

ACTON[®]
FINISHING

Surface Finishing Machines

we redefine

Waste Water Treatment



We're the UK's leading experts in designing and developing machinery and consumables for mass finishing applications.

we redefine:

- Aerospace
- Automotive
- Coin blanking
- Fashion
- General Engineering
- Hospitality
- Manufacturing
- Medical

and more...

Why Choose Us?

We're a family run business that pride ourselves on working as a strong unified team of specialists.

We believe in British

Born in the United Kingdom, we are unique in our product design and the manufacture of our specialist machines and consumables.

We're here for you

Being based in the heart of the country means we have easy access to all of our clients.

We have experience

With five decades of experience and knowledge in the finishing industry, we know what works for you.

We provide options

We have an impressive range of media and compounds to choose from, including one of the best polishing compounds in the market. We also provide a wide range of machinery and subcontract services to meet all of your needs.

We go the extra mile

We'll tailor our services to your needs, not the other way round. Our service is all about you.



Treatment of Discharge in Mass Finishing Systems

The process of wet mass finishing generates a discharge of the processing liquid, which comprises of the metal fines, abrasives, compound and in some instances, oil due to the condition of the parts.

ActOn suggests having a suitable treatment system in place as a responsible measure towards the environment, and also to facilitate recycling in certain applications to reduce processing costs.

Recycling method

Recycling processed water is an environmentally friendly and a cost-effective water treatment method as it allows the user to recycle the water and compound. At the end of the mass finishing process, the effluent is discharged from the finishing machine to the centrifuge via gravity or transported with a pump. The solids are then separated from the solution. The clean solution, which contains water and compound, is pumped back into the finishing machine. ActOn's special recirculation compounds are to be used with this system.

However, there may be cases when recycling of processed water is not possible. This may occur when:

- An acidic compound is used in the mass finishing process.
- Several compounds are used in the process.
- Component surface requires a certain degree of cleanliness at all times.
- Components manufactured from different materials are mass finished.

In all of the above cases, the effluent may have to be discharged to the drain post-treatment in the ActOn centrifuge, which requires the addition of flocculants.



Batch Centrifuge ABC01

The ActOn batch centrifuge comprises of a mechanical centrifuge, recycling tanks and pumps.

The unit is designed to work in the most effective manner to treat the discharge water from mass finishing, either suitable for recycling or discharge to the foul drain as dictated by the process. The solids are captured in the basket of the centrifuge and then disposed of based on country specific regulations.

A brief on the process flow is as follows:

- The discharged process water from the mass finishing equipment is transferred to an "effluent tank".
- The effluent tank is equipped with an agitator to prevent the solids from settling down.
- The liquid is then pumped into the centrifuge chamber by an air operated diaphragm pump.
- The centrifuge chamber rotates at high speed and due to the g-force generated in the chamber; the solids are captured and contained within a removable basket provided in the centrifuge.
- A specially designed conical guide nozzle automatically forces the clean water into the clean water tank.
- On filling of clean water tank, the machine is switched off and the centrifuge chamber is opened for removal of polyurethane basket with sludge.
- The treated water is pumped to a "recycling" tank and then discharged to the mass finishing equipment, or emptied into the drain as per process.
- Flocculation tanks are introduced as required for treatment before or after the centrifuge operation.

Key Features:

- ✓ Precision balanced drum
- ✓ Easy to replace sludge collection basket
- ✓ Effluent tank with complete drain ability
- ✓ Recirculation tank for collection and storage of recycled / fresh water
- ✓ Robust and easy to operate pumping system's specially designed agitator to meet the required duty conditions
- ✓ Strainer to arrest heavy particles
- ✓ Sensors and alarms to detect level in the tanks
- ✓ User friendly control system with/without PLC Controls.
- ✓ ActOn centrifuge has been designed to be connected to 3 VB10 / VB10S machines, the pumps being operated through PLC. It is advised that all 3 machines use the same chemical
- ✓ Ease of adding clean water and new compound is provided to maintain the required concentration in the recirculation tank

ActOn centrifuge units have considered the duty conditions in mass finishing applications and ensured that the product is robust and user friendly.

