

# INDUSTRIAL SIEVING / SEPARATING PROCESSES AND THEIR APPLICATIONS

A GUIDE FOR ENGINEERS



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# THE GOUGH ENGINEERING GUIDE TO INDUSTRIAL SIEVING / SEPARATING PROCESSES AND THEIR APPLICATIONS

Industrial sieving and separating are vital value-adding production processes in many manufacturing systems and industries, helping to secure excellent product quality by removing unwanted materials and contaminants from correctly classified good product.

There are many types of vibratory and non-vibratory sieving and separating techniques which are suited to different applications; as a UK market leader in the design, supply, installation, and commissioning of industrial sieve technology, [Gough Engineering](#) can provide expert advice about which method is most appropriate for your industrial application.

In this short guide, we will outline the main types of industrial sieving and separating processes and explain how these are used in different applications.

## TYPES OF INDUSTRIAL SIEVING AND SEPARATING MACHINERY

At Gough Engineering, we design, manufacture, supply and install a range of industrial sieving and separating equipment. The following are the main types:

### Batch Sieving

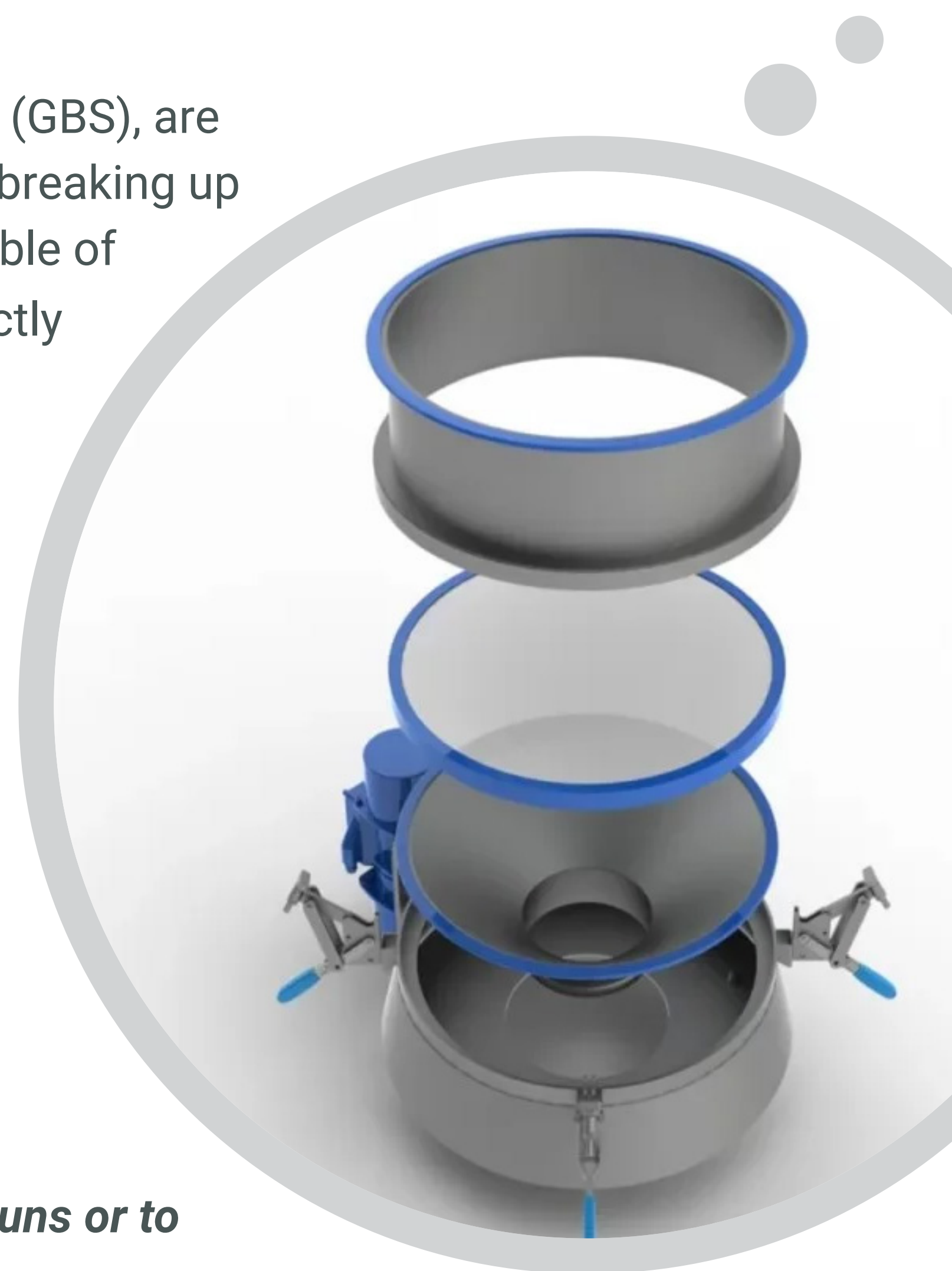
Industrial batch sieves, such as the Gough Batch Sieve (GBS), are compact vibratory systems that are highly effective at breaking up agglomerates or clumped material. They are also capable of removing, unwanted debris/contaminants, using correctly specified meshes or perforated plates determined by trials and previous knowledge/experience.

