallery - Information Technology Compliance)

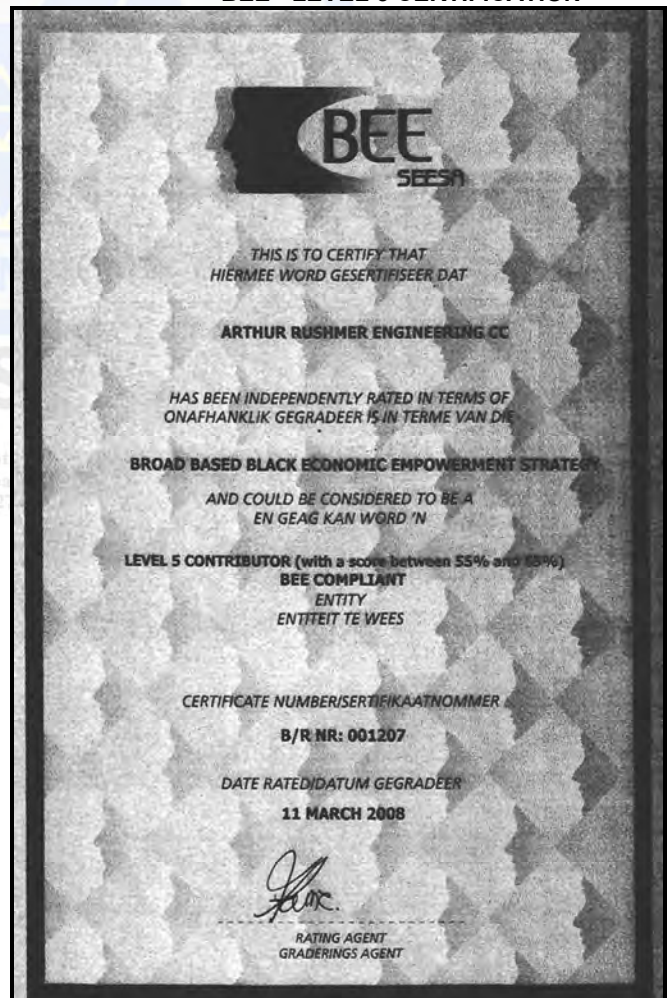
A.R.E. CUSTOMER INFORMATION - REFERENCE

	BHP Billiton	Since 2000
	De Beers	Since 1997
	Harmony Gold	Since 2003
	Eskom Group	Since 2004

ISO 9001-2000 CERTIFICATION



BEE - LEVEL 5 CERTIFICATION



COMPANY PROFILE

THE ORGANISATION'S PROFILE

The Organisation is involved in the Supply & Design of Air Compressors, Generators, Blowers and Servicing.

The product range and Servicing of the Organisation includes the following:

- Standard Electric Driven Air Compressors
- Custom Built Electric Air Compressors
- Blowers
- Air Treatment Equipment (Dryers & Filtration)
- Generator Sets (Standard or Custom Built)
- Repair of Compressors, Generators and Dryers
- In House training of equipment and personnel

Additionally:

- The administration and management staff embraces all of the organisation
- For the purpose of the day to day administration, the staff compliment embraces the entire organisation under one system
- We are an ISO 9001:2000 Organisation, Certified by Lloyds Register

11/05/2007

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COMPANY POLICY

THE ORGANISATION'S POLICY

As the Managing Director of the organisation I am committed to the Implementation of one umbrella Quality Management System (which complies with the Recommendation of ISO 9001: 2000 for all of the organisation.

We clearly understand the vital role played by quality in supporting the business objective of this organisation recognising the concept of "doing it right first time" in an atmosphere of honesty, integrity and trust. We will therefore ensure that the Quality Management System, its spirit and intent is communicated, implemented, and maintained by employees throughout the organisation to the ongoing benefit of all stakeholders.

The Organisation will achieve this policy through:

- Recognition as a totally reliable and consistent supplier in all our related products.
- Ensuring that our operational costs are minimised through the effective application of Quality Management principles and systems.
- Minimising all forms of wastage through planned systematic control of all our activities.
- Providing agreed quality and service levels, by fully undertaking our customer's needs and requirements and having the capability to meet them.
- Introducing and maintaining ongoing quality education and training for all our employees to develop individual skills and to increase Quality Awareness.
- Review our Quality Objectives on an ongoing basis.
- Improved Communication and self discipline.

