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What Design of Abrasive Blast Cleaning Machine is Best for You?

Automotive Remanufacturing companies today remanufacture a great number and mix of automotive components including but not limited to: brakes, electrical parts, axles, engine components and complete engine assemblies. The one thing that all of these parts or components have in common is that they all must be cleaned of residue or prepped for paint prior to remanufacturing. There are baking or washing processes that are performed rather than, or conjunction with, abrasive blast cleaning. This article is written to assist you in determining what design of blast machine works best for your particular application.

There are two types of blast cleaning equipment, air blast and wheel blast, often referred to as *airless blast*. Air blast propels the media with high velocity compressed air. Wheel blast propels the media via a motor either directly mounting the blast wheel on the motor shaft or indirectly with motor mounted sheaves with belts driving a bearing assembly that the blast wheel is mounted upon.

Air blast machines are normally used on fragile parts or for special or low production requirements. Air blast machines typically use aluminum oxide, glass bead or sand media. Air blast machines are available in many configurations and available with single or multiple blast nozzles. Air blast machines are suited best for low production requirements or specific applications. They are less efficient requiring more energy to move less media.

Wheel blast machines are known for being more versatile allowing for a wider range of parts, production output and finish requirements. Wheel blast machines are available in more design configurations and capacity sizes for low or high production parts requirements. Most automotive remanufacturers use small steel shot media which offers a fine profiled consistent finish. Other medias such as steel grit, stainless shots and grits, aluminum shot as well as plastics or organic medias such as fruit pits and shells of nuts are used. A properly configured and sized wheel blast machine is capable of propelling

a much greater volume of media, which in turn creates shorter cycle times and ultimately higher production output.

All Wheel Blast Cleaning Machines include these basic design criteria:

- 1) Blast Wheel(s)- The wheel(s) propels or throw(s) the abrasive media.
- 2) Work Handling system- depending on the design type of machine this may be rubber tumbling mill apron belt, fixture of hooks or pockets, hanger with hooks, rotary table or tables, or pass-through roller or belt conveyor that transfer the work piece(s) through the blast zone.
- 3) Electrical System- The wiring, controls, and motors to power and safely operate the system.
- 4) Reclaim System- Transfers the abrasive mix back to the Abrasive Storage Hopper.
- 5) Separation System- The method that the machine has to remove contaminate waste, broken down media or dust from the reusable "good" abrasive.
- 6) Abrasive Storage System- The storage hopper system that effectively provides consistent media to the blast wheel.
- 7) Ventilation System- The Dust Collection System provides negative pressure to the system to assure dust free operation as well as performs the pneumatic separation of the abrasive and waste mix.

With such a wide variety of automotive components, there is not any single design style, configuration or size of blast cleaning machine that is perfect for all applications. Different individual component sizes and shapes, or batches of multiple parts, require different methods of handling or processing to successfully offer blast cleaned parts most efficiently. Choosing the right machine for the application is made easier with knowledge of the types of machines available.

Like all manufacturing processes the cleaning process must be reviewed and evaluated as to what the ultimate goal that you expect to achieve. The surface finish requirements determine what media is used. The part/component size and configuration determine if the parts are batch cleaned in large volume or individually handled/processed, thus what style of machine is best suited. The overall production output determines the size or capacity of the machine or multiples of machines.

Following are the styles of Blast Cleaning Machines Popular with Automotive Parts Remanufacturers throughout the world.

BARREL BLAST



12 Cube Ft. Barrel Blast

The Barrel Blast Machine is the probably the most commonly used type of blast cleaning machine among all Automotive Parts Remanufacturers. The Barrel Blast work conveyor is a continuous rubber belt with tumble ridges or cleats that gently tumble the batch of "small" parts to mix and expose them in a fluid-like motion to allow the blast to offer thorough and consistent blast coverage for the batch of parts.

Goff Barrel Blast machines can be configured to be operated manually, semi-automated or fully automated with bucket loaders or load conveyors that accept tote baskets, bins or barrels of parts or components. The automated systems are PLC operated and automatically unload from the machine into a tote or onto a takeaway conveyor following the blast cycle.

Barrel Blast machines range in various sizes from as small as diminutive 1.5 cubic feet capacity up to a hefty 24 cubic feet capacity. The blast wheel horsepower range from 3 horsepower up to 30 horsepower.

To properly size a Barrel Blast Cleaning Equipment for your application please note that, contrary to that old wives tale, "Bigger is NOT always better". The size of your container or your batch of parts dictates the size of machine that is best for you. The size of Barrel Blast Machine that is closest to your particular batch size is the most efficient for your operation. This is because a properly sized batch cleaning machine operates with the parts at the proper level for optimum mix and exposure to the blast by consistently maintaining the correct distance from the blast wheel while always keeping the work pieces in the blast pattern. The parts also mix better for less potential part to part damage. The machine itself is also protected from the blast pattern if the parts being blasted are at the proper level in a properly sized machine.

Perfect parts to be blast cleaned in a Barrel Blast Machine include: Automotive Electrical Starters and Alternators, Pulleys, Valves, A/C Compressor Housings, Springs, Axles, Connecting Rods and Brake Components.

