

*Mass finishing systems for  
deburring and polishing of  
high-precision parts*



## Modern vibratory finishing technology has many different facets

Vibratory finishing refers to various processes for the surface treatment of mainly metallic workpieces. These are transferred in bulk into a container or attached to intakes together with abrasive or polishing agents and mostly with the addition of an additive (compound) in aqueous solution. Through an oscillating or rotating movement of the working container, a relative movement is produced between the various parts, which causes material ablation on the workpieces.

The surface appearance of the workpieces as well as the roughness, material ablation and deburring can be varied almost arbitrarily by means of various processes, machines, tools (abrasive agents and compounds) and parameters.

## Machines

Forplan offers a wide range of machines and processes for the processing of workpieces by vibratory finishing for the following types of processing:

- Deburring
- Edge rounding
- Shining, smoothing, polishing
- Tarnishing
- Abrasion
- Degreasing, de-oiling
- Cleaning
- Drying



## Chips and compounds

Numerous shapes, dimensions and materials are available in today's world of abrasive agents. The difficulty with finishing surfaces lies in combining the parameters of abrasive agents, machine types and compounds in such a way that, as far as parts are concerned, the result obtained can be convincing.

Forplan has taken up this challenge.

Diverse, exquisite products such as abrasive and polishing agents, powders, compounds, pastes and granules meet the highest quality standards.



## Services

The requirements for vibratory finishing technology have increased tremendously over the years.

The market demands customer-specific, part-related solutions.

These demands are met by Forplan in its in-house, well-equipped laboratory.

In order to achieve optimum results with the parts to be processed, various processing techniques are tested on different machines by specifically devising formulations for chips and compounds.

In this process, experience and knowhow are key elements.

## Process development

The specialists in the laboratory work purposefully and systematically to develop interesting solutions for the given problem.

The results of the first tests indicate the direction for the further intensified tests.

The numerous parameters such as equipment, processes, compounds, abrasives and the experience of motivated employees allow us to achieve remarkable results.



## Subcontracting

Subcontracting is carried out on the basis of Forplan processes.

In the workshop, skilled workers work on the customer's parts using state-of-the-art machine technology.

We attach the greatest importance to flexibility, punctuality and constant quality.



## The finishing vibrator

The strength of finishing vibrators is manifested in their extremely wide range of applications. The process is suitable for both large and small parts. The parts are processed very gently – even during deburring and polishing of large series. Depending on the application, circular, rectangular or triangular vibration pots are used.

Forplan supplies vibrators with capacities from 7 to 920 litres.

Part feeding, separation of media and parts, stone return and part drying can be largely automated in larger systems. Vibrators are only suitable for wet processing.



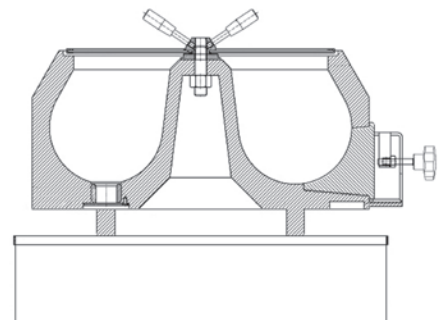
## Secrets of success

The better the parts are circulated in the vibrator, the more efficiently and evenly they are processed.

The internal shape of the vibrator is extremely important for the flow of parts. The pots are moulded from an anti-abrasive, extremely tough polyurethane.

This results in a perfect sliding form.

In addition, moulded pots produce significantly less noise than conventional pots and never have to be coated.



## Accessoires

The vibrators can be equipped with various additional modules.

- Sludge centrifuges
- Vibrating screens
- Dosing pumps
- Decanting tanks
- Spacers
- Part holders etc.



