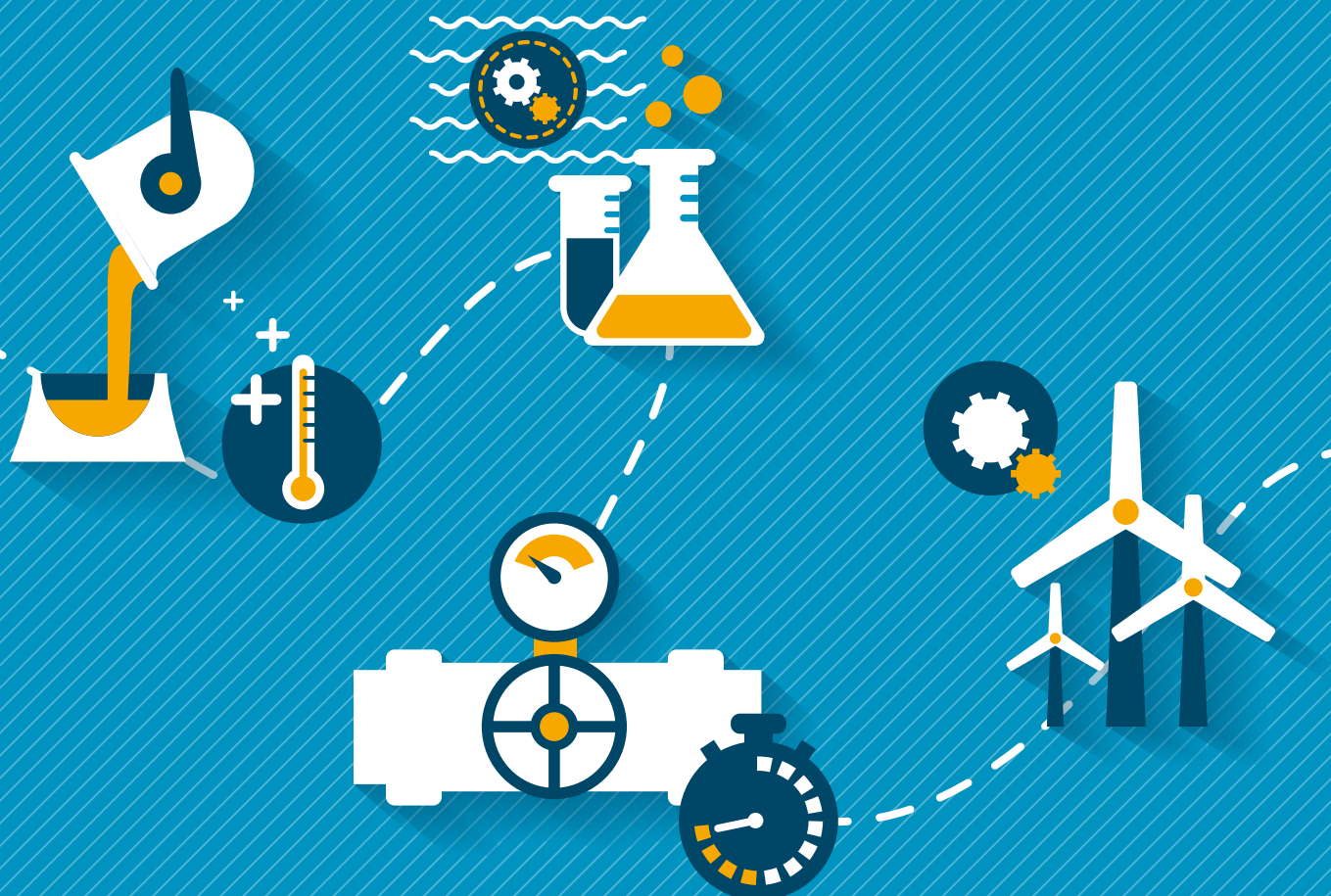




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CASE STUDIES

**4 AIR MOTORS
APPLICATIONS**

INTRO

Modec Air motors are used in various industries :

- Nuclear
- Food and beverage
- Printing
- Special machinery / mechanical engineering
- Chemical and Pharmaceutical
- Textile
- Agricultural
- Oil & Gas
- Waste & water management ...

Our high performance air motors are used for quite diverse and specific applications, in many different industries, although our customers requirements are often similar.

