



Cement Handling Equipment Maintenance Manual

Holcim (New Zealand) Limited

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Scope

The Equipment Maintenance Manual is a basic look at the following items. This will give batchers and managers a better understanding on just how the listed products work, and how / when to maintain them.

- Compressors
- Moisture Traps
- Regulators
- Auto Oilers
- Pressure Silos
- Gravity Silos
- Alarms
- Silo Safety Relief Valves
- Gravity Silo Aeration
- Silo Filters

Compressors

There are two types of compressors that are normally found at concrete plants and they are:

- HIGH-PRESSURE
- LOW-PRESSURE

The low-pressure compressor will not be found on all sites, as they are usually only used to transfer cement from a pressure pod to a main silo.

Low-pressure Compressors

The most common type of low-pressure compressors that were installed on sites around the country are the

- Atlas Copco IE23
- Atlas Copco IE83
- Maksas 7 / 70
- Ingersoll-Rand-T30
- Betico SB1

All of these compressors produce around 160 CFM of free air except for the Betico. The Atlas Copco compressors are about 30 years old. They were first used on the cement trucks before being replaced for the bigger Kockums Betico compressors. These units produce between 290 to 330 CFM and the blowers currently used are up to 380 CFM. As parts are no longer available for the Atlas Copco compressor the Ingersoll-Rand-T30 and the Maksas compressors are used as a replacement for them. These compressors are normally low maintenance units, as long as a few basic rules are followed.

1. Installation must be in a well ventilated, dust free and dry location, out of direct sunlight.
2. Compressors must be serviced every 6 months.
3. The air filters must be kept clean and replaced regularly.
4. The oil level must be checked daily.

Please Note: Dirty air filters will cause the crank case pressure to build, causing oil to be forced passed the compressor rings and blown through the air lines to the silo.

Set up a service contract with a service provider to maintain the compressors every 6 months if you have not already done so.

High-pressure compressors

The type and size of high-pressure compressors will vary from site to site depending on the amount of air that will be required to operate each plant. The most common size used would be the 30CFM minimum.

Again these should be placed in a well ventilated, dry and dust free location, out of direct sunlight.

The same basic rules apply for these compressors as they do for the low pressure units

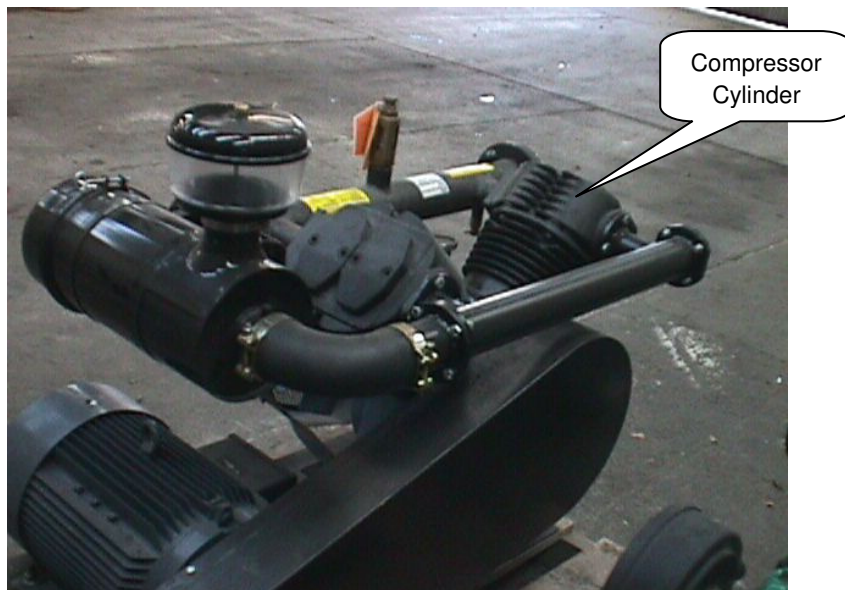
1. Compressors must be serviced every 6 months.
2. Air filters must be kept clean and replaced regularly.
3. Oil level must be checked daily.
4. Tanks and auto drains (where fitted) must be drained daily.
5. Installation must be in a well ventilated, dust free and dry location.

Never have a compressor that is too small for the demand. When this occurs the compressor is working a lot harder than it should, and it will then generate a lot more heat and produce a lot more water. This will then only create more problems up stream, in the moisture traps and regulators etc.

The last thing that is needed is water in the silo aeration system, or over filling the moisture trap and oiler. If this happens it will then get into the air rams and cause them to either operate slower or freeze and fail to work altogether.

It is essential, at the end of each day when the compressor is turned off, drain the tank(s) and leave the valves open over night. Before starting the compressor in the morning, close the valves and check the oil level.

If you look at the two photos in Fig 1 and Fig 2 on the next page you will see the main difference between the low and high-pressure units. The low-pressure compressor is not mounted on a receiver tank. This is because the pressure silo is used as the receiver. The other difference is there is no moisture traps used on the low-pressure compressor or on the pressure silo. The reason for this is the volume of air needed to operate the pressure silo is too large for moisture traps, and it is not economical to run an air dryer. It is important to make sure the compressor is installed in a dry location. Any water entering the system will end up in the aeration pad at the base of the silo causing it to fail.