11/05/2007

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COMPANY OBJECTIVES

QUALITY OBJECTIVES

- MEET DELIVERY DATES > 85%
- CUSTOMER SATISFACTION > 95%
- WARRANTY CLAIMS < 3 PER MONTH
- WARRANTY CLAIM COSTS < 0.05% OF TURNOVER

To Provide Products and Services to our Customers, which Conform to Agreed Requirements, Including Product Performance, Delivery Time and Cost.

To meet Customer and Internal Requirements the First Time, Every Time.

To provide Customers with the Confidence that they will be Supplied with High Quality Products and Services Consistently.

To have a Complete Quality Related History available for each Product and Process.

To Achieve and Maintain the aforementioned, the Organisation has Adopted a Policy of Quality Assurance.

11/05/2007

- Meet Delivery Dates > 85%
- Customer Satisfaction > 95%
- Warranty Claims < 3 per Month
- Warranty Claim Costs < 0,05% of Turnover

To provide Products and Services to our Customers, which Conform to Agreed Requirements, Including Product Performance, Delivery Time and Cost.

To meet Customer and Internal Requirements the First Time, Every Time.

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RECENT ADVERTISEMENTS

UTILITY OR AIR CONTRACT?

MAXIMA
BASE LOAD

OPTIMA
Variable Speed Drive

Specific Energy 5,4KW / M³ / Min

OIL INJECTED COMPRESSORS OFFERING OIL FREE AIR (ISO 8573)

In the past the concept of offering Oil Free Compressed Air with Oil Injected Compressors seemed impossible due to the complexity of such a plant. Maintenance, security, finance, economic energy management, efficiency and of course the assurance that the air conforms to an International Quality Standard seemed a daunting task, facing any potential supplier.

We **ARE** an ISO 9001:2000 Organisation, Certified by Lloyds Register

ARTHUR RUSHMER ENGINEERING ENT CC
11 BERYLLIUM STREET, ALRODE, JOHANNESBURG
TEL: +27 11 908 4169
FAX: +27 11 864 1588
SMS: +27 83 703 1291
EMAIL: info@are.co.za
WEB: www.are.co.za / www.airbankcorp.co.za

SECTION 105 COMPRESSORS

Open Frame - 64 dB(A)
100 SERIES
Receiver Mounted 1.5 - 3 KW

Open Frame - 61 dB(A)
1000 SERIES
15 - 22 KW

Open Frame - 71 dB(A)
500 SERIES
Receiver Mounted with Integrated Dryer
4 - 11 KW

Open Frame - 74 dB(A)
2000 SERIES
New Generation
30 - 55 KW

ENERGY SAVING & ALL BELOW 70dB(A)
FULL RANGE OF SUPER SILENT VERSIONS

Mattei Generators
10 - 2000 kVA

Portable Series
Silent, Diesel or Electric Driven
1.5 - 4.3, 7.5 - 11 KW

Arthur Rushmer Engineering Ent. CC, established in 1997, is a major player in the Compressor market, with staff that collectively have more than 150 years experience in the industry. WE SPECIALISE IN ROTARY VANE COMPRESSOR TECHNOLOGY.

We **ARE** an ISO 9001:2000 Organisation, Certified by Lloyds Register

Our subsidiary - Air Bank Corporation, was established for the purposes of rental compressors, supplied under a contract that would include full servicing, condition monitoring and maintenance of the units with the option to purchase at the end of the contract period.

ARTHUR RUSHMER ENGINEERING ENT CC
11 BERYLLIUM STREET, ALRODE EXTENSION 14, ALBERTON, 1449
PO BOX 167173, BRACKENDOWNS, 1454, SOUTH AFRICA
TEL: +27 (0)11 908 4169/9099 FAX: +27 (0)11 864 1588
SMS: 083 703 1291
EMAIL: info@are.co.za
WEB: WWW.ARE.CO.ZA
WEB SITE: WWW.AIRBANKCORP.CO.ZA

UTILITY OR AIR CONTRACT?

OIL INJECTED COMPRESSORS OFFERING OIL FREE AIR (ISO 8573)

MAXIMA
BASE LOAD

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Variable Speed Drive

Specific Energy 5,4KW / M³ / Min

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PO BOX 167173, BRACKENDOWNS, 1454
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SMS: +27 83 703 1291, Email: info@are.co.za
www.are.co.za & www.airbankcorp.co.za

RECENTLY PUBLISHED ARTICLES

Myths and truths: compressor efficiency and variable speed drives

October 2007

The myth: Variable speed drive compressors are more energy-efficient than traditional compressors that employ on/off control.