A [batch sieve](#) features a deck rim that allows the efficient loading of material without the risk of spillage or wastage, using controlled vibration to move the product through the machine with little need for supervision.

The equipment can be mounted securely on a fixed support frame or attached to a mobile stand with robust castors to facilitate movement from one place to another.

***Batch sieves are designed for use in short production runs or to process small batches.***

Batch sieves are ideal to process product material for small batch runs where bags are manually emptied into the sieve.

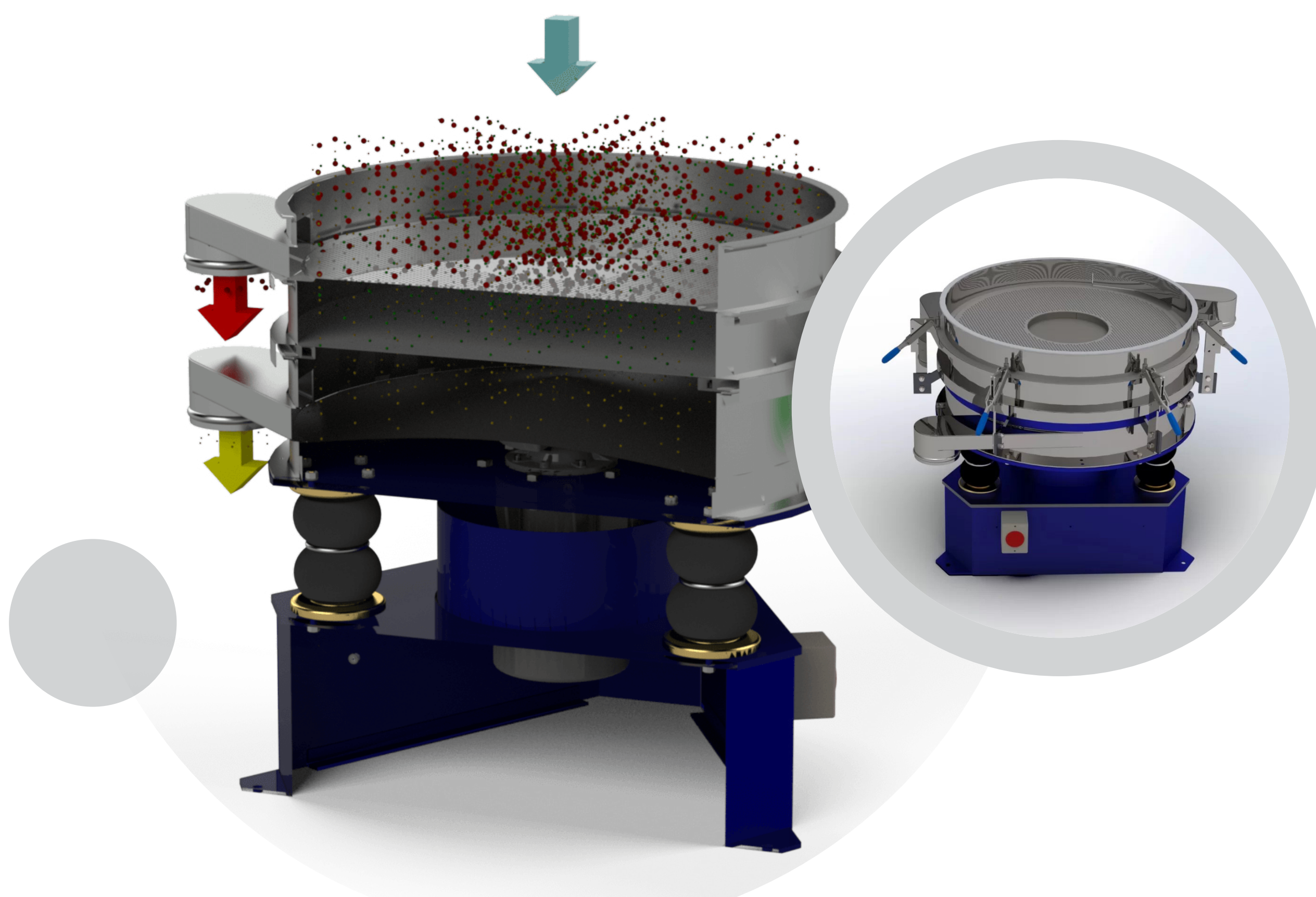




Advantages of batch sieves:

- ✓ Simple design for a proven check screen process.
- ✓ Excellent manoeuvrability to allow fast transfer between operational locations.
- ✓ Supports continuous flow to eliminate stoppages and increase productivity.
- ✓ Designed for quick disassembly to allow cleaning and washdowns without specialist knowledge and tools, to avoid any risk of contamination.
- ✓ Additional options can accommodate; magnets, oversize exit spout, ultrasonics and different support frame heights depending on your current production layouts / and collection bin heights. Rip & Tip stations can include shelf and hood designs and extraction for reducing airborne particles for cleaner environments

## Vibratory Separators & Classifiers – Circular Direct Drive



A vibratory separator, such as the Gough Vibrecon<sup>®</sup>, is a separating and classifying system that uses circular gyratory motion to process material on an industrial scale using either wire mesh or perforated plate (holed) screens. Suitable for handling many types and grades of material in different industries, a vibratory separator provides an efficient and cost-effective way to separate particles of difference sizes to ensure internal product quality is maintained. This means the classification of particle sizes can remove any unwanted particles, de-dusting and ensure consistent good quality material is used in your next processes and is available as a single or with multiple screening decks in a variety of sizes to meet the specific needs of the application.



