Detect – Repair - Save

Air Leak Detection Audit and Repair

BCAS
Compressed Air Services

Leaks in a compressed air system

Detect – Repair - Save

All compressed air systems have leaks. The average leakage rate is approximately 25% but some plants lose as much as 80% of their compressed air due to leaks. A single 3mm diameter leak can cost up to £600 a year.

While it may not be practical to eliminate all leaks, it is not difficult to greatly reduce and minimise them. The percentage lost to leakage should be less than 10% of your total compressed air production. A well-maintained system with a proactive leak detection programme in place should allow you to achieve this.

In addition to being a source of wasted energy, leaks can also contribute to other operating losses. By forcing the equipment to cycle more frequently, leaks shorten the life of almost all system equipment (including the compressor package itself). They cause a drop in system pressure, which can make applications run less efficiently, adversely affecting production.

Increased running time due to air leaks can lead to additional maintenance requirements and increased unscheduled downtime. Finally, leaks can lead to increasing compressor capacity unnecessarily.

BCAS specialist engineers have extensive knowledge of compressed air systems and our state-of-the-art ultrasonic testing equipment provides accurate results to allow us to identify and quantify all air leaks – many of which are not audible. Our comprehensive leak assessment and repair programme can vastly improve the operation and efficiency of your facility and generate significant financial savings.

The benefits of an air leak detection audit:

- Reduced energy consumption
- Cost savings
- Short payback period
- Less environmental impact
- Improved reliability
- Prolonged equipment life
- Production lines operate more efficiently and to their optimum capacity
- A pro-active process that can be planned and timed
- Equipment runs more quietly leading to more comfortable working conditions

Common causes of leaks in a compressed air system:

While leakage can come from any part of the system, the most common problem areas are:

- Couplings, hoses, tubes, and fittings (tubes and push-to-lock fittings in particular)
- Disconnects: O-rings required to complete the seal may be missing.
- Filters, regulators and lubricators (FRLs): Low first-cost, improperly installed FRLs often leak.
- Open condensate traps: Improperly operating solenoids and dirty seals are often problem areas.
- Pipe joints: Missed welds are a common problem.
- Control and shut-off valves: Worn packing through the stem can cause leaks.
- Point of use devices: Old or poorly maintained tools can have internal leaks.
- Flanges: Missed welds are a common problem.
- Cylinder rod packing: Worn packing materials can cause leaks.
- Thread sealants: Incorrect and/or improperly applied thread sealants cause leaks.
- Bag houses

The process

1. Identify & tag leaks

Our fully trained engineers use specialist equipment to identify the source of all leaks. These are then tagged and their location recorded.

2. Prioritise leaks

Leaks are assessed and graded according to severity. This is based on the annual loss of air, and the implicit cost of this loss.

3. Produce a leak report

A comprehensive report is produced with the results of the audit, recording all leaks, locations and projected costs. Repair recommendations and costs are also included.

4. Make repairs

Repairs are carried out and recommendations are made regarding user best practice to identify and minimise future leaks.

5. Reassess regularly

As a system ages or changes are made, new leaks can occur. We therefore recommend having a leak detection audit performed at least once every 12 months.

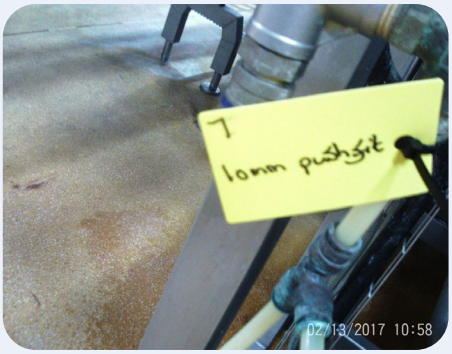
BCAS can manage the entire process for you: from logging the performance of your system, to identifying and repairing leaks. We recommend that data logging is carried out prior to a leak detection audit to determine the energy costs of running your equipment, and then after repairs are made so that you can see just how much you are saving.

