

YES, AIR IS FREE BUT NOT FOR EVERYONE!

Whilst fresh air is free, compressed air is not. The compressed air distribution network is all too often a cause of leaks and load losses.

The actual cost of compressed air therefore depends directly on the type of distribution circuit.

Increased compressed air costs

Although the compressor acts as the real motor in the installation, in reality it is generally not this item which is the most expensive. Other essential factors must be taken into account when drawing up an objective analysis of the network: - air quality - required working pressure - type of network - air losses - choice of material. Apart from poorly designed networks requiring more powerful compressors, air leaks are all too often present throughout the system and in some cases can absorb nearly 50% of the compressor's production, wasting both energy and money. But is this tolerable?

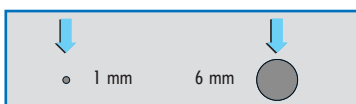
Small holes, large effects

On an older network, leaks or the like are in abundance. After a time, the compressor becomes out of breath and is replaced with a more powerful one. Do you believe that this is the correct way to solve this problem without effectively dealing with the causes? Let's take a look at an actual example.

Shown below are a 1 mm hole and a 6 mm hole.

The calculations were performed based on the following:

- network pressure = 7 bar
- cost per kWh = FF 0.45 / 5 pence
- operating time = 8000 hours/year



Compressed air pipework system

The real costs of these leaks

| 1 mm hole | 6 mm hole |
|----------------|-----------------|
| FF 1,088 /year | FF 48,000 /year |
| £ 110 /year | £ 5000 /year |

Productivity and savings

To obtain the optimum efficiency from a network, apart from the ultra fast installation aspect, four criteria are absolutely essential:

- Intelligent and suited design: low or even zero load loss
- Perfect sealing: no leaks
- Clean air with constant quality: protected tooling
- No corrosion: longevity and maintenance savings.

editorial

Stolen money?

For your company and those of your customers, productivity gains are a constant concern.

Under these conditions, each factor involved in the correct running and operating quality of the company must be taken into account, with the utmost thoroughness.

However, there is one factor in many production facilities which is all too often neglected since it is invisible. In fact, just as invisible as air itself - compressed air.

This essential driving force behind various manufacturing steps in the most diverse sectors of activity is quite troublesome and very costly if not closely monitored.

A poorly designed, poorly suited or old compressed air distribution circuit may therefore invisibly but unavoidably steal the so carefully acquired productivity gains.

Money, your money and your customers' money may be stolen in the most cunning way ever!

The aim of this issue of GIRPI INFOS is to explain to you about the «pitfalls» of a compressed air circuit and their cost and to offer you simple, effective and quick ways of solving them.

