sievgen
by farleygreene

Powder Recycling

Controlled. Efficient. Safe.

Additive Manufacturing

Contents

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Powder Processing with Control.

Sievgen powder recycling systems are designed specifically for the Additive Manufacturing (AM) market as it transitions from prototyping into full-scale production.

To meet the needs of customers, Sievgen systems have been developed to reduce both downtime and operator involvement.

To benefit production facilities, Sievgen 04 (SG04) opens up to reveal the sieve at the heart of the process, minimising turnaround times between batch or material changes. The intuitive touchscreen interface facilitates automated processing, releasing the operator from continual supervision whilst enabling them to keep full control of the recycling process.

To assist research establishments, Sievgen 03 (SG03) is a highly flexible and time efficient machine. It offers exceptionally high throughput so that there is no delay in processing even larger amounts of powder.

Sievgen systems are a balance between efficiency and throughput, separating the unusable, oversize from the reusable powder as quickly as possible without losing valuable product. Since their establishment in 1976, this is a technique Farleygreene has refined based on years of experience in Pharmaceutical and other equally challenging markets. Based on that experience we know that every powder is subtly different, as are every customer's needs. Our engineers will work closely with you in order to achieve the required throughput parameters for your environment.

As the AM industry grows and develops, the Sievgen range of systems also continues to advance, through working with partners, consortiums and research establishments such as the Manufacturing Technology Centre (MTC). This strategy is built on a baseline of experience that defines our commitment to staying ahead of the competition in key areas; developing systems that are more user friendly, easier to clean and more seamlessly integrated into your facilities.

Product Features

- Controlled
- Efficient
- Safe

Optional extras

- Mirror polished internal surfaces.
- Wheeled barrel/container: Factory option to fit smaller floor panel to allow container to be wheeled up to sieve.
- Oxygen monitoring: To control and log atmosphere within system.
- Connection to canister of choosing.

Detailed Specification

Standard

Machine type	sievgen 04 vibratory fine powder ultrasonic screening system. Fully enclosed system for screening of fine powders. Sieved powders can be cleanly and safely collected into flasks / barrels or conveyed directly to the next process.
Mesh size & material	• 316SS plain woven wire mesh @ 63 micron. (or as required 25 – 500 micron). • Tensioned bonded screen system complete with digital ultrasonic frequency variation.
Parts & finish	• 304SS contact parts – Satin finish. Gaskets and seals from silicone rubber.
Vacuum Conveyor	• Remote anti-static filters (0.3µm pore size) in removable housing. • Vacuum multi stage venturi pump housed with main cabinet. Single air connection to rear of main cabinet. Compressed air consumption approx. 94 l/min @ 5.5bar (3.3CFM). Suction smooth bore hose 2.5m long with crevice nozzle lance end for product transfer from source. Connection to vacuum inlet by 32mm triclamp.
Hopper detail	• 25 litre buffer hopper ultrasonically excited to aid maximum powder flow. • Removable lid for cleaning access. • High level probe to ensure hopper overfill cannot occur. • Outlet fitted with an automated butterfly valve. • Internal metering of powder to feed sieve mesh.
Outlet detail	• Oversize material discharge through downturn outlet terminating in smooth bore crevice free flexible connection with 100mm triclamp end. Fine material discharge through downturn outlet terminating in smooth bore flexible connection with 100mm triclamp end. Oversize outlet supplied with 2litre collection barrel.
Sieve detail	• Fully accessible via cassette drawer system to allow for quick no tool strip of sieve parts for cleaning. • All internal faces/joints dressed and finished to provide crevice free surfaces.
System details	• Anti-static swivel castors with total stop locking brakes. • Front panel E-stop button. Rear panel electrical, pneumatic and inert connections. • Power supply via single 16 Amp male plug – 220/240v 1ph 50/60hz – Control circuit 24vdc. (other voltages available on request).
sievmetric Software	• Touchscreen interface with sievmetric control system. • Controls: o Material process type. o Batch weight – only with container option. o Cleaning protocols. o Inert purge. o Vacuum transfer system.
Suspension & Motor type	• Centrally mounted 3000 rpm high speed vibratory motor. Sealed motor to IP66 with grease for life bearings. Aluminium cast painted housing.
Ultrasonic System	• Ultrasonic generator box with converter probe connected to mesh ring assembly & hopper.
Load Cell	• Single point load cell, 0-250kg. Controls maximum powder processed per run. Data logged.
Certification	• CE conformity certificate. ATEX approved
Documentation	• Supplied with English operating & maintenance manual. CE conformity certificate. ATEX approved.