Example: Snapshot

Detect – Repair - Save

These are some examples of leaks that have been identified, recorded and tagged during a leak detection audit. Calculations are then made to establish how much air and therefore money is being lost to each individual leak every year and how much it will cost to repair.

Leak 7 - Fresh milk pasteuriser
10 mm pushfit

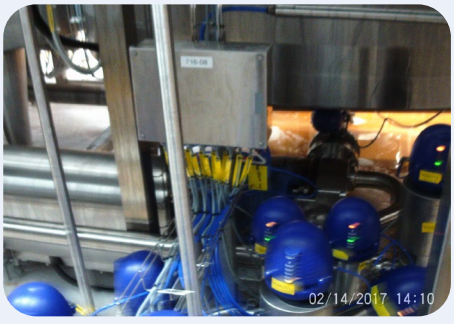


Severity: 3
Total air loss: 3.75 CFM
Cost per year: £532.17
Cost to repair: £90

Leak 27 - Line 5 - behind milk filler,
behind desiccant dryer

Severity: 5
Total air loss: 6.25 CFM
Cost per year: £886.95
Cost to repair: £95

Leak 43 - Beneath date labeler
6mm pushfitt on Manifold



Severity: 2
Total air loss: 2.5 CFM
Cost per year: £354.78
Cost to repair: £95

Leak 39 - Behind tank 1060
6-8mm elbow

Severity: 4
Total air loss: 5 CFM
Cost per year: £709.56
Cost to repair: £95

Tags are left in place so that leaks can be easily located when repairs are being carried out and data is compiled so that further calculations can be made. These results are then presented in report form for you to see exactly what has been found and what next steps should be.

Example: Snapshot

Detect – Repair - Save

This is an example of some of the data produced during an air leak detection audit. From this you can see the level of detail involved as well as the headline figures which illustrate the likely payback period of the entire project.