Analysis: With many industrial facilities often operating around the clock, plant-wide efficiency is paramount. The compressed air requirements on any given industrial site can be numerous and varied. Often, each application requires varying quantities of compressed air at different pressures, and at intermittent times. The resulting fluctuation in compressor load profile can complicate the task of selecting an appropriate compressor system.

In recent years, this quest for energy efficiency has seen an increase in the use of variable speed drive (VSD) compressors. It is often - and incorrectly - assumed that a VSD will always provide a more energy-efficient means of controlling the output of an air compressor than that of an on/off motor. This misconception is born from the popular belief that a variable speed rotary screw air end displays the same performance characteristics as a variable speed fan. There is, however, a fundamental difference between the two - the efficiency of a rotary screw air end is affected by changes in the speed of the apex of the rotary screw (tip), while the efficiency of a rotating fan blade remains essentially constant, regardless of the rotational speed of the fan (see Figure 1).

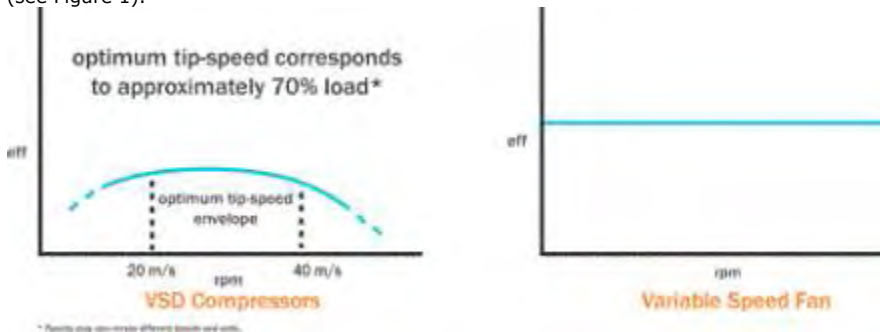


Figure 1. The efficiency of a rotary screw air end is affected by changes in the speed of the apex of the rotary screw (tip), while the efficiency of a rotating fan blade remains essentially constant, regardless of the rotational speed of the fan

This difference stands to reason, given that the rotary screw air end is a far more complex device than a simple fan. A rotary screw air end transforms the volume, temperature and pressure of incoming air, whereas a fan merely moves the air from one side of the fan blade to the other.

VSD compressors, by design, have an optimum tip speed 'envelope' within which they operate most efficiently. The optimum efficiency 'envelope' is usually bound by tip speeds of 20 m/s (at the low end) and 40 m/s (at the high end). A tip speed of less than 20 m/s results in air escaping back through the tip, while tip speeds greater than 40 m/s creates turbulent and inefficient compression.

Unfortunately, VSD compressors are designed to span the entire tip speed range corresponding to 0 to 100% compressor load. As a result, VSD compressors cannot operate within this optimum tip speed 'envelope' across the entire capacity range of the compressor. Manufacturers of VSD compressors predominantly size the air end to operate with an optimum tip speed corresponding to 70% load. When compressor loads reach above or below 85%, the tip speed is in turn adjusted above or below the optimum, and the VSD compressor's efficiency drops away.

As a result, compressors employing VSDs are more efficient than conventional on/off motor-driven compressors through approximately 50% of their capacity range - outside this '50%' envelope they are far less efficient. The manufacturer determines where this '50%' envelope lies. If the compressed air load regularly occurs outside this range, then other compressor options would be best suited to the application in place of a VSD compressor.

A variable output compressor (VOC) represents an ideal solution to maximising the efficiency of compressed air usage on the plant floor. The VOC is able to address changes in compressed air demand without changing the tip speed, making it one of the most energy-efficient compressed air solutions available. By controlling the delivery of air to the rotary screw air-end, the effective rotor length and compression volume is modified, enabling the delivery of compressed air at the selected capacity and pressure (see Figure 2). The VOC operates at an optimum tip speed across the entire load range (0-100%) and does not change throughout the output capacity range.



Figure 2

Conclusion: Before spending capital on a VSD compressor, careful analysis of the compressed air requirements of the application is crucial. It may cost more to run a VSD compressor. VSD compressors are only a more efficient compressor option in a limited number of applications. Conventional on/off load compressors are often still a more cost-effective solution.