It is therefore essential to us to offer a catalog of that offers a wide range of products in order to meet most of the needs of our customers.

But it is also essential to be able to adapt and propose solutions that are not available in our catalog because too specific (that would be too easy!)

This is where the flexibility and responsiveness of Modec come in!

We regularly respond to very specific requests. To ensure the same quality of service to every customer and provide the right products, we have to study their requirements in detail, understand the application environment, and perform various tests to ensure a top quality solution.

In those 4 case studies we will show you specific client challenges and the way we responded.

A good way to present the range of possible achievements by our team!

Good reading !





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WHEN THE GOING GETS HOT!

**HIGH TEMPERATURE RESISTANT
AIR MOTOR**

HIGH TEMPERATURE RESISTANT AIR MOTOR

This type of air motor is commonly used for machines and appliances operating in hot and humid environments, for example in the blast furnaces and foundries of the steel industry or in the injection molding industry.

THE CUSTOMER NEEDS

The primary aim when using air motors in high temperature environments is to ensure they keep working when rising from a cold temperature to a very hot temperature. If certain parts in the motor expand, for example if the rotor dilates and touches the end plates, then the motor will stall bringing your machine to a grinding halt.

So the key is to focus on the expansion coefficient of all the motor's parts to make sure they keep their dimensions and don't expand. For this, the choice of materials is paramount, notably for the blades and other rotating parts causing friction.



Our technical team at Modec tested the performance of various materials in extremely high temperatures for hundreds of hours before making the final selection. The materials must also be sufficiently robust to withstand wear and tear so as to avoid costly regular maintenance and repair.



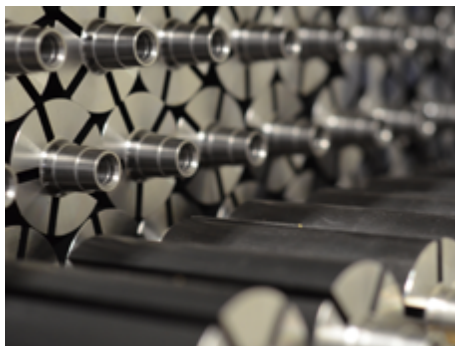
THE MODEC EXPERIENCE

Equally important is the design of the mechanics. The parts should be assembled in such a way as to allow for a small margin of expansion without affecting the way the motor runs.

Other critical factors include the choice of lubricating product for the gear box and the type of roller bearings used. We use a form of grease that will not liquefy under high temperatures – if the lubricating grease liquefies there is a danger it will leak out of the gear box, and if insufficient grease remains in the gear box it will overheat. As for the roller bearings, they need to be the right fit and well protected in order to avoid undue exposure to different elements in the environment, such as tiny dust and sand particles often prevalent in steel workshops and foundries, which can lead to rapid deterioration.

In general, air motors are better suited to hot, humid environments than electric motors because they have an integrated cooling system thanks to the cooling effect of expanding air. Electric motors need to be significantly oversized in terms of power, size and weight to withstand high temperatures. Also, electric motors are operated via large panels of expensive switches and wiring that can be prone to rusting or malfunctioning in this type of atmosphere.

The initial cost of a pneumatic motor may be greater, but once you factor in the maintenance and replacement costs required for electric motors, then you find air motors give a better return on investment in the long run.