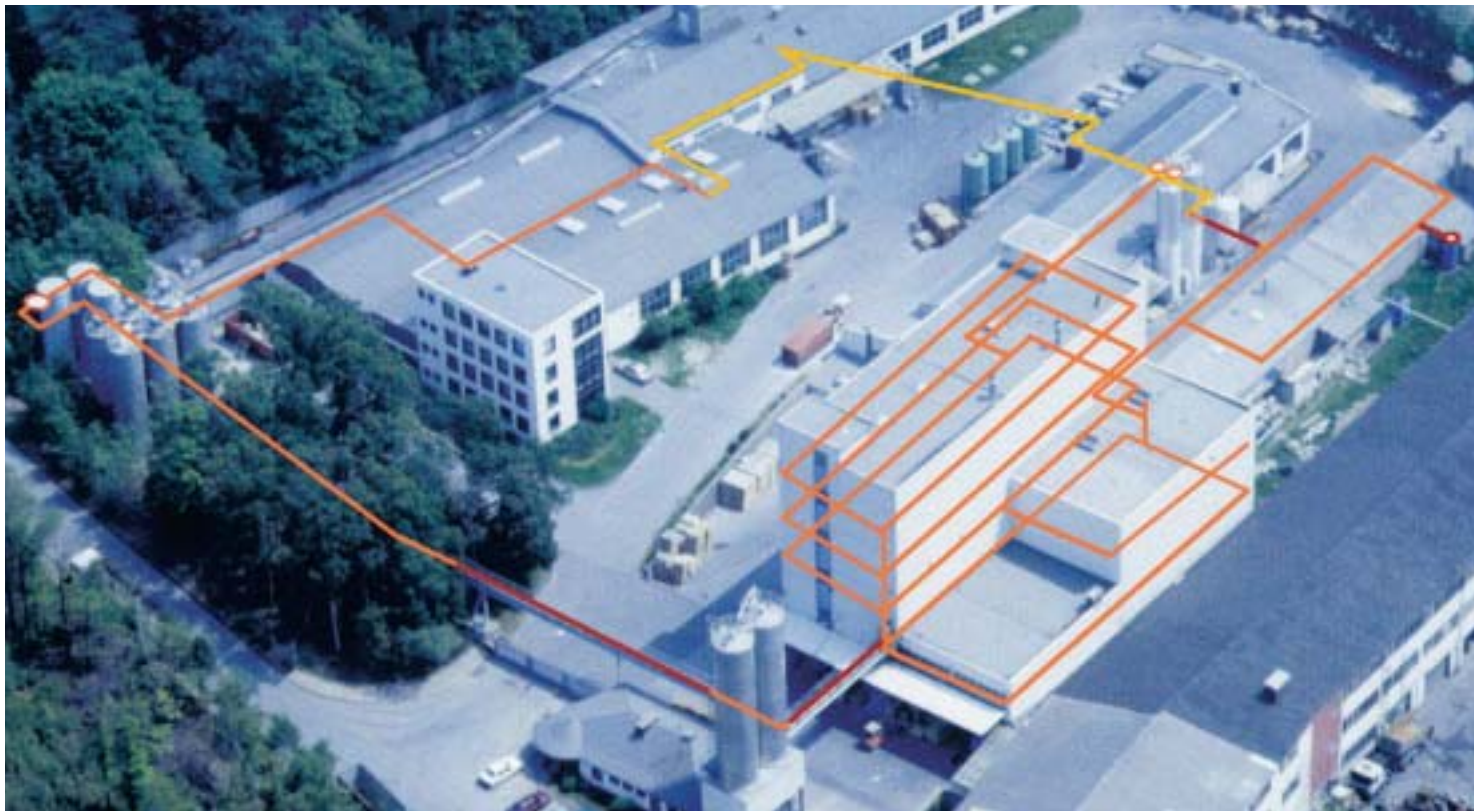
EFFICIENCY FOR COMPRESSED AIR: GIRAIR® SATISFIES ALL TECHNICAL REQUIREMENTS

- › operating conditions:
 - nominal pressure 12,5 bar
 - temperature -20°C to + 25°C
- › absolute sealing
- › always clean air
- › totally corrosion free
- › simple and quick to install
- › technical reliability
- › incomparable longevity, reduced maintenance
- › light weight, easy to handle
- › immediate identification

GIRAIR®: NO NEED TO BE DEPRESSED ABOUT COMPRESSED AIR!

compressed air GIRAIR IN GERMANY: AN EXEMPLARY SITE

By renovating its old compressed air network, the Voerde factory in Ennepetal (Germany) which manufactures various products for Hoechst, now makes more than £ 10,000 of actual savings a year.



Girair compressed air distribution system in the Voerde factory in Germany

Dark red line: visible external ducting

Yellow line: old connection ducting used

Orange line: ducting inside the buildings

Red/white ellipse: compressed air generator

An old network incompatible with new objectives

Compressed air is present everywhere in the Voerde factory to operate the various manufacturing stations.

The imposed competitiveness required the company to take a thorough look at the energy costs required for production.

There was much to be done regarding compressed air which included several kilometres of network, highly corroded overhead and underground ducting, various metal pipes, many different types of connectors which were often poorly dimensioned all supplied by decentralised compressors with a capacity of 1600 m³ / hour.

Result: constant pressure losses and leaks caused by these old metal ducts.

Rationalisation and state of the art technique

A precise study (carried out with K.H. Feldmann METAPIPE GmbH, Girpi's partner in Germany) highlighted certain problems of the old network, and the weak points in terms of nominal diameter and leaks were identified.

It was then recommended that most of the ducting network be replaced with a more rational circuit made from a material which must withstand external and internal corrosion and withstand impacts.

GIRPI's GIRAIR system was chosen for its excellent resistance and suitability to the imposed constraints.

The new network was therefore fitted with GIRAIR over a length of more than 2 km and in diameters from Ø 32 to Ø 110. To serve this network, the decentralised compressors were upgraded. The whole system is now fully installed and is currently being progressively put into service.