A rotary screw air end has an optimum tip speed envelope that can be breached by a VSD. When compressor loads frequently reach levels that demand rotor speeds outside of the optimum tip speed envelope efficiency decreases and energy and money is wasted.

The 'Compressor Myths and Truths' series is supplied by Champion Compressors, an Australian-based designer and manufacturer of industrial rotary screw air compressors especially designed for harsh environments.

10 years of renting air successfully

Fourth Quarter 2007

Arthur Rushmer Engineering (ARE) was established in 1997 as a specialist service supplier for rotary vane compressors and the sole distributor for Mattei rotary vane compressors in South Africa.

Kevin Rushmer, CEO of ARE, says the company distinguished itself in the market by providing expert services as well as industry-leading products. "Subsequent to gaining the Mattei distributorship, our service and support brought a number of blue chip companies to our door and we were engaged at various smelter plants in SA and Mozambique.

"We therefore decided to enhance our rotary vane services with rotary screw products and services, most significantly gaining sole distributorship of the Champion range of air compressors in 2002."

It was then that ARE's management realised the market needed more than good products and service. ARE was the first company in its field to offer comprehensive maintenance contracts. Rushmer says these 'Aircontracts' are similar to the motor plan available on many cars today and provide for mandatory servicing of the products throughout the duration of the agreement.

The company was very successful in this endeavour and soon found it could not supply Mattei and Champion products in sufficient numbers. In 2005, the group gained the Kaiser distributorship to supplement its product line.

These products are handled via a subsidiary company, Air Bank Corporation (ABC), which is responsible for the servicing, condition monitoring and maintenance of all the units rented to customers on a maintenance contract. The clients, of which there are now over 100, are given the option to purchase their compressors at the end of the contract period.

ISO 9001/2000 certification

At the moment ARE is not planning to bring any new compressor products into the country, but has embarked on an even more difficult task, ISO 9000/2001 certification. Rushmer says this is to ensure the company operates in a completely transparent manner in all its contractual dealings.

This will also ensure its customisation of products for this market will be carried out professionally. "Our competitors attempt to offer this service at a premium to the purchase price, while ARE includes it in the price," Rushmer explains. "Again, we make sure our customers get the best deal."

As part of the company's ISO certification, and to ensure it handles customer information timeously and through the appropriate channels, ARE is in the process of computerising its entire operation with a Customer Relationship Management system. All company documents and communication will soon be digitised and stored electronically to ensure they are processed appropriately and by the right people.

The IT system has been developed in-house and will ensure all the necessary processes associated with ISO certification are followed and that the company's focus on quality is maintained.

Power generation

One new area of operation the company will be entering in the near future is that of supplying and servicing power generators. MQ Power, one of the top manufacturers of power generators in the USA, recently approached ARE with a view to distributing its products in South Africa.

MQ has done its homework and found that energy shortages and power outages in the southern African region will treble in the next decade, making this a lucrative market. Never one to turn away a good business deal, Rushmer says ARE will begin distributing generators in the 15 kVA to 3 MW range in 2008.

The company is in the process of upgrading its facilities and installing new compressor and generator testing facilities to better support its existing and new business lines.

With 25 people on board, ARE focuses on finding, training and retaining people with the appropriate expertise to deliver the services its clients demand. It also takes its social responsibility obligations seriously and is committed to skills enhancement for its entire staff.

For more information contact Kevin Rushmer, Arthur Rushmer Engineering, +27 (0)11 908 4169, kevin@are.co.za, www.are.co.za

Air system service and maintenance: penny wise is pound foolish

Second Quarter 2008

Kevin Rushmer of Arthur Rushmer Engineering is quite emphatic: trying to save money by reducing compressor and air system maintenance boosts electricity consumption, increases maintenance costs and compromises the life expectancy of pneumatic equipment.

The myths:

** Extending the intervals between compressed air system servicing saves money.*

** Fixing air leaks often is not worth the expense.*

Compressed air, along with electricity and hydraulic systems, is an essential means of reticulating energy in a modern industrial enterprise. Rushmer says that in South Africa around 10 to 15% of power generated is used to compress air. While this may be a surprise to some, the facts behind the true cost of air power can be even more surprising.

Service intervals

Consider a 22 kW compressor operating a two-shift (4000 hours per year) application. With electricity charged on average 25 cents per kWh, the average running cost of the compressor is R28 300 per year if no breakdowns occur. This assumes that the compressor is serviced three times a year at a cost R2100 per service, incurring an annual servicing expense of R6300.