160 CFM – 20HP

Fig 1 Low-pressure Compressor

Note: The difference in cylinder sizes between the two



30 CFM – 7HP

Fig. 2 High-pressure Compressor

Ideal for a small concrete plant

Moisture Traps

There are several types of moisture traps available on the market:

- Manual drain
 - Auto drain
 - Auto drain (Float type)
 - Auto drain (electronic type)
1. The first one is the manual type. This one needs to be drained manually each day or more regularly if you have a lot of water coming through from the compressor and lines. Don't mount this type where it can't be reached easily.
 2. The second one is the auto drain, this only works when all the air pressure has been drained from the system. It should only be used if it is easy to get to and service, as you will still need to drain it manually from time to time. Sludge will build up on the bottom of the sight glass and block the drain hole.
 3. The third one is the auto drain float type. This will work any time the water level builds up in the bowl, the float will then rise and release the water. It is a good one to install in hard to get at places i.e. up on the gravity silo aeration. It will still need to be checked from time to time and cleaned.
 4. The fourth auto drain is the electronic type. This works off a timer and can be set to open as required, depending on the condition of the compressor and the amount of water that it produces. This is ideal to install on the compressor receiver tanks.



Electronic type auto drain

All moisture traps must be checked regularly to ensure they continue to operate correctly.

Regulators - Oilers

Regulators

Regulators are just as their name suggests, they regulate the air pressure and airflow through the system. Dropping the air pressure to air rams and actuators etc is what regulators are used for.

Why operate an air ram or actuator at full pressure of 120psi when it will work just as well at around 80psi? There will also be a saving in wear and tear on equipment by not having it moving with much force. The regulator can either be built into the moisture trap or be a separate unit.

Do not install a regulator without a moisture trap. Keep all moisture traps, regulators and oilers as close as possible to the actuators, air rams, and silo aeration systems.

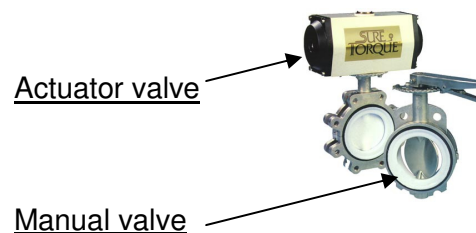
(Please don't put an oiler on the silo aeration system)

Auto Oiler

Auto Oilers are also as their name suggests. Their function is to feed a very small amount of oil into the airline to lubricate the air rams and actuators.

Air rams and actuators are piston operated with O ring seals, and need to be lubricated. If this is not done their operating life will be shortened and, problems with them from time to time will be experienced i.e. moving slowly and on colder days they may even freeze. The oiler should only be injecting one or two drops each time an air ram or actuator is activated, any more is wasting oil and going to make a mess. Oilers need to be checked regularly and topped up.

The oil used is clear and very lightweight. If the oil becomes discoloured at all change it, as it is a good indication there is water in the system. Shell R10 should be the oil used.



WARNING:

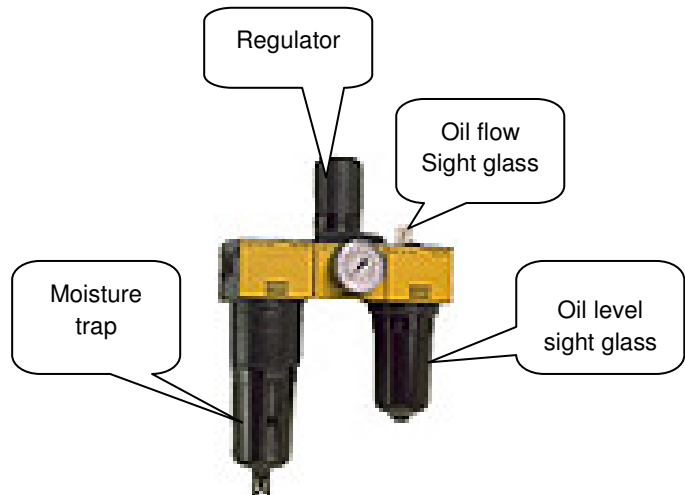
Do not remove the sight glass to top up the oil, until all the air pressure has been drained from the line, as the remaining oil will be ejected under pressure.

Be careful when removing the sight glass, as there is a small O ring at the top of it. Care should be taken not to damage it, and make sure it has sealed when replacing it.

(Don't over tighten the sight glass when replacing it)



Filter/Regulator with Gauge



Filter, Regulator & Lubricator with Gauge

Summary

All air contains water vapour especially in regions of high humidity. When air is compressed so is the water vapour, often in large amounts. Compressing air generates heat, and this holds the vapour in gas form initially but the air will produce water as it cools. Water in any form is obviously the enemy in any system required to handle cement, hence the need to maintain traps in good working order.

Moisture traps, oilers and regulators need to be installed as close to equipment as possible. If a regulator is mounted too far away from any equipment, the compressed air will have time to expand in the line and cool down, producing more water.

Receivers

The photos below show that receivers come in all different shapes and sizes.



Compressor receiver tank



Large air receiver tanks



30 tonne pressure silo

Make sure the receiver tank is large enough to handle the volume of air that is required. If extra receivers are to be used they should be installed up line from the compressor and closer to the plant. Receivers will then also act as a moisture trap and must have a drain, which is blown down daily.

