

NEW SPECIAL

READY FOR THE 1990s

Vacu-Blast is proud of its role as the leading light in the advancement of abrasive blasting technology since the end of the second world war, which saw the introduction of the now world-famous Vacu-Blast Closed-Circuit pollution-free in-situ blaster, first used in naval dockyards.

Over the last 40 years, in parallel with the new techniques it has pioneered –

particularly in the field of impact treatment – the company has also been instrumental in destroying the old-fashioned picture of abrasive blasting as a crude, uncontrollable and dirty operation.

Today, the picture is quite the reverse. Abrasive blasting has evolved into a process of hi-tech surface engineering, with many of its most advanced faces being applied in the defence and aero-

space industries. As it has in other parts of production engineering, spin-off technology from these areas is also benefiting manufacturers of many other products. Increasingly, the use of sophisticated computer-controlled systems and robot manipulators is becoming the norm in abrasive blasting and impact treatment procedures. Thanks largely to Vacu-Blast, these processes have a new image, a new

value and a new direction – into the 1990s.

State-of-the-art tube cleaner

A new PLC-controlled automated machine for cleaning the inside bores of 15-28mm diameter domestic copper tubes, purpose-designed by Vacu-Blast for IMI Copper Tube Ltd (Kirkby, Liverpool), is an ideal example of state-of-the-art abrasive blasting.

Design of the machine has evolved over a number of years through close co-operation between Vacu-Blast and copper tube manufacturers. The production of half-hard tube – the most popular temper since it is straight and bendable – can lead to the creation of a very thin film of carbon in the bore. In certain waters this carbon film can cause electrolytic corrosion cells to be set up which in turn lead to pitting failures. Consequently, to ensure the tubes are suitable for all waters and meet today's stringent quality requirements, the tube bores have to be thoroughly cleaned of all carbon deposits. Earlier Vacu-Blast tube cleaning machines carried out this process effectively but could only process a small number of tubes at a

time at a relatively slow rate.

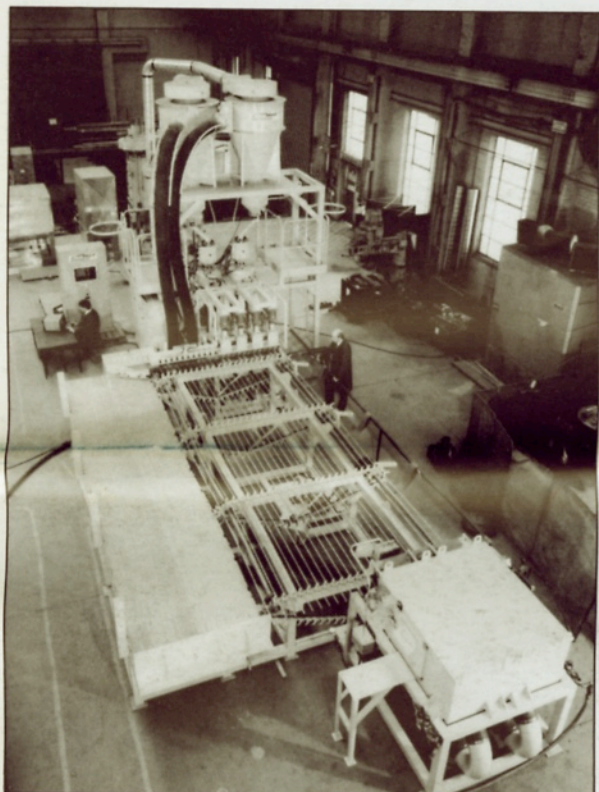
Atlantic crossing!

Progressive production development has led to this latest programmable machine which continuously processes twelve 6-metre long tubes simultaneously at a rate of up to 1150 lengths per hour. This means that in a month the machine could process enough tube to span the Atlantic!

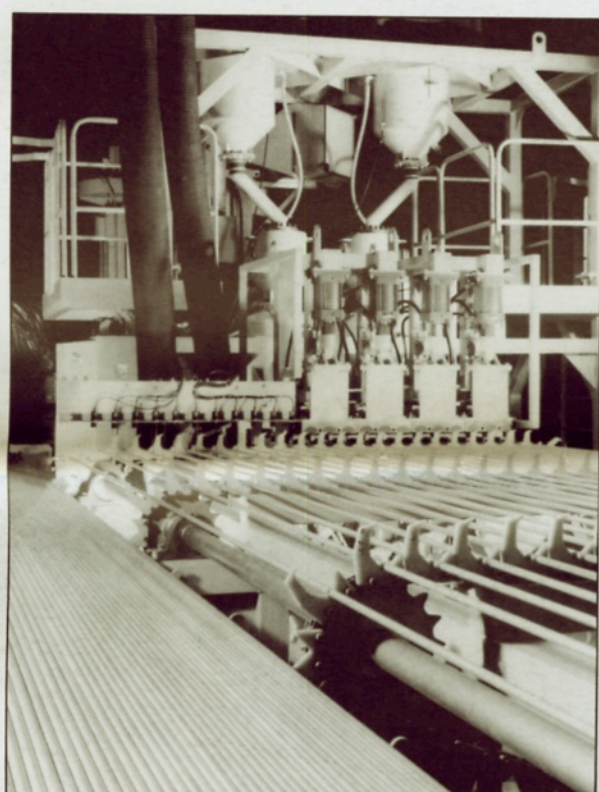
The machine automatically clamps the tubes very precisely and directs a carefully metered blast of chilled cast iron grit down each, via a series of twelve in-line blast nozzles. The abrasive 'bounces' along the entire length of each tube to produce even cleaning and totally removes all traces of contamination.

The resultant mixture of dust and spent abrasive is recovered automatically – reusable abrasive is recycled back to the twelve blast nozzles and dust is collected in a special container for disposal.

An integral conveyor automatically indexes the tubes through the process from an automatic infeed magazine to an off-take conveyor, and blast pressure and time are variable to suit the diameter of tube being processed.



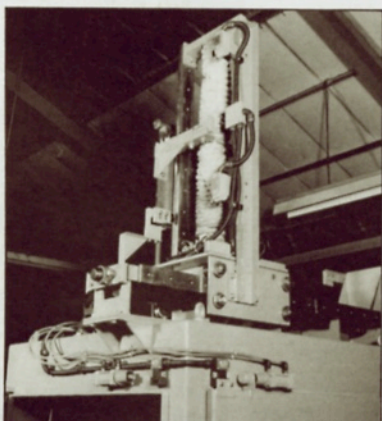
Two views of the automatic abrasive blasting machine for cleaning the inside bores of 15-28mm diameter domestic copper tubes.



AUTOMATED NOZZLE MANIPULATORS

Vacu-Blast has developed a range of automated blast nozzle manipulators for its cabinet blasting machines. These are available on all new machines and can be retro-fitted to existing ones.

The manipulator pictured here is a two-axis version with a precision-engineered rack-and-pinion drive to ensure the highest positional accuracy and process repeatability. The associated control packs for this and other types in the range provide a wide degree of programmability for a variety of abrasive blasting or shot-peening applications. Vacu-Blast has tested a number of 'off-the-shelf' manipulators for handling its blast nozzles, but none could withstand the unique demands of an abrasive



blasting environment. Consequently, its own manipulators are of an exceptionally rugged design, highly resistant to the ingress of dust and aggressive debris.

User-proven by a number of the UK's leading aerospace companies, Vacu-Blast automated nozzle manipulators are ideal for high-throughput surface treatment applications where optimum accuracy is essential.

Because of the ruggedness of their design, Vacu-Blast expects the manipulators to have other production handling applications in adverse operating environments. As well as the rack-and-pinion version, manipulators are also available with less complex drives for less demanding uses.

Media quality must improve!

Recent advances in surface treatment equipment and applications are placing more stringent demands on blast media. In fact, in Vacu-Blast's experience, developments in blast media are not keeping pace with the more critical performance requirements of today's surface engineering, especially when it comes to the strict control of particle size and shape. In order to optimise results, the need to

control the quality and consistency of blast media is vital – especially when dealing with the critical glass-bead and steel-shot peening applications for aerospace.

Recognising the increasing emphasis its customers are placing on media selection, Vacu-Blast has established a separate Media Division which is working closely with manufacturers of blast media to tighten-up quality and

assist in the development of new, more consistent materials. In addition, the new division will provide customers with detailed technical advice on their blast media needs. Close study of applications involving the latest plastic media, in particular, are receiving a high priority – see the back page for more on this.

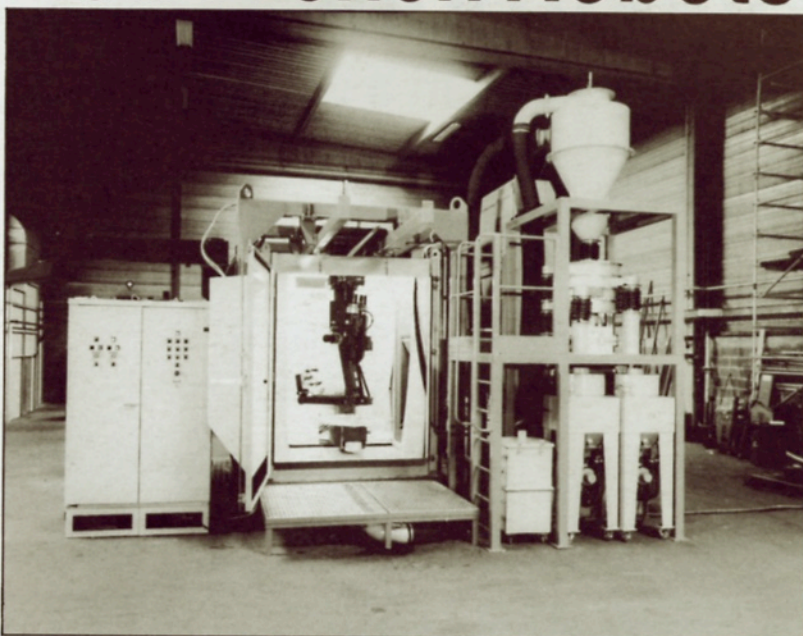
Latest Far East orders total over \$2.5m

Orders valued at more than \$2.5 million from customers in the Far East have recently been secured by Vacu-Blast.

