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Process Water Circulation Systems
Flocculation Systems



finding a better way ...

When it comes to dealing with surface finishing and surface preparation problems, Rösler offers **the total process solution!** Our customers can choose between two processing technologies, **Vibratory finishing or Shot blasting**, which offer virtually unlimited possibilities. Through extensive processing trials, we always find the right finishing solution for our customer's needs.

This includes not only the development of a specific finishing process, but also the selection of the right equipment and consumables.

We deliver the total solution to satisfy your surface finishing requirements. Our success in the market proves that we are right. It is not by chance that our innovative developments and our high quality standards have established Rösler as the world technology and market leader in surface finishing and surface preparation.

In more than 50 countries we support our customers with a closely-knit network of Rösler subsidiaries and sales representatives.

We are the only company in our field operating **test and demonstration centres** throughout the world's. This allows us to run test trials under real production conditions close to our customers.

This offers several advantages: Our customers save time and money, and at the same time – through our professional processing trials and advice – they are assured of receiving the best process solutions and products available on the market!



Worldwide Demonstration and Test Centres

Vibratory finishing and shotblasting test centre located at the Rösler headquarters in Untermerzbach:

- more than 95 vibratory finishing and shotblasting systems
- working space: approx. 2,700 square meters

Similar test centres are located in the United States, Great Britain, France, the Netherlands, Belgium, Switzerland, Spain, Italy, Austria, South Africa and Brazil.

The Total Process Solution

Consumables, machines and process safety in perfect combination:

- A perfect interaction between consumables, equipment, process and safety
- Cost-saving automation linking multiple process steps
- Qualified field service teams guarantee smooth installation and commissioning of your equipment
- Comprehensive training of your operators and maintenance staff
- After-sales service guarantees high uptimes for your equipment

Environmental - Quality

The consideration of environmental issues guarantees a high level of product quality and environmental protection. For example, circulating the process water is a key feature of our mass finishing technology. In this case, the positive effect on the environment is reflected in savings of compound and water of up to 95%. At the same time, a high level of process reproducibility and finishing quality is guaranteed.

Team Spirit

Rösler is a dynamic organization where the initiative and commitment of each employee plays a key role. Systematic training and a cooperative management with lean structures are essential elements of our corporate philosophy. This allows us to create a workplace environment which attracts talented young people.



Process Water Circulation Technology

For environmental reasons, process water circulation is the preferred water treatment method for industrial applications. The principle of the 2 – phase separation (solid/liquid phase) by centrifugal force is the foundation of modern process water cleaning systems. Proven process technology, combined with highly efficient treatment systems, opens up a wide range of applications, not only in the field of mass finishing.

Functional Principle

The effluent to be cleaned either flows directly from the mass finishing system to the centrifuge by gravity, or is transported to the centrifuge by a lifting (pump) station. Larger solid particles are prevented from entering the collecting tank by a filter to prevent them from plugging up and damaging the subsequent pumps. A stirring device in the collecting tank maintains the solid fines in suspension. A powerful, low-maintenance diaphragm pump transports the effluent from the collecting tank to the rotary drum of the centrifuge. The rotational speed up to 3000 RPM separates the liquid from the solid phase: While the solid particles contained in the effluent are deposited on the drum wall as sludge, the cleaned process water is picked up by a peeling nozzle and transported ("recycled") back to the mass finishing, or other, system. Periodically, the cleaned process water is collected in a clear water tank and then pumped to the finishing system. The sludge has usually a residual water content of about 20%. It can be easily removed from the system by a polyurethane basket that is inserted into the rotational drum.

Rösler also offers systems which use a peeling knife to provide fully automatic extraction of the sludge.

Depending on the type of machine, several mass finishing machines can be equipped with only one process water circulation system.

Fields of application:

- ▶ process water circulation in vibratory finishing systems
- ▶ cleaning of coolants used in grinding, honing and lapping machines
- ▶ extracting water from different types of slurries (for example: wet blasting)
- ▶ extraction of valuable metals



Fully automatic system "ASS"



Semi-automatic system "HA"

Ecologically safe consumables (media and compound) Provide an excellent basis for optimum process water cleaning

Rösler is the only supplier that offers the "total solution". In addition to the comprehensive range of equipment, Rösler also manufactures ceramic and plastic media, as well as cleaning and flocculation compounds. Several thousand Rösler process water circulation systems are operating successfully in the field. Why not use our extensive know-how?