Location of Leak	Slide	Leak in Location	CFM Value	Est'd Value £	Cost to repair £	Est'd Payback £	Leak Tag #	Fittings/Parts Required	Photo #	Repair Responsibility
Raw milk cip	1	Think top V1033T	2.5	354.78	95.00	259.78	1	6mm Elbow	1	BCAS
Raw milk cip	2	Upper floor tank T142 V1074	2.5	354.78	95.00	259.78	2	6mm to 1/4" BSP	2	BCAS
Raw milk Silos	3	MS1B - TK06 Manifold	2.5	354.78	95.00	259.78	3	6mm to 1/4" BSP	3	BCAS
Raw milk Silos	4	Downstair solenoid valve V0119T	3.75	532.17	110.00	422.17	4	2 x 6mm elbows to 1/8 BSP	4	BCAS
Finished milk silos	5	Downstairs next to manifold V0391	2.5	354.78	95.00	259.78	5	6mm to 1/4" BSP push fit	5	BCAS
Top Car Park	6	Valve V8631.170.26	6.25	886.95			6	Valve seal in think top valve	6	Customer
Efficient plant	7	In front of vertical air receiver	2.5	354.78	120.00	234.78	7	Solenoid valve 2 x 8mm to 1/4 BSP	7	BCAS
Efficient plant	8	In front of main air receiver	2.5	354.78			8	Solenoid valve 110v	8	Customer
Milks process room	9	Top valve next to elec box 530-38-3	6.25	886.95			9	valve next to elec box 530-38-3	9	Customer
Milks process room	10	Manifold V1426 behind tank TK02 343	1.25	177.39	95.00	82.39	10	3/8 BSP fitting needs re-seal	10	BCAS
Milks process room	11	Valve next to tetra alcross	1.25	177.39	110.00	67.39	11	10mm tee	11	BCAS
Milks process room	12	Valve next to tetra alcross	1.25	177.39	110.00	67.39	12	10mm to 1/4 BSP push fit	12	BCAS
Milks process room	13	Manifold in front of interface tank 102	1.25	177.39	140.00	37.39	13	3x6mm to 1/4 BSP push fitts	13	BCAS
RCA	14	Line 2 trolley lead entrance	3.75	532.17			14	Activator leaking	14	Customer
1st floor creamery	15	Steam activation regulator gauge	3.75	532.17	95.00	437.17	15	Gauge re-seal	15	BCAS
1st floor creamery	16	Back manifold off room V7119.170.27	2.5	354.78	140.00	214.78	16	1/4 - bmm push fit x 4	16	BCAS
1st floor creamery	17	P1002 main air machine in valve.	2.5	354.78	110.00	244.78	17	10mm to 1/2 BSP push fit	17	BCAS
1st floor creamery	18	P1011 panel back of reg block	2.5	354.78	110.00	244.78	18	3/8 BSP to 10mm push	18	BCAS
1st floor creamery	19	Behind 702 cabinet	1.25	177.39	110.00	67.39	19	6mm to 10mm reducer push fit	19	BCAS
1st floor creamery	20	Elec box CB301-08 behind cream buffer V6243	3.75	532.17	155.00	377.17	20	6mm to 1/8 BSP x 10	20	BCAS
1st floor creamery	21	Opposite room above control box 708-01	2.5	354.78	140.00	214.78	21	1/4 BSP filter bowl	21	BCAS
1st floor creamery CIP	22	Lower floor between pipe runs	2.5	354.78	110.00	244.78	22	1/2" BSP - 10mm push fit	22	BCAS
1st floor creamery CIP	23	Elec Box CB301-05	3.75	532.17	160.00	372.17	23	6mm - 1/8 BSP push fitts x 8	23	BCAS
1st floor creamery CIP	24	Lower floor between pipe runs	2.5	354.78	110.00	244.78	24	1/2" BSP -10mm	24	BCAS
Cream almix 1200m	25	Underneath Almix tank A1202	3.75	532.17	95.00	437.17	25	1/8BSP to 6mm elbow	25	BCAS
Cream Almix room	26	Next to hopper panel manifold	1.25	177.39	95.00	82.39	26	Fittings re-seal	26	BCAS
Cream Almix room	27	Manifold behind tank 1092	2.5	354.78	95.00	259.78	27	Fittings re-seal	27	BCAS
Cream Almix room	28	Manifold above pig launch station 9	3.75	532.17	95.00	437.17	28	6mm-1/4 BSP push fit	28	BCAS
Cream Almix room	29	Launch station 1 manifold	2.5	354.78	95.00	259.78	29	6mm-1/4 BSP push fit	29	BCAS
Line 7	30	Upstairs above line 7 donaldson process filter	3.75	532.17	110.00	422.17	30	O-ring on filter	30	Customer
Line 1	31	Back od de-elevation on union	2.5	354.78	95.00	259.78	31	Re-seal union	31	BCAS
Line 2										
Line 2										
Line 3										
Line 3										
Line 6										
Line 7										
Creamer										
Creames										
2nd floo										
2nd floo										
Conti rol										
McDonal										
Milk proces										
Milk process seperator room	45	Abover upstairs seperator 1	2.5	354.78	95.00	259.78	45	6mm pip 1/2 meter	45	BCAS
Milk process seperator room	46	Upstairs above seperator 2 on think top valve V212	2.5	354.78			46	6mm to blue think top	46	Customer