The most recent contract is for a \$441,000 special shot-peening machine for Samsung, Korea, to be used primarily to increase the fatigue resistance of airframe components on the latest Boeing 747. Added to this, Korean Airlines have ordered custom-designed shot-peening facilities – a peen-former/saturation peener and a fatigue life improvement peener – to process Boeing aerospace components produced under license. The contracts are worth \$800,000. The orders follow closely the installation of programmable shot-peening machines at China Airlines in Taiwan and the Hong Kong Aircraft Engineering Company (HAECO), worth \$245,000 and \$135,000 respectively. Vacu-Blast's current Far East order book is completed by the second of three automatic machines worth more than \$750,000, for cleaning the moulds used in the manufacture of rubber tyres, and a number of standard Closed-Circuit machines for Taiwan.

This fast-developing area of the world is proving to be a major market for the company and following a recent Far East sales trip by Vacu-Blast's Export Sales Director, Ted Nye, further significant orders are expected soon.

New French Robots



This new custom-engineered blast enclosure, produced by Vacu-Blast's French sister company, Matrasur, features a robot operator. Installed by aeroengine manufacturer, SNECMA, at its main component production centre in Evry-Corbeil, the machine is used for the surface preparation of a variety of components prior to plasma spraying. The Vacu-Blast group pioneered the use of robots for abrasive blasting – another of its robot installations is featured on page two.

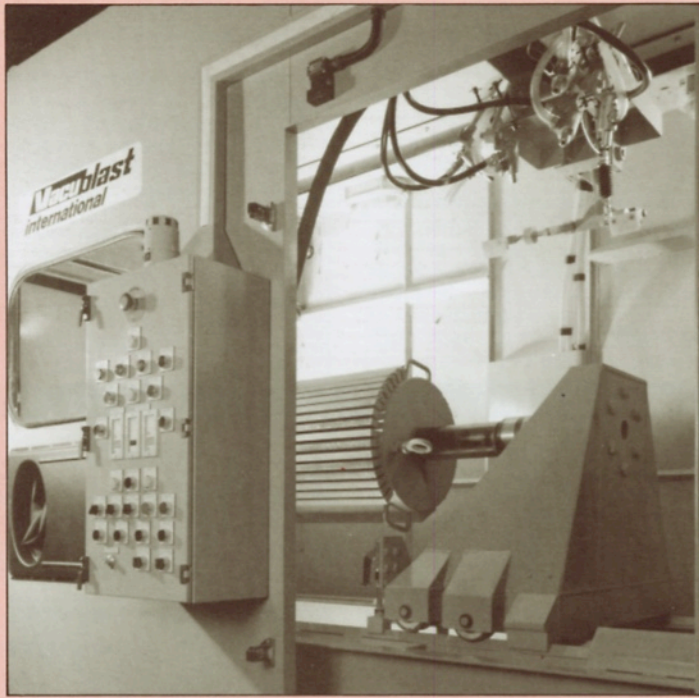
STREAMLINED CLEANING OF LOCOMOTIVE GENERATORS

This specially-designed Vacu-Blast machine, using 'soft' abrasive media, is helping Indian Railways to speed-up the refurbishment of the electric generators used in diesel locomotive traction drives.

Installed at the company's modern diesel workshop complex in Patalia, the new unit is used for the controlled blast cleaning of generator armatures and commutator risers. It employs an automatically guided multi-nozzle array – comprising five suction-fed blast nozzles – which cleans caked insulation and varnish from the components following the removal of old winding and prior to rewinding. Because the 'soft' vegetable blast media is used, there is no danger of damage to or abrasion of the armature core lamination or commutator segments.

Up to 174 slots and 486 segments are involved on the largest components handled, which can measure up to 1676mm in length and 1118mm in diameter, and weigh as much as 3.5 tonnes.

To facilitate loading and streamline the overall procedure, the machine incorporates two 3048mm tracks on each side of the enclosure which operate in conjunction with a loading/unloading work carriage – this allows a component to be loaded or unloaded whilst another is being processed.



ROBOT SURFACE PREPARATION USED ON 'ARIANE' FUEL TANK PANELS

Aerospatiale, Europe's largest aerospace specialists, has installed at its Les Mureaux production complex what is said to be the first surface engineering plant of its kind – a robotised abrasive blastroom, designed and manufactured by Matrasur.

The new plant is used for the surface preparation and finishing of fuel tank panels for Aerospatiale's 'Ariane' satellite launch vehicle, prior to welding and plasma spraying operations, and for removing heat-scale from components for the CFM56 turbofan aeroengine, under contract to SNECMA.

It has radically improved working conditions for blastroom operators. So much so, that the operator works from outside the blast enclosure, remotely controlling the blast nozzle and viewing his work through a large double-glazed window.

Components for processing are transferred from lift trucks into the 4m x 3m x 2.6m high enclosure by an external extending jib and placed onto a fixed-position rotating work platform. The robot holding the blast nozzle assembly is positioned in the corner of the enclosure, protected by a rubberised shroud specially designed to prevent the ingress of the aluminium oxide blast media.

As a further safeguard, the shroud inflates during blasting to positively seal against particles of media and the resultant blast debris.

New Concept

Starting from pre-determined datum points on the work platform, the robot

can blast from hard-disk programs, designed for components with known blasting parameters, or it can mimic the movements of a 'syntaxer' – a manipulator sited outside the blastroom which is controlled by the operator. In the latter case, the operator simply acts as though he is working inside the blastroom, although he is actually seated in a comfortable, air-conditioned control room; the robot automatically follows his every movement. The syntaxer also controls the work platform. The noise level outside the blastroom is only 71 dB whilst inside it is 110 dB.

This new concept in abrasive blasting has taken the operator out of the unpleasant working environment and drastically

reduced the fatigue factor – the major reason for its introduction, says Aerospatiale. It has also led to improved quality through more consistent processing, a quicker production rate, and reductions in component handling times. Another important feature of the Matrasur robot blastroom is a dual media feed system which provides automatic changeover between two different grades of aluminium oxide – 24 and 150 mesh. The blast nozzle is self-purging during the changeover to prevent cross-contamination, and a sophisticated media air-washing and sieving mechanism ensures complete separation during the recycling stage.



Major Benefits with 'D-I-Y' Blastroom Pays for itself in a year!

The availability of off-the-shelf abrasive blasting powerpacks from Vacu-Blast, has enabled Blackpool-based Kilgour Engineering Ltd to construct their own blastroom and, in the process, save money, dramatically improve work throughput times, and govern quality more strictly.



Kilgour, which offers a high-quality machining, fabrication and finishing service to manufacturers in the North West, including many major names, used to sub-contract their abrasive blasting work. However, this meant that controlling the quality of results was difficult, transportation costs were involved and the turnaround of work was often as much as five days, which increased delivery times.

With more stringent paint specifications demanded by their customers, quality control of surface preparation became of paramount importance and Kilgour decided to bring abrasive blasting in-house so that effective QA checks could be made.

Since the company are in the metal fabrication business, they decided that to minimise the capital outlay they would build their own blastroom. After studying the problem of delivering and recovering the abrasive, Kilgour opted for a Vacu-Blast power-pack as the most rugged, reliable, efficient – and proven – unit available for 'd-i-y' applications. The resultant 3m x 3m x 3.5m blastroom says Works Manager, Chris Hardman: "Easily paid for itself in a year. We saved all our transport costs and, because blasting is now under one roof, have increased the throughput of work significantly. We can now blast and prime a fabrication in less than an hour. There's no waiting time between the processes, which means that we can process far more units in a day than before."

Better service

"Also, quality of surface preparation is totally under our own control and with no delay now between blasting and painting, surface deterioration is a thing of the past. All this adds up to a much better service to customers."

Kilgour received full technical support from Vacu-Blast during the design, construction and installation stages of the blastroom, which utilises a simple system of vacuum recovery of spent abrasive via a floor duct. The power-pack automatically separates out reusable abrasive from dust and debris and recycles it – thus saving on materials costs.

IN-SITU ABRASIVE BLAST CLEANING SAVES 21 HOURS!

The introduction of in-situ abrasive blasting has enabled NEI Thompson to slash the post-fabrication cleaning time of nuclear reactor 'penetration' service ducting from an average of 22 hours, to just one hour.

The operation is carried out using a specially-adapted Vacu-Blast PHA 06 Closed-Circuit blasting machine which has an integral power-pack for recycling reusable abrasive – in this case 'Vacu-Beads' glass bead media. Dust and fines are filtered out and collected for discharging separately. It is a pollution-free system with the major advantage of allowing blasting in areas close to other processes or machinery.

Produced by the Nuclear Engineering Division of NEI Thompson at Wolverhampton, under contract to NEI Nuclear Systems, the penetration ducting is a multi-tube arrangement in a special steel alloy, made up of forty-four 9 metre long tubes, each of 22mm outside diameter and with a wall thickness of 3mm. These are contained within a large diameter pipe with a special manifold at one end.

In operation, the tubes carry cooling water through the biological shield. Because of this operating environment, the surface of the whole unit must be cleaned to the highest standard, in particular the insides of the tubes.

Previously, chemical cleaning using a simple pull-through method and mechanical cleaning with a flexible honing head were tried for cleaning the insides of the tubes. Both proved extremely time-consuming and suffered from other major drawbacks. Effective overall cleaning, particularly of any slightly pitted areas, was difficult. In addition, the use of chemical agents is restricted because of possible weakening effects and honing meant working from both ends of the tube. Cleaning the interior of the manifold where the tubes protrude was also difficult because of the awkwardness of reaching the interspatial areas.

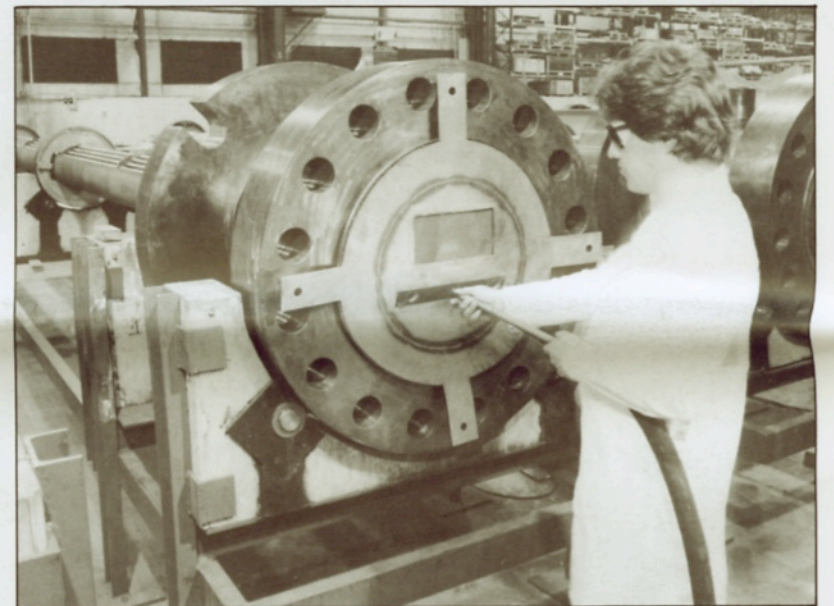
The ideal solution

Blast cleaning seemed to offer the ideal solution. Before implementing the new system, however, NEI carried out exhaustive tests in conjunction with Vacu-Blast and a number of official inspection bodies, to determine the most compatible media for the job and to ensure that blasting did not weaken the thin tube walls. Using Vacu-Blast it was found that no substantial thinning of the tube occurred, even after a continuous 30 second blast; in practice, a blast of only a few seconds is sufficient to achieve thorough cleaning of any area of the component. Also with glass beads, there was no danger of any subsequent contamination.