Decanting tanks



Sludge centrifuges

### 3D Finishing vibrators model FP

The classic model for standard applications

Litres	7	11	16	32	50	105
Pot Ø	294	320	368	512	660	810
Pot width inside	114	124	134	185	220	262
Length	500	680	680	800	800	1000
Width	880	880	880	1050	1050	1100
Height	1550	1550	1550	1550	1550	1600
Filling quantity kg	17	20	25	35	50	100



### Circular vibrators can be automated

Optimum for large quantities and interlinked systems

Litres	220	330	550	720	920
Pot Ø	980	1180	1380	1580	1680
Pot width inside	255	330	380	445	500
Length / Width	1066	1286	1486	1658	1808
Height	1000	1110	1215	1310	1385



### Triangular vibrator 10 litres

Thanks to its special shape, it is also suitable for flat punched or laser-cut parts

Model	VV	FP
Pot Ø	350	350
Pot Ø inside	117	117
Length	680	493
Width	880	493
Height	1550	1550
Filling quantity kg	40	40



### Rectangular vibrators

Used for long parts, such as bar material.

Litres	16	18	21	84
Pot length	440	550	500	1050
Pot width	170	150	195	300
Pot height	225	250	235	300
Length	930	1027	922	1490
Width	600	631	631	750
Height	972	972	972	960
Filling quantity kg	50	50	65	250





## The centrifugal force system

The centrifugal disc finishing unit is second to none in terms of productivity and effectiveness on the workpiece. This vibratory finishing process uses centrifugal forces. A rotating disc sets workpieces in an energetic spiral motion together with chips. The rotational speed defines the abrasion pressure acting on the parts.

This vibratory finishing process is particularly suitable for smaller workpieces – both for abrasive operations and high-gloss polishing work.

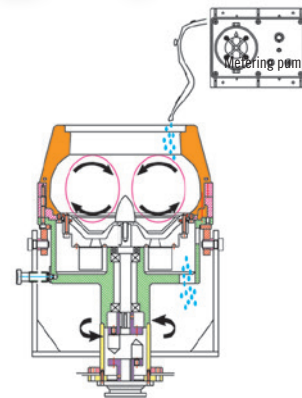
This technology is suitable for wet and dry processing.

Forplan offers centrifugal disc finishing units from a capacity of 15 litres in manual systems up to 130 litres in fully automated plants.



## Wet processing

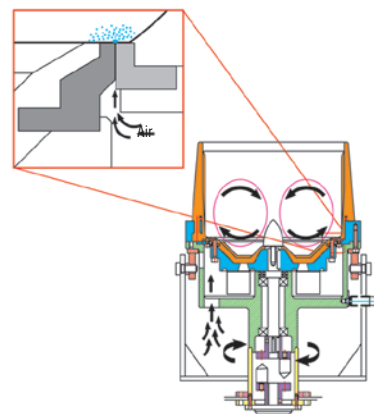
The 3D high speed pot guarantees a very efficient wet processing due to its cambered shape.



## Dry processing

The adjustable air supply keeps the polishing medium constantly cooled.

The excess pressure means that neither parts nor polishing media can get stuck in the gap.



### Turbo models

Litres	15	30	60	105	130
Pot Ø	324	385	524	980	980
Length	520	600	680	1280	1310
Width	753	725	852	884	1080
Height	1615	1635	1825	1447	1651
Filling quantity kg	15	30	30 – 40	30 – 40	30 – 40



### Fully automatic models

The automated centrifugal power plant combines the advantages of the Turbo models with automated loading, separation and unloading. This model is available with a container volume of 60 litres.

- Operation and programming via touch screen or central workstation
- Connection to the ERP system possible
- Programs can be read in and retrieved using a barcode reader
- Automatic dosing of water and compound
- Monitoring of the abrasive consumption
- Easy operation and maintenance
- Fast change of abrasive thanks to cassette system and lift truck
- OPTIONALLY, a dryer unit can be integrated
- Fast change of abrasive agents thanks to cassette system and cassette storage.



## The ergospin+ planetary system

Planetary vibratory finishing systems are used when the highest demands are placed on the surface. They are ideal for a wide variety of materials such as stainless steel, gold, brass, ceramics and plastics.