Rösler Turbo-Floc®-System

The Rösler Turbo-Floc®-System enhances the separation capabilities of the centrifuge: special flocculation compounds combine very fine particles into larger "flocs", which are easier to separate from the liquid. Even process water contaminated with oil can be cleaned in this manner. The mass finishing compounds in the process water are not affected.

The result:

- ▶ very clean parts
- ▶ very stable operating conditions with no variation
- ▶ long life of the process water



Process water before treatment

Process water after addition of special flocculation compound
(The enlarged solid particles ("flocs") have settled at the bottom.)

Process water after treatment in the centrifuge
(The solids are separated from the liquid and deposited as sludge on the drum wall)

Liquid flocculation compounds for process water circulation

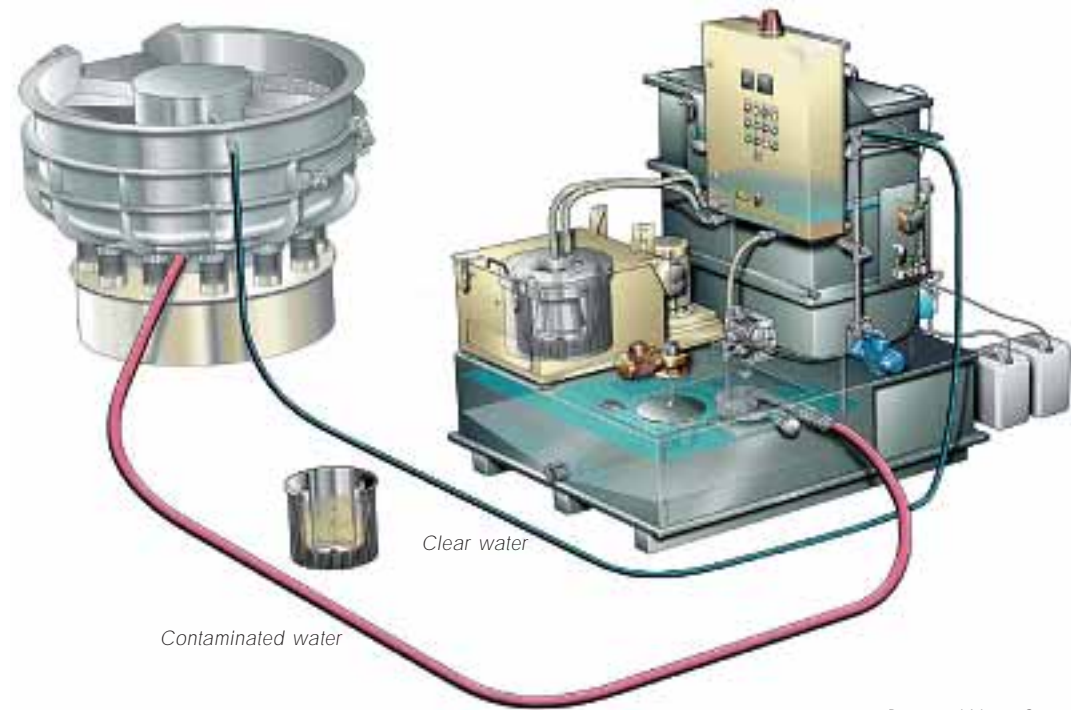
Type	AR 8407	AR 8403	AR 8405	AR 8400
Function	Cationic Polymer for keeping the circulation system stable			
Consumption	As supplied or mixed with water at a ratio 1:4 up to 1:10: Approximately 0.1 – 1.0 kg/m ³			

Powder flocculants for standard flocculation systems

Type	AR 7009	AR 7090	AR 7038	AR 7234	AR B0
Function	Powder flocculant for removal of oil, grease, media and metal fines from mass finishing effluents				
Consumption	Depending on the degree of contamination of the effluent: Approximately 0.5 – 1.0 kg/m ³				

Semi-automatic compact centrifuges

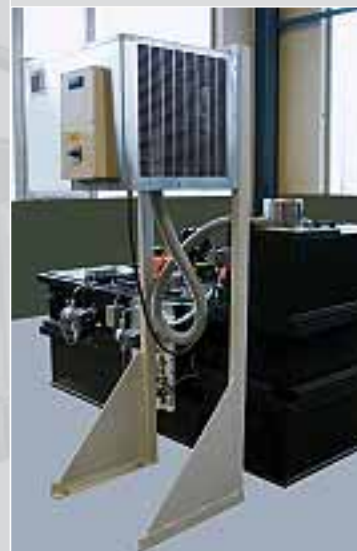
This range of centrifuges provides excellent cleaning characteristics, as well as requiring very little space. The complete unit with electric controls, collecting and clear water tank is shipped to the customer pre-installed, requiring no on-site installation.