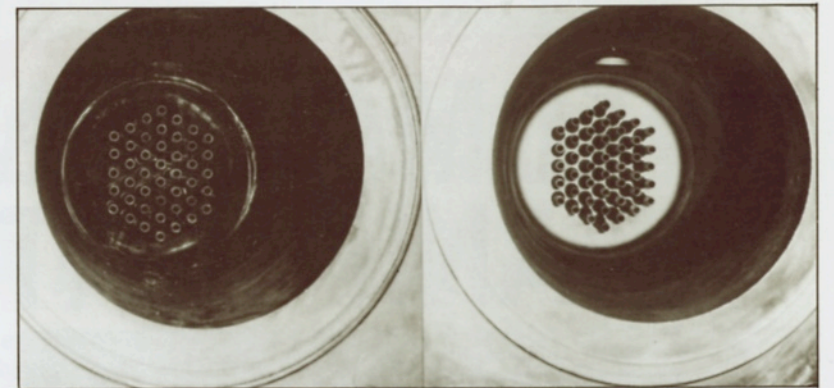
Blast cleaning of the tubes is now carried out with a special nozzle which is simply placed against the end of each tube in turn. At the other end, a collector box connected to the Vacu-Blast Closed-Circuit suction recovery system, enables spent media, dust and fines from five tubes at a time to be recovered. A timing mechanism ensures that blasting is contained to the required cycle time.

The result is visually inspected using an intrascope for comparison with a trial test piece.

For cleaning the manifold area, NEI have constructed a special end plate incorporating a window which, in effect, turns the component into a blast enclosure. The operator passes the Closed-Circuit nozzle through a small rubber-curtained aperture for the blasting operation. Resultant dust and spent media are again collected by an associated suction recovery hose.



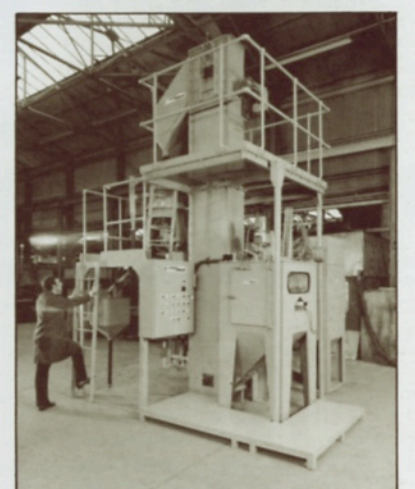
The nuclear reactor penetration ducting before and after the Vacu-Beads treatment (Below).



LAND ROVER SHOT-PEENING UNIT HIGHLIGHTS AEROSPACE TREND

Increasingly, the automotive industry is following aerospace shot-peening techniques to optimise weight-to-performance ratios. This specially-designed Vacu-Blast shot-peening facility at Land Rover, used to process gearbox components, is an ideal example of the trend.

The machine incorporates a shot size and shape classification system, unique to an automotive engineering application and has ensured much closer control of the quality of the shot-peening process.



Vacu-Blast Helps Behind-the-Scenes with Fossil find of the Century

A new British dinosaur, 'Baryonyx walkeri', named after Bill Walker, the man who found its fossilised skeleton in a Surrey clay pit, has been hailed as the fossil find of the century. Vacu-Blast played an important part in the reconstruction of the dinosaur's

skeleton by the Natural History Museum's Department of Palaeontology. A Vacu-Blast 'Nova 150' cabinet blasting machine was employed to speed up the preparation of the many fossilised bones which make-up the skeleton – superseding some of the more time-consuming methods used traditionally. Surrounding rock and a plaster cocoon applied in the field to protect the fossils were removed using the Vacu-Blast

machine, prior to fine-finishing with delicate dental instruments. Commenting on the installation of the machine, Ron Croucher, the senior technician at the Museum largely responsible for developing the Vacu-Blast rock removal technique said: "The machine had made an enormous contribution to our bone preparation work. We can now remove bulk material in minutes rather than the hours needed before."



An artist's impression of the new British dinosaur, 'Baryonyx walkeri'.



CREATING THE RIGHT IMPRESSION

One of the most notable historic buildings in Paris – the Administration des Monnaies et Médailles, overlooking the Seine and near to the Louvre – houses a 'production line' which marries the finest traditions of French craftsmanship with the latest surface engineering techniques.

Built between 1770 and 1775, the building originally housed the Paris mint, founded by Louis XV, and now produces medals and collectors' coins, many of which have been specially designed to have an antique finish. Instrumental in producing this 'authentic' appearance and an integral part of the production process, is this special multi-nozzle aluminium-oxide blasting cabinet, custom-built by Matrasur, Vacu-Blast's French sister company. Highly-controllable, the machine is used to clean each coin and to provide varying degrees of surface texturing prior to a chemical oxidation procedure.

CAREFUL TREATMENT FOR YESTERDAY'S ARMOUR

The gentler side of Vacu-Blast's surface treatment capabilities is well illustrated here. This ancient, priceless and fragile Indian armour from the Tower of London was restored to its original appearance using carefully controlled glass bead cleaning in a Vacu-Blast cabinet.

The fine chain mail was cleaned without the slightest damage and during the process a zig-zag pattern was revealed which had not been previously visible. Whilst it would have been possible to clean the armour by hand, the task would have taken months. Using the Vacu-Blast glass bead treatment it was completed far more efficiently in hours.



CABINETS FOR THE NATIONAL PHYSICAL LABORATORY

The National Physical Laboratory, Teddington (Middlesex), uses a number of Vacu-Blast cabinet blasting machines in its shot blasting facility which handle a wide variety of components in virtually every kind of metal, as well as in glass and plastics. These range from parts for high-precision instruments to basic welded fabrications, used in the Laboratory's measurement calibration and research projects. Only high-specification glass-bead or aluminium oxide media are employed, to avoid the corrosion problems associated with ferrous abrasives.



Here the new cabinet at the NPL is shown fine-finishing a brass optical instrument component.

National corrosion service

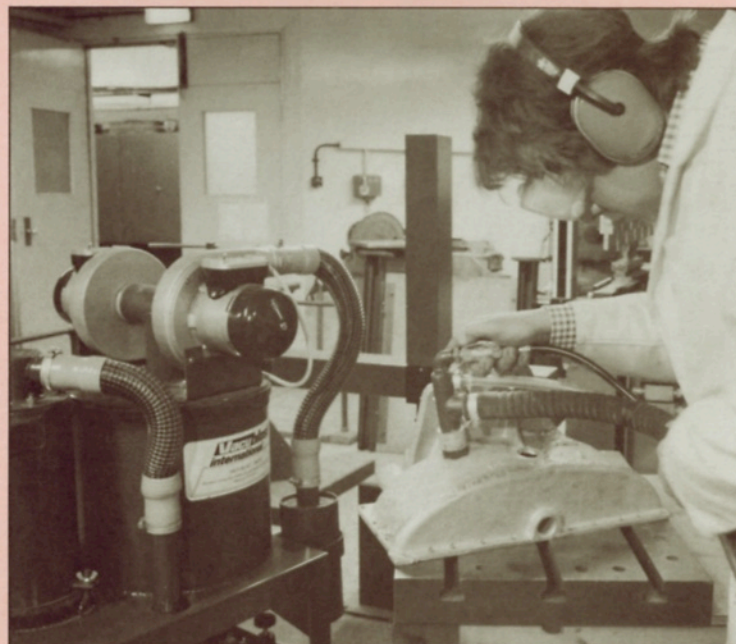
Two 'Honermaster' cabinets are used primarily for fine finishing such as producing a frosted surface on glass tubes used as sheaths for high-temperature resistance thermometers to reduce heat radiation transfer, and for creating non-glare satin finishes on instrumentation of various kinds. Heavier-duty surface preparation work – corrosion removal, in particular – is undertaken with a 'Blastmaster' cabinet – much of it in connection with the Laboratory's National Corrosion Service (NCS). Operated on behalf of the Department of Trade and Industry, the NCS provides a valuable advisory and consultancy service to British industry on corrosion control techniques and technology; current estimates put the cost to industry of corrosion problems at more than £5,000 million a year. Vacu-Blast cabinet machines offer high dust-control efficiency and accurate control of media flow, and are used extensively for laboratory applications, including 'clean-room' operations.

In-Situ Surface Preparation at the Science Museum

The advantages of the Vacu-Blast Closed-Circuit abrasive blasting system are highlighted by this application at London's Science Museum.

The Museum has recently bought a Vacu-Blast 'S-04' Closed-Circuit machine for use in its extensive Engineering Workshop to assist with the refurbishing and restoration of a wide range of exhibits. Because the machine is mobile, it can be used in-situ to clean or prepare surfaces for painting on items or components of all shapes and sizes – particularly from larger exhibits – without moving them into a special blast enclosure.

The machine is pollution-free so can be used without interrupting other nearby operations, and has proved itself to be "an invaluable tool for the specialist workshop", in the words of the Engineering Workshop Foreman, Mr R Martin.



The Science Museum's Closed-Circuit machine is shown here being used with a small gun for cleaning an awkward area repaired by welding, on the bottom radiator tank housing of a 1937 Ferguson Brown tractor.

CLOSED-CIRCUIT SHOT BLAST SYSTEM OVERCOMES OFFSHORE PLATFORM POLLUTION PROBLEMS

The Closed-Circuit abrasive blasting system has been instrumental in minimising the pollution risks of in-situ blasting on offshore platforms.