Operated by a numerical control computer, it is now at the forefront of technology in the field of compressed air.

A very positive assessment

Leaks and energy losses were totally removed, which allowed compression to be reduced to less than 5 bar. The air obtained is now clean and at constant pressure, providing the various operating stations with excellent longevity and minimum maintenance.

For Michael BLASSHOFFER, the factory's maintenance director, the most amazing fact is the ease and speed with which his own personnel (no «compressed air» specialist) were able to install the new GIRAIR network.

A well designed, well prepared and well implemented operation of this nature will provide Voerde with excellent quality compressed air for a long time and unarguable savings at the end of the year.

Leaks are expensive!

| Hole diameter mm | Air leak 6 bars, l/s | Energy loss kW | Annual cost | |
|---------------------|-------------------------|-------------------|-------------|--------|
| | | | £ | € |
| 1 | 1,238 | 0,3 | 170 | 245 |
| 3 | 11,140 | 3,1 | 1700 | 2533 |
| 5 | 30,950 | 8,3 | 4500 | 6741 |
| 10 | 123,800 | 33,0 | 18000 | 26.965 |

ASK THE RIGHT QUESTIONS:

| | | |
|---|--|---|
| Is the overall cost for producing compressed air in your company (compressor, energy, network, maintenance) | <input type="checkbox"/> falling | 1 |
| | <input type="checkbox"/> stable | 2 |
| | <input type="checkbox"/> rising | 3 |
| Operating costs represent a: | <input type="checkbox"/> minor factor | 1 |
| | <input type="checkbox"/> average factor | 2 |
| | <input type="checkbox"/> high factor | 3 |
| About your compressor | | |
| - has it been replaced in the last 3 years? | <input type="checkbox"/> yes | 1 |
| | <input type="checkbox"/> no | 3 |
| - if its power has been increased, has the network been modified? | <input type="checkbox"/> yes | 1 |
| | <input type="checkbox"/> no | 3 |
| About your compressed air network | | |
| - do its performances fully satisfy your needs? | <input type="checkbox"/> yes | 1 |
| | <input type="checkbox"/> fairly | 2 |
| | <input type="checkbox"/> no | 3 |
| - has your maintenance team repaired it in the last six months? | <input type="checkbox"/> rarely | 1 |
| | <input type="checkbox"/> sometimes | 2 |
| | <input type="checkbox"/> frequently | 3 |
| | <input type="checkbox"/> running maintenance | 1 |
| | <input type="checkbox"/> leaks | 2 |
| - what was the most common problem? | <input type="checkbox"/> load losses | 2 |
| | <input type="checkbox"/> corrosion | 3 |
| | <input type="checkbox"/> bad air | 2 |
| About your pneumatic equipment | | |
| - has it suffered breakdowns or premature deterioration ? | <input type="checkbox"/> never | 1 |
| | <input type="checkbox"/> sometimes | 2 |
| | <input type="checkbox"/> often | 3 |
| - do you feel the situation: | <input type="checkbox"/> is normal | 1 |
| | <input type="checkbox"/> could be better | 2 |
| Does your company incorporate the following criteria: quality/productivity/prevention/savings? | <input type="checkbox"/> yes | 1 |
| | <input type="checkbox"/> no | 2 |
| Do you require the following qualities for your compressed air network: clean air, maintenance free, anti-corrosion, impact resistance, airtightness | <input type="checkbox"/> yes | 1 |
| | <input type="checkbox"/> no | 2 |
| TOTAL SCORE | | |

- **9 - 12** Your network is satisfactory. You are a good manager.
- **13 - 18** You can certainly improve the efficiency of your compressed air network. Refer to the technical check-list opposite.
- **19 - 31** Compressed air must be expensive for you. It is time to take action. Consult our specialist technicians urgently.

«NETWORK QUALITY» CHECK-LIST

If you answer **NO** to more than 2 questions, we strongly advise that you check your network and consult a GIRPI distributor.