When using a [vibratory separator](#), product is fed onto the centre of the top screen from where it is sent in a controlled, clockwise motion from the centre to the outside of the mesh. Oversized product is collected through an outlet while fine material passes through to the next screening deck or into the base/final outlet spout. This is highly effective as it continuously clears the screening area, delivering excellent throughput without compromising on efficiency or accuracy.



Single  
Solutions



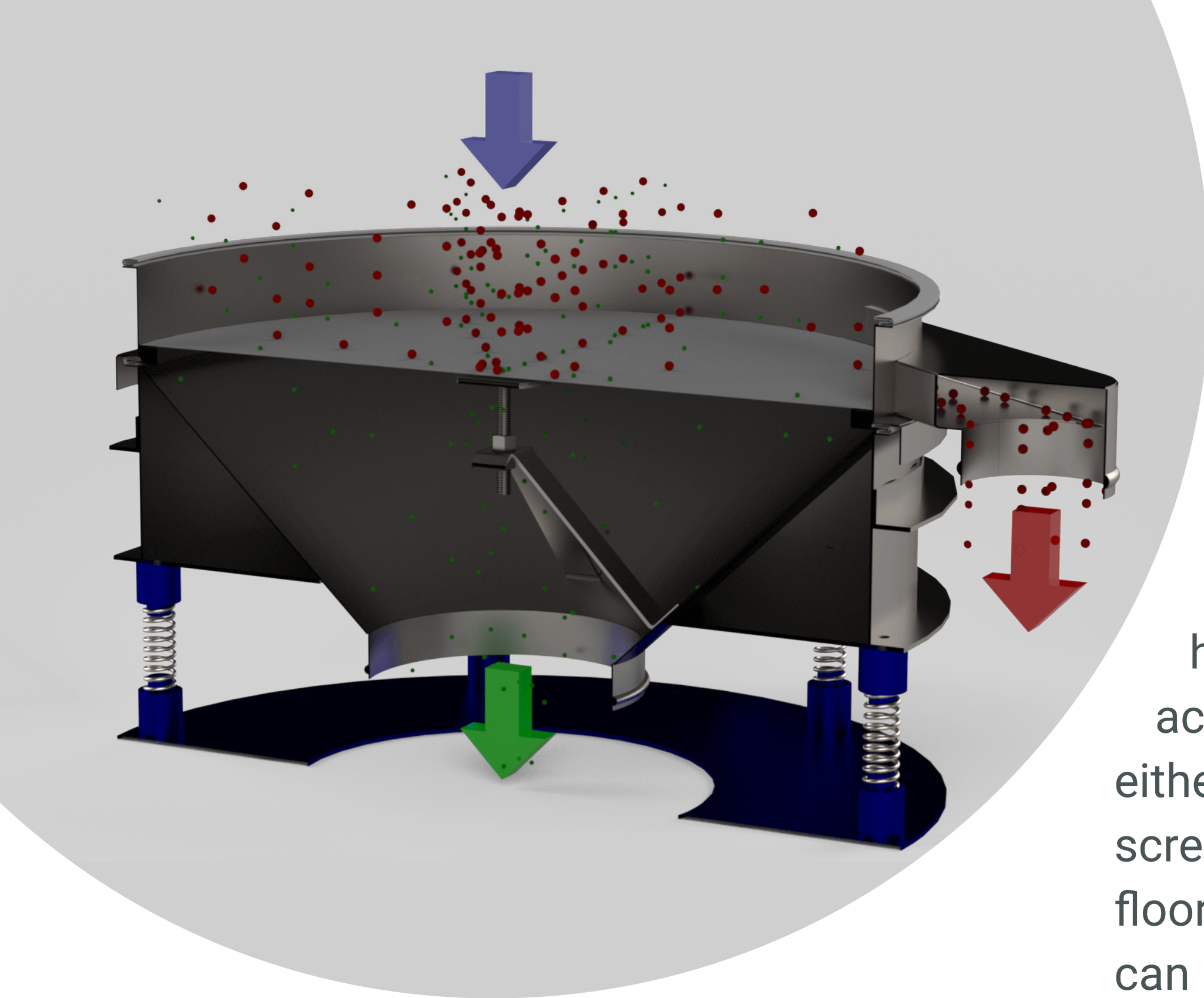
Small  
Integrated  
Solutions

**Advantages of Vibrecon® Units:**

- ✓ **Accurate particle separation**  
The unique design of air bellows on Gough Vibrecon® unit, allows better control of vibratory motion to the application's product material and reduces vibration into the base unit housing the motor.
- ✓ Adjustable motor weights allow fine tuning to achieve optimum separation and throughput.
- ✓ Additional decks can be added to separate products according to particle size and a maximum of 4 fractions can be achieved for certain applications.
- ✓ Quick release clamps allow rapid disassembly for easy cleaning to avoid lengthy downtime.
- ✓ Additional options can accommodate magnets, top covers to minimise air-borne particles, extraction, ball trays to provide additional mesh vibration, different base and deck designs depending on your current production layouts and collection bin heights with additional ultrasonics options.