Please Note:

Due to changes in the pressure vessel regulations in 1999, all pressure silos and some air receivers are now required by law to have an annual pressure vessel inspection and certification. These need to be carried out by a third party inspection body. Holcim already have procedures in place for annual inspection and certification of all Holcim owned Pressure silos. Please check the requirements regarding your site compressed air receivers.

Pressure Silos

A large number of these silos were installed around the country. (About 50)

Pressure Silos were an easy way to increase the on site storage capacity by taking up less room than a gravity silo in most cases. Pressure Silos range in size from 8 tonne to 100 tonne.

Tankers discharge a load of cement into the pressure silo through a fill pipe, which enters into the top of the silo. The air is vented off to the filter on the main gravity silo through the transfer pipe.

The cement sits on an aeration pad in the base of the silo, and when the contents need to be transferred to the main silo, large volumes of air from the low-pressure compressor is pumped into the base of the silo below the aeration pad via a manifold which is mounted on the outside of the silo. The air will then pass through the aeration pad into the silo fluffing up the cement. When the pressure in the silo has reached a maximum of **20Psi** the boost valve can be opened to a ¼ open position and then the cement discharge valve can be opened.

The silo pressure will take a few moments to settle after the cement valve has been opened.

The boost valve can then be adjusted to maintain the silo pressure at between **15 to 18Psi**

SAFETY DEVICES

Pressure silos and ISO Pods must have a safety relief valve fitted to the manifold and this needs to be checked annually and set to 158kpa (23psi) by a certified person. The performance of the silo is not improved by increasing operating pressure and therefore must not be altered:

SAFETY RELIEF VALVES MUST NEVER BE TAMPERED WITH OR ALTERED BY UNAUTHORISED PERSONS

The compressor safety relief valve should be set to a maximum of 1 to 2psi higher than the silo safety relief valve.



Pressure Relief Valves come in all shapes & sizes valve



Pressure silo safety relief valve

The pressure silo relief valve should be of a size that it is capable of dumping at least twice the volume of air that is produced by the compressor.

Non-return valves

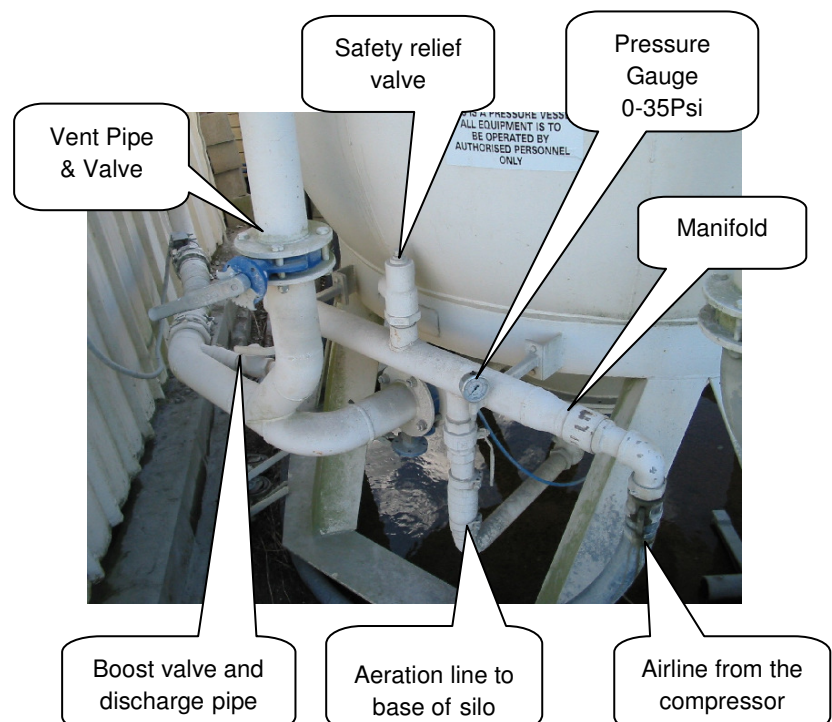
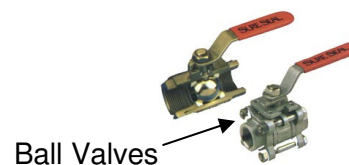
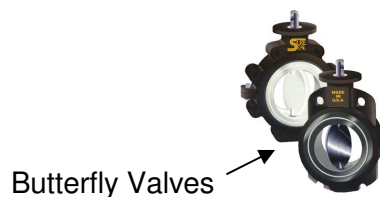
Swing check type non-return valves should be fitted to the main airline at the base of the silo, and one fitted to the boost line. Regular checks of non-return valves are needed. The purpose of non-return valves is to stop cement feeding back into the manifold and back to the compressor.

Valves

Ball valves should be fitted to the aeration line at the base of the silo, and to the boost line, between the manifold and the non-return valve. The purpose of these valves is to enable the function of the pressure relief valve to be tested and in an emergency to prevent the flow of cement back to the manifold and compressor.