Effluent holding & recirculation tank dimensions in mm / inch (L x W x H)	1600 x 1400 x 1600 / 62.9 x 55.1 x 62.9
Agitator & recirculation pump rating (kW)	0.68
Centrifuge dimensions in mm / inch (L x W x H)	650 x 625 x 900 / 25.6 x 24.6 x 35.4
Centrifuge rating (kW)	3.2
Centrifuge basket dimensions in mm / inch (Ø x H)	385 x 235 / 15.2 x 9.3
Control panel dimensions mm / inch (L x W x H)	600 x 400 x 210 / 23.6 x 15.7 x 8.3



Paper Band Filter

The paper band filter has been built to separate the solids from the effluent discharged from the vibratory and grinding machines via a filter paper.

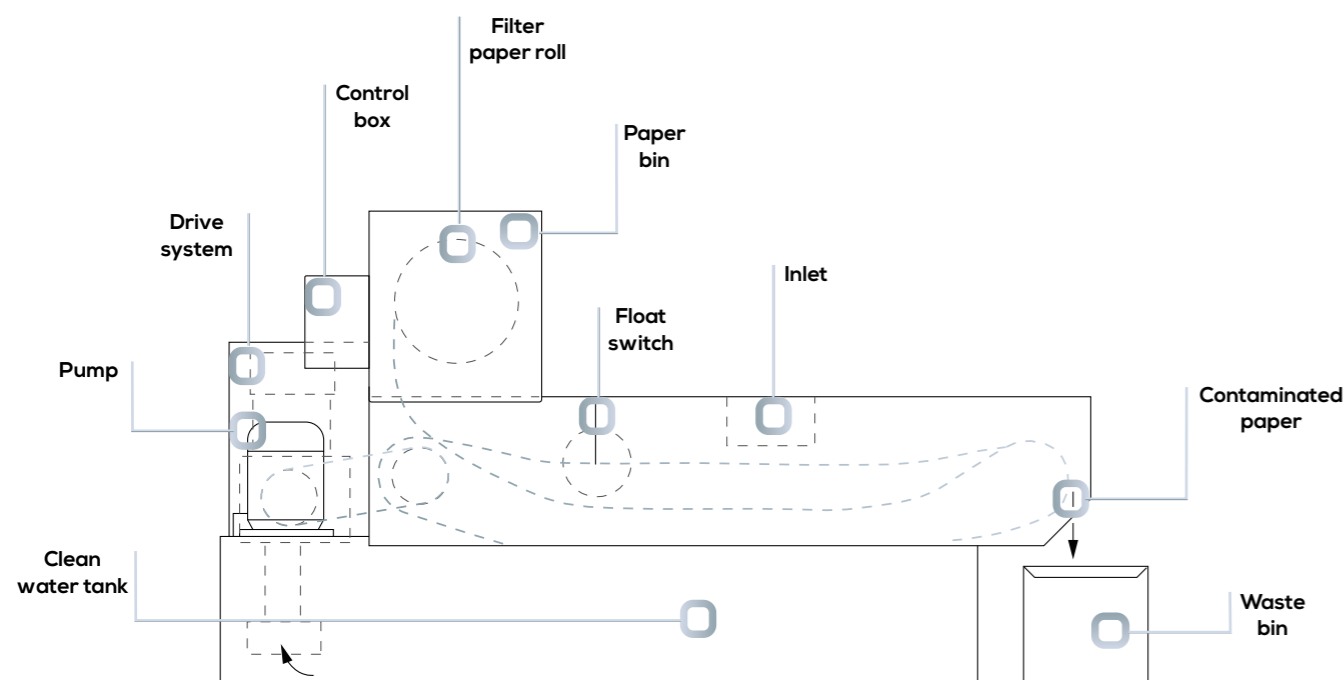
A brief guide on the process flow:

- The discharged process water is transferred via a flow dispenser into the filter paper bed.
- The effluent passes through the filter paper which captures the contaminated sludge.
- The filtered water flows through the clean water tank. From here, this can be discharged to the mass finishing equipment or discharged into the drain as per process.
- When the filter paper can no longer be used due to the contamination level, the process water rises. This activates a float switch which generates the endless belt to move forward and discharge the contaminated filter paper into a waste bin. A clean filter paper is brought on by the belt.