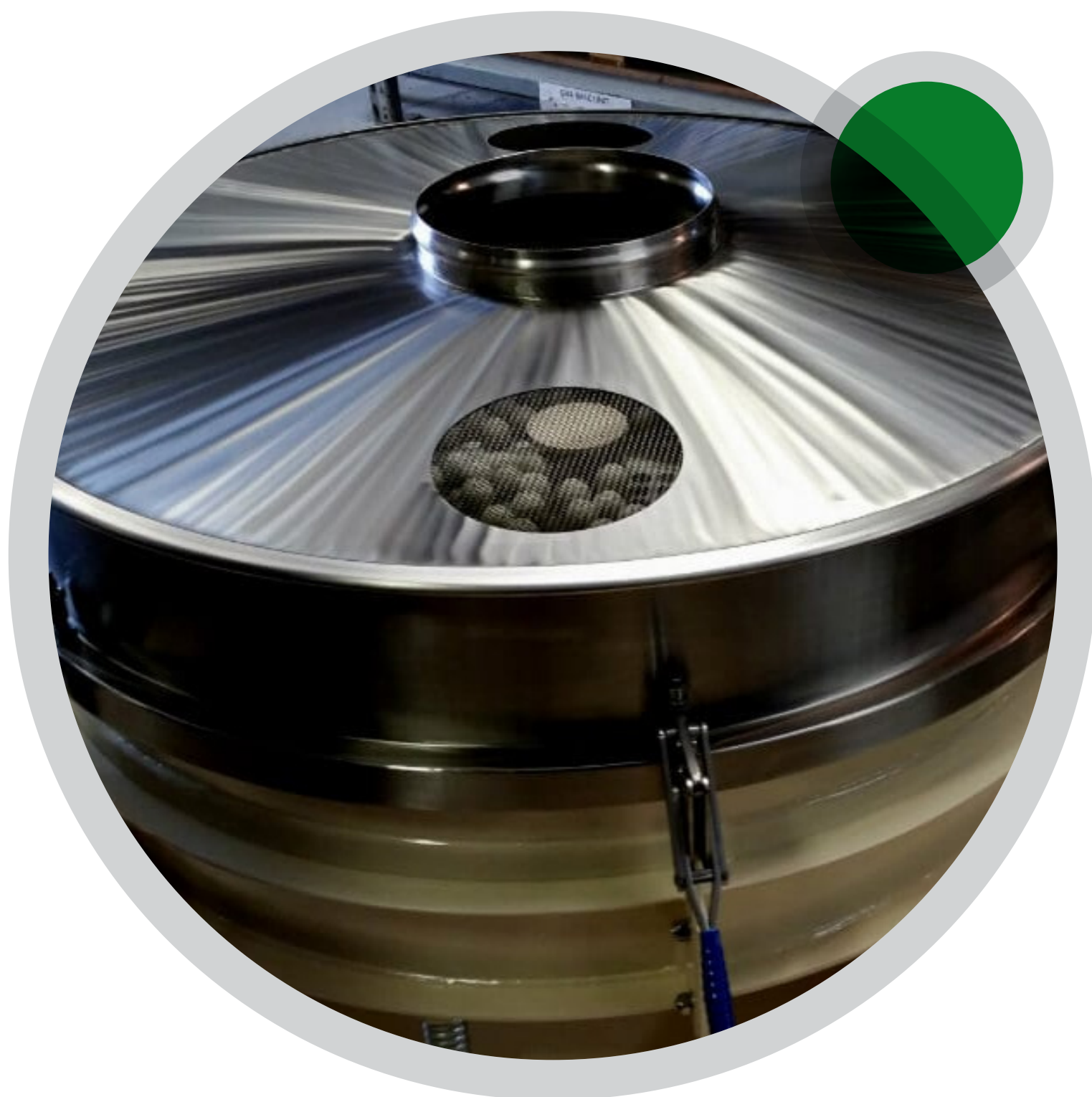




## Vibratory Sieves – Twin Motor Vibraflo® Flowthrough

Twin Motor ‘flowthrough’ Vibratory screens such as the Gough Vibraflo® (where good product runs through the centre of the unit) are used to screen higher volumes of product material with accurate separation of particle sizes using either a wire mesh or perforated plate (holed) screen. These units can also occupy less floor space compared to a linear screen, and can deliver reliable, continuous screening to maintain excellent product quality.

Industrial grade vibratory sieves operate on the principle of gyratory vibration – meaning that the vibrations are generated in a circular motion. Vibrations produced by twin out of balance electric motors causes the product to move within the sieve, with finer particles passing through the mesh and larger one and foreign bodies moved to a different outlet spout. Vibratory sieves can accept over 20 litres of product at one time and are easy to disassemble for regular cleaning.



