

WALTHER
TROWAL!



WASTE WATER TREATMENT
for surface treatment applications



Effluent – an important cost factor

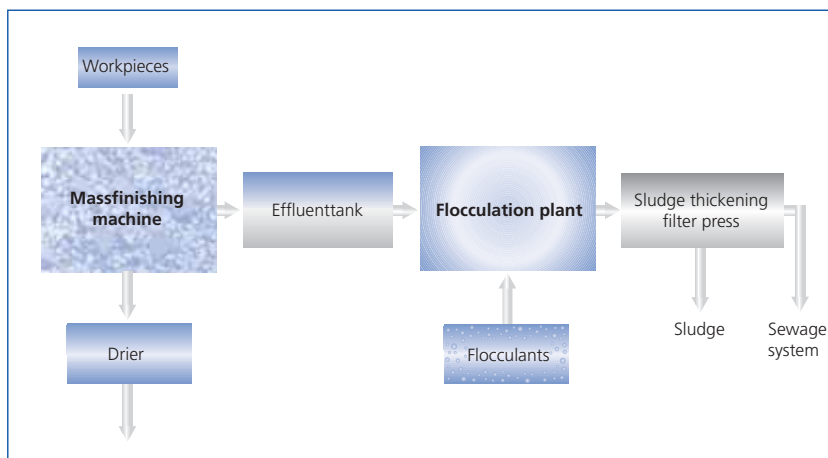
Effluent cannot be avoided

Water and compound are essential for vibratory mass finishing. During the finishing process the process water is polluted with fines from the media, metal fines and oil. For this reason, the process water must be cleaned before going to drain or being recycled to the finishing machine.

The idea to constantly recycle the effluent from mass finishing operations in a "closed loop" system is both ecological and economical. It saves not only water but also compound. In addition, it also saves disposal cost. With most mass finishing applications recycling is possible. Occasionally, there are applications where recycling is not advisable: For example pickling with acid or using several compounds in one

process, or the parts surface must be extremely clean. In such applications, a "single pass" system including flocculation and transfer directly to drain is the best alternative for treating the effluent.

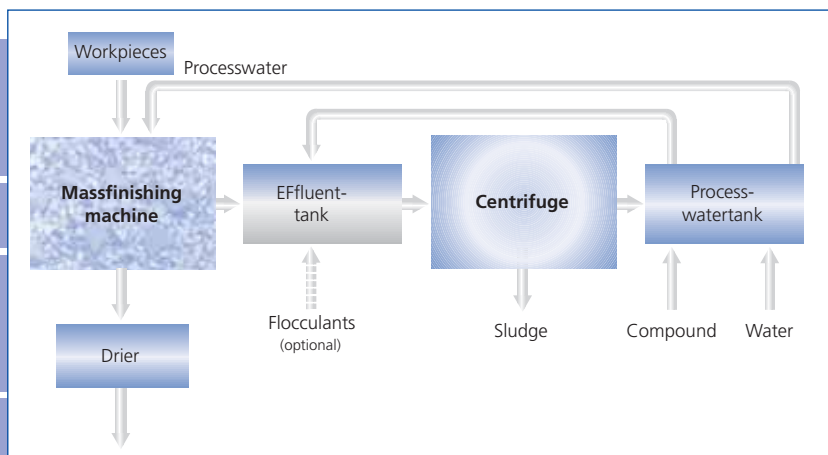
Flocculation process



Flocculation

By flocculation, contaminants like media and metal fines, metal in solution and oil, are removed from the effluent. After flocculation the water can be discharged to drain in full compliance with legal requirements. Unfortunately, with this treatment method, the compound used in the finishing process is also lost and must be continuously replaced!

Centrifugal recycling



Recycling with centrifuges

In recycling applications media and metal fines are removed from the process water with a centrifuge. Oil and/or extremely fine solids $\leq 1\mu$ can be removed by adding flocculants. The compound utilized for the finishing operation remains largely in the process water for re-use in the finishing machine.

Trowalpur flocculation – for complete water cleaning

Crystal clear water

All effluents from mass finishing – acidic or alkaline – can be transformed into clear water with a trowalpur flocculation system. The clear water is in full compliance with legal requirements for discharge to drain.

Simple powder flocculation

If the daily quantity of produced effluent is no larger than 3000 l, it can easily be cleaned in an economical, easy to operate batch system of the type RT. During the finishing operation the effluent is collected in a collecting tank with stirrer. After work flocculation powder is added. Within a short time flocs are formed and sink to the bottom of the tank. They are automatically filtered during the night via filter bags or a filter press.



GA 10 - Fully Automatic

Automatic flocculation

The fully automatic, PLC-controlled Trowalpur GA and DO-systems have a capacity of up to 2000 litres per hour. They are used in larger mass finishing operations. They have been successfully developed over many years and they process batch by batch without the need for an operator. Automatic control and monitoring functions guarantee a stable and safe effluent cleaning process.