Key Features:

- ✓ Flow rates from 90 to 900 litres/ min (10 to 200 gallons/ min)
- ✓ Filtration from 20 to 100 microns
- ✓ Different paper grades available to suit the filtration rating required
- ✓ Auto functionality with minimum supervision required
- ✓ Low cost of running as the filter paper lasts for a few months while the filter paper band only operates when the filter paper is changed
- ✓ The unit installation includes carrying out the gravity inlet and electrical connections and installing the pipework to the machine, making it easy and quick to install
- ✓ Low maintenance as it only needs the filter paper changing and waste bin emptied

Technical Specifications of Paper Band Filter



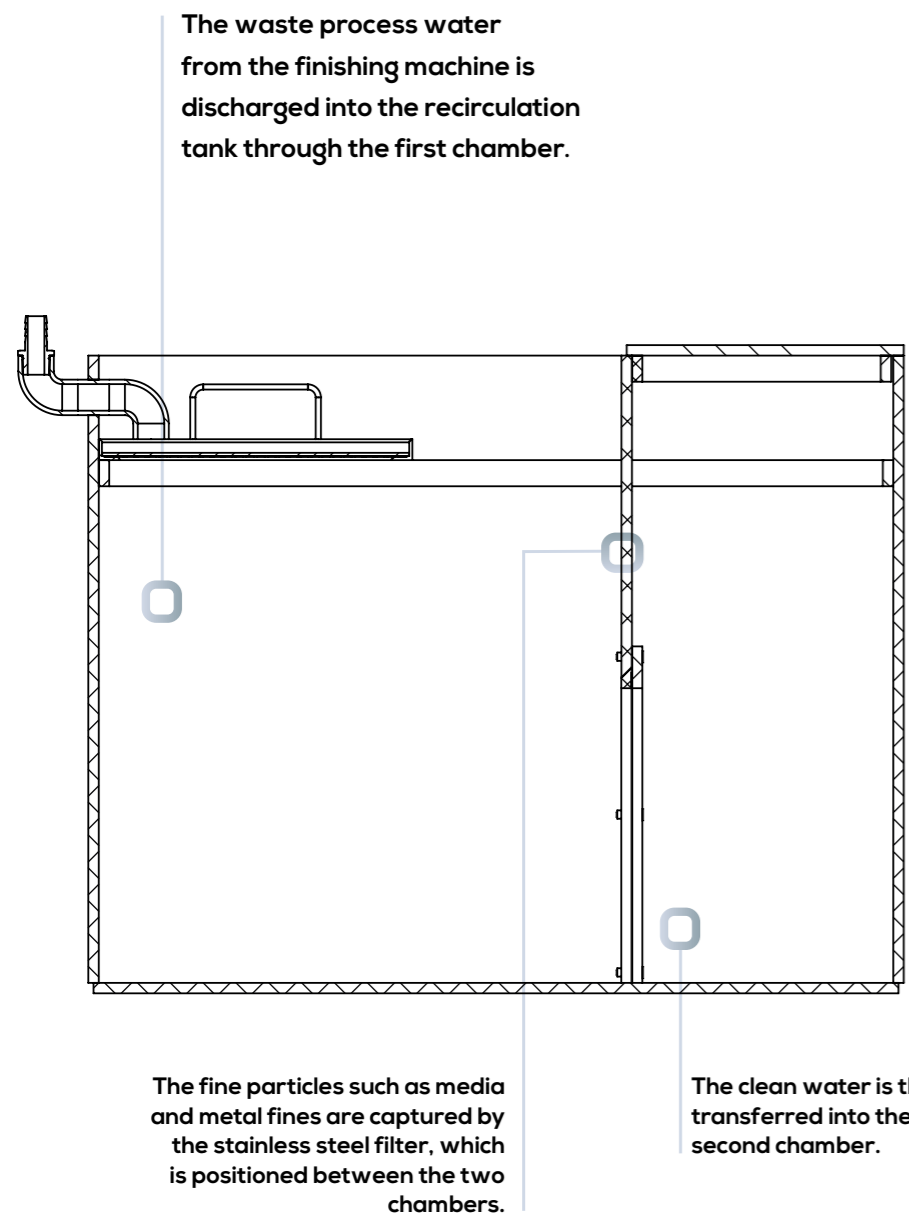
Model	gpm	L.P.M.	Inlet Height in mm / inch	Overall dimensions in mm / inch			Tank capacity	
				Length	Width	Height	Cu. Ft.	Litres
PBF10	10	45	413 / 16.3	1349 / 53.1	508 / 20	651 / 25.6	2.8	80
PBF20	20	90	413 / 16.3	1502 / 59.1	687 / 27	702 / 27.6	4.6	130
PBF40	40	180	413 / 16.3	2149 / 84.6	859 / 33.8	829 / 32.6	8.8	250
PBF50	50	225	457 / 17.9	2448 / 96.4	1235 / 48.6	1064 / 41.9	22.4	635
PBF60	60	270	457 / 17.9	3388 / 133.4	1235 / 48.6	1064 / 41.9	32.5	920
PBF70	70	315	457 / 17.9	4099 / 161.4	1235 / 48.6	1064 / 41.9	40.3	1140
PBF100	100	450	457 / 17.9	6283 / 247.4	1235 / 48.6	1064 / 41.9	63.9	1810