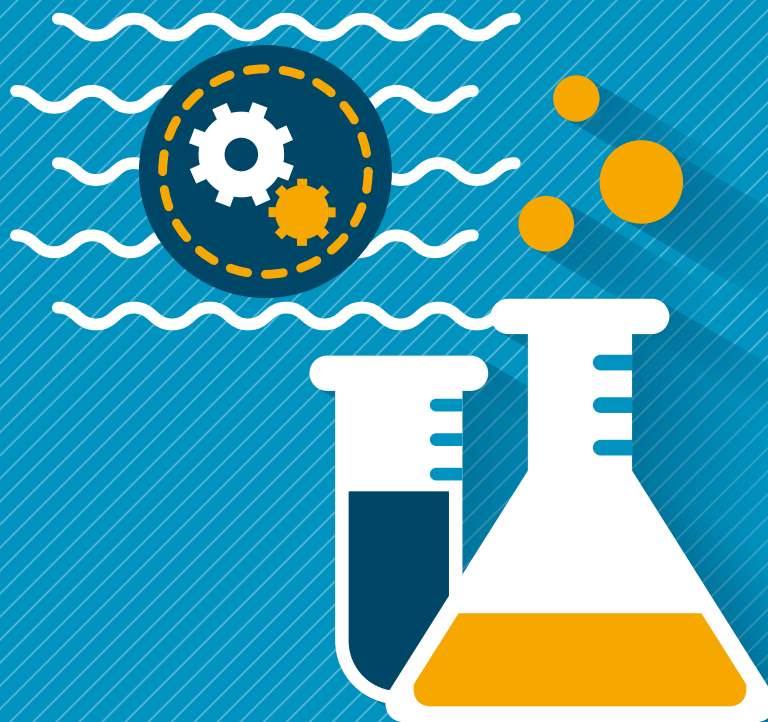


THE MODEC SOLUTION

Air motors are also ideal for industries, like the steel industry, which use air in the processing action and therefore have a ready supply of air on site.



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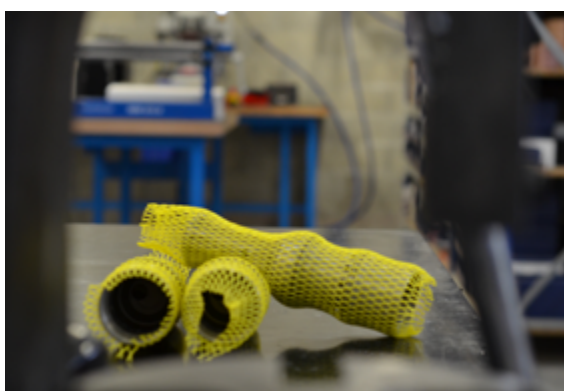


LET'S DIVE !

**MODEC SUBMERSIBLE
AIR MOTOR**

MODEC SUBMERSIBLE AIR MOTOR FOR A RELIABLE UNDERWATER SOLUTION

Our watertight air motor is 100% water resistant and suitable for use in all kinds of underwater applications. It also offers a highly effective solution for applications used in environments that demand a comprehensively sealed air motor, such as the nuclear or chemical processing industries.



THE CUSTOMER NEEDS

The design team here at Modec initially developed our watertight air motor in direct response to a client's specific needs. The client, a successful global company, runs a variety of operations dependent on the management and movement of clean, unpolluted water.

As a certified eco-friendly business, the client had two key requirements for the air motors activating its underwater systems:

- they had to be absolutely watertight to prevent any salt water entering and damaging the motor, especially as the company wished to avoid time-consuming regular maintenance of the motors; and
- it was imperative to prevent air bubbles escaping from the air motors which could potentially contaminate the water.

THE MODEC EXPERIENCE

To address the issue of viable long-term waterproofing, we make the motor using top of the range materials, including high performance INOX stainless steel for all the rotating parts that come into contact with the water, for example the output shaft, where there is the most danger of water seeping through sealed joints over time. The seals can resist the effects of output shafts turning at a speed of around 100 rpm and, crucially, remain watertight when the motor is turned off.

Preventing the escape of bubbles from the motor posed a complex technical challenge. As well as completely sealing the motor, it meant finding a way to collect the air at the exhaust point and bringing it back outside the water. This sealing allowed us to use a motor fed with lubricated air which significantly increases the length of time it can operate without requiring maintenance.

As this was a key factor for the client, we carried out targeted trials here at our test centre to ensure our motor met their demands. First, we immersed the motor 6 meters deep in water for one week and were pleased to find that not one drop of water had entered the motor. Secondly, we put the motor in a water tank for a similar length of time and checked that no air escaped into the water.



