



# TECWILL

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# ARCAMIX CONTAINERIZED CONCRETE MIXING PLANT



# ARCAMIX CONCRETE MIXING PLANT



The containerized construction of the modern ARCAMIX concrete plants is based on sea container dimensions. The modular containers are pre-assembled already in the factory, including all process equipment, thermal insulations and electrification. The basic scope of supply includes all the equipment and facilities required for the producing of concrete. The purpose and with this the equipment of the ground floor and first floor containers can be fixed according to customer requirements, as these can be used e. g. for admixture storage, as control room, as concrete laboratory or as workshop. These containers could also be provided by the customer.

At the site, the containers can be put either on reinforced concrete slabs or mobile steel frames. Electrical and automation cables connecting the containers, only need to be plugged in. The pre-assembled and factory tested modular containers guarantee fast installation and start-up.

ARCAMIX plants each are equipped with a high-quality twin-shaft mixer. The plants are suitable for production of ready-mix concrete as well as for production of concrete for high-quality precast elements. The aggregates are weighed by the **"flying" aggregate dosing and weighing system** developed by Tecwill Oy. The system provides a low aggregate bin unit and high-precision aggregate weighing.

## ARCAMIX benefits

- + The whole concrete mixing plant, all winter equipment and electrification are pre-assembled and tested already in the factory.
- + ARCAMIX's facilities and functions are supplied in one compact package.
- + ARCAMIX plants are easy to relocate to a new place.

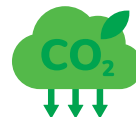
### Benefits of the "flying" aggregate dosing and weighing system

- + Approx. 3-5 m lower aggregate bin unit and loading ramp compared to the traditional belt weighing belt systems.
- + Up to 50% less electricity consumption.
- + High-precision aggregate weighing and moisture measurement, saving cement and reducing CO<sub>2</sub> emissions.



## Benefits of all ARCAMIX models

- + Semi-mobile concrete mixing plant.
- + Suitable for production of ready-mix concrete as well as concrete for high-quality precast elements and for on-site projects.
- + Large control room and admixture storage, huge additional storage facilities.
- + "Flying" aggregate dosing and weighing system.
- + Winter equipment pre-assembled already in the factory.
- + Aggregate heating system an production of warm concrete.
- + Low cost foundation, no ground works required.



- + Saves cement by up to 10% compared to traditional technology
- + Solutions to reduce CO<sub>2</sub> emissions by up to 30 kg/m<sup>3</sup> and increase sustainability
- + Significant savings in fuel and electricity consumption

## ARCAMIX models

### ARCAMIX

- Production capacity up to 100 m<sup>3</sup>/h, 120 m<sup>3</sup>/h or 130 m<sup>3</sup>/h
- Twin-shaft mixer, batch volume 2.5 m<sup>3</sup>, 3.0 m<sup>3</sup> or 3.33 m<sup>3</sup>
- 3 – 7 aggregate bins



### SUPER ARCAMIX

- Production capacity up to 140 m<sup>3</sup>/h or 150 m<sup>3</sup>/h
- twin shaft mixer, batch volume 4.0 m<sup>3</sup> or 4.5 m<sup>3</sup>
- 3 – 7 aggregate bins







## Mixer options

It is recommended to choose the batch volume of the twin-shaft mixer according to the loading capacity of the concrete trucks in use for transport.

Mixer accessories, such as wear plates, central lubrication system and special discharge hatch functions can be chosen according to customers' needs. The mixer can be equipped with a high-pressure washing system, which automatically cleans the mixer. Other options are e.g. a mixer camera installed on top of the mixer cover, and a frequency converter for adjusting the mixer's rotation speed.



## Admixture dosing

The admixture tanks and pumps are placed in the thermally insulated admixture container. Admixtures are pumped to the dosing valves through pipes. The valves are located on top of the scale, ensuring precise dosing. The admixture scale has separate weighing chambers for each admixture, allowing to discharge the admixtures in the desired order and time.

ARCAMIX







## ↑ Binder dosing

The binder scale has a large capacity, which allows the production of special concrete with up to 550 kg cement/m<sup>3</sup> with the maximum batch volume. The scale discharges into the mixer by a special screw conveyor, guarantying continuous binder flow and a homogenous mixture even with a quite short mixing time.