### Advantages of Vibraflo® Units

- ✓ Continuous, high throughput and excellent classification process.
- ✓ Compact design with minimal height requirements.
- ✓ Options for lids with inspection ports to reduce airborne dust.

## Linear Vibrating Screens (Twin Out of Balance Motor Drive)

Linear vibrating screens work by separating products into fractions as the material is moved in a linear direction rather than circular, enabling the separation to occur and be classified according to the screen aperture size using wire mesh or perforated plate. A [linear vibrating screen](#) can, in some circumstances, provide classification and travel material across small distances, therefore replacing a small conveyor. It is also possible to ‘decline’ a screen to help move certain product material downwards, if necessary, using 1 or 2 decks with different screen mesh apertures.



Linear vibrating screens (normally using twin out-of-balance motors) provide a robust method for continuous process production screening and the size of the screen/mesh area is designed to match production throughput with correct classification and have the following benefits.

For specialist application requiring start/stop feature, Electro-magnet drives are used as an alternative to out-of-balance motors.



#### **Advantages on Linear Vibratory Screens**

- ✓ High screening capacity.
- ✓ Excellent separation of small and large particles, with a maximum 3 fractions.
- ✓ Easy, interchangeable meshes for each deck.
- ✓ Tailor made support frames to suit your existing/production heights.
- ✓ Robust and durable industrial design for continuous operations.
- ✓ Secure onward product transfer over the units length from entry to discharge points

### **Centrifugal Sieving**

For Reference only: Gough Engineering do not manufacture this type of unit.

Centrifugal, or rotary, sieves use a non-vibratory technique to separate different sized particles using centrifugal force. A set of rotating paddles push the product through a static cylindrical screen, spinning them at a high speed to apply centrifugal force. This pushes larger particles across the screen to an outlet further along the cylinder. The force created by the paddles can break up persistent lumps of material or compacted powder to increase the yield.

The cylinder is horizontally mounted onto a cantilever shaft, so additional bearings are not required. This improves cleanliness and delivers a strip down time of approximately 30 seconds. Only a single mesh can be fitted to a centrifugal sieve, making this equipment ideal for check sieve processes.

- ✓ High productivity delivers greater throughput.
- ✓ Easy cleaning and rapid mesh change to minimise downtime.
- ✓ Increased yield as agglomerated material is broken down.
- ✓ Low noise level and a dust-tight design improves safety for machine operators.



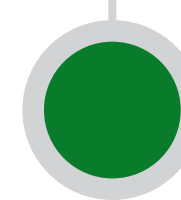
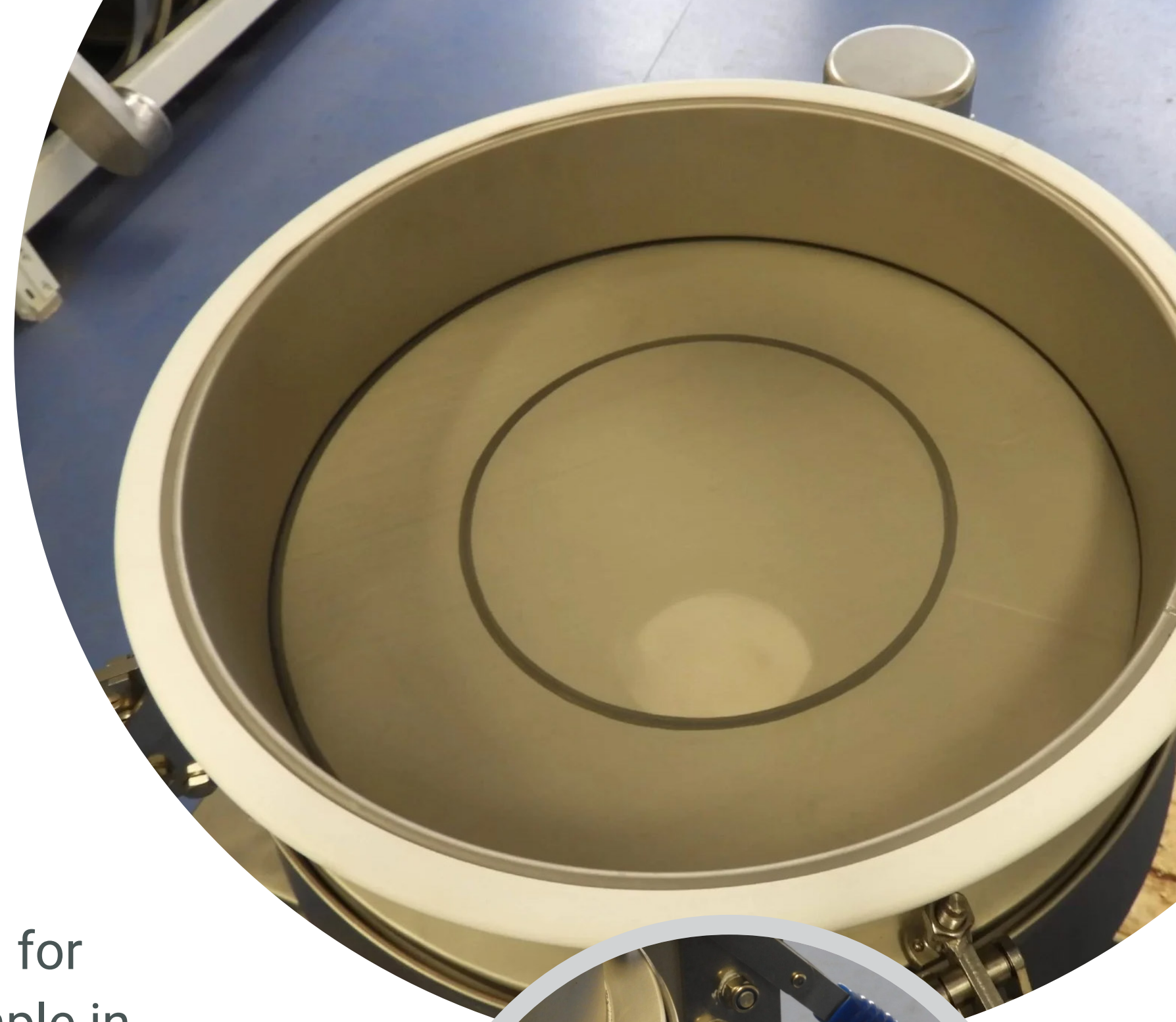
## Ultrasonic Package

