



FINTEC

METAL FINISHING TECHNOLOGY

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WHEELBLASTING 101 BASICS

Here are 9 critical points to help you get the most out of shot blasting:

1. Regularly Check That You Have Enough Abrasive In Your Machine



It is critical you maintain a balanced abrasive particle size to obtain a consistent, quality finish. When a machine is first installed it should be filled with new abrasive constituting a “*working mix*” of different sizes of media.

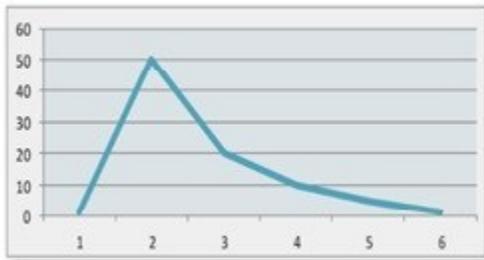
The quantity of abrasive for your machine will be advised when the machine is first installed; as with all shot blasting processes though, abrasive will wear and as a result the level in the storage hopper will drop. Where are you running an aggressive process (especially with angular or irregular abrasive) this can happen quickly and so it is vital you are constantly checking the level. Abrasive levels can also drop

as a result of carrying media out on the parts being blast so regular checks are essential.

Should the level drop you will effectively ‘*starve*’ the blast wheels and as a consequence process times will increase, your finish quality will deteriorate and your processing costs will escalate accordingly.

Similarly be careful of the amount of media being introduced each time as it is possible to ‘*flood*’ the machine. An automatic replenishing system can overcome this. Correct media levels will be set when the machine is set up for the first time. This should be recorded and referred to on an ongoing basis.

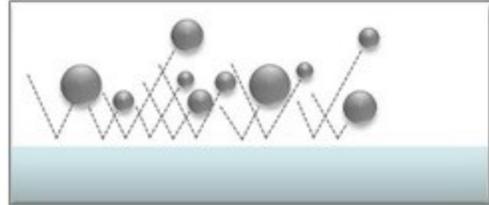
2. Regularly Check Your Abrasive Working Mix is Correct



Irrespective is the starting size of your media in your blast machine (i.e. S110, S230, etc...) within a very short time that media will reduce in size as a result of abrasion, deformation as a result of impact (i.e. rounding) and/or fracturing/splintering. This will cause a drop in the abrasive level which needs to be topped up with new media (as per tip 1).

The longer the abrasive is in the machine, the more it will reduce in size until eventually it is small enough to be removed by the air wash separator and expelled to the dust collector. As a result over a period of time you will develop the

'working mix' which will be present under normal (optimal) processing conditions. New abrasive should be added on a 'little and often' basis, rather than adding larger quantities when the level is allowed to get to a low level in the hopper. It is best to change the frequency and amount of fresh abrasive being added. If the experience is a loss in performance it might be from a clogged dust collector or a loss in efficiency in you air wash separator, or through the 'working mix' being adversely affected. The optimum process should be established once the abrasive has gone through its initial wear and this is then sustainable providing the 'working mix' is regularly checked, assessed and new abrasive added accordingly. Too much large abrasive and your finish will be inconsistent, too much small abrasive (down to dust) and you will experience high levels of wear in your machine, which can dramatically increase your maintenance costs.



3. **Check That The Abrasive Condition Is Good In Your Shot Blast Machine**

As abrasive is recycled and re-used within your shot blast machine it is affected by impact. It will gradually reduce in size as result of a combination of: splintering, spalling (peeling), deformation (i.e. rounding) or smoothing (i.e. grit becoming blunt).

As your abrasive changes, so will your process along with the result you achieve.

Where you are working with angular abrasive (i.e. grit) the rounding of the abrasive angles will produce a less-impacted surface, with a reduced and smoother profile. This will affect paint adhesion properties.