Many platform operators and offshore services companies have reported problems when carrying out routine surface preparation with open blasting, of flying grit and dust fouling gas turbines. This can severely affect turbine performance and could lead to a shutdown. Since the turbines provide all the electrical power offshore, such incidents are inconvenient at best and, at worst, could lead to the halting of drilling or production operations. In addition, open blasting creates a basic pollution hazard which can affect other equipment such as air-conditioning and electrical switchgear, and prevents unprotected personnel from working in the vicinity of any blasting operation. This can hold-up other routine maintenance work. Debris from open blasting left on walkways or other

pedestrian areas could also cause slipping accidents or form a harmful wind-borne dust cloud.

Easily prevented

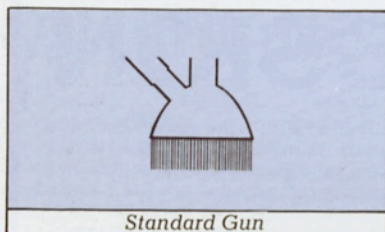
All this can easily be prevented, say Vacu-Blast. The company's mobile Closed-Circuit system enables on-site blasting to be carried out virtually anywhere without causing pollution problems. The system uses a specially-designed blasting head which safely contains the abrasive medium during blasting, simultaneously collecting the resultant dust and debris. Throughout blasting, the latter is returned to a reclaimer unit by vacuum recovery. Reusable abrasive is separated out automatically and recycled to the blast-head. Other nearby operations and machinery are unaffected. On top of this, because the system is totally air-operated with no electrics to cause sparks, it is safe for use in many 'hazardous' areas.

These advantages have been recognised more and more in the offshore industry and converts to Vacu-Blast Closed-Circuit blasting include Shell and BP.

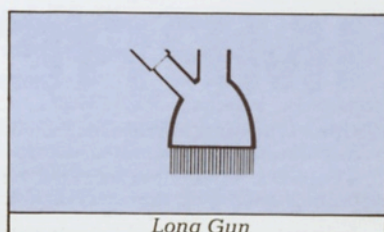
"But many offshore operators still seem to be unaware of the benefits of the system," said a spokesman. "We believe that the use of our Closed-Circuit system is the only safe, pollution-free, way to carry out abrasive blasting offshore – or on any site for that matter. The potential savings in maintenance time and trouble are tremendous, not to mention the safety and environmental considerations!" Although mechanical surface preparation can also be considered a safe alternative to open blasting, field trials offshore have shown that a coating on a surface prepared by abrasive blasting can last up to three times longer than one on a mechanically prepared surface, with obvious cost benefits.

A GUN FOR ALL REASONS

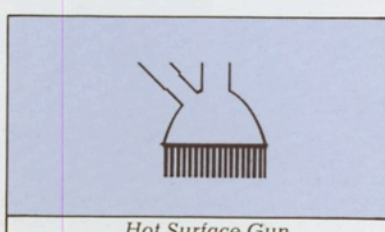
A wide range of blast guns can be supplied for the well-proven Vacu-Blast mobile Closed Circuit system. Suitable for a variety of special purposes and like all Closed-Circuit guns, they safely contain the abrasive during the blasting process and automatically collect the resultant dust and debris for subsequent separation and recycling. Cross sections of some of the available guns are shown here, together with photographs of pipe and edge cleaning operations.



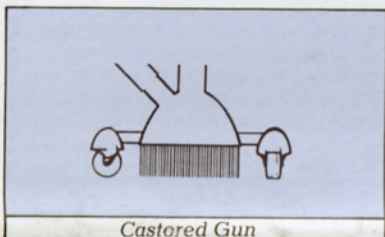
Standard Gun



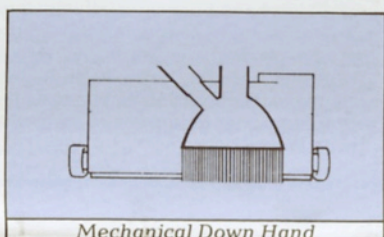
Long Gun



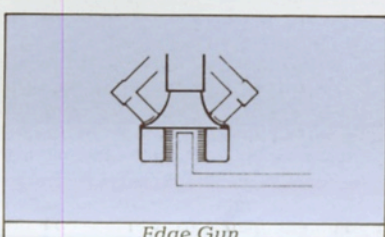
Hot Surface Gun



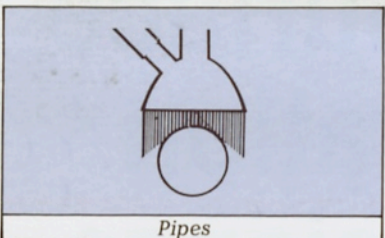
Castored Gun



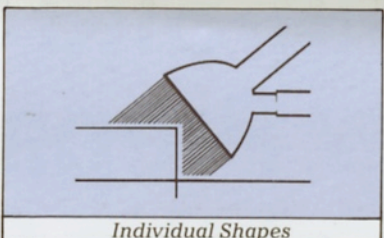
Mechanical Down Hand



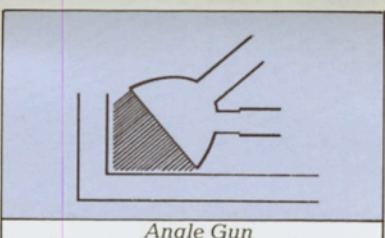
Edge Gun



Pipes



Individual Shapes



Angle Gun



Special Vacu-Blast 'Nut Guns' Keep Heathrow Runway Lights Clean



Two views of the Vacu-Blast runway light cleaner in operation.



A special blast cleaning unit has been developed by Vacu-Blast and the British Airports Authority, specifically to clean the glass lenses of runway lights at London's Heathrow Airport.

An unusual feature of this application is the abrasive blast media – crushed walnut shells – which removes grime, exhaust carbon, and aircraft-tyre rubber, but does not damage the high-quality, impact-resistant optical lenses. After the cleaning operation, the light bio-degradable material blows away with no effect on either the runway or surrounding grass areas.

The entire unit complete with its diesel compressor is mounted on a flat-bed trailer. Cleaning is carried out with four hand-held blast guns which were designed specifically for this operation and are attached by 15 metre supply hoses. The new Vacu-Blast machine has replaced traditional hand cleaning methods, substantially reducing the time a runway is out of use. At one of the world's busiest airports, this is obviously a vital factor, since all threshold and edge lights require cleaning once a week and runway centre-line lights, twice a week.

Mobile Mould Cleaner Saves Time & Trouble

Semiconductor encapsulation moulds cleaned in-situ.

With this 'SH-03 Mouldmaster' glass-bead Closed-Circuit machine, moulds used for the encapsulation of semiconductor devices can be cleaned in-situ and when still hot – in a matter of minutes.



The regular cleaning of chromium-plated and other special moulds is vital to ensure that stains from mould release agents and general deposits from encapsulation materials, do not affect the surface quality of semiconductors. Traditionally, cleaning has involved waiting for moulds to cool and removing them for chemical immersion followed by hand finishing, a process which can take many hours.

The new Vacu-Blast unit is simply taken to the moulding machine, plugged into an air supply, and is ready for use. A typical mould can be thoroughly cleaned in 15 minutes.

No special clothing or ear protection is required by the operator, although the use of heat-resistant gloves is recommended when working with hot moulds.

MINI-MACHINE FOR GENERAL WORKSHOP APPLICATIONS

The SB-03 Closed-Circuit machine shown here has been designed specifically for those general, lighter-duty surface cleaning and preparation applications in the workshop or smaller production unit. Typical uses include weld cleaning, localised preparation of damaged areas for re-painting, removal of corrosion or surface contamination, and cleaning prior to bonding.

Designed to use ferrous abrasives, the SB-03 is only 750mm in height and weighs just 22.7Kg so it is highly portable. Like all Vacu-Blast Closed-Circuit machines, it creates no pollution since it employs a special vacuum recovery blast gun which completely contains the blasting process.

The SB-03 is available in two versions: the AE, totally air-operated for

maximum convenience and freedom on-site, and the VP, with an electrically-driven vacuum pump to reduce total air consumption.



Successful run for tyre mould cleaner

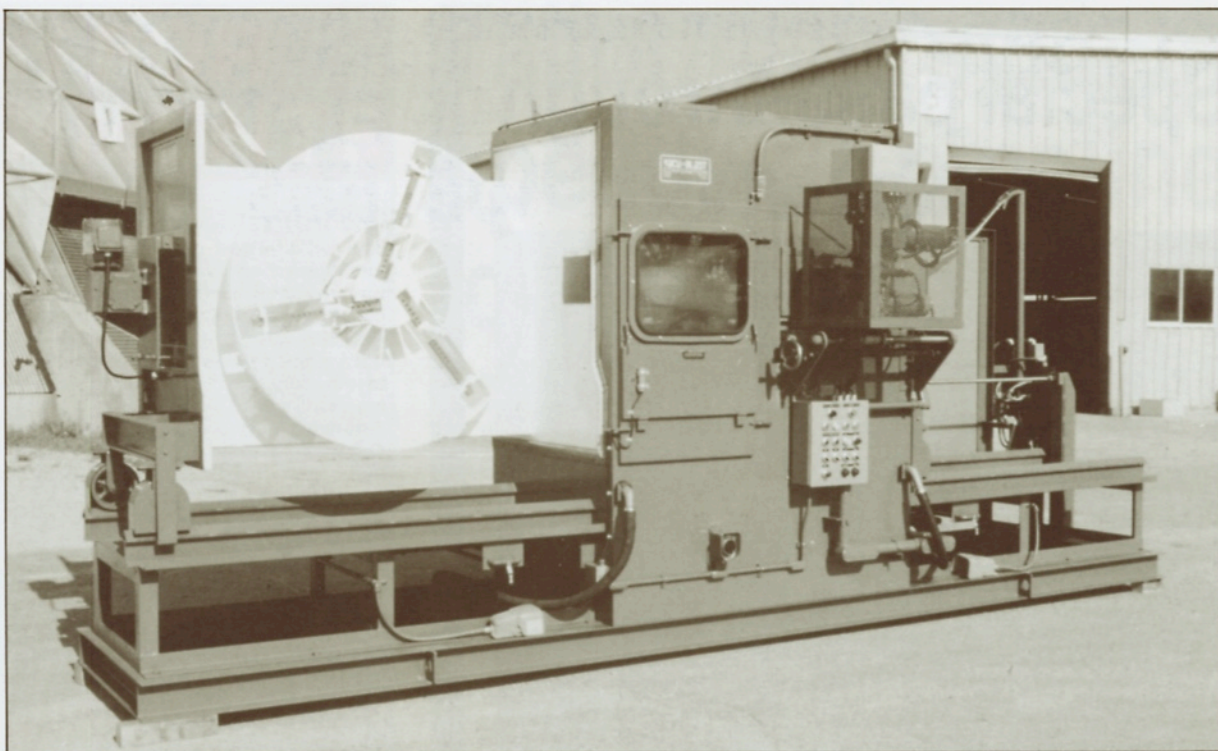
An automatic tyre mould cleaner, developed originally in the USA by Vacu-Blast Corporation – US sister company to Vacu-Blast – is now being produced in the UK.