Process Water System Z 800 K HA

Constant Process Water Temperature

Maintaining a constant (low) temperature of the process water is very important. Certain mass finishing applications – especially in high-energy systems – generate a lot of heat which increases the temperature of the process water. This increased temperature can cause damage at the finishing machine, decrease the finishing results and increase plastic media consumption. Powerful cooling systems maintain constant process water temperature, ensuring a stable finishing process.



Technical features

Sturdy and corrosion-resistant collecting and clear water tanks made from polyethylene.

- ▶ Collecting tank with angled bottom and stirring device
- ▶ Easy-to-replace coarse particle screen
- ▶ Level control via level switches with emergency stop
- ▶ Lifting / Pump station for transporting effluent from finishing machine to centrifuge (optional)
- ▶ Robust, easy-to-operate pump systems
 - Effluent from finishing system: Compressed air diaphragm pump
 - Clear water: Electric or diaphragm pump
- ▶ Multiple cleaning of the process water by overflow from clear water tank to collecting tank
- ▶ Precision balanced drum made of aluminium (optional: stainless steel for corrosive liquids)
- ▶ Conical guiding system in drum for best separation conditions
- ▶ Automatic residual water discharge from the drum
- ▶ Flexible sludge insert for easy removal of sludge
- ▶ Automatic water and compound top-up system (optional)
- ▶ Turbo-Floc package for dosing of flocculation compound (optional)
- ▶ Control panel with PLC controller
- ▶ Device to monitor if centrifuge lid is in "locked" position



Z 800 K HA Turbo Floc® with collection and clear water tank



Z 800 HA Turbo Floc® with collection tank

Machine type	Z 800 HA Turbo-Floc®	Z 800 K HA Turbo-Floc®
Rotational speed (RPM)	3160	3160
g-value	2010	2010
Max. sludge capacity (l) Sludge volume (kg)	15 22	15 22
Capacity ¹ (l/h)	100 – 1200	100 – 1200
Total installed power (kW)	5,0	5,0
Average power consumption (kW)	1,6	1,7
Collecting tank (l)	250	340
Clear water tank (l)	---	400
Process water cooling system	---	optional
Automatic top-up system for water and compound	optional	optional

¹) For mass finishing liquids, depending on amount of solids in effluent and desired cleaning effect

Process Water Circulation Systems with Automatic Sludge Removal

In applications with large water and sludge volumes, manual removal of the sludge from the system is no longer feasible. In such cases, centrifugal systems with automatic sludge removal are utilized. The main characteristic of these systems is that the sludge is "peeled" from the drum wall and is collected in a sludge container located below the drum with a capacity of 300 liters (79 gal). After peeling, the drum is rinsed to remove residual sludge and to prevent imbalance during subsequent cleaning cycles. All centrifuges are equipped with an imbalance monitor. If an imbalance occurs, the centrifuge automatically turns itself off.



Technical features of Rösler Automatic Process Water Circulation Systems

- ▶ Impulse controlled pump for pumping effluent into rotating drum
- ▶ Clear water transport by compressed air diaphragm pump
- ▶ Multiple cleaning of the process water by overflow from clear water tank to collecting tank
- ▶ Turbo-Floc® package for dosing of flocculation compound (optional)
- ▶ Centrifuge equipped with filling pipe and clear water collecting nozzle
- ▶ Precision balanced drum made of aluminum (optional: stainless steel for corrosive liquids)
- ▶ Electronically controlled peeling knife made from hardened, wear-resistant steel
- ▶ Movable sludge cart with tilting device for unloading sludge
- ▶ Residual water collecting pan, pneumatically operated
- ▶ Automatic water and compound top-up system (optional)
- ▶ Fully automatic operation controlled by PLC
- ▶ Vibration check of the centrifuge drum with Auto-Stop function
- ▶ Powerful main drive; frequency converter for variable drum speed

The circulation tanks

The volume of the circulation tank is dimensioned according to the required process water quantity.