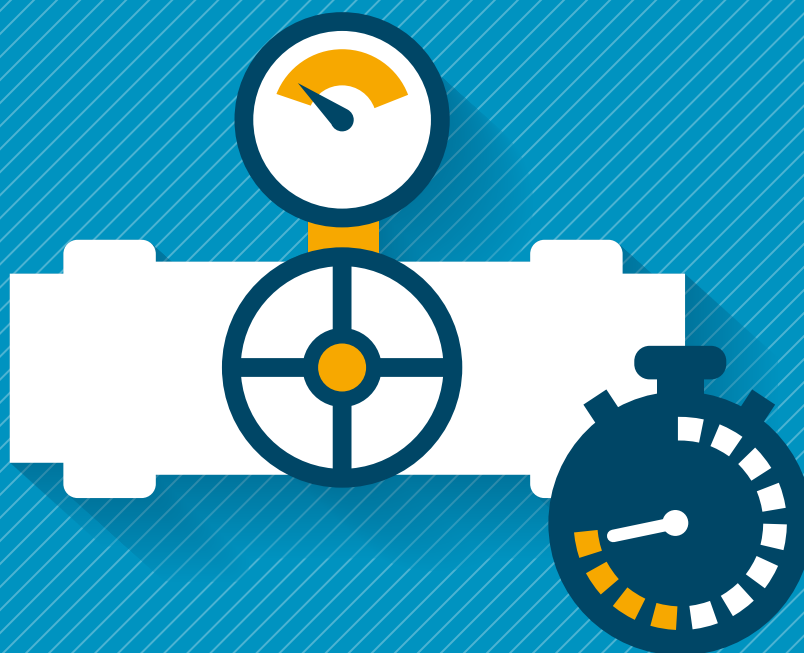
We believe air motors offer the best solution for underwater applications. Hydraulic motors often leak oil which pollutes the water, while electric motors inevitably involve an element of risk when used in water. Watertight air motors protect the environment and guarantee safety.

THE MODEC SOLUTION

Significantly, our watertight motor can be adapted to meet the precise requirements of other companies operating in the sub-marine sector, and in other industries where an airtight or water resistant motor is of primary consideration.



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TAKE YOUR TIME !

LOW SPEED AIR MOTOR

OUR BESPOKE SOLUTION FOR YOUR LOW SPEED AIR MOTOR

Certain functions using air motors require precision movement and/or a slow rotation speed. Take for example, the valve industry. If you open a valve too quickly, you risk bursting the pipe. Or the crane industry, where heavy loads have to be lifted, rotated and lowered very carefully.

THE CUSTOMER NEEDS

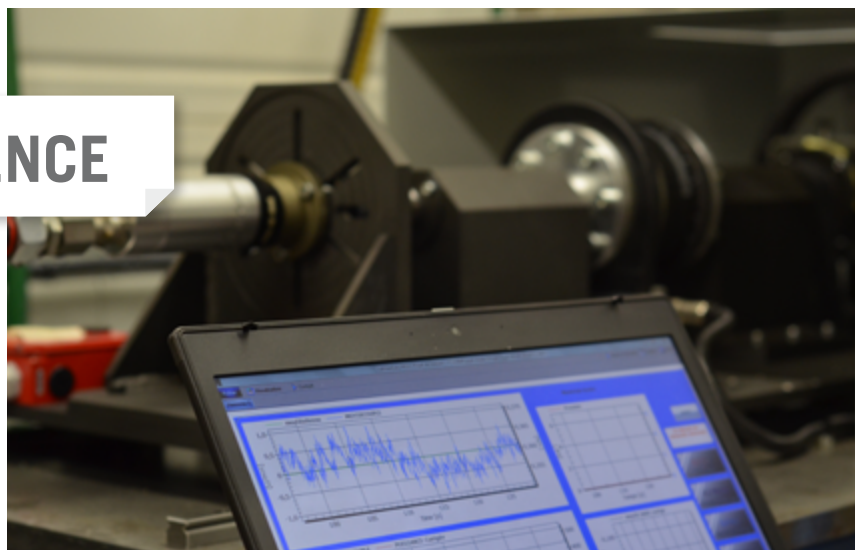
We first encountered this issue when working with a client in the nuclear industry. The company required a motor with a rotation speed of just 1rpm (which involves very high reduction) for a specific application. This meant we had to find a way to control the torque but without installing a large, heavy gear box that would normally be needed to achieve this. We found a solution by incorporating a small torque limiter into the motor.



Pneumatic motors reduce the rotation speed by using planetary gearing. However reducing the speed has the effect of increasing the torque, so we have to find a way of regulating the torque in order to protect the motor and, more importantly, the client's machine and the person operating it!

