

Blasting Aluminium – Business as Usual?

Aluminium parts are increasingly being subjected to blasting processes, often using abrasives made from aluminium. This offers a number of advantages, but also has an impact on the design of the blasting machines.

In order to be able to come up with good solutions, you need an in-depth understanding of the material. This is a familiar concept in the world of surface technology and applies in particular to aluminium. Parts made from aluminium are becoming increasingly widely used and one common manufacturing process is die-casting.

Aluminium can also function as an abrasive in blasting machines. One reason for choosing it as a blasting medium concerns the subsequent processing of the parts. If hard shot, for example made from stainless steel, remains in inaccessible areas of

the component, it can cause damage to the machine tools in the downstream machining processes. For this reason, aluminium abrasives are often used for blasting non-ferrous components. Another advantage is the more attractive finish of surfaces that have been blasted with aluminium, which is a particularly desirable result in the automotive industry. For these reasons, the engineers and technical specialists at Agtos, a manufacturer of wheel blasting machines for cleaning, deburring and finishing, have investigated in detail the use of aluminium abrasives. They have carried out intensive tests with the help of cus-

tomers and developed machines specifically for use with this material. They have also acquired extensive experience in the Agtos test centre and in practical applications on the sites of well-known customers.

Designing the machines

It is becoming increasingly common for parts made from aluminium to be blasted using abrasives made from the same material. This brings a number of benefits, but also has an effect on the design of the blasting machines.

The physical properties of aluminium, such as its specific weight, which is lower than that of steel blasting media, must be taken into consideration when designing the blasting machines. For example the angle of repose of the shot has an impact on some of the components of the machines, including the hopper and the bunker. Certain machine parts also need to be a different size.

In addition, the turbines have to be modified and the flow characteristics of aluminium shot must be taken into account. Therefore the turbines are designed to work efficiently with different grain sizes. The aluminium shot needs to be processed with care and the turbines must not become too hot, as this will damage the shot. All of these measures are essential to ensure good blasting results and cost-effective operation of the machines. Agtos blasting machines are designed to allow the abrasives to achieve their full



Die-cast aluminium parts leaving a wire mesh conveyor blast machine.

The aluminium test centre: a continuous overhead rail blasting machine for processing aluminium parts.



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impact without being destroyed inside the machine. They also enable abrasive loss to be avoided which prevents valuable material from being wasted and helps to reduce operating costs. After the blasting process, a highly efficient blow-off device cleans any remaining shot from the parts and prevents it being removed from the machine. The measures described above are intended to ensure that the blasting machines operate cost-effectively and keep running costs to a minimum.

The best types of machine

The blasting system should ideally be designed for the material flow of the company in question. Wire mesh conveyor blast machines are popular with operators who have automated systems. The main advantage of this type of machine is the fact that the wire mesh belt allows the components to be blasted from above and below, without them needing to be turned manually or automatically or suspended.

In this type of machine, the parts are automatically transferred to a wire mesh belt or placed on the belt by a manipulator (in some exceptional cases this is done manually). The belt then transports the parts through the machine.

First of all they pass through the inlet airlock. This ensures that the blasting chamber is sealed off from its surroundings. High-performance turbines in the blasting chamber throw the abrasive at the parts at high speed. The wire mesh belt is designed to ensure that the parts are effi-

ciently blasted from above and below. After the blasting process, any shot or dust remaining on the parts is blown off. The dust is separated out by an integrated filter unit and the abrasive is returned to the machine.

Short blasting times

Wire mesh belt blasting machines are designed to withstand extreme stresses. The use of high-performance turbines ensures that the surface of the parts is fully blasted. This keeps the blasting times to a minimum and produces high quality results. The automatic abrasive metering unit installed directly over the turbines ensures that blasting only takes place when there are parts in the blasting area, which reduces the wear on the machine.

Overhead parts conveyors

In many companies parts are transported on overhead conveyors. Agtos has developed continuous overhead rail machines for blasting aluminium parts using aluminium abrasive in conveyor configurations of this kind. Conventional hanger shot blast machines are also available for non-circulating systems.

The blasting process begins when the loaded hangers enter the blasting machine. An inlet airlock seals the blasting chamber off from its surroundings. The hangers pass through the blasting chamber and the parts are blasted with abrasive. After the blasting process, the parts

move into an outlet airlock where a blow-off device allows the blasting media to be recovered. The hangers can then be transported to the next stage of the manufacturing process or the shipping department.

Solutions are also available for processing parts that are transported in containers such as crates or mesh boxes. Rubber belt tumble blast machines or steel belt tumble blast machines, which have a belt made from steel plates, can be used for this purpose. However, these types of machines are rarely chosen to blast aluminium parts, which often have thin walls, because the parts constantly knock into one another during the loading, blasting and unloading processes. //

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