Cement Valves

Cement Valves should be rugged enough to withstand the high volumes of cement that will pass through them. Due to cement being so abrasive the valves need to be of a good quality, if they are to last any length of time. Use of a Keystone butterfly valve with the ductile iron disc is recommended. Over the years cement valves have proven themselves.



30 tonne pressure silo

Pressure gauges

Pressure gauges on cement pressure silos must no smaller than 63mm Dia and must have a scale of 0 to 250kpa (0-35psi). The gauges must be liquid filled. Pressure gauges must be checked regularly to insure the gauge resets to zero. If in doubt change it.

IMPORTANT:

It is very important that pressure silos are not taken for granted, as they hold between 30 to 80 cubic metres of compressed air, which under pressure equals over 40 tonnes of stored energy. They have the potential to do a great deal of damage and kill if misused or not maintained.

DO NOT hit the side of the silo with hard objects (this includes hammers, steel or rubber) to check the cement level as this can cause stress and lead to vessel failure.

DO NOT let any-one operate a pressure silo before being trained in how to do so safely, and have an understanding of the equipment and the risks.

NOTE:

All Plant and Area Managers are responsible to insure full training has been given before anyone is aloud to operate a pressure silo / pod and must advise their staff, not to leave these silos under pressure over night and or weekends. Safety of this equipment is paramount, as we do have earthquakes in this country, which could trigger a major disaster.

Pressure Vessel Certification

All pressure silos, tankers and pods are required by law, to have an annual pressure vessel inspection and to be certified. Inspections must be carried out by a third party inspection body. For all Holcim owned vessels on customer sites, Holcim NZ Ltd arrange for these inspections to be carried out annually.

Maintenance

Before any repairs are carried out on a Holcim owned pressure vessel, other than replacement of valves a Holcim Maintenance personal must be contacted first, as some repairs may require the involvement of a third party inspection body (pressure vessel inspector) and also require records to be kept which could also include welding certificates and welding procedures before any work can commence.

Gravity Silos

The sizing of a cement silo will depend upon the demand to be placed on the plant i.e. previous peak demand patterns and the distance from the supply depots.

Ideally one should aim for a storage capacity of at least 2 days supply – discuss with your sales representative about the ideal storage requirement for your site.

Extra capacity should be included in the silo to allow for variations in the supply timetable.

The silo should be erected securely and must be inspected regularly i.e. six monthly by either own maintenance staff or by a third party contractor. It is important that all connections are kept free of hardened cement, and all ladders, handrails etc, are secure and free from rust. Inspections must also include the filters, over pressure valves, high level alarm systems and support structures.

Silos and supply lines should be clearly marked to display the type of cement, which they contain.

Proper vehicle access to the silo is essential. With vehicles up to 20 metres long and 45 tonnes in weight, adequate ground strength and manoeuvring room are required.

Lighting is required if deliveries are to be made outside daylight hours.

The level of cement in the silo should always be checked before filling i.e. dip the silo with a weighted line. A chart should be available for each silo to give tonnes in store for each metre of dip.

The bulk density of fresh cement varies from 1200 to 1400kg/m³. The capacity of a silo may therefore be reduced by over 25% with freshly aerated cement. It is therefore advisable to be conservative when estimating the volume of cement required to fill a silo.

The cement fill pipe is best located approximately 1 metre above ground level for easy access by the tanker driver.

Fill pipes should be arranged so that excessive horizontal runs or tight bends of less than 1 metre radius are avoided. If this is not possible use 5" Tees or radius bends. Never use 90 degree bends.

Gravity silos must be given as much respect if not more than a pressure silo, as they are not designed or built to handle any pressure build up, which will happen if filters become blocked or over pressure relief valves are not functioning correctly. Six monthly inspections need to be carried out on welds, structure, ladder and handrails. Rust spots should be cleaned back and paint work touched up. Monthly inspections and three monthly servicing must be carried out on filters. Monthly inspections and servicing must be done on over pressure valves and high level alarms must be checked weekly. Maintenance records must also be maintained.

Overfilling a silo will cause severe dust emissions from the silo. The structural soundness of the silo will also be put at serious risk posing a threat to personal safety.

Cement Auger

These need to be kept clean and rust free. Some augers may have grease nipples and these will need to be serviced. Others may have pre packed or internal bearings.

Gravity Silo**Note:**

Six monthly inspections must be carried out on silos; these inspections must also include support structures, ladders, handrails and attachment points. Small spot repairs to silos and support frames must be kept up to avoid major repairs at a latter date. Any damage to support structures must be repaired immediately.



Steel gravity silos will not handle more than 1 ½ psi and concrete silos no more than ½ a psi.

The above photo is the roof of a Gravity silo, after it has been over filled. The safety hatch had also sealed itself closed and was not checked regularly. The pictured roof has **not** had a lot of pressure placed on it to end up in this state.

If the silo has been over filled the filter socks can hold up to 1 ½ tonne of cement, the cause of a silo being over filled could be due to an alarm failure or the filling operation has exceeded the alarm. Another cause is the filter for one reason or another can't handle the pressure placed on it normally produced by the filter material becoming "blinded" that the weave of the cloth becomes clogged with cement particles. If the filters and safety hatch are blocked, then the silo aeration is also capable of damaging a silo if the pressure is set too high. The silo aeration must not exceed 10psi.