## ← Water dosing

There are separate dosing valves for cold and hot water, making it possible to properly adjust the concrete temperature. As option the water scale can be provided with two chambers, one for clean water and the other for grey (recycled) water. Clean water gets discharged into the mixer by a pump, spraying the water through special nozzles, making the mixing process faster. Recycled water gets weighed and discharged in free fall directly into the mixer.



## ← Aggregate bins

The aggregate bins can be filled with a wheel loader or directly from a truck using the ramp or by a separate conveyor system. There is plenty of space to do maintenance work inside the wide base of the aggregate bin unit. The bins are thermally insulated and electrified already in the factory. The cones are steep, leading to a best possible material flow.





# ARCAMIX MAIN MODULE



## 1) CONTROL ROOM CONTAINER

- + Sound and thermal insulation.
- + Good view to the discharge area.
- + Pleasant working environment.

## 2) ADMIXTURE STORAGE CONTAINER

- + Sufficient space for admixture pumps and tanks.
- + Compressor.
- + Optionally admixture filling system.

## 3) LABORATORY CONTAINER

- + Concrete samples can be submitted directly to the laboratory.
- + Laboratory data can be transferred directly to the control system.

## 4) MIXER CONTAINER

- + All process equipment is pre-installed and tested.
- + Pre-insulated, including floor and roof.
- + Pre-installed electrification and heating.

## 5) MIXER CONTAINER'S EXTENSION MODULES

- + Large space for maintenance around the mixer.
- + Maintenance hatch for lifting up tools or spare parts.
- + Pre-insulated, including floor and roof.

## 6) SCALE CONTAINER

- + Large space for maintenance.
- + Pre-insulated, including floor and roof.
- + All equipment is pre-installed and tested.

## 7) BINDER SILOS

- + Number of cement, silica, slag and fly ash silos as required.
- + Easy to maintain from ground level.
- + Easy and safe access from service ladders, walkways and platforms.

# ARCAMIX

## AGGREGATE BINS



### 8) AGGREGATE BINS

- + Thermally insulated aggregate bins with racks and covers.
- + Low construction and filling ramp thanks to the “flying” weighing system.
- + Steep cones ensure efficient heating of the aggregates.

### 9) HEATING CONTAINER AND HEATING SYSTEM

- + Heating container with oil tank and hot water tank.
- + Automatic aggregate heating by dry steam and production of hot water.
- + Production of warm concrete with the required temperature.
- + Heating of plant facilities by heat blowers.

### 10) CONCRETE FOUNDATION OR MOBILE STEEL ELEMENTS

- + Simple concrete slabs, no underground work required.
- + Mobile solution with bolted steel frames and steel elements for the filling ramp walls.
- + Quick to install and easy to move to a new destination.

### 11) FIBRE DOSING

- + Steel and/or synthetic fibres are dosed onto the aggregates “flowing” on the belt conveyor, leading to a premixing already before the aggregates reach the holding hopper.
- + Homogeneous fibre concrete without lumps.
- + Optionally housed fibre feeder and fibre storage.



# FEATURES AND BENEFITS



## PLANT INSTALLATION

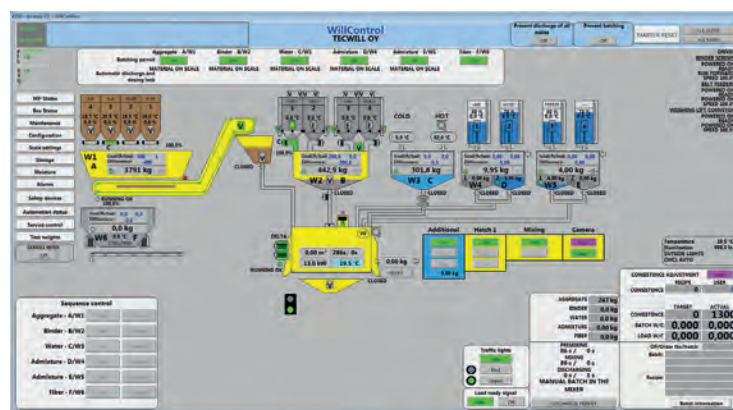
Thanks to the pre-assembled and tested equipment, the whole plant can be erected within just a few days. The customer receives a finished plant, which is ready for production. In traditional "build at the site"-solutions the installation and start-up take a lot longer and require a lot of on-site testing.