Optional

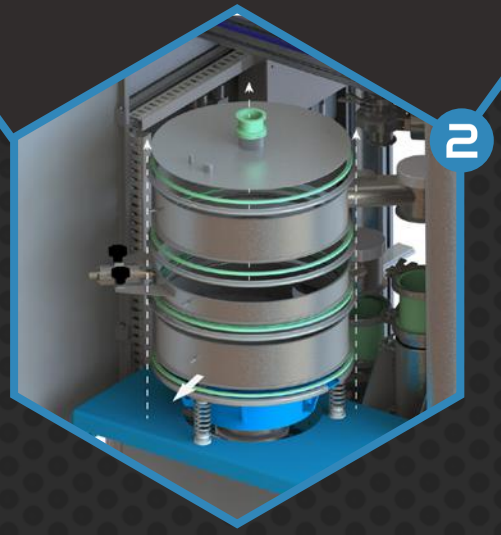
Inert Sieving	• Sieve under timer controlled inert atmosphere – 0.05%/hour leak rate (system at rest).
Oxygen monitoring	• For controlling purge and maintaining required O2 level. Measurement Range: 0-25% O2.
Blank Shelf	• Control of sieving based on timer, not weight.
Easier access for larger containers:	• Open access to front of sieve for larger canisters, either wheeled or lifted in to position.
Or	
Return loop conveying	• Efficiently transfer powder back into AM machine or alternative hopper.
Flexibility of Fines capture	• Connection to canister/barrel/hopper of choice, or • Farleygreene design, 10 litre fines collection barrel in 316SS. 2 x lifting boss handles. 100mm triclamp inlet c/w clamp, cover disc & gasket for connection to sieve flexible outlet. Butterfly shut off valve to inlet.

Disassembly and Cleaning

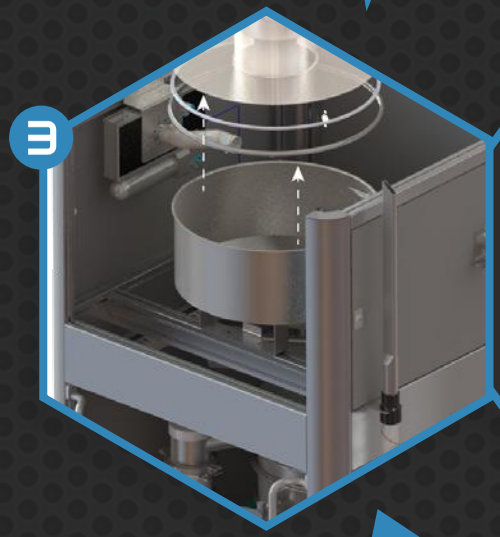
SG04 has been designed to reduce downtime in the AM process. All changable parts are easily accessible and do not require tools to disassemble and reassemble.

Undo clamps - remove sleeves.

Position sieve outside of frame - disassemble.



Undo clamps - remove hopper lid, filter unit and bulkhead seals.



Replace components in reverse order to complete cleaning cycle.