If for any reason the silo has been over filled the filters and safety hatch must be checked and cleaned immediately.

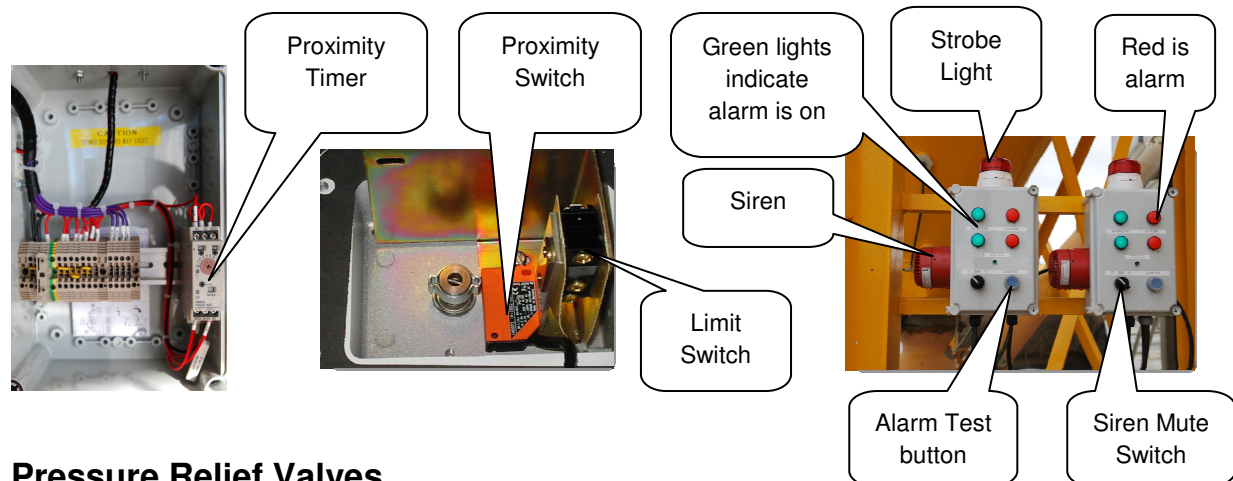
If regular checks are not carried out on the filter and safety valves, then it is only a matter of time before the filter and or the roof of a gravity silo is blown off.



This is only one of many silos in this condition.

Alarms

A high level alarm is essential and a Holcim requirement to avoid the consequences of overfilling a gravity silo. The function of the alarm is not only to tell when a silo is full, but also to ensure there is an airspace left between the cement and the filters to allow for the pressure vessel (Tanker / pressure silo) to vent its air to the filters. The alarm must be checked and tested weekly by pushing the test button. Non Self-test systems Bin-Dicator must also be tested weekly.

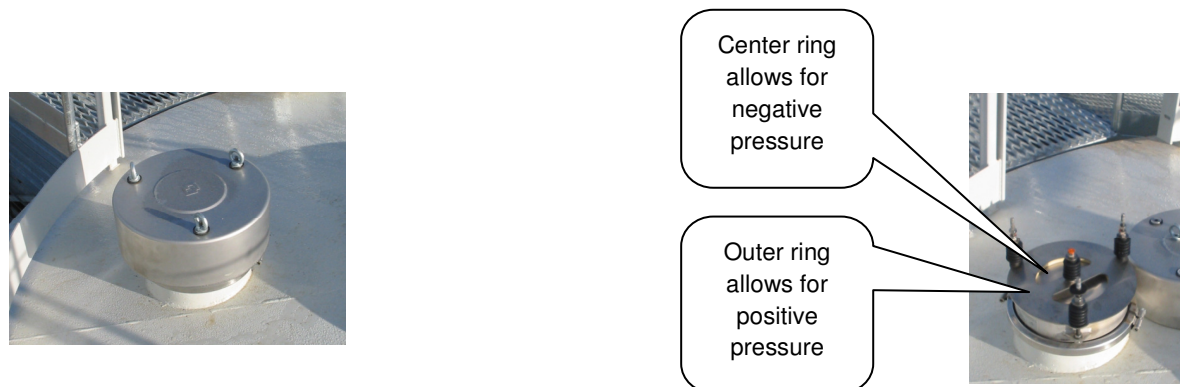


Pressure Relief Valves

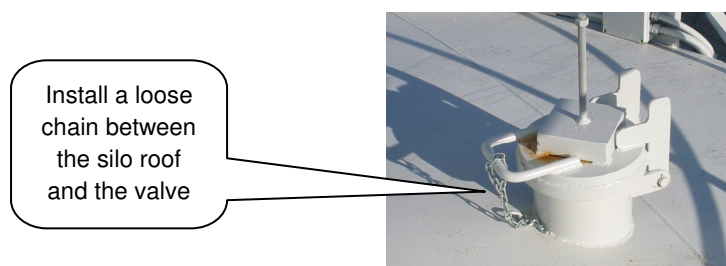
A pressure relief valve installed in the roof of the silo is essential and a Holcim requirement. The pressure relief valves are used to prevent excessive pressure build up in the silo. A valve of no less than 200mm in diameter and responding to a pressure of 1psi – 7kpa is sufficient.

The pressure relief valve must be checked and serviced monthly.