Vacu-Blast sees considerable export potential for the machine following hugely successful sales in the United States, where virtually every major tyre manufacturer is using it – including Goodyear, Goodrich, Kelly, US Rubber and Armstrong. Vacu-Blast has already secured orders from the Far East for two machines worth \$500,000.

Utilising a controlled dry blast cleaning process with glass beads or aluminium oxide, the machine can clean moulds of up to 1829mm in outside diameter. It is fully-programmable, with simple push-

button operation, and automatically compensates for different mould cavity depths and contours. The use of two mould carriers allows reloading during the cleaning process to speed throughput.

Typical cleaning time for a car-tyre mould is five to seven minutes; a tractor-tyre mould is processed in about 20 minutes. Spent blast media, dust and debris is continuously recovered during the process and reusable media is separated out, cleaned and recycled to the blast nozzles. The machine is designed for easy integration with associated mechanical handling equipment, is robustly constructed and incorporates a number of fail-safe features.



PRE-BONDING PREPARATION

Yuthane Ltd of Bordon, (Hampshire), specialises in the manufacture of solid elastomeric polyurethane mouldings, and is utilising two Vacu-Blast cabinet machines for the critical task of surface preparation of metal components prior to bonding-on mouldings.

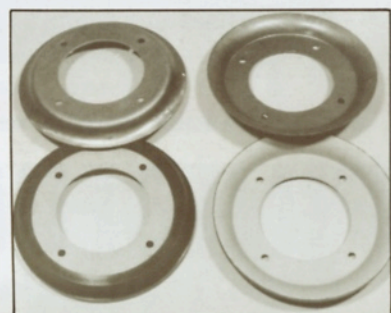
One of the few companies in the country capable of producing polyurethane moulded products and components to the high standards demanded by the toughest industrial and military applications (the company is an MOD approved supplier), Yuthane manufactures mouldings in an extensive variety of shapes and sizes for use worldwide.

Much of the company's work involves the bonding of polyurethane to steel and cast iron components – to produce wheels, rollers and mountings, for example – where the quality and long operational life of the end product relies on soundness of the bond.

Clean and consistent surface

To achieve a perfectly clean and consistent surface etch to ensure the permanence of the bond, all metal items undergo abrasive blast surface preparation in one of Yuthane's Vacu-Blast PB 100 cabinet blasting machines. An angular chilled cast iron grit

abrasive is used, the grade depending on the size and type of component being processed. Degreasing then follows before the actual multi-stage moulding/bonding process.



A steel rope carrier from a coal belt conveyor is shown here, before and after refurbishment by Yuthane. Prior to bonding on the tough polyurethane 'tyre', surface preparation of the pulley body takes place in a Vacu-Blast cabinet blasting machine.

This particular component is from a 30-kilometre conveyor used in the Australian mining industry and believed to be one of the longest of its kind in the world.

COST AND TIME SAVING GLASS MOULD CLEANER

Vacu-Blast's French sister company, Matrasur, has produced an automatic dry abrasive blasting system for cleaning the metal moulds used in the manufacture of glass bottles. Development of the system followed an extensive research programme involving comparison tests with other forms of cleaning, including chemical, ultrasonic and other abrasive procedures.

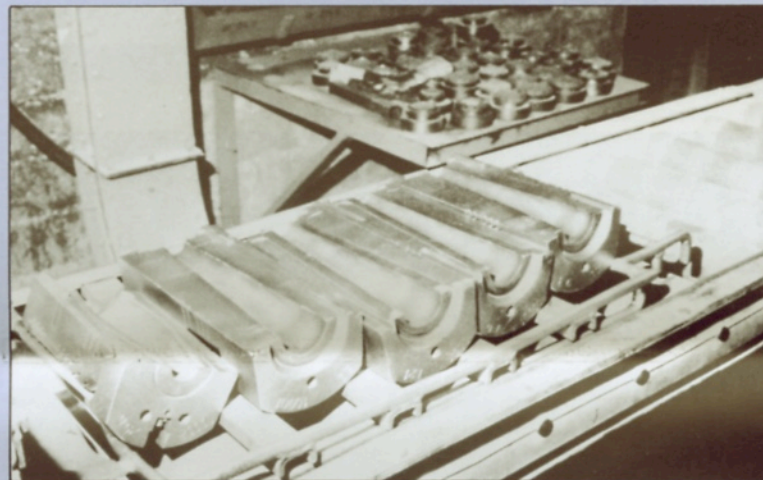
The system has already been installed by a number of leading glass bottle manufacturers in France, including such well-respected names as Saint Gobain and Perrier which, uniquely, produces its own bottles for the popular mineral water. All the users report substantial savings in both time and operating costs over the mould cleaning method traditionally used in the French glass bottle industry, which employed wet blasting. The old method involved eleven different operations with four operators working an eight-hour shift. The new integrated system is supervised by a single operator simply to load and unload moulds, and handles the same throughput in only five hours.

All-round cleaning

The system comprises an in-feed roller conveyor, an open flame oven

to raise the mould temperature sufficiently to carbonise surface grease, a blast cabinet with four automatically manipulated nozzles, a powered through-conveyor, and an out-feed roller conveyor. The moulds are carried in special wire mesh baskets to facilitate all-round cleaning. The glass bead cleaning media is

completely compatible with the glass being moulded and will not cause contamination of bottle contents. Oxidation on moulds due to finger marking has been virtually eliminated. The system, in fact, maintains the highest quality of mould finish – vital to the final appearance of bottles in such a competitive industry.



This photograph shows the type of mould handled by the Matrasur automatic blasting system.

FINISHING WIRE ERODED TOOLS

The Vacu-Blast 'Nova 76' cabinet machine is being adopted increasingly for the surface cleaning of wire eroded tools.

Two typical customers are Ashley Accessories Ltd of Ulverston (Cumbria) well-known manufacturers of domestic electrical fittings, and GEC Installation Equipment Ltd, Liverpool, which produces heavy-duty electrical switchgear and fuse components.

Ashley installed its Nova cabinet as an integral part of its AGIE CNC electric-discharge tool cutting facility, specifically to clean press tools produced by the wire erosion process. Since this process involves the use of a water coolant, it is vital for the tools to be thoroughly dried and then blast cleaned to remove oxidation and avoid the danger of subsequent corrosion.

A glass bead blast media is used. This cleans effectively without impinging upon the surface of the tools which are produced to very high standards of accuracy.

Ashley's Toolroom Manager, Keith Jones, regards the blasting procedure as an inherent part of the wire erosion process: "Glass bead blasting is actually a built-in requirement of the overall design program of the AGIE machine, the machine's 'technology' in CNC spark erosion terms. In fact, cabinet blasting in our context can almost be regarded as finish-sizing."

The only alternative to blasting would be the use of acid treatment, which is not favoured generally because of handling and safety problems.

The Vacu-Blast cabinet was chosen by Ashley as it offered the close control of nozzle pressure essential for consistently accurate results. "With the increasing introduction of automated machinery in manufacturing industry, much tighter tolerances become necessary right down the line to ensure efficient production," commented Keith Jones. "This also applies to fairly

basic processes such as abrasive blasting."

Ashley's modern toolroom is continuously producing press tools, mould tools, and jig and fixtures, both replacements for existing worn-out tools and for the production of new components. Average tool life is 7 to 8

million off. Some 130 press tools are in use at any one time.

One of the major benefits of the newly installed wire erosion system is that its computerised tool design and production program has led to a dramatic cut in toolmaking time – from three weeks to one week! In addition,

paper tape storage of tool dimensional/shape information saves time on prototyping work and allows any damaged or worn tools to be reproduced quickly and easily.

GEC – general purpose work as well

GEC also uses its Nova cabinet for the

glass bead cleaning of wire eroded tools used in the production of countless components for switchgear, circuit breakers and fuse equipment. Added to this, the GEC toolroom has found the Vacu-Blast machine extremely useful for a variety of other surface preparation, cleaning and finishing operations.

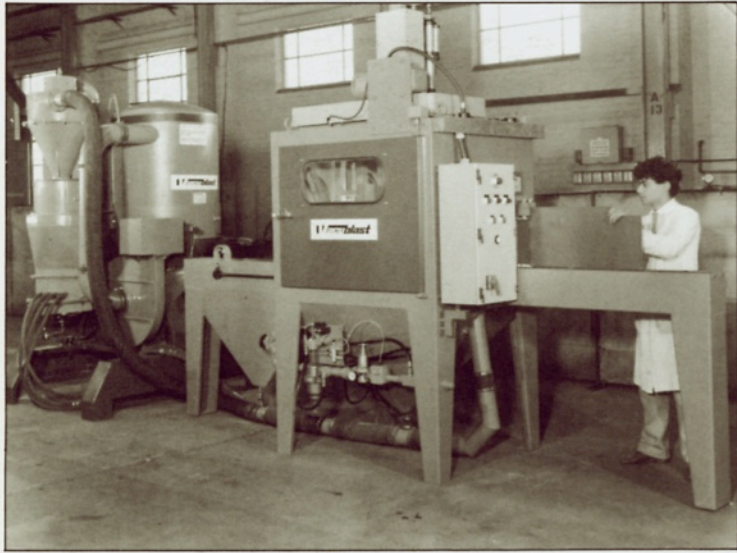
These include removing surface scale prior to grinding, removal of burrs, refurbishing measuring instruments such as height gauges, cleaning weldments on small sub-assemblies, and 'satinising' metal surfaces prior to marking-up. For all these operations, the accurate control of nozzle pressure provided by the cabinet is considered of prime importance. A special metering system enables a variety of abrasives to be used in the cabinet – aluminium oxide and chilled iron grit, as well as glass beads – depending on the particular application.

Both at Ashley and GEC, the known expertise and reliable track-record of Vacu-Blast influenced their choice of the Nova cabinet. Designed as a high-quality, realistically-priced unit, the machine operates from a standard electrical supply and normal compressed air supply. It utilises the well-proven suction blasting principle and requires only minimal maintenance.