Consumables/Spares

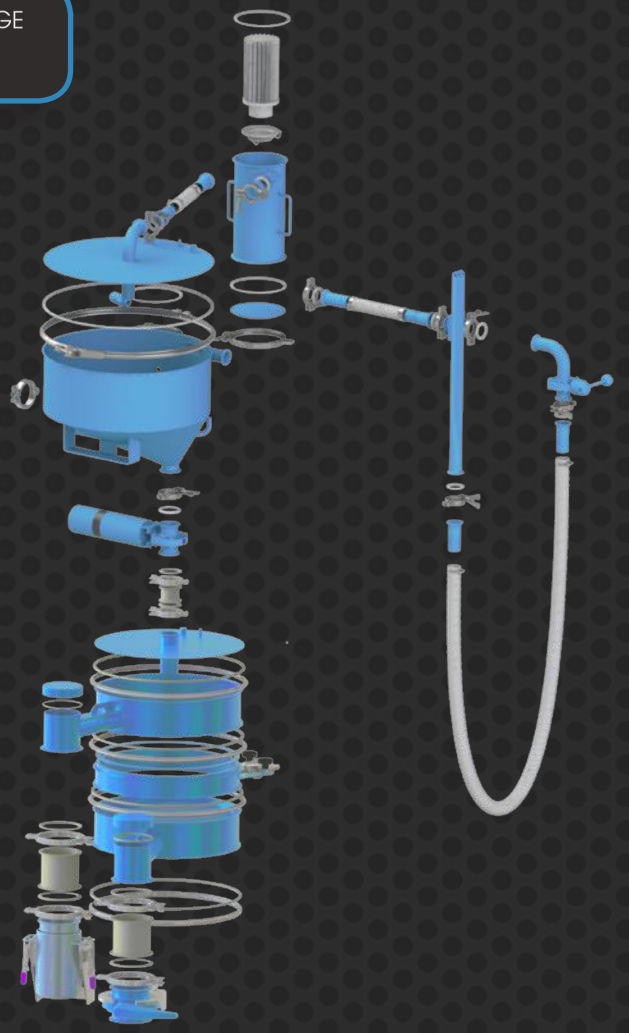
Sieve Section	Quantity
SIEVE INLET FLEXIBLE CONNECTION SLEEVE	1
LID ASSY	1
TOP GALLERY	1
ULTRASONIC MESH RING ASSY	1
BOTTOM GALLERY	1
GALLERY FLANGE GASKET	3
OUTLET COVER DISC	2
OUTLET COVER DISC GASKET	2
OUTLET FLEXIBLE CONNECTION SLEEVE	2
OVERSIZE COLLECTION BARREL	1
FINES OUTLET BUTTERLY VALVE	1

Buffer Hopper Section	Quantity
LID ASSY	1
LID GASKET	1
FILTER HSG TOP COVER	1
FILTER HSG COVER GASKET	1
QX VACUUM FILTER	1
QX GASKET AND CLIP ASSY	1
HOPPER ASSY	1
LEVER SENSOR	1
LEVER SENSOR GASKET	1
HOPPER OUTLET GASKET	1
BUTTERFLY VALVE	1
HOPPER INLET GASKET	1
HOPPER INLET HOSETAIL	1
HOPPER INLET TO VAC BULK HEAD ASSY HOSE SECTION (0.5m)	1
VAC BULK HEAD HOSETAIL (INTERNAL)	1
VAC BULK HEAD GASKET	1
VAC BULK HEAD ASSY	1

Vacuum Lance Section	Quantity
VAC BULK HEAD GASKET	1
VAC BULK HEAD HOSETAIL (EXTERNAL)	1
VAC BULK HEAD TO LANCE HOSE (3m)	1
LANCE CUFF END	1
CREVICE TOOL LANCE	1