Do not tamper with the settings or add weight to the over pressure valve.



Wam over pressure valve



Standard type over pressure valve

Gravity Silo Aeration

Gravity silo aeration will be in the form of Aeration rings, Bin flow aerators, Zenith aerators or an Aeration pad.

Aeration Rings

Aeration rings are made from ½" galvanised steel pipe curved to fit in the cone of the silo. Each aeration ring will have 1mm holes drilled at 35mm centres, then covered with an aeration sleeve. There should be about 3 aeration rings, spaced from 300mm up from the bottom too ½ way up the cone of the silo.

Bin Flow Aerators

Bin flow Aerators are about 6" to 8" long x about 3" wide and have a felt pad covered by a wire mesh. Installation needs to be from inside the silo. The Bin flow aerators can't handle high-pressure air, or any moisture. As inflow aerators tend to blind, often replacement is needed.

Wam Aerators

Wam aerators are installed from outside of the silo, by drilling a 2 ½" hole and welding in the socket, which is supplied with the aerators, and then screwing the aerator in place. The Wam aerator is very hard wearing and can be replaced easily.

Aeration Pressure

To set the aeration pressure their needs to be a regulator / filter mounted as close as possible to or on the silo. On the outlet side of the regulator / filter there must be a ball valve fitted. With the aeration turned on and the ball valve turned off, the regulator can be set to around 5psi maximum. When the ball valve is opened, the pressure gauge will drop, this may even drop too give a 0 reading on the gauge. The whole idea of the aeration is to gently fluff up the cement and let it flow like water. If the aerators are positioned correctly this will allow the air and cement to track down between the aerators. On some of the larger sites using high volumes of cement, and large Hydro-vane compressors, they may have their aeration consensually working and set too 1psi allowing for a constant flow each time the valve is opened or the auger starts up. Normally the aeration would only start when the silo discharge valve is opened or the auger starts. Turning the pressure up on the aeration system will not fix any problems within the aeration system, but will only lead to more problems, such as blowing holes in the aeration cloth or damaging the silo if the filters are blocked.



Install a ball valve
between the filter /
regulator to set silo
aeration

If the silo aeration is set to high this will not only damage the silo, it could cause the filters to become blocked.

SET THE SILO AERATION UP TO 5PSI

Filters

Filters are necessary to remove cement dust from the excess air leaving the silo during the filling operation, and also allow the silo to vent excess air from the silo aeration system.

The filter is often located on the top of the silo; where extracted dust is allowed to drop back into the silo below.

Silo Filter Requirements

The industry standard for a silo filter to meet the required air flow of the modern tankers and blowers must have a cloth surface area of at least 24 m²

Filters need to be large enough to handle the maximum airflow experienced through it. For modern tankers operating at a pressure of 158kpa (23psi), an airflow of up to 20m³/min is expected. An extra allowance of 10m³/min is therefore recommended as minimum.

Pulse – Jet

A lot of modern filters are self-cleaning pressure filters. (Cartridge type filters).

While a minimum amount of attention is required with these filters, it is recommended that a weekly check is done on the filter to insure the filter pulse-jet system is working. The pulse-jet system must be turned on and working every time during the silo filling operation. If cement deliveries are made outside normal working hours, then the compressor, alarm siren, and filter must be wired to the same switch on the alarm control panel. This will allow the tanker driver to start the compressor and the filter before the silo filling operation starts.

A visual inspection of the filter elements must be done every six months. It is also very important the air supplied to the filter is clean and dry, as any water in the system will cause the filters to become blocked with hard cement.

Single Bag Filters

The older static single green bag filters no longer meet industry standards as they are only have a cloth area of around 9m². These filters should not be used and must be replaced.

Vinder

The most common static filter used today that has a cloth area of 24m² is the Vinder system. A visual inspection of the filter bags should be undertaken every six months; the socks should be shaken and brushed down using a soft brush. This can be done with the filters in place. Annual inspections should also be done on the bottom up stands to remove any build up of cement. This can be done by undoing the hose clip around the base of the filter and removing the filter from the up stand and cleaning inside surface of the up stand. It is also important to check the tension of the filters, this can be adjusted by turning the centre bolt located through the top spider holding the filters up in place.

Note:

Filters must be checked weekly to insure they are functioning correctly and a full inspection and service must be carried out three monthly.



Wam Pulse Jet Filter



Vinder Filter

Weight Hopper

Weight hopper filters should also need to be checked and cleaned six monthly.

The cement weigh hopper requires accuracy to within 3% at all times. Hardened cement in the hopper can affect the weighing accuracy and so the hopper should be regularly cleaned and calibrated.