▶ **Combi-Tank:**

Combined tank with dual-chamber system, designed as collecting and clear water tank with a capacity of 2 x 700 liters (185 gal) .



Combi Tank

▶ **Stand-alone tanks:**

Separate collecting tank and clear water tank with capacities of 2 x 1,000 liters (264 gal), alternatively 2 x 2,000 liters (528 gal).

Technical Details:

- Sturdy tanks made of high quality polyethylene
- Easy-to-replace coarse particle screen
- Level control with float switch and emergency stop
- Angled bottom for complete discharge
- Collecting tank equipped with stirring device.
- Optional stirring device for clear water tank available.
- Robust, wear-resistant diaphragm pumps



Stand-alone Tank

▶ **Lifting station:**

- Transport of the effluent from the finishing machine to the water treatment system.
- Robust tank made from polyethylene with angled bottom
- Compressed air diaphragm pump with level control
- Coarse particle screen



Lifting station

Technical Data

Type	Z 800 ASS-II-Turbo Turbo-Floc®	Z 1000 ASS-II-Turbo Turbo-Floc®
Rotational speed (RPM)	2770	2770
g-value	1500	2000
Max. sludge capacity (l) Sludge volume (kg)	14 16	28 30
Capacity ¹⁾ (l/h)	500 – 2000	800 – 3500 ²⁾
Total installed power (kW)	5,5	11
Average power consumption (kW)	2,2	6,5
Collecting tank (l), size optional	700 / 1000	700 / 1000 / 2000
Clear water tank (l), size optional	1000 / 1000	700 / 1000 / 2000
Process water cooling system	optional	optional
Automatic top-up system for water and compound	optional	optional

¹⁾ For mass finishing liquids, depending on amount of solids in effluent and desired cleaning effect

²⁾ for low solid concentrations up to 12,000 l/h (3,170 gal/h)

Flocculation systems

Chemical effluent treatment systems based on the flocculation principle complement our range of waste water treatment systems. They are used when process water circulation is not possible. Flocculation systems are utilized in cases where different finishing processes with different parts and compounds take place in the same machine, when large quantities of oil are carried into the finishing process, when a high degree of parts cleanliness is required, or when the use of acidic compounds does not allow circulation.

To reduce the amount of hazardous materials in the effluent to below the legally required levels, requires the use of special flocculation and cleaning compounds, type AR.

Functional Principle

The effluent is cleaned according to the "floc and drop" principle:

- Step A: Collection of a batch of effluent
- Step B: Separation of solids from the liquid phase by flocculation
- Step C: Sedimentation of the flocs
- Step D: Filtration/Sludge water extraction, occasionally with partial circulation



Semi automatic Systems, Series C-SF and C-FP

The series C-SF and C-FP systems are used for the treatment of relatively small quantities of effluent which for economical reasons do not allow a high degree of automation but require the same degree of treatment effectiveness as larger systems.

Buffering and processing are done in one tank. The height of the tank allows a gravity feed of the effluent from the vibratory finishing system into the tank.

Depending on the water and sludge quantities, the extraction of water from the sludge can be done by either a bag filter or filter press.