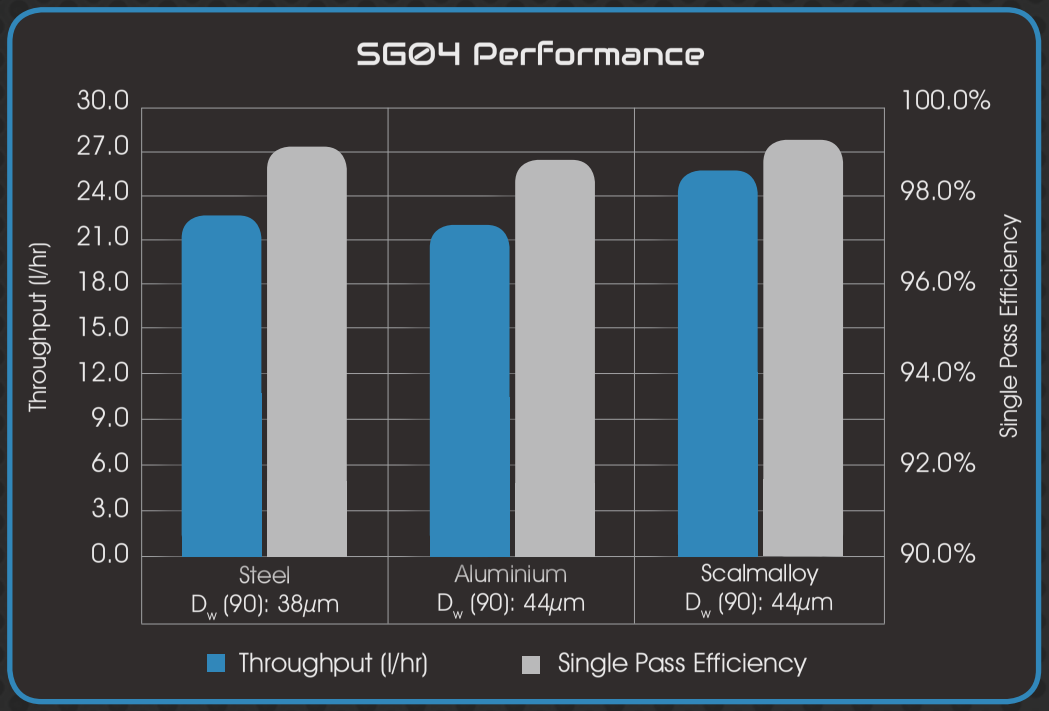
GREY = BATCH CHANGE

BLUE = MATERIAL



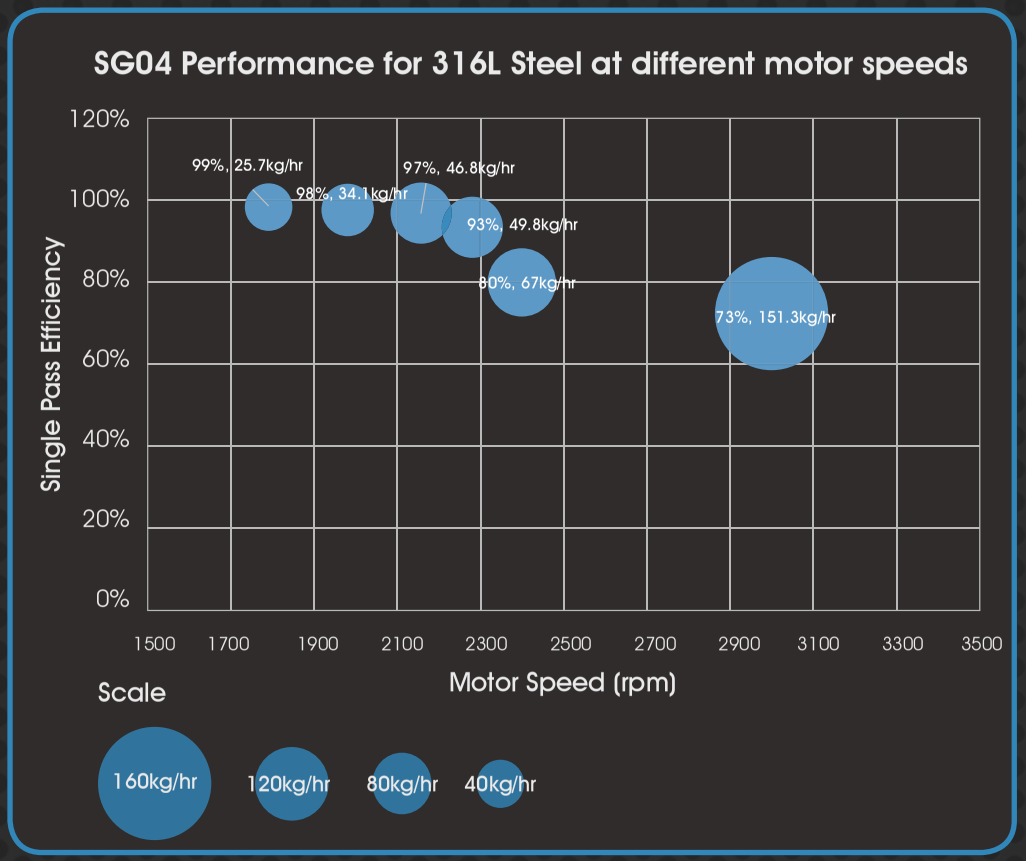
Throughput/Performance

Material	D_w (90)	Mesh Size	Throughput (kg/hr)	Throughput (l/hr)	Single Pass Efficiency
Steel	38 μm	63	98.4	22.9	99.%
Aluminium	44 μm	63	28.8	22.2	98.8%
Scalmalloy	44 μm	75	36.8	25.6	99.1%

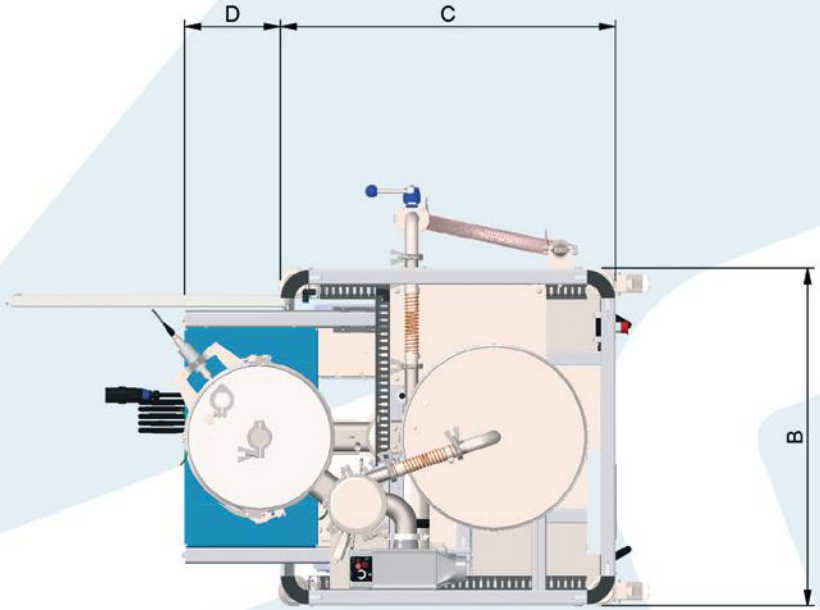


Tuning

The below graph shows how we can tailor your motor settings to achieve the best Single Pass Efficiency (SPE) and throughput possible. In this graph the area of the circles represents throughput and the Y axis is SPE.



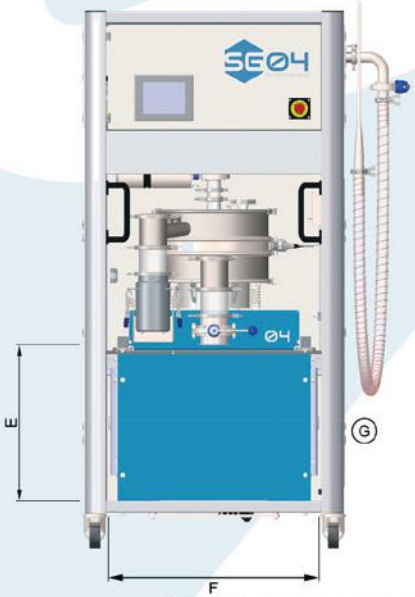
The above information demonstrates the commitment to single pass efficiency, eliminating the need for re-processing of waste powder.