Trouble Shooting

Compressor

Compressor fails to start	Check power supply / and fuse
Compressor fails to reach full pressure	Belts slipping / leak in air line Compressor needs overhaul
Excessive water in air lines and receiver	Compressor too small / worn Located in damp location

Pressure Silo

Unable to build up pressure in silo	Cement valve(s) leaking/open Hole in aeration pad Warm boost line valve
Cement leaking into discharge line while Pressuring silo	Cement discharge valve leaking
Pressure drops while transferring cement	Vent valve leaking / Boost valve open too far or worn out, aeration pad worn, lumps blocking discharge pipe
Silo fails to discharge cement	Blockage in discharge line Lumps blocking discharge pipe / valve
Relief valve working while trying to pressurise silo	Manifold, air line blocked Hole in aeration pad Main air line valve closed

Gravity Silo

Excessive dust while filling	Filter blocked / Hole in filter Clean and reseal safety hatch Filter too small / Pulse Jet not turned on
Cement won't run from silo	Aeration system not working or blocked Lumps blocking the valve
Cement auger jammed	Silo filter blocked causing aeration to vent too weigh hopper filter Lumps

Preventative Maintenance Programme

DAILY

Compressors	Check oil level / leaks / damage	Top up	
Drain Air Tanks	Check for damage / leaks / wear	Report / Repair / Replace	
Gauges / Controls	Check for damage / function	Report / Repair / Replace	
Moisture traps	Drain / Check for leaks/damage	Report / Repair / Replace	
Conveyor Belts	Check for damage / function	Report / Repair / Replace	

WEEKLY

In line oilier/s	Check oil level / condition	Top up	
Air Ram/s Gates	Check function / leaks	Report / Repair / Replace	
Silo filters	Check function / leaks	Report / Repair / Replace	
Silo alarms	Check / Test	Report / Repair / Replace	
Safety Valves	Check function / leaks	Report / Repair / Clean	

MONTHLY

Compressors	Clean Air filter / Pre cleaner etc.	Report / Clean / Replace	
In line oilier	Check oil level / Condition	Remove / Clean & Refill	
Silo Safety Hatch	Check / Clean	Clean Inside & Lid Seal	
Hatch Lids	Check / Clean	Clean Inside & Lid Seal	
Belts/guards/pulleys	Check for wear / damage	Report / Repair / Replace	
Grease bearings	Bin gates /Agg belt rollers etc	Report any wear /damage	

THREE MONTHLY

Silo filters	Check for wear / damage / Clean	Report / Repair / Replace	
Weigh Hopper Filter	Check for wear / damage / Clean	Report / Repair / Replace	

SIX MONTHLY

Compressors	Full service	Change Oil / New Filters	
Belts/guards/pulleys	Check for wear / damage	Report / Repair / Replace	
Drive Gear Boxes	Check oil level / condition	Top up / Report	

TWELVE MONTHLY

Plant Audit	Check for wear / damage / rust	Report / Repair / Replace	
Support Structure	Check for wear / damage / rust	Report / Repair / Paint	
Site Audit	Check for slip / trip hazards	Report / Repair / Replace	
Pressure Vessel Certification	Inspection by Third party inspection body (Holcim appointed)	Inspect / Report/ Repair / Replace	

TWENTY FOUR MONTHLY

Site Audit	Audit carried out by Holcim	Report / Repair / Replace	
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[illegible]

Pressure Vessel / Silo Inspection Report

All questions need answers or marked not applicable					
Pressure Vessel Details:					
External Condition					
	Good	Corroded	Dents	Cracks	Comments
Paint			N/A	N/A	
Shell					
Welds					
Support Frames					
Hatch seals		N/A	N/A		
Hatch threads			N/A		
Ladders & Kick rails					
Product Valves			N/A		
Aeration valves			N/A		
Lifting Frames					
Hold down Bolts			N/A		
Pipe work Vent / fill					
Safety Devices					
Note: - Check that all necessary safety devices are fitted and operate correctly.					
	Operational	Leaks	Comments		
Non Return Valves					
Pressure Gauge					
Safety Relief Valve					

Other comments: -

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Site:	
Location:	
Inspection Date:	
Signed:	

Six Monthly Gravity Silo Inspection Report

All questions need answers or marked not applicable					
Silo Details:					
Location:			Auditor / Inspector:		
External Condition					
	Good	Corroded	Dents	Cracks	Comments
Paint			N/A	N/A	
Shell					
Welds		N/A	N/A		
Support Frames					
Hatch seals		N/A			
Alarm			N/A		
Ladders & Kick rails					
Aeration			N/A		
Silo Filter				N/A	
Filter Type	Raltex	Vinder	Sonic	Other	Please Tick One Box
Hold down Bolts			N/A		
Fill Pipe & Fittings					
Safety Devices					
Note: - Check that all necessary safety devices are fitted and operate correctly.					
	Operational	Leaks	Comments		
Valves					
Silo Filter					
Silo Relief Valve					
Alarm					

Other comments: -

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Site:	
Location:	
Inspection Date:	
Signed:	

Task Procedure - 30 Tonne Pressure Silo

For the transfer of cement from a 30 Tonne pressure silo to the main gravity silo

1	Check silo fill pipe valve is closed
2	Check vent valve is closed
3	Check discharge valve is closed
4	Check boost valve is closed

5	Connect 4" rubber hose to discharge pipe
6	Turn on the main silo alarm
7	Check compress oil level
8	Start compressor

9	Build the pressure in the silo to 18 to 20 PSI
10	Open boost valve about ¼ turn
11	Slowly open discharge valve
12	Allow pressure to settle and maintain at 15 to 18psi by adjusting boost valve

13	On completion close discharge valve
14	Reopen discharge valve
15	Close discharge valve
16	Repeat the above two or three times

The above procedure will insure the silo is empty. If there is any cement left in the silo you should be able to feel it pumping through valve & in the discharge hose.

