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Important Tips for regulating Wheel Blasting Process

Wheel blasting machines have very high outputs and it is very important to maintain a consistent degree of efficiency. The following points, if kept under constant supervision, will ensure a consistent degree of efficiency in the centrifugal blasting process :

- 1. The Abrasive Feed :** It is important to understand that shots continuously break down during the blasting process. The broken shots and fines are removed through separator and dust collector. Hence it is a must to replenish abrasive at regular intervals. Any drop in abrasive feed will lead to a longer blasting time or incomplete finish. It is advisable to install shot level indicators interlocked with an auto shot replenisher. This will ensure that there is constant feed of abrasive to the blasting wheel.
- 2. Control Cages :** It is one of the most vital components which ensure that the abrasive is thrown in the right direction. However, most users do not pay any attention to its adjustment. A worn out control cage will not only affect the efficiency of the machine but will cause severe damage to the very fabric of the machine.
- 3. The Abrasive Type :** One of the most important factors for blast cleaning efficiency is selection of the right kind of abrasive. Before selecting the type and size it is advisable to seek an expert opinion. Once the correct abrasive is chosen care must be taken to ensure the proper operating mix. An improper operating mix can adversely affect the efficiency of blast cleaning efficiency. A balanced work mix size distribution produces a better more uniform surface profile, best suited for subsequent operations such as machining, bonding or painting etc. Effective and economical abrasive mixes contain a size range from small, medium to large particles. The choice of an abrasive for a particulate application is that of finish. Hence it is very important to carry out the sieve analysis of operating mix and ensure that the desired percentage of each grade is maintained. It is a good practice to have a procedure of inspecting incoming abrasives.
- 4. The Separator:** A very critical component of any blast cleaning machine. Its main function is to remove debris and contaminants from the abrasive and maintain the proper operating mix. The separator should be inspected regularly an improper separator can increase abrasive consumption as good usable abrasive will be moving out of the system. One should regularly carry out sieve analysis of the refuse from the trash tube and ensure that good abrasive should not find its way to the trash pipe or the dust collector. In such a situation a thorough inspection of the separator and dust collector should be carried out. Possible reasons could be bags burst in the dust collector thereby disturbing the line balancing or may be a leakage between the abrasive hopper and the expansion chamber.

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6. The Ammeter : The amperage reading of the motor indicates the volume of abrasive thrown. Once the correct amperage reading is ascertained the endeavor should be to ensure constant amperage. To achieve this it is necessary to ensure proper abrasive feed as spelt out in Sl. No. 1. A higher amperage reading may lead to over blasting and lower amperage reading will lead to longer cycle time. This situation is inefficient and a consequence expensive. It is best to have a system wherein if the ampere drops below the set ampere the machine aborts setting off an alarm.

7. Wheel Efficiency : Wheel efficiency is defined as below :

Wheel efficiency =

Actual wheel amperage – Amperage when the wheel is running free

Wheel motor rating – Amperage when the wheels is running free

Based on the above one can determine the wheel efficiency. An important factor is the value of amperage when the wheel is running free, the higher the value the less potential energy available to drive the abrasives. It is very important to monitor both the no load current and load current. An abrupt increase in the no load current is an indication pf a bearing failure in the motor or the wheel bearing unit.

8. House Keeping : One has to accept the fact that spillage of abrasives around machines is inevitable. It could be because of carry over or it could be a hole worm in the fabric of the machine or it could be a worn out vestibule. Flying abrasives can be very serious in nature if the holes are at eye level. Proper care and attention should be taken to ensure that there are no flying abrasives because of a worn out fabric or vestibule. As regards the carry over these have to be regularly put back into machine to ensure that proper operating mix is maintained.

9. Wheel Hour Meter : This unit indicates the running hours of the wheel in blasting time. It however does not indicate the change in the volume of abrasive. However if a constant volume of abrasive is maintained then the wheel hour meter reading will indicate the number of hours of efficient running. From the start it is important that the machine should be designed to maintain a constant volume of abrasive and in case of any eventuality the process should abort and alarm set in. The wheel hour meter can be correlated to productivity, wear parts life and abrasive life. This is one of the best tools to monitor the overall efficiency of a centrifugal blasting machine. However, users rarely use this tool to monitor the centrifugal blast cleaning process.

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10. Routine inspection & Preventive Maintenance: The life of any centrifugal machine is determined by the way it is use. The machines being self destructive, require constant attention. It has been observed that blast machine maintenance is usually the last priority until it becomes essential. By this time the damage is so severe that it calls for a major overhaul. Hence it is important to carry out the routine inspection at the start or end of the shift as per manufacturer's guidelines.

11. Blast Stream Control : As we have seen in the earlier paragraphs we can control the ampere control the abrasive quality and also the volume of abrasives but one of the most critical controls is the accuracy and direction of the blast stream on the components. An incorrectly directed shot stream can cause a fourfold loss.

- The work pieces are not fully blasted.
- The abrasive is thrown to waste.
- The a=fabric of the machine is needlessly worn.
- The abrasive is broken down unnecessarily.

A misdirected blast stream can be caused by any of the below :

- Wrong setting of control cage
- Worn out control cage
- Worn out impeller
- Worn out blade

Of the above, the worn control cage contributes the maximum for a misdirected blast stream. In actual use it becomes difficult to ascertain when the direction of blast stream has shifted since the entire operation is carried out in concealed condition. To control the blast stream condition we need a special test coupon called Almen strips that reacts to any change in the following :

Change in media size
Change in media hardness
Drop in wheel amperage
Shift of the blast pattern because of wheel parts wear.

From the above it is very clear that if we maintain constant wheel amperage carry out sieve analysis regularly we can control the wear of wheel parts.

If the above points are controlled there is no reason why a centrifugal blasting machine cannot be run at its full efficiency.

For questions, contact :

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