

PATENTED SYSTEM



**NEW TECHNOLOGY FOR THE PRODUCTION
OF QUALITY CONCRETE**



WHAT THE CHTT SYSTEM IS?

The CHTT (Concrete High-Tech Turbomixer) is a system for the production of the Cement Paste.

The Cement Paste is obtained mixing the cement, the water and the additives.

The CHTT prepares the cement paste and discharges it into the Truck Mixer (the feeding of the cement paste into the Truck Mixer is made simultaneously to the aggregate feeding)

The Truck Mixer completes the mixing of the cement paste with the aggregates.

The cement paste feeding into the Truck Mixer is made in such a way to obtain a perfect distribution of the cement paste in the bulk of the aggregates, thus obtaining a homogenous concrete.

The innovative Mixing system is based on a special Mixer for the preparation, in one batch only, of a Mixture composed of water, additive and cement which is fed into the Truck Mixer in a proportional and simultaneous way to the aggregate.

The cement paste quantity which can be produced with the CHTT in one single batch is sufficient to load a 12 m³ Truck Mixer.

All the system is controlled with a PC with Dedicated Software.



WHY USE THE CHTT SYSTEM?

For the **QUALITY** of the concrete due to the perfect mixing of the components.

The recipe being equal, the workability and the mechanical characteristics of the concrete made with CHTT sensibly increase.

For the **ECONOMY** of the concrete production costs. The optimization of each phase of the production process results in a sensible economic advantage for the producer.

For the very high **PRODUCTIVITY**; the system can load a 12 m³ Truck Mixer in one batch only.

For the **LOW ENERGETIC CONSUMPTION** in respect to the traditional mixers (Twin Shaft or Planetary); the electric absorption is reduced approximately to one fifth. Important reduction of the water consumption.

For the **ENVIRONMENT** preservation thanks to the drastic reduction of the cement dust emissions at the Truck Mixer loading point and the optimization of the washing.

For the **EASE** of installation even on the existing plants, it does not require any structural modification to the Concrete Batching Plant.

CHTT COMPONENTS

Mixing Vat/Weighing

No. 1 Mixer with a capacity of 4000 lt installed on load cells, adequate for the preparation of a quantity of mixture for 12 m³ Truck mixer loading.

Equipped with butterfly valves with electro-pneumatic actuators for the automatic operation of the loading, mixing, discharge and washing phases.

Weighing System

Weighing in sequence of water and cement.

System of no.4 load cells with CE homologated digital display (serial data transmission included).

Automatic Washing

No.1 electro pump for the automatic and high pressure washing of the inside of the mixer performed after every batch.

System composed of no. 3 rotating nozzles which at the end of each cycle are lowered into the mixing tank by an automatically operated pneumatic device.

The washing cycle is automatically operated and includes the vat and pipes washing. The washing water which remains in the vat after the washing is automatically computed in the dosage of the following batch.

Pneumatic System

Connection to the Compressor of the existing Batching Plant. The FRL groups (filter -pressure regulator-lubricator) and the pipes for the pneumatic system of the C.H.T.T. are included.

Dust Extraction

Connection to the Suction Filter of the existing Batching Plant with pneumatically actuated valve on the suction pipe.



Cabin for the Control Board

No. 1 Control Cabin (2 x 1,5 mt) installed on the frame of the CHTT and equipped with access door and window. The Cabin contains the Control Board of the CHTT.

CHTT Control Board

Control Board with weight display installed on the CHTT and inside the control cabin.

The controls are electro-manual and some phases have electrical blocks and signals to avoid priority errors made by the operator.

All the controls on the Control Board are 24 Volts, according to the safety regulations.

The electric cables from the Control Board to the components of the C.H.T.T. are included in the supply (voltage 380 Volts - frequency 50 Hz).



Automation

Software Updating for automatically handling the production process with the CHTT.

This updating consists of a software module which is added to the PC of the Concrete Batching Plant and automatically handles the Truck Mixer loading operation via the CHTT.

No. 1 electric cable for the connection of the CHTT Control Board and the Personal Computer in the cabin of the Concrete Batching Plant.

The Software with its license is installed on the PC of the Concrete Batching Plant.

Perimeteral maintenance walkway

Maintenance cantilever walkway on 3 of the 4 sides of the CHTT, installed 2.1 meters above ground level without supports laying on the ground.

Floor made in galvanized plate with railings and stairs for the access from the ground.



Clean Water Dosage

No. 1 pneumatically operated Sphere Valve for loading the clean water on the Waiting Tank.

No. 1 Waiting Tank of the clean water, installed on the top of the Mixing vat and complete of:

Minimum level probe for the signal of water loading.

Maximum Level probe for the signal of water loading stop.

Pneumatically operated butterfly valve - complete of rubber collector - for water discharging into the Mixing Vat.

Pipe attachments to the High Pressure washing pump.

Attachments for the connection to the Concrete Batching Plant water pipes.

Reclaimed Water Dosage

No. 1 pneumatically operated dosage valve for the reclaimed water discharging into the CHTT Mixing/Weighing Vat.

Attachments for the connection to the Concrete Batching Plant water pipes.