Similarly where you are using a round steel shot, should a percentage of that shot be broken and splintered the surface will change from a satin appearance to a more matt finish. More importantly still, if you are using shot to generally 'peen' a surface and remove tensile stress, the impact of broken / splintered abrasive introduces the risk of worsening the stress factors, rather than improving the present state. This introduction could result in components performing badly (increased risk of failure through fatigue and shortened life expectancy).

Whilst an abrasive type and size should be defined when a machine is first installed or components are introduced, sometimes this doesn't happen, things change, and what can happen is abrasive being used on parts harder than it is. Instead of deforming and/or hardening this can result in the abrasive 'shattering'. This same effect is achieved where empty blast machines are run (or parts loadings are lower than prescribed) allowing the abrasive to have a direct impact on a hardened wear plate. Similarly where abrasive can be sat and/or exposed to the elements it can become corroded, change its properties, etc ... and this again can have a detrimental effect on both the machine (increased wear and spare parts usage and maintenance costs) and the process result sought.



4. **Ensure Contaminants Are Removed**

Just as abrasive circulates in your shot blast machine so will any contaminants that aren't removed by screens (if fitted), by the air wash separator and/or dust collector.

When larger oversized particles are allowed to remain in the machine they can cause damage to the blast wheels (giving a high risk of blast wheel part breakage) and can affect the finish produced and process times adversely.

5. **Monitor Your Abrasive Removal Size**

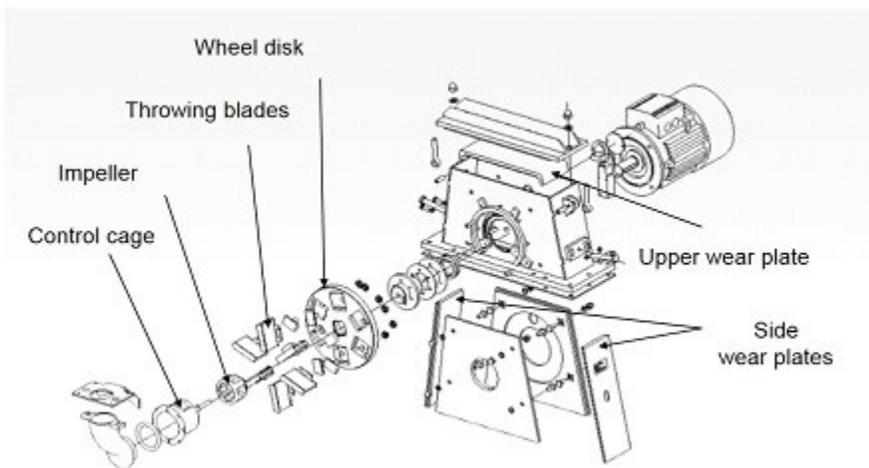
The blast media in your shot blast machine is provided as a 'working mix' to achieve your required process. After a period of blast time it will not perform to the required standard as it has now reduced in size. If it remains in your machine, you can expect to increase the wear and degradation of the blast wheel components together with the recovery system of your machine. It will increase production times and power consumption because of the longer blast duration required. An efficient separator will remove unwanted contaminants and undersized media without carrying out good, usable abrasive. It is vital you regularly check the efficiency of your separator and the size at which media, fines and dust are being removed.

6. **Regularly Check Your Wear Parts**

Wear parts in your shot blast machine are the: blades/vanes, control cage, impellor and side / top wear plates in the blast wheel(s) themselves and the wear protection plates in the blast zone (in the area calculated to have the most impact from the abrasive when it is thrown from the wheel).

Every time the machine operates these parts will be subjected to wear and so need to be checked on a regular basis. Thinning of parts / sections must be noted and once minimum material section parameters are reached the wear parts need to be changed. Options are available on many wear parts for harder materials to prolong service life, minimize downtime intervals where replacement frequency is considered too high.

In the case of wear plates in the blast chamber these are protecting the housing material of the blasting machine which would otherwise be destroyed. These need to be replaced once a minimum thickness is measured to protect your machine. In the case of Rösler machines these are quickly replaced due to the simple, hung fixing method.