- + Electrical and automation connections are made by rapid plugin connectors.
- + Mechanical devices are pre-installed and tested.
- + Pre-installed winter equipment and aggregate heating system.
- + Production begins immediately after commissioning.
- + Clear picture of the total investment costs.

## WORKING SAFETY AND MAINTENANCE

The design of the ARCAMIX takes into account all facilities required for maintenance and service as well as all necessities in matters of H&S. Thanks to the "flying" weighing system the maintenance inside the aggregate bin unit can be carried out from floor level. A service contract with different levels of maintenance can be chosen to make it easier for the customer and guarantee the required maintenance at any time.

- + Wide and safe walkways and ladders.
- + Large space for maintenance around the equipment and inside the production facilities.
- + Service hatch providing easy access to the holding hopper.
- + Service contract, on-line spare part catalogue.



## HIGH PERFORMANCE WILLCONTROL CONTROL SYSTEM

The modern control system ensures the production of high-quality concrete in accordance with the requirements of the EN 206 standard. The system can be composed by adding different programs and devices according to the customers' needs. Versatile reporting can be connected to the customer's systems to receive up-to-date information for the management. Remote control allows quick support and regular updates.

- + Stable production without avoidable downtime.
- + Comprehensive reports.
- + Real time remote support and regular updates.



## **“FLYING” AGGREGATE DOSING AND WEIGHING**

The “flying” aggregate dosing and weighing system offers significant benefits compared to the traditional weighing system. The frequency controlled system guarantees high-precision dosing. The right amounts of aggregates and accurate aggregate moisture information allow to calculate the correct water-cement ratio, no need to add extra cement to compensate inaccurate dosing.

- + Down to a few kilos aggregate dosing accuracy can be achieved.
- + Saving of up to 30 kg cement per m<sup>3</sup>.
- + High-speed weighing leads to high production capacity.

Thanks to the dynamic “flying” weighing system, the combined belts and the aggregate bins can be installed several meters lower, compared to plants using normal weighing belt solutions. The lower filling ramp require less space on the site and provides remarkable savings in operational costs of the wheel loader.

The “flying” aggregate weighing system doesn’t need an aggregate skip hoist, which requires a lot of space, consumes a lot of electricity and reduces the production capacity of the concrete mixing plant.

- + 3-5 m lower aggregate bin and filling ramp compared to traditional solutions.
- + Saves space required on the site and provides remarkable savings in operational costs of the wheel loader.
- + Simple concrete slab foundation without underground work.

## **MOISTURE MEASUREMENT WITH THE “FLYING” WEIGHING SYSTEM**

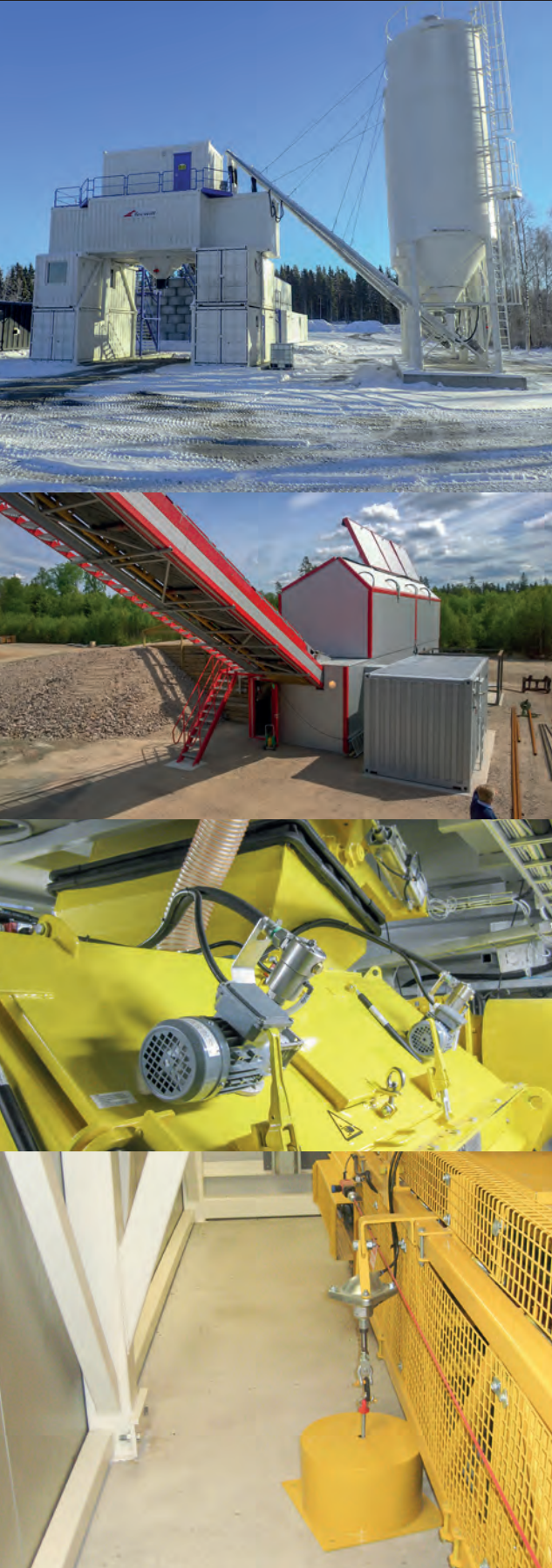
Moisture data are taken into account when calculating the amount of additional water needed for a batch. The “flying” dosing and weighing of aggregates enables moisture measurement with one sensor only, installed above or sliding on the aggregates “flowing” on the belt conveyor. Measuring can be done by an ultrasonic or optical sensor. The moisture measurement is much more accurate and faster compared to conventional solutions. Accurate moisture measuring reduces the mixing time and the quality variation and thus the need for extra cement in the mix.