The Ultrasonics package can provide an additional high frequency screen vibration and avoid any blinding on certain fine powders. Ultrasonic vibrations are created by a generator and converter connected to a specially designed mesh frame.

Ultrasonics can be used in screens between for example 50 and 200 microns in size, and are ideal for many fine powder applications and used for example in carbon black materials in the Chemical Industry.

The advantages of this technique include:

- ✓ Higher sieving throughput.
- ✓ Avoid pegging or the blocking of apertures in a screen mesh.
- ✓ Superior separation accuracy of the sieved product.
- ✓ Easy-to-clean screens minimise system downtime.
- ✓ More efficient material flow.



## HOW INDUSTRIAL SIEVING AND SEPARATING SOLUTIONS ARE USED IN DIFFERENT INDUSTRIES

How are industrial sieves and separators used in different industries and how can they facilitate compliant performance?

### Pharmaceuticals

In the demanding [pharmaceutical industry](#), sieving and separating are fundamental parts of the production process, that can dictate very tight tolerances in product material quality control. Gough's reliable sieving and separation equipment enables pharmaceuticals manufacturers to guarantee stringent quality assurance standards at certain points in production using stainless steel 316L and polished surfaces with easy to clean components and minimal time for assembly/disassembly of the units, decks and screens.



The Gough Vibrecon (Sanitary) Separator has been specifically developed to meet the very stringent engineering finish and design specifications required by the Food, Pharmaceutical and Allied Industries. High quality stainless steel such as 316L with smooth internal lines and superior welding, carefully dressed both internally and externally with high surface polishing ensures that all surfaces can be easily cleaned to eliminate any unwanted potential bacterial traps. Ultrasonic sieving can be used to remove unwanted particles and is essential to guarantee excellent production processing for granulation and tablet pressing.

## Food Production

Whether your business produces [food](#) for human or animal consumption, hygiene and quality assurance are essential to comply with relevant food safety legislation, to protect consumers from harm, and guarantee repeatable, high-quality results.

Sieving and separation of dry and wet foodstuffs is essential for many reasons, including:

- ✓ Prevention of contamination by foreign bodies, such as bag debris, fibres, dust, and hair.
- ✓ Safeguarding the appearance, texture, and taste of products.
- ✓ Grading products in line with established market grades, such as coffee granules.
- ✓ Removing oversize or undersize particle ingredients so that a product meets its specification.



Sieve aperture sizes are crucial to give manufacturers the right classification over the sieving and separation process. Additional ATEX-ratings can also be clarified in certain application environments requiring this standard where combustible powders are present.

## Recycling And Recovery

Recycling and recovery businesses benefit from industrial sieving and separating equipment during material handling, transfer, and separation. Concern about the damaging effects of waste materials, including microplastics, coupled with the Waste Electrical and Electronic Equipment (WEEE) regulations, means recycling specialists need reliable ways to process recyclable goods.

Gough Engineering support the [recycling and recovery sector](#) in several ways:





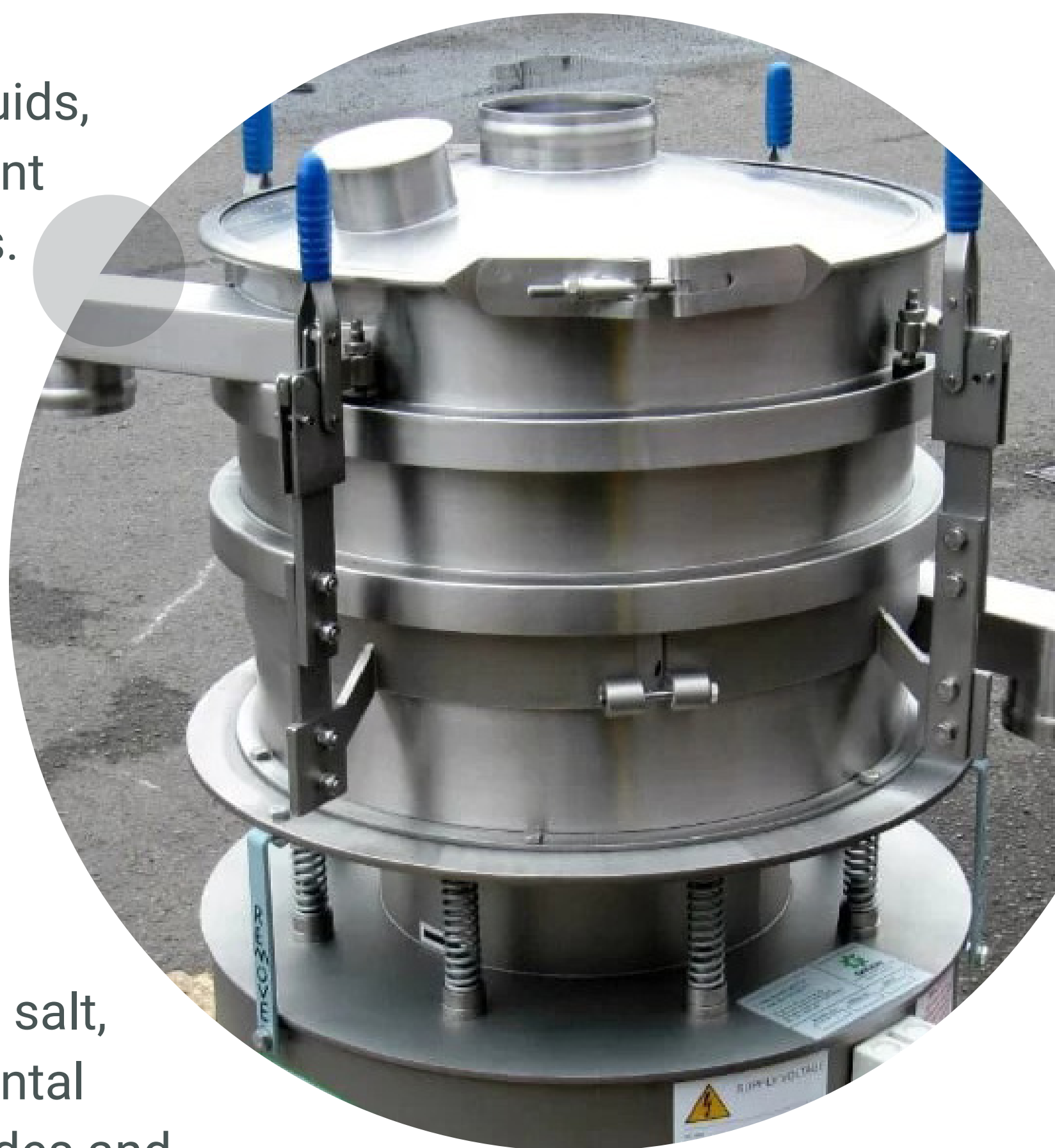
- ✓ Linear vibratory screens being used in the waste recycling of food, glass, and crushed or shredded materials.
- ✓ Circular or linear vibratory screening aids in the classification of polyethylene terephthalate (PET) materials.
- ✓ Vibratory sieves and separators sorting granulated rubber from vehicle tyres into smaller pieces for use in, for example, flooring, safety surfaces, and AstroTurf.

## Chemicals

In the [chemical industry](#), all chemicals – powders, liquids, granules, and suspensions – are created using different processes, including dispersion, mixing, and reactions. Industrial sieving is vital after each process to ensure product materials meet predefined specifications and to check that quality assurance is achieved.

Sieving and separation equipment processes play a key role in chemical manufacturing processes, ensuring the safe handling of powders, liquids, suspensions, and acids.

At Gough Engineering, our equipment is used in many ways, such as the elimination of contamination within salt, talcum powder, or limestone; to reduce the environmental impact of solvents, or to produce herbicides, insecticides and fungicides for agriculture.



## Plastics And Polymers

Industrial sieving and separation are widely used by businesses that handle masterbatch production, plastic pellets and resins, synthetic and natural rubbers. In particular the Vibrecon® vibratory pellet screen with special features has played a key role in the [plastics and polymer industry](#) for many years - primarily to provide accurate classification and grading of materials. This equipment has distinct advantages over alternative methods:

- ✓ The ability to use two, three, or four fraction separation can provide an efficient way to complete multiple simultaneously classification.
- ✓ With the correct mesh aperture, the Gough separators can deliver accurate classification with consistent performance results.
- ✓ With the Gough air bellow solutions, better suppression of vibration in the base unit, allowing the motor and weight setting to generate a more accurate classification process.
- ✓ Gough can advise on the correct type of separator and accompanying features to provide the optimal solution for your application.



## Manufacturing And Packaging

Industrial sieving and separating equipment can facilitate productive and profitable manufacturing lines by:

- ✓ Increasing yield by breaking down compacted materials.
- ✓ Producing excellent classification and separation of good vs waste materials.
- ✓ Reducing the time taken to separate different sized particles.
- ✓ Improving product quality by removing contaminants.
- ✓ Sustaining efficient material flow to the next stage of the process.
- ✓ Minimising downtime with durable, high quality machine components.
- ✓ Minimising clean-down times with quick and uncomplicated assembly/disassembly.