Additive Batching Units (By-weight or volumetric)

Additive Batching Units by load cell. (serial data transmission included)

Cement conveying to the CHTT

Components for the modification of the Existing Cement Silos:

Kit for the installation of an additional discharge outlet on the discharge cone of each cement silo. The kit includes the flange for the connection to the screw conveyor.

Manually operated butterfly valve for closing the additional outlet of the cement silos.

Screw conveyors for the cement conveying from the silos to the CHTT Mixing/weighing vat.



INSTALLATION OF THE CHTT

Clean Water Connection

The CHTT is equipped with a clean water Waiting Tank installed on the top of the Mixing Vat to speed up the water dosage.

A connection to the Clean Water network (used for both the dosage and the washing) is the only thing requested.



Reclaimed Water Connection

The reclaimed water, when used, is discharged directly in the Mixing Vat and, in order to avoid sediments and deposits, it does not pass from the water Waiting Tank.

A pipe with a diameter of 3" (large enough to avoid to slower the loading time) should be supplied by the client.

Emergency discharge

The CHTT is equipped with an outlet for the emptying of the Mixing Vat in case of emergency.

The discharge must be connected with the water collecting system of the plant and particularly with the reclaiming system of the dirty water.

Connection to the cement dust suction filter.

The connection of the vent of the Mixing Vat with the system for the dust extraction at the Truck Mixer discharge point is also foreseen.

The CHTT has not new dust emissions, on the contrary it strongly reduces the total emissions of the Batching plant by reducing the dust emitted during the Truck Mixers loading.



Delivery and recirculating cement paste pipes

No. 2 systems of pipes are installed, one for conveying the cement paste to the Truck Mixer loading point and the other one for recirculating the cement paste.



TRUCK MIXER LOADING WITH CHTT

The Truck Mixer loading cycle with the CHTT is made of a series of controls and actions automatically performed by the automation.

The operator of the Concrete batching plant has no additional complications and from his point of view the operation procedure does not change.

On the plants installed up until now we have that after the installation of the CHTT the total time of the Truck Mixer loading cycle did not change, nor the hourly production of the concrete batching plant.

HOW THE CHTT WORKS?

Choice of the formula set in the automation system.

Operator's choice to produce concrete via the CHTT system

Start of the cycle, with the simultaneous batching of the following:

- Aggregates
- Water and cement, with their introduction into the Mixing Vat equipped with load cells system.
- Additives, via specific dispenser (by weight) . The additives are then introduced into the mixing vat.

Start of the Mixing phase, with the Mixing performed both by specific stirrers placed in the mixing vat and by the recirculation of the mixture through a specifically designed and manufactured centrifugal pump. The automation checks and processes both the moisture values – measured by the humidity probes, and the water/cement ratio value of the mixture in the Mixing Vat

- This value should be not less than 0,30.

If this ratio is less than 0,30, the exceeding cement quantity (which is usually very little) is weighed in the cement batcher of the plant and then conveyed to the Truck Mixer simultaneously and proportionally to the aggregates and the cement paste.

The mixer is equipped with an electronic system with 4 load cells which grant the best precision in the cement and water dosage. The additives are separately batched with volumetric or by-weight dispensers.



AD-HOC AUTOMATION FOR THE PROCESS MANAGEMENT

The developing of the CHTT system led us to define a specifically dedicated automation which, further to the control of this equipment together with the Concrete Batching plant, also allows to operate the plant in the classic way, without the CHTT. Depending on the type of the supply the following will be possible:

Installation of the CHTT on plants which are already operating

The prerequisite for the installation of the CHTT is the presence of a PC-PLC based automation supplied by Elettrondata Company or Onyma Company; in this case it will be possible to proceed with the Software updating, otherwise it will be necessary to rely upon a system interfacing with the automation installed on the Concrete Batching plant.

Installation of the CHTT on new plants

The supply will include an automation from Elettrondata or Onyma.

The connection of the PLC of the concrete batching plant with the CHTT is made with one cable only.



ALL THE ADVANTAGES OF THE CHTT

In respect to the classical concrete production (Direct Truck Mixer loading and concrete mixing into the Truck Mixer), the concrete produced with the CHTT shows the following advantages:

Real saving of the cement due to the bigger workability, the water quantity being equal.

Bigger resistance and workability, the concrete recipe being equal.

Perfect Mixing of the components and increased homogeneity of the concrete.

Optimization of the admixture performances due to the forced mixing of water and cement.

Better pumpability of the concrete, the fine parts being equal.

Ideal for the production of self-compacting concrete (SCC).

Low Electricity Consumption (0,5 KWh per cubic meter of produced concrete).

Wears and maintenance costs almost nonexistent.

Drastic Reduction of the cement dust emissions at the Truck Mixer loading point.

Less wears of Truck Mixer and Concrete Pumps.

Reduction of the Truck Mixer washing time and of the water consumption.

High productivity with 12 m³ Truck Mixer load in just one batch.

No structural modification of the concrete batching plant is requested (installation on the ground)

Possibility of producing homogeneous **coloured concrete**.

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CONCRETE MIXING PLANTS