17	Close discharge valve
18	Crack open vent valve ¼ turn to allow air to vent to main silo
19	Close boost valve
20	Turn off compressor
21	Allow to vent for 10 minutes
22	Leave the vent valve open
23	Remove cement hose from discharge pipe

The cement level in the silo may be checked by tapping the side with your hand only.
Please do not hit the silo with hard objects, including rubber or steel hammers

This is only a basic look into preventative maintenance. However it is a starting point and will go along way to preventing breakdowns. Preventative maintenance is a lot cheaper than having to carry out corrective maintenance.

Even if you only start with one section at a time, build on it. It will take time to get into a routine, but if you start with a one or two smaller items each day and one of the bigger items a week it will fall into place.

If site managers or batchers find they are too busy to carry out the maintenance then try delegating it to a staff member i.e. driver or if you are lucky enough to have a yardman.

Note: not doing maintenance is not an option

All Plant and Area Managers are responsible for the ongoing training, safety and maintenance of all equipment on their sites.

Equipment Contacts

Keystone Valves

Tyco Flow Control

Phone 09-921 7279
Fax 09- 921 7341

AR1C YE2 – for manual valves
F1 Milburn Spec - for actuator valve

Industrial Textiles

Phone 09-828 3022
Fax 09-828 1022

Aeration Sleeve
Aeration Mats

Transport Specialities Ltd

Phone 09 980 7300
Fax 09 980 7341

Bin-Dicators
Binflow Aerators

Wam NZ Ltd

Jim Fairlie
Phone 027-699 2671
www.wamaust.com.au

Silo Over Pressure Valves
Aerators, Viberators, Silo & Weigh
Hoper Filters, Augers, Silo Valves

Filter Corp International Ltd North Island

Phone 09 483 7149
Fax 09 483 4355

South Island

Phone 03-377 9200
Fax 03-377 9212

Sonic Pulse-jet filters

Raltex Ltd

Phone 06-353 3800
Fax 06-353 3800

Raltex Single Bag Filters
Portable Filter Bags

Vinder Development Ltd

Murray Vincent
Phone 03 348 7976
Fax 03 348 7976

Vinder Maxi filters
Silo & Weigh Hopper Filters
Portable Filters
Outer Bags for Vinder Filters

Ash Air (NZ) Ltd

Auckland
Phone 09-444 8486
Christchurch
Phone 03-338 8408

Compressor Service/Sales

Automation Equipment Ltd

Hamilton
Phone 07-847 2082

Filter/Regulator
Aeration fittings, Air Rams

Norgren

Auckland 09-579 0189
Waikato 07-847 9031

Aeration Fittings
Filters/ Regulators

Holcim Contacts

National Sales Manager

Murray Dickson

DDI 09 635 1160
Fax 09 635 1159
Mob 021 899 425
Email murray.dickson@holcim.com

Technical Sales Manager (South Island)

Jared Dickson

DDI 03 339 7575
Fax 03 339 7499
Mob 021 272 1442
Email jared.dicksonr@holcim.com

Technical Sales Manager (North Island)

Hayden Mason

DDI 09 635 1164
Fax 09 635 1159
Mobile 021 715 974
Email hayden.mason@holcim.com

Sales & Marketing Representative (Auckland Northland)

Mike Hand

DDI 09 635 1154
Fax 09 635 1159
Mobile 021 748 383
Email mike.hand@holcim.com

Sales & Marketing Representative (Lower North Island)

Peter Ludwig

DDI 09 635 1156
Fax 09 635 1159
Mobile 021 748 383
Email peter.ludwig@holcim.com

Maintenance Supervisor

Laurie Porter

DDI 07 854 4071
Fax 07 855 0576
Mobile 021 500 218
Email laurie.porter@holcim.com

Sales Administrator

Sybil Woolmore

DDI 09 635 1150
Fax 09 635 1159
Email sybil.woolmore@holcim.com

Depots (Bulk Cement Orders)

Dunedin

Phone	03 479 2072	Otago/Southland
Fax	03 479 2081	
After Hours	021 665 606	
Email	dunedindepot-nz@holcim.com	

Lyttelton

Phone	03 328 7406	Canterbury
Fax	03 328 7133	
After hours	021 664 356	
Email	lytteltondepot-nz@holcim.com	

Napier

Phone	06 974 4508	Hawke's Bay / Eastland
Fax	06 974 4509	
After Hours	021 451 962	
Email	napierdepot-nz@holcim.com	

Nelson

Phone	03 548 9081	Nelson / Marlborough
Fax	03 546 9575	
After Hours	021 327 663	
Email	nelsondepot-nz@holcim.com	

Onehunga

Phone	09 635 1153	Upper North Island
Fax	09 635 1159	
After Hours	021 754 763	
Email	onehungadepot-nz@holcim.com	

Wellington

Phone 04 473 1329

Fax 04 471 1768

After Hours 021 427 661

Email wellingtondepot-nz@holcim.com

Lower North Island

Westport Works

Phone 03 789 7259

Fax 03 789 5892

After Hours 021 330 590

Email westportworksdepot-nz@holcim.com

Buller / West Coast