By reducing the number of services to two per year, an apparent R2100 annual saving can be made.

In reality, allowing the compressor to run un-serviced for an additional two months, twice a year, has a dramatic effect on electricity consumption. Dust begins to clog the pre-filter, air-intake filter, oil filter and the air/oil separator. This clogging is cumulative and gives rise to a decrease in performance, and an increase in electricity consumption. For every 1 kPa of clogging, efficiency is reduced by 1%.

The snowball effect of the clogging in these two-month periods can cause significant pressure drop, equivalent to a 15% reduction in efficiency over a one year period. Consequently, reverting to two compressor services per year, results in an increase of R3300 in annual electricity consumption cost. Servicing the compressor three times a year instead of twice will thus actually save the user R1200 per year. More importantly, the lifespan of the compressor components is increased, and the chance of breakdown and the consequential downtime and repair costs are reduced.

Air leaks

The opportunity to save energy and money is not limited to the compressor itself. It is not uncommon to find multiple air leaks in the compressed air pipe work of any given medium-sized industrial facility.

The cost of producing this wasted compressed air is often considered less expensive than the cost of fixing the leaks. The time and cost of hiring a pipe fitter, approximately R2800 per day, to locate and mend these leaks often deters businesses from addressing this problem.

While this remedial work sounds expensive, a quick calculation would suggest otherwise.

From studies by the International Sustainable Energy Development Authority (SEDA) the cost of a 1 to 3 mm diameter compressed air leak can be shown to waste R9200 worth of compressed air per year (based on 700 kPa air pressure, operating 6000 hours per year, with electricity charged at 25 cents per kWh). Six such air leaks will incur an annual cost of R55 200. By contrast, a pipe fitter could be expected to repair all six air leaks in one day, at R2800. This equates to a payback period of just over 2,5 weeks, and an annual return on investment of 1957,5%. The total annual saving of fixing these leaks would be R52 400.

Conclusion

Poorly maintained compressed air systems negatively impact on the environment and can have a significant impact on a company's bottom line profit. Extending periods between compressor services and neglecting compressed air leaks results in increased operating and repair costs, shorter component life and a greater risk of production losses. Regular servicing and predictive maintenance are the most efficient means of compressed air system upkeep, and yield lucrative economical benefits.

The figures used in calculations are illustrative approximations. Actual cost/benefits will vary from application to application.

For more information contact Kevin Rushmer, Arthur Rushmer Engineering, +27 (0)11 908 4169, info@are.co.za, www.are.co.za

Lubrication guidelines for rotary vane compressors

Third Quarter 2008

Arthur Rushmer Engineering has compiled a 17-page document on this subject and has given Motion Control permission to host the guide on its website so that readers can access it in its entirety.

The following serves as an introduction:

Function of the lubricant

The oil in a rotary vane compressor serves four main purposes:

- * *Lubrication.*
- * *Sealing.*
- * *Cooling.*
- * *Protection.*

There are many undesirable and desirable characteristics for lubricants:

They should not:

- * *Form deposits.*
- * *Age quickly.*

Ideal lubricant properties include:

- * *Lowest possible viscosity.*
- * *Highest lubricating power.*
- * *Resistance to high temperatures.*
- * *Detergent and dispersant properties.*
- * *Chemical stability.*
- * *Technical-economic benefits (ideal properties vs. cost).*

Lubricant analysis

Regular analysis of the lubricant in a compressor provides an important insight into:

- * *Suitability of lubricant for continued use.*
- * *Quality of intake air.*
- * *State of wear of compressor.*

For the complete article visit www.motioncontrol.co.za/papers/083Q84A.pdf and for more information contact Kevin Rushmer, Arthur Rushmer Engineering, +27 (0)11 908 4169, info@are.co.za, www.are.co.za

Screw vs rotary vane compressors: technology and maintenance

Fourth Quarter 2008

Different technology compressors show differing wear patterns, behave differently as they wear and have differing maintenance, lubrication and ownership costs.

Screw compressors

A screw compressor is most efficient when it is new and its clearances, compression cycle leakage and energy consumption (specific energy requirement) are at their minima. As the compressor runs, its efficiency declines. Dirt particles begin to clog the inlet filter and those that pass through the filter combine the lubricating oil to act like a grinding paste. Gradually clearances deviate from the original design, resulting in the blow-hole effect – air blowing back between the male and female rotors.