RT 05-semi-automatic machine

Fully automatic machine	DO 03	GA 05	GA 10	GA 20
Connected loads (kVA)	11	11	11	11
Capacity (ltr/h)	300	600	1000	2000
Dimension (mm) (L x B x H)	1600 x 2000 x 1900	1600 x 2000 x 1900	2000 x 2000 x 1900	2200 x 2200 x 2800
Sludge thickening	filterpress	filterpress	filterpress	filterpress

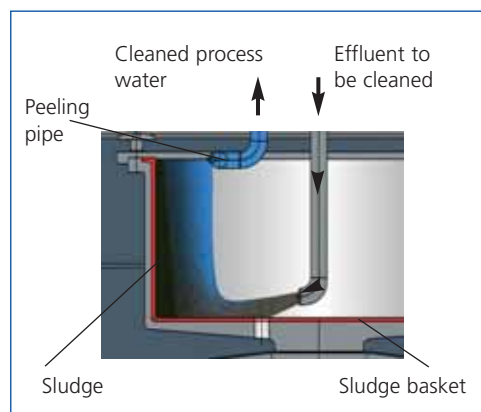
Semi-automatic machine	RT 05	RT 10	RT 20	RT 30
Connected loads (kVA)	2,5	3	3	3,5
Capacity (ltr/h)	500	1000	2000	3000
Dimension (mm) (L x B x H)	2000 x 14600 x 1310	Ø 1600 x 2000 reactor	Ø 2000 x 2000 reactor	Ø 2200 x 2200 reactor
Sludge thickening	filter stand	filter stand/filterpress	filter stand/filterpress	filter stand/filterpress

Centrifugal technology – the easy cleaning method

With the centrifugal technology solid fines are removed from the process water with a centrifugal force which is 2417 times greater than the gravity of the earth.

Basket Centrifuge ZM

"ZM 03 ECO" 1 and "ZM 03 FL" are easy to operate, robust systems with manual removal of the sludge basket from the centrifuge. During one cycle 14 litres (19 kg) of sludge can be removed from the effluent.



Functional sketch of a basket centrifuge



Basket Centrifuge ZM 03-ECO

The solution for the use of up to two vibrators with standard applications and isolated mass finishing applications.

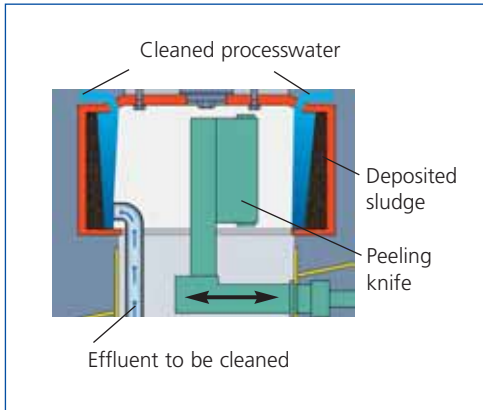


Basket Centrifuge ZM 03-FL

The universal solution, which can be upgraded retrospectively with process specific options such as pump stations, dosing units, cooling systems and fully automated, un-manned, operation.

	ZM 03-ECO 1	ZM 03-FL
Capacity (ltr/h)	1000	1000
Sludge volumen (ltr)	14	14
Centrifugal rating (g)	2012	2012
Mud water tank (ltr)	200	300
Process water tank	-	100
Overall dimension (mm) (L x B x H)	1300 x 900 x 1400	1300 x 1015 x 1450
Connected loads (kVA)	6	6
Motor power-average (kW)	1,5	1,5

Automatic Centrifuges ZA



Functional sketch of an automatic centrifuge

The PLC-controlled, automatic ZA centrifuges can clean up to 2 m³ of effluent per hour.

The sludge deposited on the wall of the rotating drum is automatically removed with a "peeling" knife and dropped into a sludge container according to preset time intervals.

Due to modular construction many variants of the system are possible and a completely tailored solution can therefore be provided to suit various process requirements.

Application limits

Not every mass finishing application is suitable for effluent cleaning with centrifuges. Their use is limited with the following operations:

- For chemically accelerated-processes and paste treatment
- With multistage finishing, using more than one compound
- When pickling with strong acids
- With ball burnishing applications



Peeling Centrifuge ZA 04

Peeling Centrifuge ZA 06

	ZA 04	ZA 06
Capacity (ltr/h)	1000	2000
Sludge volumen (ltr)	14	28
Centrifugal rating (g)	1920	2417
Mud water tank (ltr)	800	1500
Process water tank	500	1000
Drive technology	Direct drive	V-belt drive
Overall dimensions (mm) (L x B x H)	2100 x 1650 x 2200	2500 x 2150 x 2300
Connected loads (kVA)	10	13
Motor power-average (kW)	3	5

Advice for everyday operation

Recycling

For recycling operations special flocculants are available. They clean the process water in accordance with the requirements for the cleanliness of the parts.