Wheel spares, and in particular blades/vanes, impellers and control cages affects how the abrasive is thrown. Particular attention needs to be given to these wear parts. Blast pattern changes can result in abrasive being

thrown into areas of the machine not protected by wear plates, blasting into wheel housings and missing the parts to be processed. If this isn't addressed, considerable wear / damage can be inflicted to the machine which will be costly to rectify.

When worn parts need replacing it is important that the OEM's rules for changing parts are adhered to (i.e. quality of the replacement parts – correct dimensions / hardness, replacement procedures, etc.). In a number of cases sets of parts need to be replaced rather than the individual wear parts to ensure integrity and performance of the blast wheel after repair. These will always be advised by the manufacturer.

7. **Check Your Blast Pattern**

Every time you use your shot blast machine, wear will take place on anything the abrasive comes into contact with. In the blast wheel itself, over a given period this will result in changes that will affect your blast pattern (how and where the abrasive is thrown).



When wear occurs such as the thinning of the blades / vanes or a widening of the aperture in the impellor, the difference in the blast pattern can quickly exceed a change of 20%. This will lead to an increased blast cleaning time, decreased production output and unnecessary wear to the blast chamber. This condition leads to greater abrasive usage caused by the blast stream firing onto the chamber wear plates causing unnecessary abrasive



breakdown.

Therefore it is vital that you regularly check your blast pattern. Principally this involves blasting a test plate to see that the area of impact is where it should be.

As blasting machines come in a range of styles and sizes we will be happy to assist you with this, simply contact our service team on Tel: 0151 482 0444 at any time.

During maintenance there is a risk of blast pattern change. When the components of the wheel are dismantled and replaced, unless the settings are verified to be as per the original machine set-up, there is a good chance that a 'repaired' wheel is already throwing abrasive in areas it shouldn't and you are suffering the consequences.

Even a 1 or 2 degree change from the correct settings can lead to a 10% shift in the blast pattern so it is important this is checked. Again we can help with this.



8. **Check Your Blast Wheel Amp Efficiency**

A number of factors can affect blast wheel operating efficiently, some of which may not be obvious until your shot blast machine is stripped down and/or serviced. Monitoring the amps the blast wheels are pulling can allow you to see that something needs attention.

When your machine is first installed and commissioned with the correct settings, the number of amp pulled by the blast wheels should be recorded. Ongoing checks can be made whilst the machine is running to ensure the amps pulled remain the same. When they drop it is a sign something requires attention.

A drop could mean the level of abrasive in the machine hopper has reduced due to work component carry out and/or an inadequate tipping up of abrasive. It could also indicate that a

wheel (or wheels) is being starved due to blockages in feed pipes or separators, worn blast wheel feeds parts, (i.e. vanes, impeller, impeller case; wear or damage to the abrasive gate control assembly), causing the blast wheel to either starve, flood or insufficient circulation of abrasive in the machine.

Insufficient circulation can be caused by a number of factors including an elevator belt slipping, damaged and/or missing elevator buckets, a worn elevator discharge area, or blocked separator, etc.

A correct procedure in the service schedule would mean these elements of your machine are checked on a regular basis to prevent issues which would affect the quality of the finish produced as well as the blast cleaning time.



9. Check Your Starting Condition Is The Same

Sometimes things change ... including the starting condition of your component parts to be blasted. Worn tooling, changes in materials or investment in new manufacturing methods can result in you no longer getting the result from your shot blasting machine.

We would typically recommend keeping an original sample part by the machine for reference. Should the starting condition prove to be different often this can be accommodated in the shot blasting process itself by extending the blast time, changes in wheel speed or applying a different abrasive.

Should the change be dramatic, the shot blasting process will need to be re-evaluated. It may be that a different abrasive or loading / fixture method will be necessary – and we'd be delighted to help make a recommendation using our process development service.



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