GEC Installation Equipment Ltd employs its Nova 76 cabinet for the glass bead cleaning of wire eroded tools used in the production of countless components for switchgear, circuit breakers and fuse equipment. Added to this, the GEC toolroom has found the Vacu-Blast machine extremely useful for a variety of other surface preparation, cleaning and finishing operations.

Special pass-through cabinet



The cabinet abrasive blasting machine shown here was specially-engineered by Vacu-Blast to handle a continuous throughput of complex metal pressings, processing both sides at the same time prior to plating. This particular machine was designed to accept parts made from special alloys which measure up to 1,200mm long by 320mm wide and 10mm in thickness, and works at a maximum rate of 20 per hour. The same basic system can be adapted to cope with widely varying component sizes and thicknesses, required throughputs and materials – providing even blast coverage to an extremely high standard. The machine comprises a central blasting chamber, served through special sealed openings by input and output powered roller conveyors. Blasting is carried out by four blast heads – two each side of the component – which are attached to a reciprocating mechanism, programmed to provide complete coverage of the component whilst it slowly travels through the chamber. An associated media recovery unit automatically separates reusable media from dust and debris and recycles it.

FASTER SURFACE TREATMENT OF SHOTGUNS

2½ hours down to 10 minutes!

The UK's largest dealer in shotguns for clay and game shooting and main agent for the well known 'Beretta' Italian shotguns – Fareham-based, Gunmark Ltd – have dramatically reduced surface treatment times on shotgun barrels and other components with the recent installation of a Vacu-Blast cabinet blasting machine.

Gunmark carry out shotgun repair, rebuilding and customising work as well as selling new guns, and bought the Vacu-Blast machine specifically to strip-off black Teflon coatings from gun barrels prior to re-blackening and re-assembly. Previously, this process took as long as 2½ hours using laborious manual rubbing down with emery cloth and buffing: now it only takes 10 minutes!

In addition, by employing different grades of glass beads or cast iron grit in the machine, not only can Gunmark duplicate exactly the original finish, they can also offer customers a choice of cosmetic finishes on barrels.

Instead of re-blackening barrels with Teflon, the method used in the Beretta factory in Italy, Gunmark use the traditional hot salt blackening tank method following bead or grit blasting, to achieve a rich satin or heavy matt black finish. The Vacu-Blast 'Nova 76' cabinet is also used for cleaning hand-engraved areas of shotguns. The variable blast pressure feature of the machine facilitates the very gentle glass bead blasting of delicate engravings to remove dust or 'acid' handling stains and produces an attractive white satin finish.

A versatile unit offering simple abrasive metering and blast-nozzle size variation, the Vacu-Blast Nova 76 has the ability to handle almost any abrasive media – aluminium oxide, glass bead or chilled cast iron grit – and has been purpose-designed for specialised workshop operations. It utilises the well-proven suction blasting principle and requires only minimal maintenance.

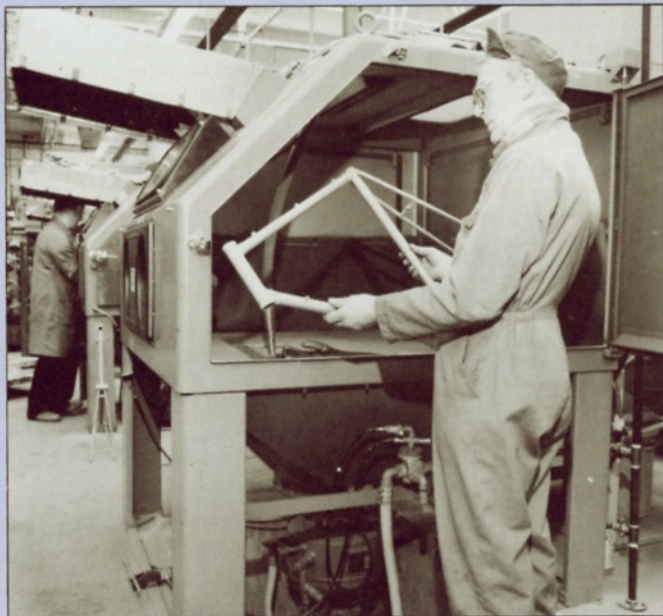


A perfect finish for TI Raleigh

TI Raleigh, Europe's largest bicycle manufacturer, uses a number of Vacu-Blast cabinet blasting machines at its Lightweight Unit in Nottingham.

Raleigh's Lightweight Unit has a production capacity of more than 5,000 high performance machines a year, all incorporating TI Reynolds 531 lightweight tubing. Finishing and assembly work is done exclusively by hand, with particular attention paid to the cleaning of brazed joints and the complete surface preparation of frames. This is carried out in the Vacu-Blast cabinets, using a chilled cast iron grit abrasive.

The plant operates as a separate facility, and not part of the main manufacturing complex, as it is dedicated to the sole production of these superior machines that command premium prices in the marketplace. Vacu-Blast has also supplied other specialist bicycle manufacturers with blasting cabinets, including Holdsworth of London and Halmanco of Pontypridd, South Wales.



FINISHING FOR SURGICAL PRECISION

Surgical instruments, specially designed by Finsbury Instruments Ltd of Morden (Surrey) for use in knee, hip and other joint replacement operations, are being provided with a high-quality glass-bead finish in Vacu-Blast cabinet machines operated by its sub-contract sister company, Impact Finishers.

The stainless steel instruments involved were devised by Finsbury Instruments in close collaboration with Consultant Orthopaedic Surgeon, Mr M A R Freeman MD, FRCS, who developed the Freeman/Samuelson Knee surgical procedure over a number of years at The London Hospital.

The use of surgical implants to replace joints severely affected by arthritis is still a rapidly progressing area of surgery. The latest technique involves the use of high-precision polyethylene and steel components which replace existing damaged areas of bone of the arthritic joint and form an artificial joint. The damaged bone has to be removed with extreme care and the resected surfaces must conform to certain size and shape parameters in order for the replacement to fit accurately and therefore perform successfully for many years. Maximum accuracy is vital to achieve success, since no cement is used to affix the implant to the existing bone; it is attached using special 'finned' pegs which hold themselves in position within pre-drilled holes in the bone.

Positioning of the implant so that it mates exactly with the remaining bone requires precise measurements to be taken before and during cutting of the affected bone areas. Positional and angular tolerances must be within ± 1 mm and ± 2 mm, respectively.

To achieve this, over 32 special measuring instruments and tools have to be employed, all produced from top quality stainless steel and finished to the highest standards to meet surgical requirements. These ensure that only first-time bone cuts need be made, reducing the amount of time that a patient is under anaesthetic. The basic aim behind the design of the instruments by Finsbury is to ensure the infallibility of the surgery.



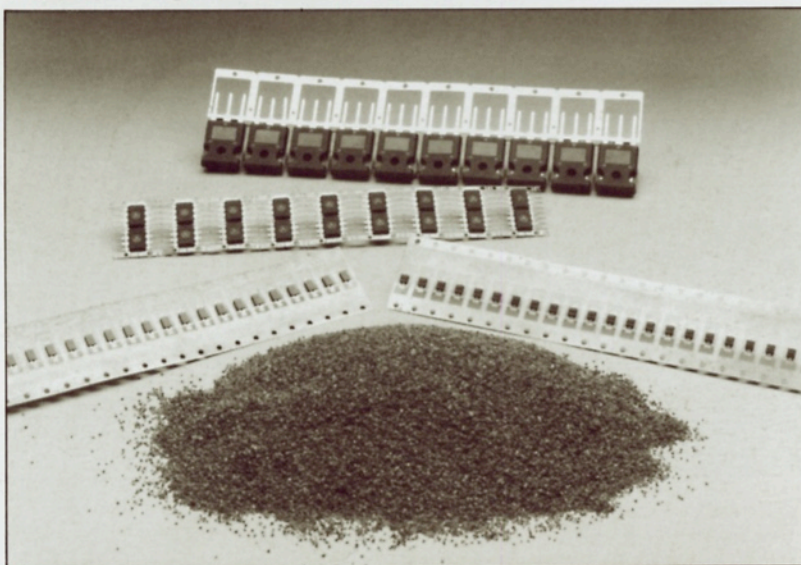
An artificial knee joint.

DEFLASHING ELECTRONIC COMPONENTS

The latest Vacu-Blast surface treatment cabinets are suitable for use with a variety of special 'soft' abrasive media for the more sensitive cleaning or finishing tasks, such as de-flashing electronic or plastic components – typical items are pictured here.

Use of the special media, processed from plastics or organic materials and also available from the company, enables delicate items like encapsulated ICs, resistors or complete assemblies to be cleaned without damage. The contamination problem created by conventional media such as aluminium oxide is eliminated.

Standard Vacu-Blast cabinets come in a range of sizes with blast enclosures up to 1.5m x 1.5m x 1m and can be fitted with ancillary handling devices to streamline throughput. The company can also custom-build cabinets to include automatic component or blast nozzle manipulation and to integrate with other production line equipment.



OPTIMUM FINISH FOR ARDUOUS ENVIRONMENTS

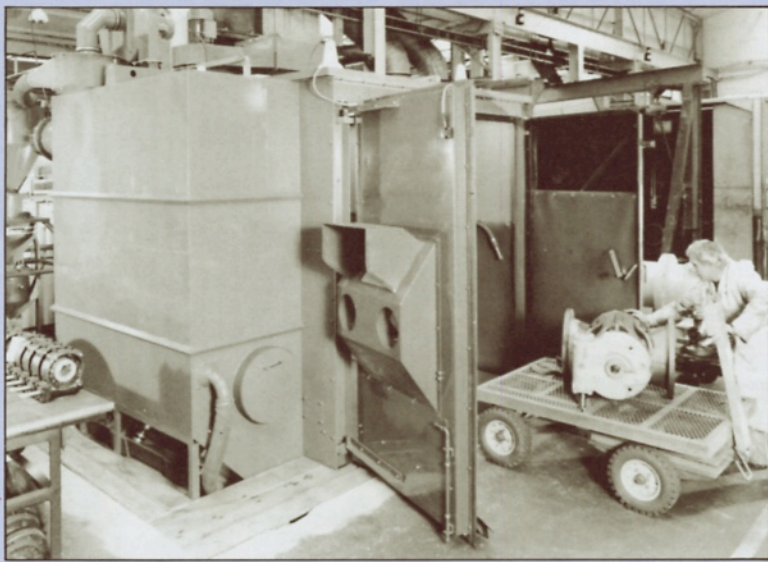
Serck Audco Valves, Newport, Shropshire, have installed a purpose-designed Vacu-Blast blastroom to streamline the surface preparation of a wide range of valves, destined for oil and gas industry users world-wide.