1 - Operating pressure

- 1-1** To generate compression of more than 1 bar, is at least 6% more energy required to drive the compressor? yes no
- 1-2** With a pressure drop from 6 bar to 5 bar, is the power of a tool reduced by 25% or more? yes no
- 1-3** Is the load loss between the compressor and the user less than 1 bar? yes no
- 1-4** Were the valves and fittings selected to ensure the load loss is as low as possible? yes no

2 - Air loss

- 2-1** Can a 1 mm hole with a pressure of 7 bar cost you up to £ 110 per year? yes no
- 2-2** When the work stations are not operating, have you worked out how much air escapes from the non sealed stations? yes no
- 2-3** Does your network contain enough segments to be able to isolate it if a leak is detected? yes no
- 2-4** Do you perform regular checks to detect leaks, especially on the work stations (valves, hoses, tools)? yes no

3 - Design, dimensions and choice of material

- 3-1** Does your compressed air network have the following components: main pipe, distribution pipe, pipes and connection accessories? yes no
- 3-2** Is the compressor located so as to be as close as possible to the main usage centre? yes no
- 3-3** Connection pipe: did you opt for the largest possible diameter to ensure large consumers have sufficient air? yes no
- 3-4** Was the material chosen taking the specific criteria of the compressed air pipes into consideration? yes no

4 - Premature wear of tooling

- 4-1** Have you checked the cleanliness of the compressed air flowing through your network to detect any metal particles due to rusting? yes no
- 4-2** Have you noticed any repeated repairs to your pneumatic tooling, due to damage and premature wear? yes no
- 4-3** Have you assessed the real cost of production stoppages, extra maintenance costs and equipment damage? yes no

GIRAIR®: THE QUALITY RESPONSE TO NEW COMPRESSORS

Whilst a great deal of technical and economic progress has been made over the last few years in the field of compressed air production, the networks themselves have not always followed suit. However...



- **New compressors** have become real computer controlled energy plants. They produce more and better air, whilst consuming less energy. However, the networks to which they are connected are mostly very old and not suited to modern tooling. Built over the years from incongruous assemblies (black steel pipes, copper pipes), they are not up to the standards required by well managed production. **And above all, these networks simply accumulate faults which even the best compressor cannot overcome.**



- **The new generation of pipes and connectors made from GIRAIR type** impact modified synthetic material from GIRPI is essentially characterised by their major qualities which are perfectly suited to the technical requirements of the new compressors:

- absolute airtightness
- excellent mechanical properties
- very high chemical resistance (especially against synthetic oils)
- fire resistance
- quick assembly using cold welding (setting time 1 hour)
- multi-purpose: vacuum and cooling agent pipes.

REMINDER ABOUT GIRAIR®

- **SAFER**
airtightness + clean air + impact resistance
- **MORE RELIABLE**
anti-corrosion + self extinguishing
- **MORE PRACTICAL**
quick installation + minimum maintenance + immediate identification

GIRAIR®
always more,
always better

GIRAIR IN EUROPE SIGNIFICANT REFERENCES FOR COMPRESSED AIR DISTRIBUTION



Italy

Borgwarner Automotive / Morse TEC Europe (near Milan)
a high-tech production facility for manufacturing transmissions for many prestigious makes of car: Ferrari, Lamborghini, BMW, etc.

(installer: Mascherpa Tecnologia Gestionale / Rozzano - Milan)



near Milan
Bodywork production factory for the automotive industry.

Calze (sanpellegrino)
Stockings and tights manufacturing facility.

- Photos: M. Vanni

GIRAIR® ADVICE

- > always measure the actual cost of your compressed air network
- > old networks: polluted air, machine stoppages, irregular pressure
- > to halve the cost of compressed air, avoid the classic mistake: powerful compressor - small pipes.



Switzerland

Germany

SANIT factory in Eisenberg / Thüringen

SANIT produces sanitary products. For the compressed air networks of its new production facility, SANIT chose the GIRAIR® system.



Ets Muller in Châteauneuf s/Sion

This company specialises in the manufacture of moulds for plastic parts mainly destined for the automotive industry. By changing the compressor and opting for GIRAIR (to replace galvanised steel) and with optimised dimensions, **this**

company is making savings of around FF 100,000 a year (£ 10,000).

- two distinct networks:
- a 500 m network at 4 bar
- a 500 m network at 8 bar



Your distributor

WRITE TO US!

We are interested in your experiences and your references!

Explain and present a project or site representative of your know-how. We are always keen to hear from you so as to be able to include you in our forthcoming issues.

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