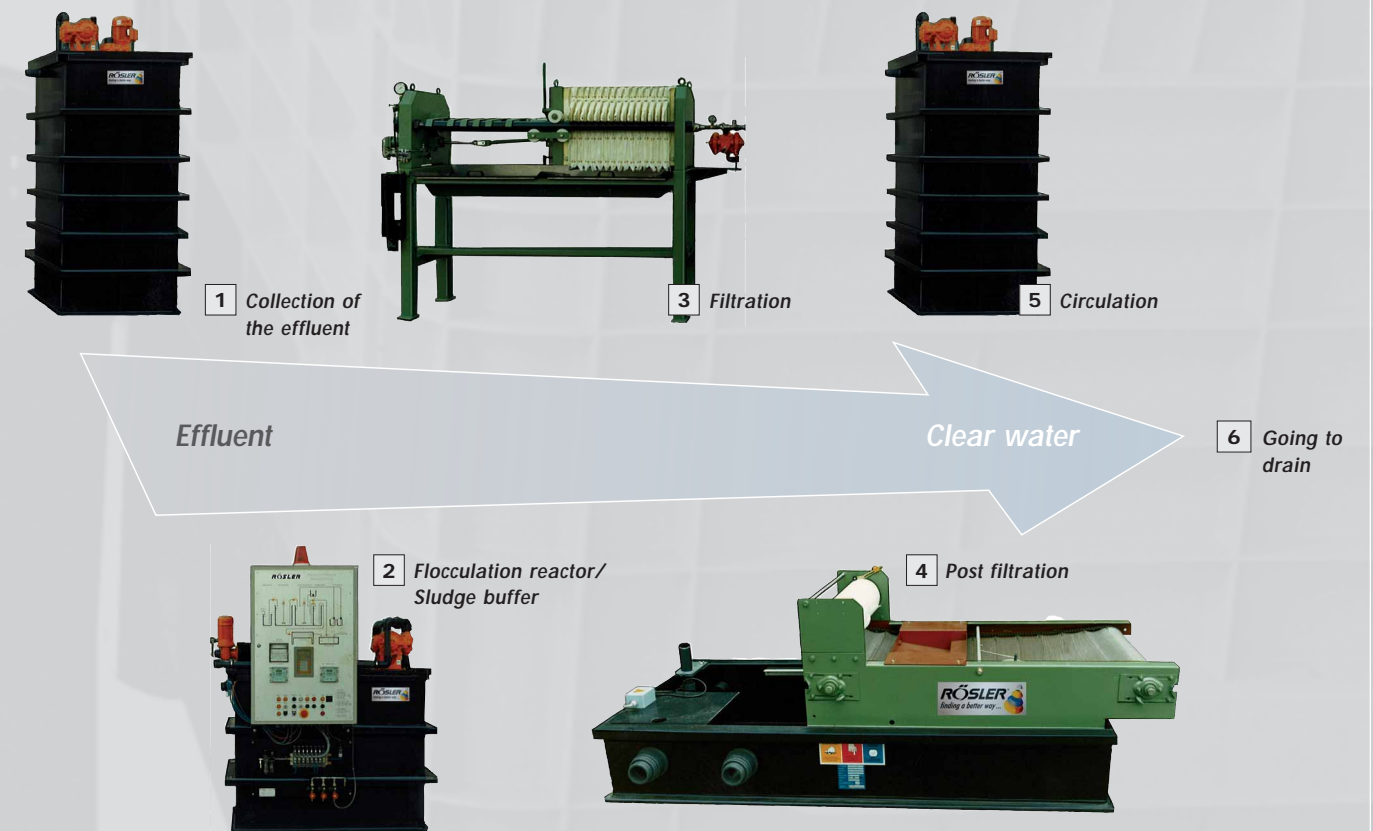
AWA 500 C-SF

Fully automatic flocculation systems

For effluent quantities of more than 500 liters/h (132 gal/h), fully automatic treatment systems, type AWA-KFP, are recommended.

The PLC controller in these systems monitors and controls the effluent quantity entering the system, the neutralization of the effluent, the dosing of the flocculation compound and the final filtration check of the clear water.

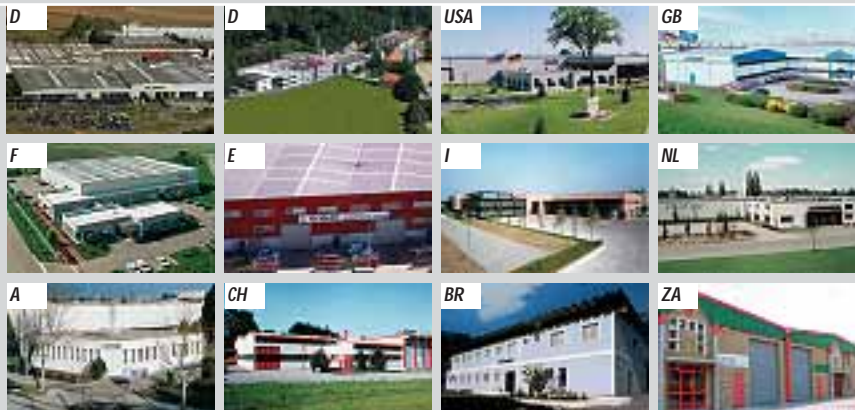
The removal of water from the sludge is always done by chamber filter press.