Recirculation Tanks

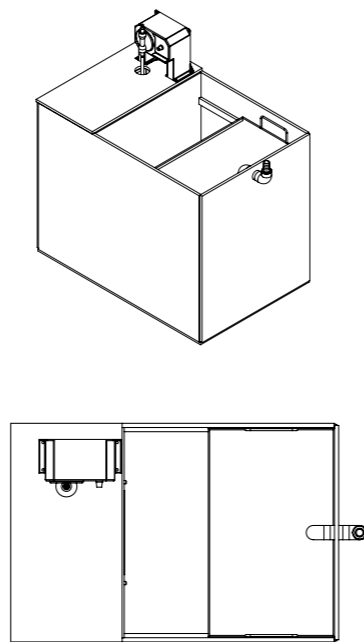
ActOn's recirculation tank is a highly cost-effective solution when processing small quantities of effluent.

Please see below for a brief overview of the operation:



Key Features:

- ✓ Recirculation tank can be offered with a pump designed to recycle the clean water into the finishing system
- ✓ Chambers can be easily accessed to clean the sludge (the amount of times the tank has to be cleaned depends on the amount of solids the finishing system generates)
- ✓ User friendly
- ✓ Durable product due to design, good quality materials and workmanship knowledge
- ✓ Approx. dimensions in mm / inch (L x W x H): 847 x 520 x 870.4 / 33.3 x 20.5 x 34.3



Settlement Tanks With or Without Pumps

The settlement tank is connected to the drain of the finishing machine and the effluent is discharged from the vibratory machine into this tank.

- Baffle plates are provided to assist settlement.
- Solids which settle out in the tank chamber can be removed with ease by the operator with the removable baskets.
- Ergonomical and easy to use.
- A pump to transfer the liquid to the water treatment area (optional).
- Available in painted or stainless steel versions (optional).

The Settlement tank is available in the following standard dimensions (mm / inch):

- 1170 (L) x 620 (W) x 560 (H) / 46.1 (L) x 24.4 (W) x 22 (H)
- 900 (L) x 365 (W) x 335 (H) / 35.4 (L) x 14.4 (W) x 13.2 (H)

According to our clients' requirements, the settlement tanks can be customised.