- + The moisture of all aggregates is measured with one sensor only, either with an ultrasonic or optical sensor.
- + Saves sensor costs and makes the calibration easier.
- + Proper moisture measuring and accurate calculation of required added water reduces the mixing time and the quality variation.



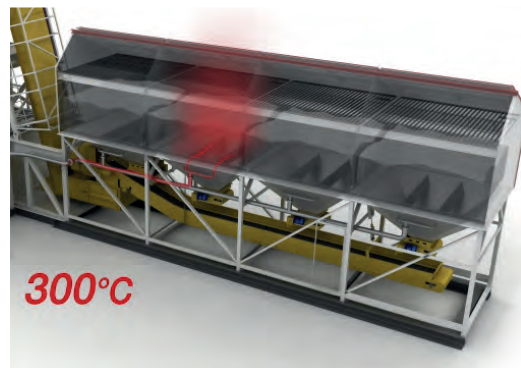


# ARCAMIX ADDITIONAL EQUIPMENT



## **FACTORY ASSEMBLED WINTER EQUIPMENT**

The plant can be completely insulated, including roofs and floors. The interior is equipped with heating and lighting. All winter equipment is pre-assembled already in the factory, and doesn't need to be disassembled when moving the plant to a new location. The aggregate bins are equipped with racks and thermally insulated covers, which can be opened from the control panel or by the remote control.



## **FACTORY ASSEMBLED AGGREGATE HEATING**

The powerful aggregate heating system guarantees concrete production also in cold winters. The system heats the aggregates in the bins up to the desired temperature. The system at the same time heats the water, which also is used for heating the plant premises. Concrete can be produced with required temperature by using the WillConHot program.

## **FACTORY ASSEMBLED PIPE TUNNEL**

All cold and hot water pipes of the plant are pre-assembled already in the factory. The water pipes are installed in the thermally insulated pipe tunnel, where they are protected against frost. This massively reduces the installation time at the site.

## **HIGH-PRESSURE MIXER WASHING SYSTEM**

The high-pressure washing system cleans the mixer using rotating washing nozzles. The washing takes place with the required amount of water and by using high pressure, making the mixer maintenance easier. The system also includes a hand gun for manual washing.

## **QUICK TARING OF SCALES**

The scales can be equipped with testing weights, which each are lifted up by a pneumatic cylinder. Scale calibration can be carried out easily and quickly.



### AGGREGATE BIN LOADING SYSTEM

The system consists of a receiving hopper, a lifting conveyor and one or more distribution conveyors. Lifting can be carried out either by an inclined belt conveyor or the VERTEC vertical conveying system, developed by Tecwill Oy. The VERTEC only needs little space and operates reliably even in the winter.

Big motors are controlled by a frequency converter system. Soft motor start reduces mechanical load and avoids power peaks.