The highest standards of surface protection are demanded by these industries, to withstand the tough operating conditions encountered in such diverse places as Alaska, the Middle East and the North Sea. Not only does this involve the multiple surface coating of valves, often a four-layer epoxy paint system, but also the most stringent preparation of the surface by abrasive blasting prior to painting.

A typical specification for abrasive blasting embraces preparation to the Swedish standard SA2½ and a blast profile of between 50 and 75 micro-inches. In addition, painting must take place not more than four to six hours after blasting to prevent surface deterioration.

Problems Overcome

Before the introduction of the new blastroom, much of Serck Audco's abrasive blasting work was subcontracted, larger items in particular, but with a constantly increasing throughput this became unsatisfactory. The need to transport valve bodies, turn them around within the necessary time limit, and dovetail efficiently with production schedules became difficult, as did effective control of blasting quality.



The introduction of the Vacu-Blast facility has overcome these problems bringing the blasting operation in-house and streamlining it as an integral part of the overall finishing process.

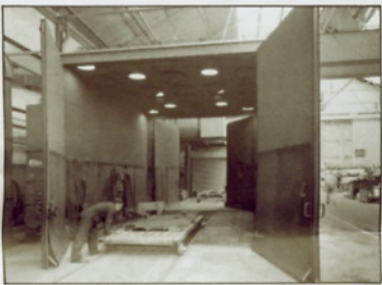
Measuring some 2.6m long by 2.6m wide and 2.6m high, the steel-shelled blastroom features a pneumatically-operated multi-hoppered floor through which the abrasive medium – in this case G17 steel grit – is recovered and recycled. Dust and unusable media is separated out automatically and deposited in a dust collector.

An external operator position is incorporated in one of the blastroom's main double doors, so that the blast enclosure can be used as a 'cabinet' blasting machine when dealing with smaller items. A special perforated steel table swings up from the inside of the door to facilitate this. The Serck Audco valves handled in the room vary from 1/2 inch to 24 inch nominal bore, and are mainly from the 'Slimseal' and 'Gloceal' butterfly valve and 'SUPER H' plug valve product ranges.

IN-LINE BLASTROOM

A Vacu-Blast purpose-built blastroom forms an integral part of an in-line paint preparation and finishing plant used to produce a tough, high quality finish on the Blaw-Knox range of specialised road surfacing equipment. The blastroom has doors at each end for the through-access of work bogies on which a wide variety of mild steel components are transported between the different elements of the line. G12 chilled cast iron grit is used to provide a thoroughly clean surface for good adhesion of the subsequent paint systems.

Measuring 7m long by 4.9m wide by 4.3m high, the blastroom incorporates a Vacu-Blast 'Waffle-Floor' pneumatic recovery system, which eliminates the need to excavate a deep pit for the installation of a blastroom. Also, because the system uses no mechanical components, maintenance is minimal and operating life longer.



The Waffle-Floor comprises a pattern of small pyramidal hoppers joined together with specially shaped ducting, under a perforated steel floor plate. In operation, filtered air is drawn continuously into the enclosure, down through the hoppers and ducting, carrying spent media and debris with it.

A three-stage separation system ensures

that only good blast media is fed to the blast generator for recycling, with broken down media and dust being conveyed automatically to the dust collector.

Extra heat in winter

The dust collector, of an advanced reverse-jet design, generates the ventilating and recovery air, and maintains the highest standards of operator visibility. It also incorporates a special feature on the outlet duct, enabling filtered air to be exhausted outside the factory in warm weather, or routed back into the building to retain heat during colder periods. In the latter case, the air passes through a secondary filter which is fitted with a device which automatically sounds a warning should a fault occur in the recovery system's main filter.

CLOSED-CIRCUIT MACHINE HELPS WITH REPAINTING OF TAY ROAD BRIDGE

The massive task of completely stripping and repainting the Tay Road Bridge, near Dundee, was made considerably easier and safer through the use of a Vacu-Blast PBV 06 Closed-Circuit blasting machine.

Refurbishment of the one-and-a-half mile long bridge became necessary as a result of new paint specification requirements. The last complete coating, applied 10 years before, contained a now-unacceptable amount of lead. For the men engaged in surface preparation this represented a serious health hazard, especially when working inside the 30 metre long box sections that span the bridge structure.

The Vacu-Blast PBV 06 is a mobile unit that restricts the blasting medium to the precise area of application, then immediately collects it, together with resultant dust and debris by means of a special blast head. Re-usable

abrasive is separated automatically and returned to the blast nozzle for further use. This recycling feature maximises the use of the abrasive and achieves substantial cost savings over open blasting. In addition, the machine's 12-15 minute blast cycle facilitated a rapid pace of work. Said Operational Manager and Chartered Engineer, Allan Gibson: "As well as being tailored for this kind of job, the machine minimises the health hazard and has proved to be highly cost effective – which is why we have been able to use a workforce of only four for such a large operation."

Use of the Vacu-Blast Closed-Circuit system on the Tay Road Bridge follows similar successful applications on both the Erskine Bridge and the Forth Road Bridge, and machines are currently being used on the Severn Bridge.



Working with a Closed-Circuit machine inside a steel box girder on the Tay Road Bridge.



The Closed-Circuit Power-Pack remains on the outside.

Tailormade system speeds-up pipeline joint coating at sea

A tailormade abrasive blasting unit, developed by Pipeline Induction Heat Ltd of High Wycombe, Bucks, and based on the Vacu-Blast PBA 06 Closed-Circuit machine, has helped to speed-up the epoxy powder coating of welded joints on a 42mm diameter methanol service line – part of a British Gas North Sea offshore pipeline supplying gas from the Eli-Frigg field.

The Vacu-Blast machine formed part of a three stage process – blast-cleaning, induction heating and fluid air epoxy powder coating – self-contained within a specially-adapted freight container and carried out on board a lay-barge. The process was designed to make good the protective surface coating around weld areas after the 12.2m sections of pipe had been welded together.



No failures

Rationalising all three operations at a single location saved valuable ship-board space and achieved a marked increase in speed over other methods of achieving the same result. The blasting operation itself took only 30 seconds. After completion of the process, joints underwent inspection to ensure that the coating was totally successful. Some 1,525 welds were treated by this method over a four-week period – without a single failure.

Pipeline Induction Heat describes the patented system as "fast and fool-proof". They add that it has successfully overcome the problems experienced before in treating small diameter pipes in the restricted lay-barge working environment, in particular, difficulties in achieving successful blast cleaning. Traditionally, open blasting has been used for weld cleaning in the offshore pipeline industry, but for health and safety reasons this is virtually impossible

on board a lay-barge.

The Vacu-Blast Closed-Circuit principle eliminates the problem since it uses a closed operating cycle, containing abrasive – in this case cast iron grit – within a specially-designed blasting head, at the same time, automatically separating re-usable abrasive from dust and debris and returning it to the blast head.

The Vacu-Blast PBA 06 machine used by the company for this application employed a double blast head fitted within a rotating jig. Profiled brushes on each blast head ensured an exact fit on the pipe, which was fed through the centre of the jig, allowing the operator to rotate it around each weld to achieve complete blasting coverage before passing on to the circular induction heat unit. The jig also ensured a constant blast nozzle distance and angle, thus providing a consistent surface profile.

Streamlined refurbishing of construction plant

Regular overhaul and refurbishment is a vital fact of life in the plant hire field, to maximise the working life of equipment and obtain the best value from the considerable investment involved. In addition, ensuring that plant looks good in company livery helps to maintain a strong corporate identity in the field and adds to the equipment's hire appeal.

But because of the adverse operating environment, plant maintenance is not an easy task, particularly when it comes to cleaning exposed exterior parts. The build-up of hard concrete residues on body panels, mixing drums, skips, and mechanical components is difficult to shift, scabbling being the traditional method of attack, and corrosion must also be halted at the earliest possible stage.

However, Agent Plant Hire at its central repair depot next to its Crayford, Kent headquarters, has adopted the latest approach in cleaning-off these residues and removing corrosion dramatically increasing the turnround of dumpers, concrete mixers and other small plant, and enabling equipment to be sent back out into the field far more quickly.

The company has installed a specially-designed Vacu-Blast grit blasting facility which has made the hammer and chisel a thing of the past. Designed on a through-access basis with doors at each end, the facility allows plant to be pushed straight

in and prepared quickly and efficiently for subsequent priming and repainting, without the usual hard physical grafting. A dumper can be processed in just over an hour, compared to the half-day or more required before!

The facility utilises Vacu-Blast's 'Waffle Floor' system for recovering and recycling the chilled iron grit blast media. With this system there are no moving parts in contact with the abrasive, so maintenance is minimal and operating life indefinite.

Special Expertise

Since very large volumes of debris are created, the use of Vacu-Blast's special expertise in recovering and recycling media is particularly important in this application. A highly-efficient three-stage separation process is employed to ensure that only good blast media is recycled to the blast generator, with broken-down media and dust conveyed automatically to the dust collector. A constant down-draught of air during blasting maintains the highest standards of operator visibility.

Agent Plant Hire also uses a Vacu-Blast cabinet blasting machine in its nearby engine/gearbox overhaul shop, in which components are thoroughly cleaned with glass bead media prior to re-assembly.

Two other major plant hire companies – Taylor Woodrow and Lovell – are also users of Vacu-Blast systems.



CORROSION CONTROL ON RAF NIMRODS

Mobile Closed-Circuit blasting machines, from Vacu-Blast are used extensively by the Royal Air Force at the Strike Command Nimrod Major Servicing Unit, RAF Kinloss, Moray, Scotland.

The machines, play a vital role in corrosion control. This is a special problem on Nimrod surveillance and airborne early-warning radar aircraft which operate almost continuously over the sea in a salt-laden atmosphere, often at low-level. External surfaces are particularly prone to corrosion and even some internal areas can become affected. Galvanic action between the Nimrod's aluminium alloy skin and steel fasteners and structural members, exacerbates the problems.

During a major aircraft overhaul, corrosion must be totally removed before a new protective surface coating can be applied. The compact Vacu-Blast S-04 Closed-Circuit machines carry out this task quickly and efficiently, their ease of mobility allowing the operator to effectively reach any part of the aircraft. This includes use of machines on wing areas.