Flocculation System

Flocculation is used to separate suspended solids from water before being discharged into the drain.

Depending on the effluent content, there are times that a flocculant is not enough to carry out the cleaning process. Hence the discharge from the mass finishing process will be first treated with a coagulant.

Suspended particles vary in source, charge, particle size, shape and density. Correct application of coagulation and flocculation depends upon these factors. Suspended solids in water have a negative charge and since they have the same type of surface charge, they repel each other when they come close together. Therefore, suspended solids will remain in suspension and will not clump together and settle

ActOn Coagulants

Coagulants are added into the solution to neutralise the negative charges on non-settable solids. The coagulants have an opposite charge to the suspended solids.

Once the charge is neutralised, the small suspended particles are capable of sticking together. These slightly larger particles are called pin flocs. Water surrounding the newly formed pin flocs should be clear. If not, coagulation

out of the water unless proper coagulation and flocculation are used.

Coagulation and flocculation occurs in successive steps, allowing particle collision and growth of floc. If coagulation is incomplete, flocculation will be unsuccessful and if flocculation is incomplete, sedimentation will be unsuccessful.

The coagulant and flocculant are added in the effluent tank for better precipitation of the contaminants in the sludge basket provided in the batch centrifuge.

and some of the particle's charge may have not been neutralised. More coagulant chemicals may need to be added.

Over mixing of the coagulant with the suspended solids in the water does not affect coagulation, but insufficient mixing will leave this step incomplete.

ActOn Flocculants

Flocculation is the formation of larger flocs using high molecular weight polymers. These products help to bridge, bind and strengthen the pin flocs formed, adding weight and increasing settling rate. Once the floc has reached its optimum size and strength, the water is ready for

sedimentation. It is important not to over mix the flocculant with the water as once the flocs formed are torn apart, it is not possible to get them to reform without the addition of more flocculant.

Flocculants							
Product name	AF AD985	AF AD987	AF AE66	AF 209	AF 990	AF A260	AF A320
Liquid / Powder	Dewatered liquid emulsion	Dewatered liquid emulsion	Liquid emulsion	Powder	Powder	Powder	Powder
Anionic / Cationic	Low anionic	Mid anionic	Mid anionic	Very low anionic	Low anionic	Low/mid anionic	Mid anionic
Application	Flocculation of metal finishing effluents – product choice dependent on chemical nature of effluent						
pH	3.5-4.5	3.5-4.5	6-8	6-8 (1%Soln)	6-8 (1%Soln)	6-8 (1%Soln)	6-8 (1%Soln)
Recommended dosage	4-8ppm	4-8ppm	5-10ppm	3-5ppm	3-5ppm	3-5ppm	3-5ppm

Flocculants						
Product name	AF K540	AF K560	AF K580	AF CE662	AF CE682	AF 528
Liquid / Powder	Powder	Powder	Powder	Liquid emulsion	Liquid emulsion	Powder
Anionic / Cationic	Mid cationic	Mid/high Cationic	High cationic	Mid/high cationic	High cationic	Anionic
Application	Flocculation of metal finishing effluents – product choice dependent on chemical nature of effluent					
pH				4-6 (1%Soln)	4-6 (1%Soln)	6-8
Recommended Dosage	5-10ppm	5-10ppm	5-10ppm	8-12ppm	8-12ppm	5-10ppm

To determine the product and dosage suitable for your process, please contact our sales representatives.

Coagulants			
Product name	AC PAC	Ferric Sulphate	AC CL520
Liquid / Powder	Liquid	Liquid	Liquid
Anionic / Cationic	Cationic	Cationic	Cationic
Application	Coagulation of metal finishing effluents – product choice dependent on chemical nature of effluent and particle size of solids		
pH	1.8-2.5	0.5-1	5.5-6.5
Recommended dosage	200-500ppm	200-500ppm	20-50ppm

Zinc & Copper Treatment

Start condition of the discharge liquid post process:
 Zn: 120 mg/l
 Cu: 1000 mg/l

ActOn carried out various tests using different parameters and mechanical solutions. After careful analysis of the various results, it was decided to progress a simple solution using chemistry and time (to allow the solids and metal to drop out of the solution) allowing the cleaner water to be discharged.