Second floor creamery	47	Elec box CB302-11 underneath tank T1213	3.75	532.17	160.00	372.17	47	1/8 BSP to 6mm x 8	47	BCAS
Second floor creamery	48	Pig launch manifold filler 6	2.5	354.78	95.00	259.78	48	6mm to 1/4 BSP	48	BCAS
Second floor creamery	49	Pig launch manifold filler 5	2.5	354.78	95.00	259.78	49	6mm to 1/4 BSP	49	BCAS
Second floor creamery	50	Pig launch manifold filler 5	2.5	354.78	95.00	259.78	50	1/4 BSP to 6mm elbow	50	BCAS
Second floor creamery	51	To right of tank T1089 on manifold between thinktops	2.5	354.78	95.00	259.78	51	1/4 BSP to 6mm pushfit	51	BCAS
Second floor creamery	52	Behind telstar pcr mini dominick hunter stainless bowl	2.5	354.78	95.00	259.78	52	Plug re-seal	52	BCAS
Second floor creamery	53	Underneath tetra pak cabinet 707 on gauge	2.5	354.78	95.00	259.78	53	1/4 BSP to 6mm pushfit	53	BCAS
Second floor creamery	54	Inside elec box CB302-03 behind tank T1089	3.75	532.17	95.00	437.17	54	1/8 BSP to 6mm elbow	54	Customer
Second floor creamery	55	Filter bowl on main line in front of tank T1133	2.5	354.78	110.00	244.78	55	1/4 BSP to 10mm pushfit	55	BCAS
Second floor creamery	56	Valve seal on V8442 underneath tank T1133	5	886.95	95.00	791.95	56	Think top valve	56	BCAS
Second floor creamery	57	Manifold opposite office red plug leaking	3.75	532.17	60.00	472.17	57	3/8 plug	57	BCAS
Second floor creamery	58	Elec box CB 302-07 behind panel opposite washroom	375	532.17	160.00	372.17	58	1/8 BSP to 6mm x 8	58	BCAS
Second floor creamery	59	Manifold at back and between tanks T1059-T1057	2.5	354.78	60.00	294.78	59	1/4 BSP Plug	59	BCAS
Second floor creamery	60	Manifold at back and between tanks T1059-T1057	2.5	354.78	60.00	294.78	60	1/2 Plug	60	BCAS
Second floor creamery	61	Manifold at back and between tanks T1059-T1055	2.5	354.78	60.00	294.78	61	1/2 Plug	61	BCAS
Second floor creamery	62	Manifold at back and between tanks T1059-T1055	2.5	354.78	60.00	294.78	62	1/2 Plug	62	BCAS
Second floor creamery	63	Elec box CB 302-05 behind tanks T1060-T1062	3.75	532.17	160.00	372.17	63	1/8 BSP to 6mm elbow x 8	63	BCAS
Second floor creamery	64	Manifold behind tanks between tank T1061-T1059	2.5	354.78	60.00	294.78	64	1/2 Plug	64	BCAS
Cottage Cheese	65	Vat no1113 pneumatic lipter cylinder	3.75	532.17			65	Cylinder	65	Customer
Cottage Cheese	66	Behind gate and behind cheese tanks box 716-10	2.5	354.17	110.00	244.17	66	1/2 to 10mm pushfit	66	BCAS
Cottage Cheese	67	Behind gate and behind cheese tanks box 716-10A	2.5	354.17	95.00	259.17	67	1/4 BSP to 6mm	67	BCAS
Cottage Cheese	68	Behind gate and behind cheese tanks box 716-08	2.5	354.17	105.00	249.17	68	1/4 BSP to 6mm x 2	68	BCAS
Cottage Cheese	69	Inside gate far wall next to steam pipe valve V9756	5	886.95			69	Think top valve	69	Customer
Second floor creamery	70	Middle floor upper back	2.5	354.17	95.00	259.17	70	1/4 BSP	70	BCAS
Sugared egg room	71	Manifold near door	2.5	354.17	110.00	244.17	71	1/2 BSP to 10mm pushfit	71	BCAS
Sugared egg room	72	Manifold next to hoist	2.5	354.17	75.00	279.17	72	Re-seal	72	BCAS
Room behind sugared egg room	73	Elec box CB301-25	2.5	354.17	140.00	214.17	73	1/8 BSP - 6mm x 4	73	BCAS
Cottage cheese fruit room	74	Manifold between fruit vats	2.5	354.17	60.00	294.17	74	Plugs 1/4 BSP	74	BCAS
Cottage cheese fruit room	75	Manifold on back wall next to activator	2.5	354.17	60.00	294.17	75	Plugs 1/4 BSP	75	BCAS
Behind 40bar comp room	76	Outside in front of tanks at 40bar	2.5	354.17	95.00	259.17	76	1/4 to 6mm push	76	BCAS
Behind 40bar comp room	77	Outside in front of tanks at 40bar	2.5	354.17	95.00	259.17	77	1/4 to 6mm push	77	BCAS
Boge plant room	78	No4 beko drain on inlet of dryer 4	3.75	532.78	210.00	322.78	78	Beko 32 drain pot	78	BCAS
Boge plant room	79	No10 beko drain on inlet of dryer 1	2.5	354.17	210.00	144.17	79	Beko 32 drain pot	79	BCAS
Veolia 5+6 plant room	80	On Donaldson filter bowl above Atlas Copco	2.5	354.17	110.00	244.17	80	PCL Coupling	80	BCAS
Veolia 5+6 plant room	81	On filter bowl above Atlas Copcp	2.5	354.17	120.00	234.17	81	Float drain	81	BCAS