VACUUM LOADING SYSTEM SURROUNDED BY PROTECTIVE SCREEN

ALL CONTROLS FOR SIEVE ULTRASONICS AND VAC LOADER ON FRONT PANEL

SHOWS SIEVE UNIT CASSETTE EXTENDED FOR STRIP DOWN



DIMENSION	SIEVGEN 04 (mm)
A	1973
B	960
C	953
D	273
E	570
F	400
G	365 (Load cell area depth)

ELECTRICAL	SIEVGEN 04
VOLTAGE	240
FREQUENCY	50 / 60 hz
POWER	0.35 kw (max)
PHASE	SINGLE
ATEX	YES

SCREEN DIAMETER = Ø400mm
OTHER VOLTAGES AVAILABLE ON REQUEST
VAC LOADER AIR REQUIREMENTS ON REQUEST

sievgen

ALL DIMS ARE APPROX. NOT TO BE USED FOR FINAL PLANNING. FULL DRAWINGS CAN BE SUPPLIED ON REQUEST SUBJECT TO CHANGE AT ANY TIME.

Product Features

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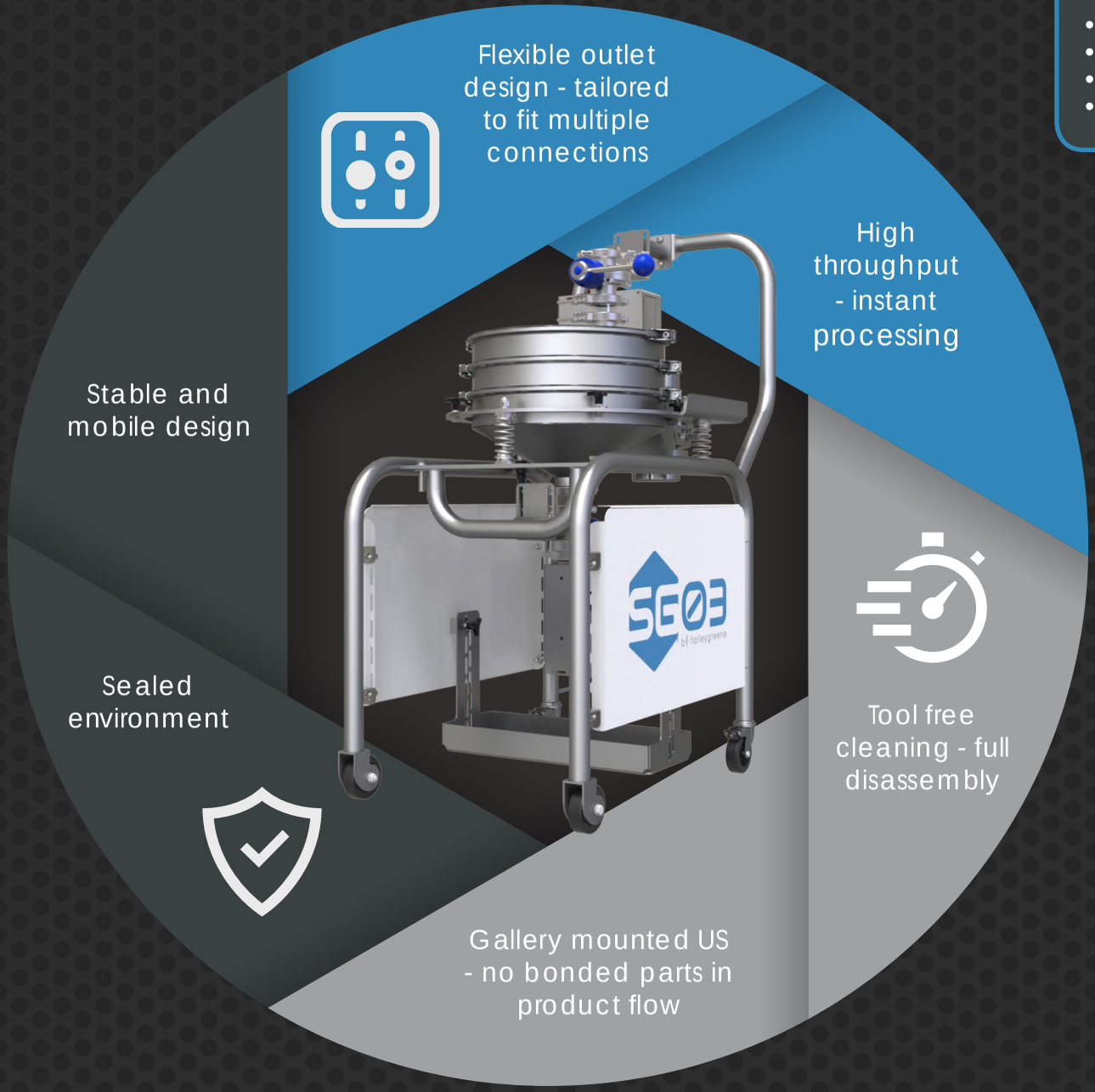