Required post-treatment:
 Zn: 7.5 mg/l
 Cu: 5.0 mg/l

The solution discharged by the deburring process was not a constant and it contained different levels of Zn and Cu depending on components processed. Therefore, testing on the final discharge, post-treatment, is regularly carried out to fully understand if further adjustments are required.

	Effluent sample picture	Effluent sample volume: (ml)	Coagulant	Flocculant	Zn: (mg/l)	Cu: (mg/l)
Start condition	n/a	100	n/a	n/a	120	1000
Test No. 1		100	<input type="checkbox"/>	<input type="checkbox"/>	0.78	36
Test No. 2		100	<input type="checkbox"/>	<input type="checkbox"/>	0.78	14.5
Test No. 3		100	<input type="checkbox"/>	<input type="checkbox"/>	0.78	6.8
Test No. 4		100	<input type="checkbox"/>	<input type="checkbox"/>	0.41	6.8
Test No. 5	n/a	5000	<input type="checkbox"/>	<input type="checkbox"/>	0.43	6.0

1. The above tests have been carried out at ActOn's laboratory and the results are derived from the effluent samples provided by the customer.
2. The parameters around Test 5 have been used in the final solution, as this was carried out on a larger quantity.

Further tests were carried out, using Palintest. This altered the parameters of the treatment compounds based on the findings from test no.5, as there was a significant decrease of Cu level at that stage. The final outcome of the tests after many trials yielded the result as follows:

Effluent sample picture	Effluent sample volume: (ml)	Coagulant	Flocculant	Zn: (mg/l)	Cu: (mg/l)
	1000	<input type="checkbox"/>	<input type="checkbox"/>	15.8	0.38

A significant difference in result was seen, that being a higher level of zinc and a lower level of copper.

After much thought, a further sample of effluent was taken from the customer's settlement tank. This appeared different in level of contaminant due to its colour. Effluent from a second machine processing brass had been manually deposited, which was a result of 'a number of hours processing'.

The testing was concluded at this point. It was clear that process control parameters were not evident, and required attention before effluent treatment processes can be established. Hence, ActOn engineers advised that the mass finishing process parameters needed to be controlled and defined in order to achieve the effluent treatment requirements.

Solution

Our engineers (based on these conclusions) suitably advised the users to undertake the required steps to improve the mass finishing process - and in turn get a cost-effective solution on the water treatment.

A water treatment has also been proposed, which includes:

- A holding tank to store the effluent from the existing collection tank.
- From here, the effluent will be transferred into a treatment tank to be treated using the coagulant and the flocculant.
- Once treatment is complete, the effluent is transferred into the settlement tank.
- The solids that gather in the settlement tank are periodically removed by the customer and disposed.
- PLC to control the entire operation.

ActOn engineers have advised the customer to clean all the tanks, probes and sensors on a regular basis to maintain optimum working parameters.

ActOn Waste Water Treatment on High Energy Finishing

Here at ActOn, we have an exclusive subcontracting facility which includes High Energy finishing machines. These machines are used daily for processing components sent by our customers. The waste water discharged from these High Energy machines is treated using ActOn's Waste Water Treatment System.

Please see below for a brief overview of the operation:

- The effluent from the machines is discharged into a lifting station.
- The lifting station pumps the effluent into a holding tank.
- The effluent in the holding tank is being agitated continuously.
- 50% of the dirty water from the holding tank is transferred to the treatment tank, which has a capacity of 1000L.
- 50% of clean water is also pumped into the treatment tank. The main reason for clean water being pumped into the treatment tank is due to the viscosity of the effluent discharged from the high energy machines, which is due to the application of the finishing process.
- A coagulant and a flocculant are added into the treatment tank, which also has an agitator. For this application, 200ml of AC CL520 and 5L of AF 528 are added. The ratios will vary on process application and tank capacity.
- The coagulant and flocculants help to create pin flocs and increase the settling rate.
- The effluent is pumped into the centrifuge, which rotates at a speed of 2000 RPM where the solids and clean water is separated.
- The clean water goes through the drain, while the solids are collected in the trolley and disposed of accordingly.