The Closed-Circuit system, a Vacu-Blast invention, confines the blast media within the blasting head – at the same time recovering, cleaning and recycling it and retaining dust and debris. Completely dust-free blasting can therefore be undertaken virtually anywhere, without affecting other nearby activities. This latter feature is an important advantage on intensive maintenance work such as that carried out by the RAF.



COMPREHENSIVE FACILITY AT HEATHROW

Shown right is part of the comprehensive Vacu-Blast facility operated by British Airways at Heathrow Airport, where a wide variety of surface preparation and treatment operations are carried out by BA during maintenance procedures.

The components pictured are RB211-524 fan blades following shot-peening to combat fretting at the root areas where the titanium blades attach to the fan disc. Processing of both blade and disc root areas take place on a computer-controlled rig in a multi-purpose Vacu-Blast peening enclosure, also used to shot-peen undercarriage and other major aircraft structures.

In addition, Vacu-Blast machines are used by BA at Heathrow for cleaning surfaces prior to Non-Destructive Testing (NDT). A number of mobile Closed-Circuit pollution-free units are also operated in-situ on aircraft largely for spot corrosion removal.

(Right) A Closed-Circuit machine being used in-situ to remove spot corrosion.



Programmable Surface Preparation Unit Maximises Management Control

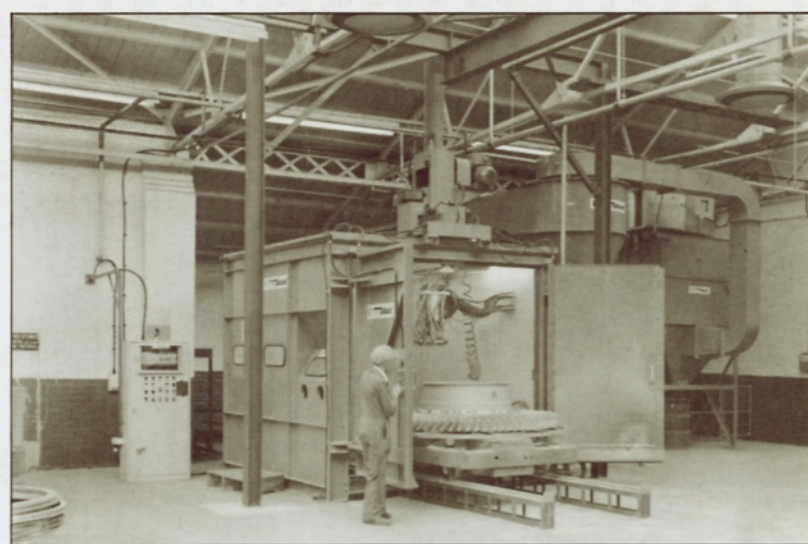
Surface preparation of a number of major components used in the latest versions of the Rolls-Royce RB211 gas turbine aeroengine, prior to bonding and painting operations, has been radically streamlined following the installation at the company's Parkside, Coventry, plant of a specially-designed Vacu-Blast programmable dry blasting machine.

The totally-automatic unit supersedes two manually adjusted and operated blasting machines which had reached the end of their useful working life, and required replacement because of increased downtime.

The need to replace these earlier machines gave Rolls-Royce the opportunity to completely re-think their approach to the surface preparation task and bring it into line with more advanced production engineering and control ideas – leading to considerably improved productivity and the reduction of lead times.

In addition, because the Vacu-Blast unit utilises programmable control techniques, it has ensured that the blasting process can now be more precisely and consistently controlled within the strict mandatory design parameters, guaranteeing the highest standards of quality assurance.

"The new Vacu-Blast machine has given us total management control of the dry blasting process in our bonding section," says Rolls-Royce. "All the operator does is load the machine, select the required program, and press one button; the machine does the rest." The machine processes a variety of components – produced in titanium, special steels, aluminium and composite materials, but was designed primarily to accommodate the outlet guide vane assemblies and front and rear cases of the RB211-524 variant, together with the front case of the RB211-525 variant. Measuring up to 2200mm in diameter and weighing 275kg, they are the largest engine components produced at Parkside, which is responsible for manufacturing fan case assemblies, the



largest single element of the RB211 engine. The components are loaded into the machine on a special work carrier which runs in on rails and becomes powered once inside the blasting enclosure.

Programmable control

A programmable controller governs the dry blasting process, using interchangeable EPROMs to provide up to eight individual blasting programs each. Each program relates to a particular component and is structured to command positioning of the eleven suction-fed blast nozzles to give optimum surface coverage. The nozzles are mounted in a cluster on a two-axis manipulator arm.

The medium used is aluminium oxide, 120/220 mesh size. A typical processing time, for the titanium outlet guide vane assembly, for example, is approximately three hours – much faster than the previous system. Other, smaller, components can be in the machine for as little as 15 minutes. Since it replaces two previous units, utilisation of the new machine is high.

The machine features a Vacu-Blast Waffle Floor abrasive recovery system which employs a multi-hoppered floor to pneumatically convey used abrasive through a common duct to a dust separation and abrasive recirculation system.

This system was specially designed to cater for the presence of titanium dust – a known explosion hazard – and explosion-relief panels are incorporated to open automatically under a sudden rise in internal pressure. Only dust-free reusable abrasive is recirculated back through the blasting system. The associated ventilation and filtration units, used to regulate and ensure a clear atmosphere inside the blast enclosure, are also designed to prevent the escape of titanium and other dust particles.

Fail-safe features are incorporated to avoid damage to the highly-expensive components in the event of mechanical failure or operator error.

Development of the machine resulted from an extremely close working relationship between the respective design and production engineering staff of Vacu-Blast and Rolls-Royce.

CLOSED-CIRCUIT MACHINES IN USE AT DEVONPORT ROYAL DOCKYARD

A large number of Vacu-Blast Closed-Circuit blasting machines are being employed at Devonport Royal Dockyard, near Plymouth for a variety of surface preparation operations on vessels of all kinds during regular maintenance and refurbishing work.

This photograph shows a PB14 Closed-Circuit unit in operation on board the Leander Class Frigate, HMS Scylla, for the removal of existing paintwork and corrosion from deck areas, prior to metal spraying and the application of a new epoxy weatherproofing system – part of a complete refitting programme. The machine is positioned so that the

power-pack remains on the side of the drydock, connected to the blasting head by means of operating hoses, which in this case measure some 45.7m long.

The Closed-Circuit blasting system creates no pollution whatsoever, so other nearby operations can carry on unhindered and, since abrasive is recycled, operating costs are minimised. Vacu-Blast Closed-Circuit machines of various capacities are also in use at the Naval Bases in Portsmouth and Rosyth. Naval dockyards both in the UK and USA were among the very first users of these machines and many older

machines are still in constant use – some with as many as 100,000 operating hours behind them!

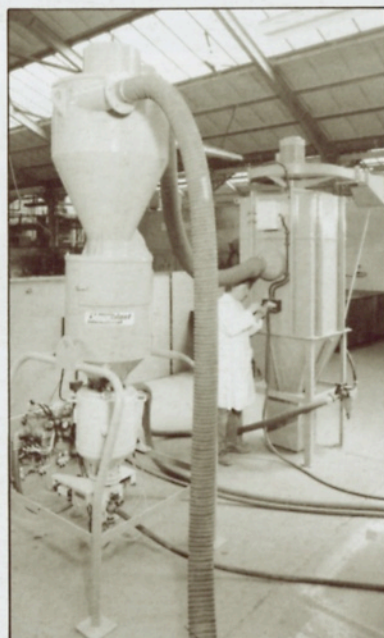


NEW 'VECTOR' POWER PACKS

Pictured here is one of a brand new range of Vacu-Blast 'Vector' abrasive blasting power-packs for use in conjunction with Vacu-Blast's own cabinets, blastrooms and special equipment, and for 'd-i-y' customers who are building their own systems.

Available in both pressure and suction-fed versions to power single or multiple blast nozzles, Vector power-packs are produced in a variety of capacities to suit virtually any application. A unique feature of their design is that the ventilation system is tailored to provide optimum conditions, whatever the size of the blast enclosure. A choice of reverse-jet or conventional filter-type dust collection systems is offered.

Other options include variations designed for operation either adjacent to or remote from the actual blast enclosure, explosion protection for uses involving hazardous component materials such as titanium or zirconium, and extra high-efficiency filters to handle toxic dusts.



SPECIAL SERVICE FOR PLASTIC MEDIA APPLICATIONS

Recognising the increasing interest in and the huge potential for applications using plastic abrasive blast media, Vacu-Blast has established a special Plastic Media Advisory Service.

Recent development work at Vacu-Blast with plastic media has centred on its potential benefits for the removal of paint from aerospace components. The aim is to strip paint without damaging the substrate. The techniques employed reduce processing times dramatically and remove the hazards of conventional wet chemical methods for both the operators and the aircraft. Development and field testing work is on-going and it is expected that the stage will soon be reached when major aerospace manufacturers will fully approve the

use of Vacu-Blast plastic media during maintenance operations that require the stripping of paint.

Similar methods could be applied to paint stripping from many other types of components with plastic media, and the material can be used for a wide range of other purposes – the damage-free cleaning of moulds, de-flashing plastic components without destroying any glazed surfaces, and other light-duty cleaning tasks, for instance.

Existing abrasive blasting equipment can be used for all these operations but

some adaptation may be needed – this is where Vacu-Blast's new service comes in. The company will assess existing machines – of whatever manufacture – for their suitability to use the new media, and carry out trials on the components to be processed on its own equipment. Then, if modifications are needed, Vacu-Blast will produce cost estimates and, if required, carry out the work using its established 'Vacu-Dapt' division. The service continues through to commissioning and production trials.

Vacu-Blast Ltd.,
Woodson House,
Ajax Avenue, Slough,
Berks. SL1 4DJ, England.
Telephone: 0753 26511
Telefax: 0753 38093
Telex: 848183

Matrasur SA,
Zone Industrielle,
36 Avenue du 1er Mai,
F-91120 Palaiseau, FRANCE.
Telephone: (1) 64 47 02 70
Telefax: (1) 64 47 02 75
Telex: 692753

Vacu-Blast Corporation,
125 Market Street, Kenilworth,
New Jersey 07033, U.S.A.
Telephone: (201) 245-6363
Telefax: (201) 245-7212
Telex: 132248

Vacu-Blast and Vacu-Blast International are registered trademarks.
Vacu-Blast Ltd, Vacu-Blast Corporation and Matrasur SA are members of the BTR group.
A subsidiary of BTR plc.