Leakage of air to the intake and to preceding pressure cells increases specific energy consumption. This is the primary reason why screw compressor manufacturers recommend air end exchanges between 20 000 and 50 000 operating hours.

Because of the large amount of metal that must be removed during machining, the rotors of a screw compressor are made of malleable mild grade steel. The surface of the metal is not porous and it does not retain oil. As a result of metal to metal contact during each start up, galling occurs. A pair of rotors that have been in service for less than 2000 hours will have gaps in the seal landings on the outer diameter of the rotor lobes, and numerous scars on the flanks of the lobes. On commissioning the intake of a screw compressor has to be bled to avoid harmful metal to metal contact.

It is impossible to produce screw compressor lobe forms that mesh perfectly. During most of the cycle leakage paths exist, which allow air to escape from the high pressure zone to the intake. The leakage through these paths is constant. The effect of this is that the percentage of leakage lessens at higher speed and increases at lower speed. This low speed characteristic causes the screw compressor to absorb high kW at low rotational speed unless the speed is regulated by inverter technology. Even then there is a threshold of 40% otherwise efficiency is compromised to a greater degree than with rotary vane technology.

The number of bearings required on each rotor of a screw compressor is double that required on a rotary vane compressor. Due to the thrust created during compression, the rotors of a screw compressor have to be fitted with expensive high quality thrust bearings to ensure fixed clearances and to absorb radial and axial loading. Generally, angular contact ball bearings have limited capacity in both directions and consequently a life expectancy of approximately 20 000 operating hours. This is further complicated by the high speed that these machines run at to obtain output, especially for oil-free models. The effect of bearing failure on a screw compressor is often complete destruction of the screw air end. The replacement cost of the air end can reach 70% of the compressor cost.

Rotary vane compressors

Rotary vane compressors do not degrade with wear but actually improve. As the blades seat in on the stator and rotor slots, leakage and power consumption are reduced and the compressor efficiency stabilises at a level up to 5% higher than when new. Clearances are maintained at a minimum throughout the life of the compressor by controlling wear factors primarily through the use of superior lubricants. A decade ago lubricant technology required rotary vane manufacturers to replace lubricant every 400 hours to ensure long bearing life and low wear. Today these replacement intervals have been extended through the use of heavyweight oils which are compatible with cast iron, porous materials and white metal.

The vane compressor has a single rotor with matched alloy blades, two white metal bearings housed in end covers, and a stator manufactured from high quality porous material. Cast iron is a superb absorber and bearing material because of the free carbons, hard iron carbides and their oil retaining qualities. There is no metal-to-metal contact between the moving parts; not even directly between the blades and the stator. Modern rotary vane compressor blades are made of superior quality materials that are machined and processed robotically to produce a high quality standard and superior wear resistance. Rotor and stator material selection in combination with modern lubricants eliminates galling and reduces wear to almost zero over the life of the compressor. Modern rotary vane compressor blades have a 100 000 hour-plus life expectancy.

Fixed speed rotary vane compressors run at a speed of 1450 rpm and most are directly coupled with no thrust on compressor or motor bearings with horizontal orientation, only producing radial loading for which white metal has proven to be the best solution. Using correctly sized white metal bearings in conjunction with suitable lubricants and maintenance, the majority of rotary vane compressors will use only one set of bearings throughout their life.

The maintenance aspect of items like synthetic lubricant, lubricant filters and separator changes, are not always similar. Certain types of rotary vane compressors have superior lubricant separation systems and separator element changes are only necessary after 10 000 operating hours while other designs of separation require separator element changes at 6000 hours.

For more information contact Kevin Rushmer, Arthur Rushmer Engineering, +27 (0)11 908 4169, info@are.co.za, www.are.co.za

Lloyds Register ISO certifies Arthur Rushmer Engineering

Fourth Quarter 2008

Arthur Rushmer Engineering's (ARE) quality management system has been approved by Lloyds Register Quality Assurance as meeting the requirements of ISO 9000:2000. The approval covers the sale, service and maintenance of air compressors and associated ancillaries until 10 May 2011.

During a ceremony in which Kevin Rushmer received the certificate of approval from Martin Ledger, the Lloyds Register auditor, Rushmer explained the importance of quality assurance for the company. This is of special significance in light of the company's recent launch into aluminium smelter services. These will be handled by ARE ~ CAAST Services (Compressed Air Aluminium Smelter Team); a team of specialists dedicated to offering expertise and services to aluminium smelter plants around the world.