SPINNER HANGER



2460 Spinner Hanger

Spinner Hanger Blast Machines are typically used on higher production requirements of large parts where the parts cannot be tumbled together without potentially causing part to part damage. These are the parts that are normally larger and/or have machined, gasket or seal surfaces that would be prone to dinging if tumbled in a Barrel Blast Machine. Carousel Spinner Hangers are unique because they are dual or even triple chambered and do not require a door to be closed in order for the blasting process to take place. The blast process is performed simultaneously to the operator, or in rare instances; a robot, unloading cleaned parts and reloading with the soon to be cleaned parts. This loading of the parts while the machine is blasting is why the Goff Spinner Hanger Machine offers higher production and is considered a continuous cleaning machine.

Spinner Hanger machines require hooks, racks or fixtures to hold the components to be blasted. Fixtures are designed to present the component for optimum exposure to the blast. Fixtures may hold one or many parts depending upon the size and configuration of the part and the machine size. The fixture is mounted on a rotating shaft in the chamber. When the front chamber is indexed into the blast zone, the fixture is rotated in front of the blast exposing it for thorough coverage in short cycle times.

Hanger Table Machines which allow for both: a Spinner Hanger hook and a Table Blast table are also available and versatile for a parts mix. These models are best suited for a larger range of parts cleaning requirements that are not suited for tumbling. Goff offers 4 different sizes of standard Table Blast Machines.

Spinner Hanger Machine Models are available in numerous standard design sizes of varying chamber dimension sizes, and the number, size and horse power of the blast wheels.

Perfect parts to blast clean in Spinner Hanger and /or Hanger Table Machines are: Engine Blocks and Heads, Connecting Rods, Crank Shafts, Housings, Axles, Covers, Pans and Gears and other parts and components.

TABLE BLAST



48 Inch Table Blast "L"

The Table Blast Machine is best to blast large heavier pieces that do not hang well or do not have a means to hang yet should not be tumbled together. The Table Blast is typically better suited for lower production and heavier work pieces than Spinner Hangers for a similar application. A Table Blast Machine consists of a single rotating table or multiple smaller tables rotating in the blast. The table rotates in front of stationary or oscillating blast wheels that allow for additional blast coverage angles, ports and pockets on the part(s). The Table Blast can clean a wide variety of parts by placing them directly on the table or on a rack or fixture on the table.

The Multi-Table has individual rotating tables in the blast chamber. Higher production Multi-Tables have more blast zones with multiple blast wheels and a load/unload station that allows for continuous operation similar to a Spinner Hanger.

Table Blast Machines are available in table diameter sizes ranging from 3' up to as large as 10' and capable of hefty weight capacities. The Multi-Tables typically have smaller individual or satellite tables for lighter parts that are hand loaded.

Swing Table Machines are also a model of Table Blast Machine available. They are best suited for very large or very heavy parts. Swing Tables allow for more accessible loading from overhead cranes or possibly fork trucks of these large parts. Swing Tables typically cost more and are not normally recommended for automotive rebuilding applications.

Perfect parts to blast clean in a Table Blast Machine are: Transmission Housings, Engine Blocks and Heads, Wheels and Crank Shafts. The Multi-Table Machines are best suited for small parts such as: Peening Connecting Rods, Gears or other hand loaded items.

CONTINUOUS BLAST



Wire Mesh 27.5-4-80

Continuous Blast Machines are normally best suited for the higher production operations that have a variety of parts that may not fixture well and/or are fragile or other reasons prohibit being batch cleaned. There are Monorail Continuous Blast Machines that are used rarely in Automotive Parts Remanufacturing operations. They are normally extremely part/component specific. The most popular Continuous Blast Machines are pass-through belt machines. They have an endless manganese wire mesh belt, which looks similar to chain link fence mesh, that conveys the parts at a consistent rate of speed into the blast zone exposing the parts to as many as 8 blast wheels attacking from various angles to allow total blast coverage on the parts. Because of the production capacities, physical size and number of blast

wheels on a pass-through machine they are a larger investment than the previous models.

The parts can be loaded by hand or with load conveyors and exit the blast machine onto takeaway conveyors, into totes, onto sorting tables or into tipping devices depending on what the parts or following operation requires. The Wire Mesh Blast Cleaning Machines come in a variety of belt widths and blast wheel horse powers and position placements that allow for numerous setup options depending on your parts or product mix. Belt widths range from 18" up to 48".

Parts to blast clean in a Continuous Blast Machine are: Crank Shafts, Housings, Heads, Blocks, Axles, Wheels, Starters and Alternators and mixes of these and other parts because these machines do not require any special fixturing.

Custom Options

All of the above machines can and probably should be fitted with some Optional Features other than required Dust Collection which all machines require. To allow the machine to: produce more work, perform better, last longer, save abrasive media, and various other benefits there are recommended options that will assist this effort and make your Blast Cleaning requirement less costly.

Please let us know how the friendly folks at Goff Inc can assist you with your Washing and Blast Cleaning needs.

Best regards,
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