Optional extras

- Polished internals
- Mechanical deblinding
- Ultrasonic deblinding
- Inert purge ready

Detailed Specification

Standard

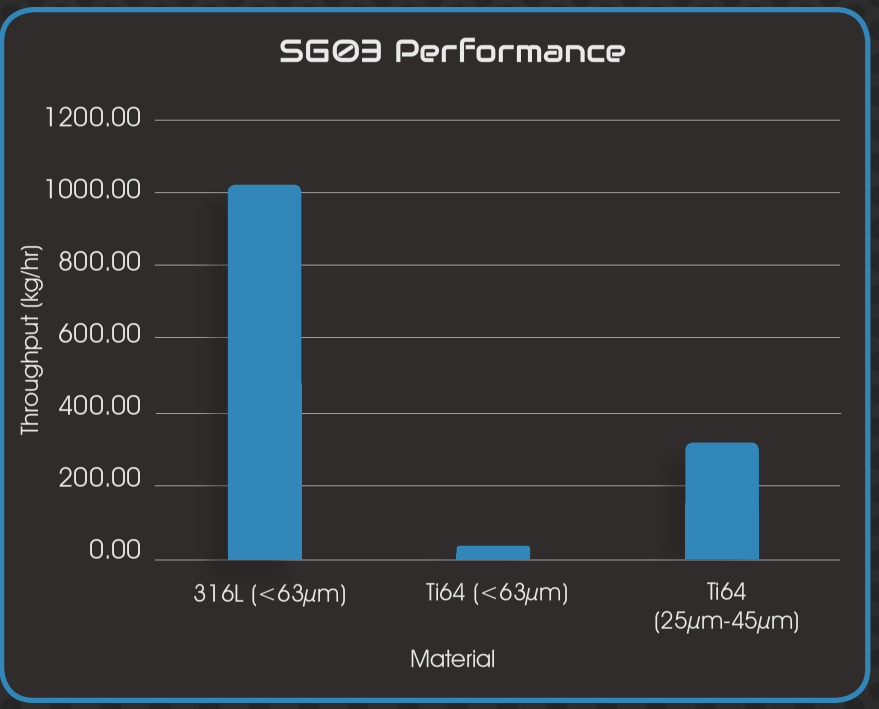
Machine type	sievgen 03 enclosed vibratory fine powder screening system. Sieved powders can be cleanly and safely collected into flasks / barrels. Unit strips down for cleaning with no tools.
Mesh size & material	• 316SS plain woven wire mesh @ 63 micron. (or as required 25 – 500 micron). • Tensioned bonded screen system.
Parts & finish	• 304 stainless steel – food quality, 304 stainless steel non-contact parts with bead blast finish. • Gasket from EPDM conductive compound.
Inlet detail	• Enclosed top gallery with removable lid with offset 2" Triclamp Butterfly Valve (BS4825 triclamp) with silicone compensator. Can be adapted to other fittings.
Outlet detail	• Conical bottom gallery with bottom centre 2" Triclamp Butterfly Valve (BS4825 triclamp) with silicone compensator. Can be adapted to other fittings.
Support Frame	• Mobile (with anti-static swivel castors with 2 total stop locking brakes) tubular stand in stainless steel, operator handle. Frame incorporates removable support arm for infeed suitable for 2"Triclamp or other style flask fitting (flasks & valves not included).
Suspension & Motor type	• Sieve unit is mounted on oscillating spring suspension system. Side mounted 3000rpm vibratory motor. Sealed motor to IP66 with grease for life bearings. Aluminium cast specially treated housing with 304SS end caps. • Power: 240v 1ph 50hz complete with 3m cable and IP65 on/off box with power indicator (other voltages available).
Misc.	• ATEX approved. (Zone 22 II 3D). Fully earthed throughout.
Documentation	• Supplied with English operating & maintenance manual. • CE conformity & ATEX certificate.