High-precision aggregate and binder dosing is achieved by a frequency converter system. When the fine dosing is being used, the rotational speed of the screw conveyor can be adjusted, so that even the final kilos can be dosed accurately.

When the mixer is controlled by a frequency converter system, the rotational speed can be adjusted as required for different mixing and discharge modes.

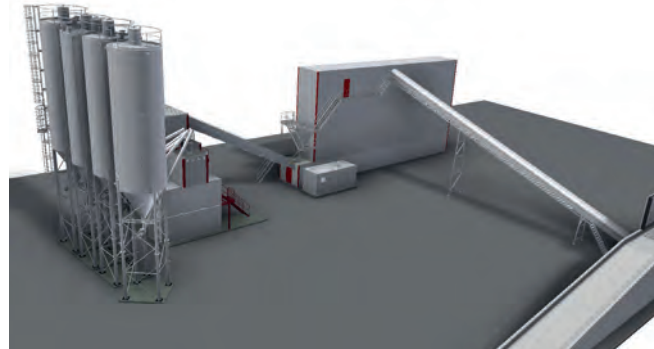
### FIBRE DOSING

The plant can be equipped with a fully automated system for dosing steel and/or synthetic fibres. The “flying” aggregate weighing system allows to dose fibres directly onto the “flowing” aggregates, providing a pre-mixing, avoiding fibre lumps and leading to a shorter mixing time.

### RECYCLING OF WASHING WATER AND RESIDUAL CONCRETE

The washing waters of the mixer and residual concrete from truck mixers and pumps can be recycled and be used again for the concrete manufacturing process. Concrete waste is processed by recycling equipment, which separates the coarse aggregates and the recycling water from each other. The recycled coarse aggregates, if not used again for concrete production, can alternatively be used for other purposes.

Recycled water is poured into one or more setting pools. From a setting pool it is dosed into the scale by a pump according to the set value. Recycled water can be further treated by a filter press, separating the fine aggregates from the water. The end result is clear water that can be used without restrictions for concrete production, instead of pure water.





# ARCAMIX APPLICATIONS



## On-site production ↗

The concrete mixing plant is erected at the construction site and after termination of the project it is moved to a new location. The plant can be purchased on base of a leasing contract scheme. Each plant is fully equipped with everything necessary for the production of concrete. A mobile plant can be purchased on base of a turnkey solution, including steel frames and loading ramp elements.



## ← Easy to move stationary ready-mix concrete plant

ARCAMIX is ideal for the production of ready-mix concrete. The plant includes all necessary facilities needed for the production: concrete mixing plant, bins and silos, control room, admixture storage, laboratory and operator cabin. The modules are equipped according to customers' needs.

Thanks to the semi-mobile concept, the plant can be easily moved to a new location.





## ↑ Construction of tunnels

ARCAMIX can be equipped with an effective fibre dosing system for the production of shotcrete. Steel or synthetic fibres are dosed onto the aggregates “flowing” on the weighing belt, which makes it easier to achieve high-quality and homogenous shotcrete without fibre lumps. The water/cement ratio of each concrete mix gets adjusted with the correct value by the WillControl control system.



## ← Airport runways and concrete roads

Concrete paved roads or runways for airport are made of semi-wet concrete. ARCAMIX’s “flying” aggregate dosing and weighing system together with a powerful twin-shaft mixer guarantee the production of homogeneous concrete at full capacity. The mobile plant solution can be installed in a short time and easily be moved to a new location after termination of the actual project.

## ↓ Element factory

In this case the concrete mixing plant is placed close to the precast concrete element factory and connected to the concrete transport system. The plant also is able to produce ready-mix concrete. The mixing unit can be located inside the factory.







# STANDARD MODELS AND TECHNICAL DATA

ARCAMIX standard models offer reliable solutions for different production needs. In case a standard aggregate bin doesn't fulfil the customer's requirements, a tailor-made solution will be provided. The number and volume of aggregate bins can be chosen according to customer requirements. **The table below presents the standard ARCAMIX models with the mixer and aggregate silo options.**