Total Value £	Total Cost to repair £	Est'd Total payback over 12 months £
33,341.40	7,715.00	20,127.31

Total Value £	Total Cost to repair £	Est'd Total payback £
33,341.40	7,715.00	20,127.31

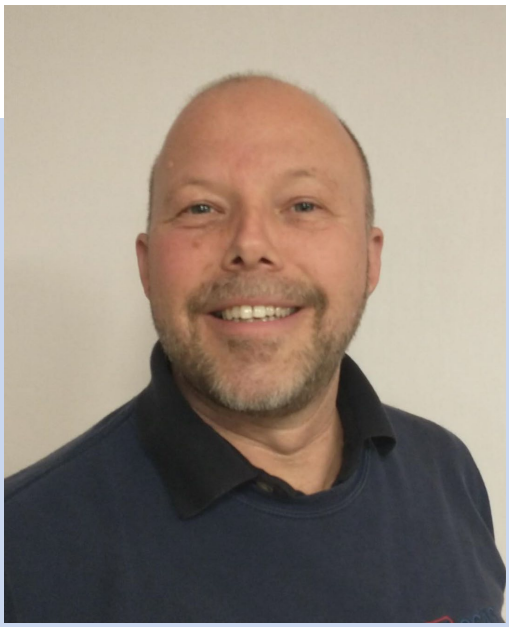
This data forms part of a leak detection report and is presented alongside a list of recommended works and repair costs.

Once the works have been completed, the system is logged once again, to measure performance and to verify the savings made.

Holistic approach

Detect – Repair - Save

With energy prices currently increasing exponentially, the return on investment of a one-off leak detection audit and repair service have never been greater. In fact, we recommend that you have an on-going programme in place in order to continually optimise the energy efficiency of your compressed air system.



However, there are additional measures that can be taken to reduce your energy costs and which should be included in your overall energy efficiency plan.

At BCAS, we recognise the importance of taking a holistic approach to the efficiency of a compressed air system. We recommend a range of checks and measures that will all contribute towards reducing your energy consumption and costs.

Specialists

Our Energy Efficiency services are heading up by our in-house specialist engineer, Des Fuller, can advise on all aspects of energy efficiency in compressed air and can tailor the services that will have the most impact for your specific system set-up.

Resources

Further information on how you can reduce the running costs of your compressor equipment can be found in our Guide to Energy Efficiency in compressed air.

To find out more about Air Leak Detection Audits or to receive a copy of our Energy Efficiency Guide, contact BCAS:

sales@bcaslimited.co.uk

01491 821737

www.bcaslimited.co.uk

BCAS
Compressed Air Services

Detect – Repair - Save

Air Leak Detection Audit

sales@bcaslimited.co.uk 01491 821737 www.bcaslimited.co.uk

BCAS
Compressed Air Services