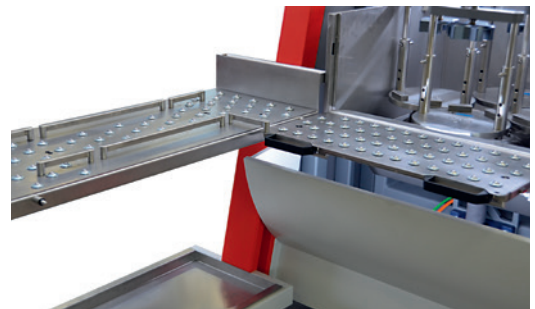
In planetary vibratory finishing systems, parts can be polished, deburred, smoothed and rounded.

The interplay of varying centrifugal forces causes a very uniform movement of the parts/media mixture. In planetary vibratory finishing systems, both wet and dry processing operations can be performed. By automatically adjusting the rotation angle axis by  $220^\circ$ , the ideal relative movement can be set for each part.



### Ergonomics

- Ergonomic loading and unloading of the system
- Loading carriage for optimum connection between machine and washing table



### Container system

- Container sizes 1 litre, 2 litres, 3 litres, 6 litres
- If required, part-specific intakes can be used.
- The containers are suitable for dry and wet processing.



Model	ergospin+ 1-6 litres
Length	1650
Width	1550
Height	1320
Speed rpm	1-250
Filling capacity/container max. kg	30



## The rotary machines

Rotary machines such as Trystar and Minirotor are ideal machines for the fine deburring and polishing of small workpieces.

These robust table models are designed for continuous use.

These machines are characterised by easy handling and uniform processing.

### Minirotor

The Minirotor is particularly suitable for the processing of small parts and small series.

Model	Minirotor 2 litres
Length	380
Width	650
Height	500
Filling quantity max. kg	5



### Trystar

The Trystar is a rotary machine with three containers which are moved by means of a planetary gear unit.

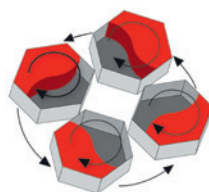
Model	Trystar 1–3 litres
Length	730
Width	690
Height	560



### Planet 2-6 litres 3D

This system has a planetary gear unit with a fixed transmission ratio. The planetary system is mounted on a horizontal axis and can be swivelled through 90°.

Model	2–6 litres 3D
Length	1150
Width	1250
Height	1810



## The magnetic vibratory finishing machine

Magnetic vibratory finishing machines are suitable for fine deburring with minimum material removal and the lowest possible amounts of rounding. Short processing times are among the outstanding features.

The unique movement of the media means that difficult to access areas such as interiors and cavities can be processed homogeneously.

The plant can be used as an alternative to blasting and brushing systems, not least because of the better achievable homogeneity.

The system is used as an alternative to blasting and brushing systems.



### Unique processing

Magnetic force sets stainless, magnetizable media in motion.

With various additives for deburring or brightening, workpieces are gently and evenly processed.

The range of metallic media can be consulted on the Forplan website.

- Ultrafine deburring with minimal edge rounding and short process times
- Alternative to blasting and brushing systems



Model	1500	3000
Pot Ø	390	616
Length	530	840
Width	670	850
Height	1442	1610
Filling quantity kg	1	3,5

## Separation systems

Since the polishing process is usually the last step in the production process, handling parts at this time is an extremely delicate task. Forplan offers various solutions for the gentle separation of workpiece and abrasive material.

### Vibraset

Circular vibrating sieve with exchangeable sieves for separating small parts and media

Model	Vibraset
Length	540
Width	540
Height	1080



### Motaset

Linear vibrating sieve for separating workpieces directly from vibrators and centrifugal disc finishing units

Model	Motaset
Length	430
Width	1395
Height	630



## Special applications

- Solutions for manual separation of highly sensitive parts
- Separating screens are available in many materials, shapes, sizes and mesh widths.



## Post-treatment

After the highly sensitive workpieces have been treated and separated, they must be rinsed, cleaned and protected against corrosion.

The ergoclean unit for cleaning and rinsing is seamlessly integrated into the process chain.

A wide range of dosing tools, storage containers and auxiliary equipment is constantly being expanded and adapted to customer requirements.