		ARCAMIX 2.5	ARCAMIX 3.0	ARCAMIX 3.33	SUPER ARCAMIX 4.0	SUPER ARCAMIX 4.5	ARCAMIX DRY
Aggregate bins		Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Number	pcs	3 - 7	3 - 7	3 - 7	3 - 7	3 - 7	3 - 7
Silo volume / filling ramp	m³	30	30	30	30	30	30
Silo volume / conveyor system	m³	60	60	60	60	60	60
Aggregate weighing		Flying weighing	Flying weighing	Flying weighing	Flying weighing	Flying weighing	Flying weighing
Aggregate transport to the mixer		Belt conveyor	Belt conveyor	Belt conveyor	Belt conveyor	Belt conveyor	Belt conveyor
Binder silos	pcs	1 - 5	1 - 5	1 - 5	1 - 5	1 - 5	1 - 5
Binder scale	kg	1700	1700	1700	2400	2400	2400
Water scale	kg	800	800	800	1000	1000	1000
Hot water dosing		Valve	Valve	Valve	Valve	Valve	Valve
Twin-shaft mixer							
Motor size	kW	2 x 45 tai 1x75	2 x 55	2 x 65	2 x 65	2 x 75	
Max batch size	m³	2.5	3.0	3.33	4.0	4.5	
Max production capacity	m³/h	100	120	130	140	150	
Admixtures	pcs	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6
Winter equipment							
Insulation - Mixer and scale container		✓	✓	✓	✓	✓	✓
Insulation - Aggregate bin unit		✓	✓	✓	✓	✓	✓
Insulation - Aggregate bin covers		✓	✓	✓	✓	✓	✓
Aggregate heating		TurboCobra	TurboCobra	TurboCobra	TurboCobra	TurboCobra	TurboCobra
Hot concrete production		WillConHot	WillConHot	WillConHot	WillConHot	WillConHot	WillConHot
Heating pipes and valves		✓	✓	✓	✓	✓	✓
Water pipes and pipe tunnel		✓	✓	✓	✓	✓	✓
Heating container		0.5 - 1.5 MW, factory assembled					

✓ = Factory assembled

Container options, all with 20' sea container dimensions	
Admixture container 1	Thermal insulation, lighting, heating, admixture storage containers and compressor
Admixture container 2	Thermal insulation, lighting, heating and additional admixture storage tanks
Control room container	Thermal insulation, lighting, heating and control system
Laboratory container	Thermal insulation, lighting, heating, laboratory equipment and laboratory computer
Storage container, insulated	Thermal insulation, lighting, heating and eventually storage shelves
Storage container, not insulated	Empty sea container for storage purposes
Workshop container	Thermal insulation, lighting, heating, work tables and possible storage shelves
Control system - additional equipment (others possible)	
WillConInv	Connection to the customer's invoicing software
WillConQuality	Quality control program
Service contract	Updates and changes within the control system



# REFERENCES



ARCAMIX 3.0



ARCAMIX 4.0



ARCAMIX 3.33



ARCAMIX 3.0



2 x ARCAMIX 3.0



ARCAMIX 3.0



Arcamix 4.0



Arcamix 3.33



Arcamix 2.5



Arcamix 3.0



Arcamix 3.33

SEE MORE REFERENCES



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**HEADQUARTER:**

Tecwill Oy  
Rahtikatu 3 B,  
80100 Joensuu, FINLAND  
[info@tecwill.com](mailto:info@tecwill.com)  
[www.tecwill.com](http://www.tecwill.com)

**EXPORT SALES:**

Tel. +358 10 830 2911

**SERVICES AND SPARE PARTS:**

[service@tecwill.com](mailto:service@tecwill.com)

**TECwill CANADA SALES OFFICE:**

2857 Sherwood Heights Drive, Unit 14  
Oakville, Ontario L6J 7J9, Canada

**Tecwill Oy is a world leading expert in manufacturing concrete mixing plants and control systems. We offer our customers reliable and modern solutions for the concrete production, solutions that reduce operating costs, save cement and CO<sub>2</sub>- emissions.**

Our business is based on long term practical experience as well as open-minded continuous product development. These, combined with new technical solutions and our uncompromising will to put the customers' needs first, are important guidelines for our activities. Tecwill concrete mixing plants meet the highest expectations in terms of mobility, reliability and speed of installation. The other strengths of Tecwill are reliable and right-on-time deliveries as well as quick spare part supply.

These are just a few reasons, why many leading construction companies and ready-mix concrete producers have chosen Tecwill plants.

The Tecwill headquarter is located in Joensuu, Finland. Our export offices serve customers in several countries.