Application	For ferrous metals	For non-ferrous metals	Compound	Flocculant*
Much oil & few fines	yes	yes	DE 97 KFL	ESM
Much oil & many fines or very clean parts required	yes	yes	DE 97 KFL	R ESM
No oil & many fines (plastic or metal parts)	yes	yes	KS 66 KS 66	R V
No oil/few fines or only ceramic fines	yes	yes	KR 50 KS 66 KFL	ESM R ESM
Magnesium	no	only Mg	MJ 20	not required

* Flocculation gives the best results when hot air drying operations exist and / or the components contain oil.

Discharging to drain

Only the selection of the right flocculant guarantees clean and clear water in compliance with the legal requirements.

Machine	Flocculant	Dosing
GA / DO	LAC with F (liquid)	automatic
RT	ESM or ESB (powder)	manual

Sludge analysis of 1 kg of worn media

The volume of sludge generated in a mass finishing process depends on the media consumption and the type of effluent treatment.

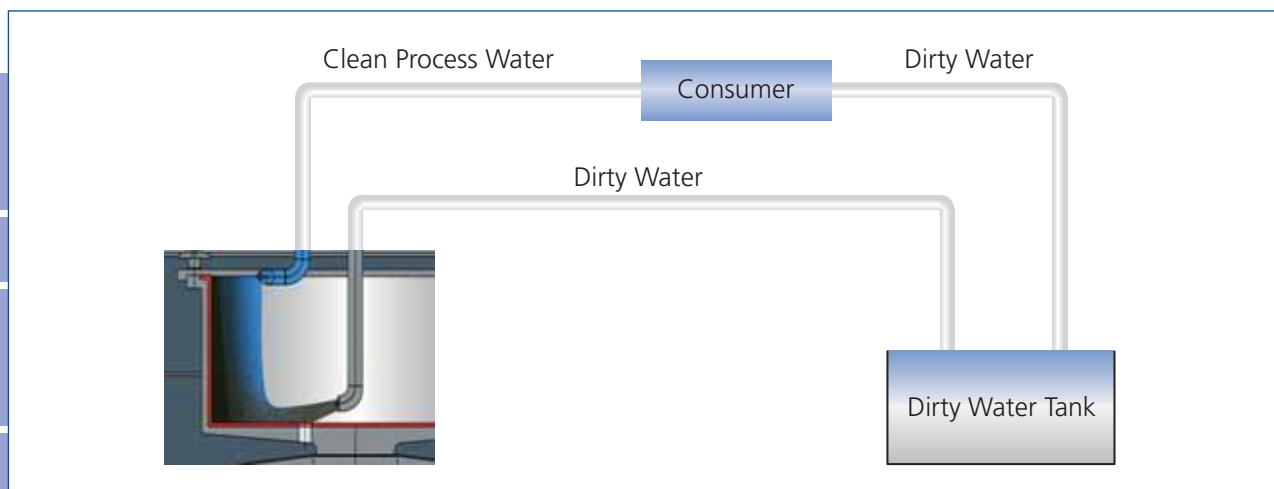
Treatment	Ceramic Media			Plastic Media		
	Mass (kg)	Percentage of Water (%)	Volume (L)	Mass (kg)	Percentage of Water (%)	Volume (L)
Centrifuge	1,55	35	0,95	1,8	45	1,4
Filter press -LAC-Flocculation -ESM-Flocculation	1,9	40	1,45	2,3	50	2
	2,1	40	1,6	2,5	50	2,2
Filter bag	3,1	60	2,6	4,2	70	3,9

Further applications for Trowal centrifuges

Besides mass finishing operations Trowal centrifuges can be utilized for removal of solid fines from the following process liquids:

- Effluent from paint rooms
- Phosphating baths
- Coolants for machining (e.g. grinding machines)
- Recycling water in wet blasting applications
- Recycling water for lapping operations
- Process water for glass grinding
- Process water for industrial washing machines (degreasing)

Functional principle of the centrifugal recycling



Customer support

The Trowal team supports you with a wide range of service functions

Expert advice, selection of the right effluent treatment system, quick trouble shooting and maintenance service ensure that your surface finishing operation runs trouble-free without costly downtime.

- Expert advice regarding your waste water treatment problems by our specialists
- Preparation of tailor-made plant layouts
- Chemical analysis of effluent samples in our chemical lab
- Environmentally safe disposal of your sludge (only in selected countries!)



MASS FINISHING • SHOT BLASTING
COATING OF SMALL PARTS • EFFLUENT TREATMENT

W | A | L | T | H | E | R
T | R | O | W | A | L | !

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