Optional

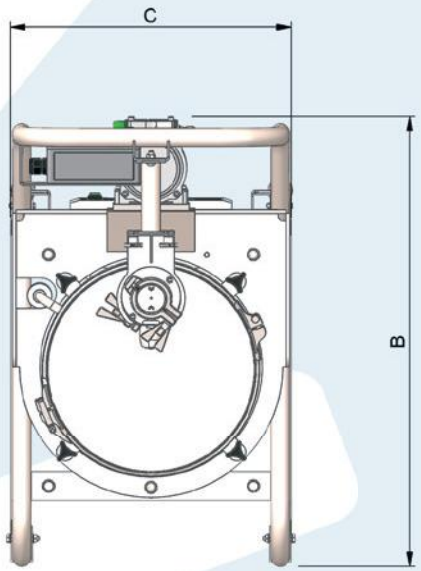
Option – Ultrasonic deblinding (and increased throughput)	• DGS35-50-S-A digital ultrasonic generator box with C35-SD8-A converter probe connected to mesh ring assembly by HF connection cable. • Upgrade to mesh assy for ultrasonic excitation of screen.
Or	
Option - Mechanical deblinding	• Underscreen rubber ball and nylon sliders with perforated support

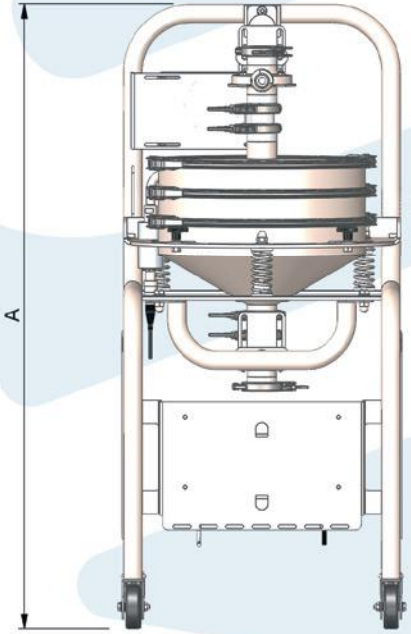
Throughput/Performance

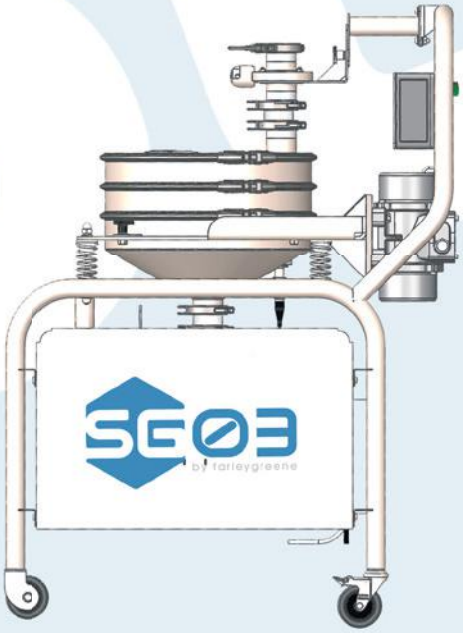
Powder	Mesh Aperture (µm)	Average Throughput (kg/hr)	Peak Throughput (kg/hr)
316L (<63µm)	63	1008.00	1920.00
Ti64 (<63µm)	63	38.90	81.60
Ti64 (25µm-45µm)	63	295.20	1188.00



Above graph demonstrates the high throughput nature of the system - minimising processing time.







DIMENSION	SIEVGEN 03 (mm)
A	1072
B	772
C	480

ELECTRICAL	SIEVGEN 03
VOLTAGE	240
FREQUENCY	50 / 60 hz
POWER	0.35KW (max)
PHASE	SINGLE
ATEX	YES

SCREEN DIAMETER = Ø350mm
OTHER VOLTAGES AVAILABLE ON REQUEST

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