Kevin Rushmer of Arthur Rushmer Engineering at the company's ISO award ceremony

Following the receipt of the ISO certification, ARE has been appointed as an official vendor to three major smelters in the Middle East and Australia.

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Compressed air shortages? Solve inadequate compressed air supply problems

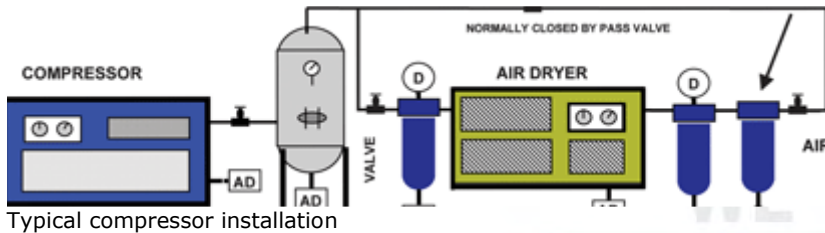
1st Quarter 2009

Many compressed air users believe that upgrading to a larger air receiver will provide more compressed air and solve all inadequate compressed air supply problems.

With modern technological advances it is principally the compressor that is vital to the performance of a compressed air system, not the air receiver. In the final analysis it is the compressor, not the air receiver, which ultimately governs the available quantity of compressed air output.

Inadequate compressed air supply at point of use can be caused by a number of system faults, but the three most common causes are:

- * An undersized compressor.
- * Pressure drops associated with the compressed air reticulation pipework.
- * Intermittent compressed air demand spikes.



Right-sizing the compressor

A genuine lack of compressed air being produced can be the obvious cause of inadequate compressed air supply. If so, the problem can be easily diagnosed at the heart of the operation: the compressor.

As a rule of thumb, a compressor struggling or unable to maintain its minimum design pressure output for at least one minute can be considered too small to meet the compressed air demands of the particular application and will cause unnecessary energy consumption. An air receiver will not overcome this inadequacy and installing an additional compressor in parallel with the undersized compressor is also no longer the best solution.

Replacing the existing compressor with a larger one will increase the compressed air output. However, modern technological advances have expanded the possibilities and today there are other ways of increasing air output capacity efficiently and effectively while simultaneously saving up to 30% in energy consumption.

Reticulation design

Frequently the design of the compressed air reticulation pipework, crucial to the performance of the compressor, is considered less important than the compressor itself. When the reticulation system is poorly designed users experience a drop in pressure between the compressor output and the point of use, resulting in a diminished compressed air supply. While some pipework induced pressure drop is expected, significant and sustained drops in pressure in healthy compressed air systems are uncommon and should be investigated. A pressure drop is often the result of undersized pipework. A more cost-effective solution to this problem is to upgrade to larger reticulation pipework: not to install more compressors or increase air receiver capacity, which is effectively energy stored and potentially wasted.

Peak demand

Finally, inadequate compressed air supply can be a direct result of temporary spikes in compressed air demand during peak periods of operation and start-up. In this case an air receiver may indeed provide a 'buffer' solution at the point of use; temporarily enabling the compressed air system to satisfy the increased compressed air demand.

Compressed air specialists will agree that this solution is limited to very few applications today due to the efficiency of modern compressors and their associated management systems.

Conclusions

- * *It is the compressor and its designed operating protocol, not an air receiver, which ultimately dictates the compressed air system supply capabilities.*
- * *A compressor controlled via a pressure switch or transducer signal only is no longer sufficient or conducive to energy saving unless combined with a VSD (variable speed drive) or compressor management system.*
- * *Introducing a larger air receiver does not enable the compressed air system to satisfy increased compressed air demand.*
- * *The problem may be alleviated by the introduction of a VSD or computerised compressor management system.*
- * *The installation of an air receiver in large industrial applications is no longer a solution and is an unnecessary expense.*
- * *It is essential that the compressor(s) and associated pipework are designed and sized adequately to satisfy the compressed air requirements of the particular application.*
- * *The right compressed air solution can only be determined through mains air analyses in order to recognise the true character of a compressed air plant.*

Arthur Rushmer Engineering provides a mains air analysis service that can help users identify the root cause(s) of inadequate air and recommend potential solutions.

For more information contact Kevin Rushmer, Arthur Rushmer Engineering, +27 (0)11 908 4169, info@are.co.za, www.are.co.za