Typical values of a sample before and after treatment:

	Required specification	Raw sample	Treated sample
COD	3000	3880	1640
Suspended solids	1000	1460	184
Chromium	5	1.25	0.5662
Nickel	5	6.52	3.28
Lead	5	0.014	0.006
Zinc	5	0.09	0.07
Copper	5	0.083	0.046
Cadmium	5	0.0015	0.0006
pH	6-10	6.1	6.5



we manufacture

Bowls

Each of our Bowls are simple to operate, highly efficient, and manufactured in classic designs and sizes to meet your unique applications.

Troughs

We offer Troughs in many different sizes and an infinite choice of length and width combinations, making them one of our most versatile. These are particularly useful for larger components.

Duals

The orbital Dual finisher works to both deburr and dry in one single unit. This is both an excellent and economical finishing option.

Dryers

Our unique, elliptical-shaped Vibratory bowl drying machines are compact in size, and simple to operate. The design provides the flexibility to use it as an effective 1 lap drying process or a multi lap process. We also offer conveyors and rotary dryers.



Centrifugal High Energy

Engineered with the latest technology, the drive mechanism is designed to produce high g-forces, resulting in shorter process times. This technology can be used for both wet and dry processes.

Automation

Both the Vibrota and High Energy ranges can be automated to reduce manual handling, and to ensure a consistent process. Our automated systems are operator friendly, and can be custom built to suit your needs.



Man x Machine x Media = M³

Consumables

Over the years, we have been at the forefront of the industry, developing a range of consumables with the aim of achieving the desired finish on various components.

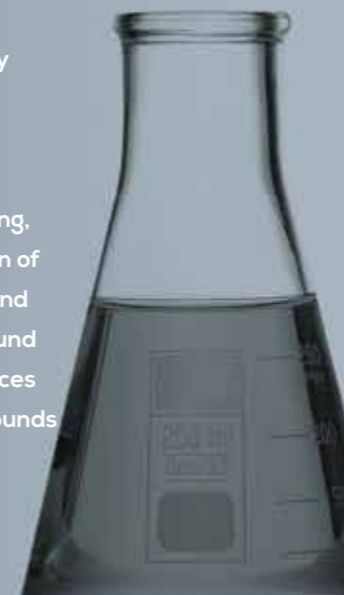
Working closely with highly skilled manufacturers, our Engineers have understood the numerous challenges faced in different industries and developed suitable consumables.

Choosing the right consumables is crucial in achieving your desired finish, and we endeavour to help you, and all customers, select the media and compounds right for your products.



Liquid Compounds

Compounds are very important to the mass finishing process. An extensive range of specially formulated compounds is manufactured on site, which suit almost any application. Compounds accomplish cleaning, inhibiting for rust and corrosion of parts, brightening, descaling and degreasing. Often, the compound reduces media costs and reduces process time. All of our compounds are biodegradable, too.



Powder & Pastes

A full range of powders and pastes are available, all of which complement the media and contribute to the grinding, cleaning and polishing of ferrous and non-ferrous materials. These products are suitable in freshwater operations.



Plastic Media

Our range of plastic media comes in various grades, shapes and sizes and is specially designed for smoothing processes and removing light burrs. This media also reduces the risk of part damage, and gives us a consistent bright and matte finish.



Ceramic Media

Our ceramic media comes in a variety of abrasive grades, starting from low abrasive to super finishing. This type of media is suitable for various deburring, radiusing and polishing processes, and is specially formulated to go hand-in-hand with ActOn's compounds.