The ultrasound baths with a capacity of 2–100 litres and solutions capable of being automated, with several cleaning, spraying and rinsing baths, are suitable for this purpose.



## The washing table

- Lots of working and storage space
- Prepared for expansions such as demagnetization, handling devices, separation systems, dosing systems
- Customizable at any time for specific customers



## Ultrasonic baths 2–100 litres

The cleaning systems have a modular design and can be extended as required. Soundproof baths allow for pleasant working conditions.



## Drying systems

Forplan offers various systems for drying workpieces without leaving spots and marks.

### Drying centrifuges

Drying by means of hot air and centrifuge technology is suitable for bulk parts which are dried before or after separation from the material to be ground. Abrasives and polishing agents can be dried very efficiently.

Model	270	360
Drum Ø	270	360
Length	400	820
Width	620	460
Height	1110	1000



### Hot air vacuum dryer

Combined hot air vacuum drying is suitable for parts with deep holes or scooping sections

Model	25	50	80	100
Volume litres	25	50	80	100
Length	550	700	810	810
Width	450	450	490	490
Height	870	920	950	950



### Condenser dryer with heat pump System AIRGENEX®

- High quality results with short drying times
- Drying in the low temperature range: fast, gentle, flawless
- High efficiency through heat pump
- Drying in a closed system
- Variable temperature range from 20°–90° C
- Increase in capacity often feasible
- Washing cycle with alcohol can be omitted
- Flexible for bulk material and rack parts
- Several drying chambers can be connected to a central drying module





## Chips and compounds

The diverse range of carefully selected products such as abrasives and polishing agents, powders, pastes, compounds, granulates, etc. meet the highest quality standards.

In order to meet the highest quality standards, Forplan manufactures a large part of the metal chips itself.

Special dimensions can be produced on request.

The available dimensions can be consulted at [www.forplan.ch](http://www.forplan.ch) and are updated on an ongoing basis.

## Copper

- Copper chips are the outstanding medium for processing high-end surfaces.
- Accurate control of stock removal and rounding
- The electrochemical and mechanical properties are combined and optimally used.
- Highly accurate chips manufactured in various dimensions  
( $\varnothing$  0.1 – 2.0 mm, length 0.5 – 6 mm)



## Stainless steel

- Cylinders especially for processing in the magnetic vibratory finishing machine
- Long service life
- An extremely wide range of shapes is available in precise dimensions  
( $\varnothing$  0.1 – 0.5 mm, length 0.5 – 6 mm)



## Dry media

- Deep gloss effect
- Excellent polishing results for the finish
- No risk of corrosion
- Also suitable for cleaning and drying



### Porcelain and ceramics

- Available in many abrasiveness levels
- Ceramics mainly for abrasion work
- Porcelain in general for fine abrasion and polishing
- Very hard and durable
- Wide range of shapes and dimensions



### Plastic bonded abrasive agents

- No bending of the burrs due to the low density
- Efficient deburring
- Fine to strong abrasiveness
- Highly suitable for non-ferrous metals and aluminium



### Powders and pastes

- Wide range of abrasives and polishing powders in an extremely wide variety of materials, dimensions and hardness grades
- Pastes for dry processing



### Compounds

Compounds are an elementary component of the vibratory finishing process. They mainly absorb the resulting abrasion and keep parts and abrasives clean. In addition, they support various tasks such as:

- Improving the Ra value
- Corrosion and tarnish protection
- Degreasing, cleaning
- Shining, smoothing, brightening up
- Defoaming



**Forplan offers the following product groups:**

- Automatic magnetic feeding systems for the feeding of mass-produced parts
- Coating systems for the application of liquid coating media such as oils, lacquers or zinc flakes
- Water-based cleaning systems for cleaning and degreasing of mechanical parts
- Centrifuges
- Vibratory finishing machines, media, processes and contract work

**forplan.**  
*surface technology*

Bernstrasse 18

CH – 2555 Brügg

Phone +41 32 366 77 78

Fax +41 32 366 77 79

[info@forplan.ch](mailto:info@forplan.ch)

[www.forplan.ch](http://www.forplan.ch)