Visco Probe 1

Consistency measuring equipment for concrete mixers

The only measuring equipment in the world for measuring of the concrete consistency during the mixing process by application of high-technological, rheological measuring principles.
Visco Probe 1

Key functions

- Measurings direct in the concrete mix during the mixing process.
- Measuring in the entire mix.
- Accurate two-parameter measurings.
- Creation of rheological data on the basis of the Bingham model.
- Wireless data transfer from probe to receiver.
- Interface to process control system or separate pc via RS 485.
- Measurements presented in an easily understandable, user-friendly and clear way.

Single **Visco Probe 1** for planetary mixers

Double **Visco Probe 1** for turbine mixers

New ways

**Visco Probe 1** is patent pending and the only consistency meter in the world to be built into the mixer.

By use of the most modern technology consistency is measured and registered throughout the entire mixing process. **Visco Probe 1** works on the basis of the latest rheological knowledge and calculates by means of a two-parameter measurement relative values for the concrete consistency.

Connection to the process control system ensures that the concrete does not leave the mixer until consistency within the acceptable limit values has been achieved.
Advantages

- Available and accurate measuring results already during the mixing process.
- Reduced discarding due to wrong flowability / workability.
- Measuring provides for the influence on consistency of all incoming materials.
- The uniform consistency of the produced concrete ensures a high quality and great customer satisfaction.
- Reduction of consistency tests in the laboratory resulting in reduced production costs.
- Especially advantageous in connection with production of SCC concrete.
- Wear parts have been separated from the electronic part ensuring low costs in connection with replacement of the wear parts.
- Modular system.
- Applicable for all known mixer types, however not drum mixers and twin-shaft mixers.
- Available and accurate measuring results for registration of the consistency of all mixes requiring no extra work and no extra costs.
- Intelligent power saver ensures a long operation time of the battery set.
- A wireless connection is obtained by means of the rechargeable battery set in the measuring probe and consequently wires in the mixers are avoided.
- Measurements are independent of wear on mixer tools, influence by shovels and oil temperature in gear box.
- Simple installation in mixer and no subsequent adjustment means low maintenance costs and high operation reliability.
- Full-scale tests have shown that the two-parameter meter can register the consistency change when 1 litre of water is added into 1 m³ concrete.

The rheological principle, the Bingham model

Today, it is well-known that a reliable determination of the concrete workability / flowability can only take place by means of equipment that can determine the rheological data of the concrete.

The concrete can be observed according to the Bingham model saying that a certain shearing stress is required before shearings appear in the concrete and that this shearing stress will increase proportionally to the shearing speed.

The force (γ) required to start an agitation and the increase (α) of the force due to increased speed (v) are the rheological factors required to determine the concrete consistency.

Application of a diagram with y as y axis and α as x axis will show that the concrete consistency can be described as a point.

Entering tolerances of the values will make an area appear within which a given concrete mix must be to be accepted.
The probe mounted on the agitator of the mixer measures and transmits the values by means of radio signals.

VP1S – for planetary mixers.

VP1D – for turbine mixers.

The base mounted on the outside of the mixer receives the radio signals from the probe and transmits the measuring results via cable to a pc.

The pc logs the measured values and presents them in an easily understandable, user-friendly and clear way.
The concrete plant of the future

Today, most concrete plants producing slump concrete or SCC have a wattmeter connected to the mixer. The wattmeter is used to control proportioning of additional water. The wattmeter describes the concrete workability by means of one single value. However, this method is too simple as to describe the concrete flowability as the stiffness of the concrete i.e. the force required to make the concrete flow and the viscosity of the concrete when flowing are important factors.

To the left the Visco Probe 1’s is mounted in a 1.5 m³ planetary mixer where the probe regulates and registers the consistency of more than 200 m³ concrete every day.

Visco Probe 1 performs a two-parameter measurement direct in the mixer and both parameters are registered.

Process control systems for the “concrete plants of the future” will be developed to use the two parameters made available by Visco Probe 1. In this way it will be possible to control both the yield value and the viscosity and continuously produce a concrete with exactly the required consistency.

Until these process control systems become available, Visco Probe 1 can be connected with the present process control systems and be extremely useful by controlling the water addition on basis of one of the parameters.

While data are supplied for control of the water addition, the two-parameter measurement is measured, displayed and registered to fully document the actual concrete flowability.

Installation

Visco Probe 1 is easily installed. Only a short access to the mixer is required i.e. minimum downtime.

Installation dimensions

The shown dimensions apply for a standard probe. In case the dimensions do not match the actual mixer, the probe can be supplied in an adjusted version.
CONVI offers measuring equipment for consistency control in concrete mixes so that our customers can produce concrete of high and uniform quality. The measuring technology is based on rheological research results.

The CONVI equipment has a high and innovative technological level and an easily understandable user interface ensuring high operation reliability.

CONVI has been founded by persons with more than 25 years of experience each within the concrete industry.

CONVI cooperates with e.g. the Danish institute Force Technology.