System		Capacity per hour or batch	Thin sludge de-watering Sludge water removal	Filter size
Semi-automatic	C-SF 500	500 l / Batch	Tandem bag filter	2 x 120 l
	C-SF 1000	1000 l / Batch	Tandem bag filter	2 x 120 l
	C-FP 1000	1000 l / Batch	Filter press	4 / 15 / 30 – 15
	C-FP 2000	2000 l / Batch	Filter press	4 / 15 / 30 – 15
Fully automatic	K-FP 1000	1000 l/h	Filter press	4 / 15 / 30 – 15 ¹
	K-FP 2000	2000 l/h	Filter press	4 / 15 / 30 – 15 ¹
	K-FP 4000	4000 l/h	Filter press	6 / 15 / 25 – 15 ²

¹ Plate volume 3,2 l

² Plate volume 10,0 l



D RÖSLER Oberflächentechnik GmbH · Werk Memmelsdorf
Vorstadt 1 · D-96190 Untermerzsbach
Tel.: +49/9533/924-0 · Fax: +49/9533/924-300 · info@rosler.com

RÖSLER Oberflächentechnik GmbH · Werk Hausen
Hausen 1 · D-96231 Bad Staffelstein
Tel.: +49/9533/924-0 · Fax: +49/9533/924-300 · info@rosler.com

USA RÖSLER Metal Finishing USA L.L.C.
1551 Denso Road · USA-Battle Creek · MI 49015
Tel.: +1/269/4413000 · Fax: +1/269/4413001 · info@roslerusa.com

GB RÖSLER UK
Unity Grove, School Lane · Knowsley Business Park · GB-Prescot, Merseyside L34 9GT
Tel.: +44/151/4820444 · Fax: +44/151/4824400 · rosler@rosleruk.com

F RÖSLER France
Z.I. de la Fontaine d'Azon · B.P. 513 – St. Clément · F-89105 Sens Cedex
Tel.: +33/3/86647979 · Fax: +33/3/86655194 · rosler@rosler.fr

E RÖSLER International GmbH & Co. KG
Sucursal en España · Polg. Ind. Cova Solera C/Roma, 7 · E-08191 Rubí (Barcelona)
Tel.: +34/93/5885585 · Fax: +34/93/5883209 · rosler@rosler.es

I RÖSLER Italiana S.R.L.
Via E. Vittorini 10/12 · I-20049 Concorezzo (MI)
Tel.: +39/039/611521 · Fax: +39/039/6115232 · info@rosler.it

NL RÖSLER Benelux B.V.
Reggestraat 18 · NL-5347 JG Oss · Postbus 829 · NL-5340 AV Oss
Tel.: +31/412/646600 · Fax: +31/412/646046 · info@rosler-benelux.nl

B RÖSLER Benelux B.V.
Avenue de Ramelot 6 · Zoning Industriel · B-1480 Tubize (Saintes)
Tel.: +32/2/3610200 · Fax: +32/2/3612831 · info@rosler-benelux.be

A RÖSLER Oberflächentechnik GmbH
Hetmanekgasse 15 · A-1230 Wien
Tel.: +43/1/6985180-0 · Fax: +43/1/6985182 · office@rosler.at

CH RÖSLER Schweiz AG
Staffelbachstraße 189 · Postfach 81 · CH-5054 Kirchleerau
Tel.: +41/62/7385500 · Fax: +41/62/7385580 · roeslerag@roeslerag.ch

BR RÖSLER do Brasil LTDA
Estrada dos Galdinos 35 · Jd. Barbacena · 06700-000 · Cotia · São Paulo · Brasil
Tel.: +55/11/46123844 · Fax: +55/11/46123845 · rosler@rosler.com.br

ZA RÖSLER S.A. Surface Technologies
P.O. Box 7949 · No. 9 N1 Industrial Park · Samrand · 0046 Centurion · South Africa
Tel.: +27/12/6570375 · Fax: +27/12/6570649 · johanv@roslersa.co.za

CN RÖSLER – BEIJING
Office 11N, Tower A, Beijing Fu Hua Mansion · No. 8, Chaoyangmen North Avenue
Dong Cheng District · Beijing 100027 P.R. China
Tel.: +86/10/6554 73 86 · +86/10/6554 73 89 · Fax: +86/10/6554 73 87 · info@rosler.com.cn

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