THE MODEC EXPERIENCE

Building on from this experience, our team has designed a wide range of torque limiters that can be adapted and used in unlimited combinations to respond to our clients' needs. We have two basic prototypes:



- A small torque limiter which is placed in the middle of the air motor as an integral part. Placing it between the pneumatic part and the gearbox means you can manage a large torque with a smaller torque switch. The advantage of this option is a lighter motor adapted for use in smaller spaces.
- The second is a larger torque limiter which is effectively a separate module added to the end of the motor. This is suitable for use in machines based in the plant or workshop, or in situations where space is not restricted.

An added advantage of Modec torque limiters is that you can either set the motor to disengage once the maximum or selected torque limit is reached, or you can opt to receive a signal that indicates the limit has been reached giving you the option to either stop the motor or any other action (for example change the rotation direction, or change the supply air pressure).



THE MODEC SOLUTION

We have clients using our low speed motors in the French valve manufacturing industry and aircraft industry (for slow-moving conveyors), in chemical refineries in China, as well as a major water supply company in France. Given that every business will have a different requirement, we prefer to work with clients individually to design and build on demand a low-speed air motor that meets their specific needs.



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**WHAT'S NOT TO LIKE
WHEN IT DOES ALL
THE HARD WORK FOR YOU!**

'NUT RUNNER' AIR MOTOR

MODEC'S 'NUT RUNNER' AIR MOTOR

We came to produce our nut runner by chance, essentially to assist our client – a leading German company for tightening tools – and have gone on to develop a niche position in the market.



THE CUSTOMER NEEDS

This company is a specialist manufacturer of high torque nut runners, but they occasionally have customers asking for a nut runner with a lower torque or requiring certain alterations for use in different applications. Prior to their association with Modec, the company wasn't in a position to provide this service and would find themselves having to suggest a competitor, running the risk of potentially losing the client's business.

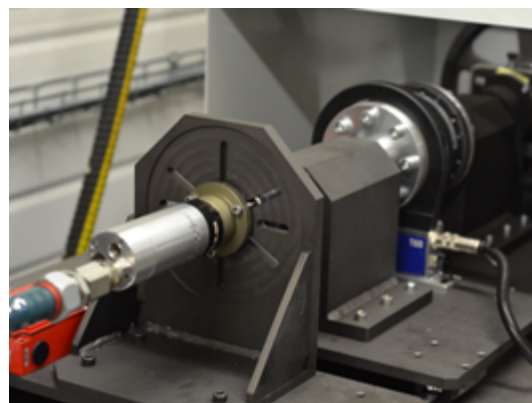
Today, if they don't have a solution within their product range to meet a customer's requirements, they come to us – we find a solution and they keep their customers.

THE MODEC EXPERIENCE

By default, many businesses have been using nut runners, which are essentially a tool, as a motor for their machines. The difference with the Modec 'nut runner motor' is that we offer an actual motor to do the same job and we can adapt our nut runner motor to fit the specific requirements of our clients' machines, which is how we were able to help our German customer.

In functional terms, pneumatic motors are better than electric motors for carrying out the role of a nut runner which is to tighten or loosen a nut bolt.

Why? Because the process involves the motor to reach its stall torque, and if you regularly stall an electric motor it won't last long except if it is oversized!



The automobile industry prefers electric motor nut runners for the simple reason that they facilitate the task of logging the date and time of interventions, but for use in other industries, such as wind turbines and notably when a very high torque is required, air motors are nearly always the better choice.

For example, we recently sold a bespoke nut runner to a company in Italy which assembles train chassis (known as bogies) and were experiencing difficulty accessing all the bolts. Another application that poses difficulties for standard nut runners is the maintenance and repair of motorway safety barriers due to the underside positioning of the nut bolts and the limited work space.



THE MODEC SOLUTION

In the nut runner market, we position ourselves as niche suppliers listening and responding to clients' specific needs. If you need a right-angled pneumatic nut runner, or a nut runner with a specially fitted crow foot, or need to be able to operate in a very tight space, our technical team at Modec will find a solution.



At Modec, we pride ourselves on our flexibility and reactivity as we understand that a fast response and top quality service can make the difference for our customers.

We like to work directly with our clients' design teams to fully understand their needs and provide a fast solution – we can design, prototype, test and deliver within a few days.

This is also where financial savings can be made: With Modec, you don't need to adapt your machine to a standard air motor, we can adapt our motors to your solution.

**« What's more,
we can do it quickly! »**



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