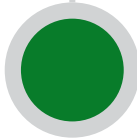
## FACTORS THAT INFLUENCE THE PRICE OF INDUSTRIAL SIEVING AND SEPARATING EQUIPMENT

Like all major purchases of capital equipment goods, it is important to achieve a healthy Return on Investment (ROI) when choosing industrial sieving or separating equipment for your business. Gough Engineering can design a bespoke solution that meets your unique needs and requirements, in whichever field of industry you operate.

What are the factors that will influence the cost of your chosen solution?

### Build Quality

When you invest in industrial sieving and separation equipment, you need confidence that it will deliver excellent performance while offering durability and reliability. Incorrect specification and poor build quality increases the risk that your machinery will perform poorly or be prone to breakdowns that disrupt production and cost your business money. Our solutions are manufactured using the highest quality components and assembled with excellent technical know-how, for a reliable solution that doesn't let you down.







## Origin

Purchasing from a reputable supplier builds confidence in your recommended solution. Renowned for our quality of design and manufacturing, Gough Engineering provide our clients with bespoke solutions that are customer specific. Throughout the process, we make open and honest consultation the lynchpin of our service, so your sieving and separation solution meets your material handling needs. All our products have full CE UKCA certification and our core products have British trademarks and a history within many major clients in different industries still using Gough equipment over decades. This respected and loyal customer base continue a strong relationship with Gough Engineering for decisions on equipment modifications or new solutions in this ever changing and demanding world we live in.

## Parts & Service

Should your sieving and separating equipment develop a technical problem, our responsive aftersales service can provide technical support with effective replacement of any parts. Our after sales department with in-house engineering design can also provide additional design support if you need alterations or modifications to changes in your equipment requirements. Backed by our in-house parts stores, we can also accommodate a quick turnaround of critical components in those situations where replacement parts are quickly needed and minimise any unsuspecting operational downtime. We also provide quick turnaround on remeshing your screens as and when required.

## The Gough Service

As no two solutions are the same, full expert support at every stage of the process is vital if your sieving and separation equipment is to provide the reliability and accuracy that your business needs. At Gough Engineering, we'll work in partnership with you to deliver a bespoke solution that is right for your business. From your initial enquiry to performance validation and service and maintenance, our service is grounded in decades of experience and technical knowledge. We also offer a trial and hire service if required.

## Accessories

To ensure the equipment accurately meets your needs and delivers a quick ROI, several additional options are available to tailor the system, including mesh/perforated plate designs, de-blinding ball trays, ultrasonics, dust extraction, tundishes and distribution cones, rare earth magnets, stands, connectors, earthing wires and more.



## FINAL THOUGHTS

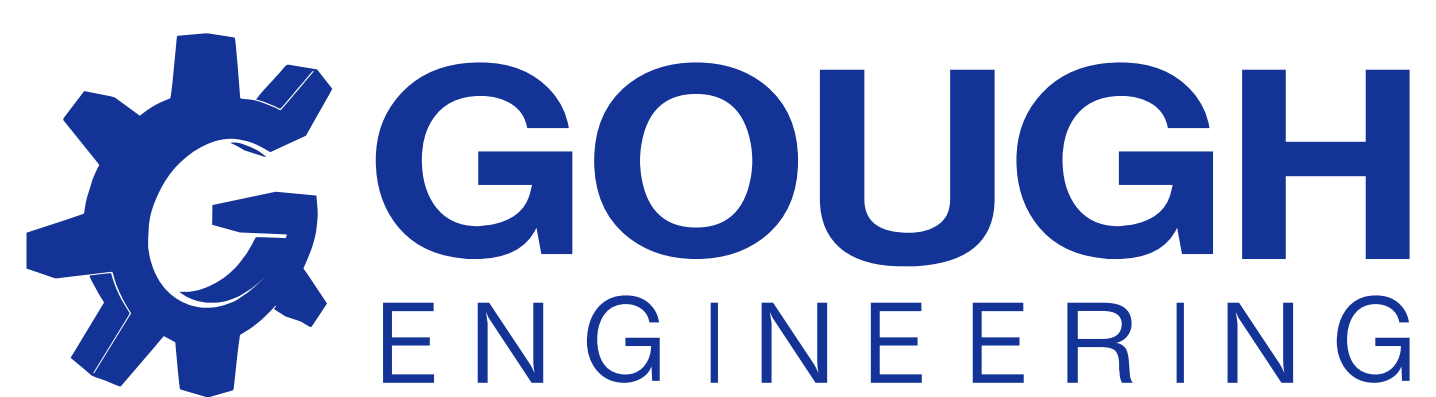
Industrial sieving and separating technology unlock the potential for better product quality and consistency, while achieving excellent value for money and reliability. However, the needs of each application are likely to vary so it's important to invest in the most suitable sieving and separating method to achieve optimum process results.

To tell us about your project or industrial application so we can help you to select the best sieving and separating process, please [get in touch](#) with Gough Engineering today on 01782 567770 or [send us a message](#) and one of the team will respond promptly.



**Integrated solutions to feed, screen and convey your product material efficiently and safely.**





Gough Engineering  
<https://www.goughengineering.com/>