Agro Media

Part of our agro media range is corncob and walnut shell. Both products come in various grain sizes, which are carefully chosen to suit the specific parts. The corncob grains are known to have high abrasion resistance, good moisture absorption, low specific gravity and are employed mainly for drying in the Rotary Dryers and Vibratory Dryers. Walnut shell is a hard and fibrous material of medium abrasiveness, and is used in both the polishing and deburring processes, as it leaves no scratches or pitting.

Pre-treated Media

All of our agro media comes in a treated, bovine-free form, which is particularly suitable for high lustre or mirror finishes.



Special Media

Our special media includes steel media, a separation ball media that keeps flat parts separate, ensuring they don't stick together.



Value Added Service

On top of our state-of-the-art machinery and media, we also supply a range of support and training services.

Learn more on how you'll benefit:



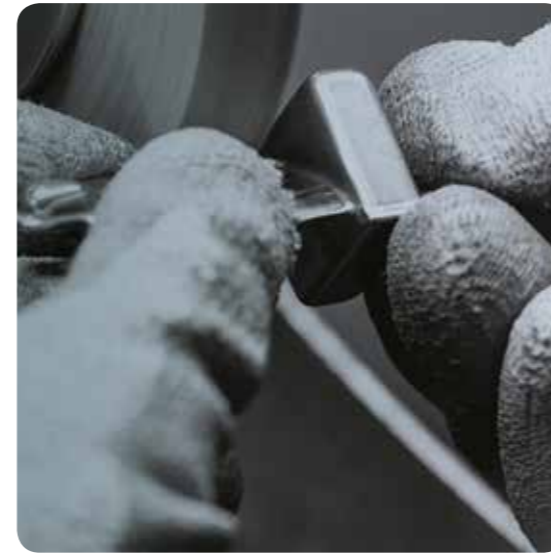
Waste Water Treatment

During the finishing operation, the effluent can be polluted with oil, media and metal fines. It is critical that the effluent must be treated before going to drain, or if it is being recycled back into the system. Each area or district has its own discharge consent, hence the effluent must be analysed against this.

The effluent can be recycled, however there are certain applications where it is not possible. In that case, the treated effluent can be transferred directly to the drain. Recycling can save a significant amount of water and compounds (greater than 90%) used.

We offer a range of flocculants (powder and liquid) coupled with our Centrifugal technology.

Subcontract Services



Precision Polishing

In order to provide you with complete surface finishing solutions, we offer a precision polishing service for components from various industry sectors. In combination with our barrelling capability, you'll benefit in terms of cost, delivery and quality. Our applications include removal of manufacturing defects on femurs and aerofoils, which are inherent in the casting and forging process.

Inspection

Our trained inspectors ensure every component is inspected to the required specification prior to delivery. The inspections can include visual, dimensional and surface finish measurements. Our document controls ensure that all inspections are recorded for traceability purposes.

High Energy and Vibratory Finishing Services

Our factory is well equipped with High Energy (HE) and Vibratory machines, which are designed and manufactured by our Engineers. The HE machines provide a speedy finishing solution, as well as a high quality finish to the parts, eliminating any need of fixturing and preventing their impingement. Along with the HE machines we also have Vibrota finishing equipment, which processes parts of variable sizes and batch quantities.



After-sales, Training and Installation

We hire a number of highly trained staff, including engineers, who are on-call for all of your after-sales requirements. From installation and training, to maintenance and prompt professional advice, our finishing specialists are here for you every step of the way.

What Our Customers Say

“ We have tried for a long time to come up with a solution to recycle our discharge. ActOn have helped us to save money and time with the use of their Water Treatment System and consumables.”

“ From developing a bespoke process, to installing machines and training our staff, ActOn were excellent throughout. ”

“ We needed a quick turnaround and ActOn were there to test our effluent and offer us a solution in no time at all”

Quality You Can See

We pride ourselves on our excellence, and over the years we have successfully demonstrated an ongoing compliance with ISO quality and environmental standards.

For ISO, we currently hold:



We're proud members of the 'Made in Britain' campaign.

