**Concrete Quality Measurement Device**

Modern spaces demand design flexibility and aesthetics while demanding cutting-edge levels of sustainability. Precast concrete beams and slabs are becoming more popular due to their efficiency, quality control, reduced construction time, and sound and thermal insulation properties.

A typical construction process is complex and typically involves several steps.

**Design and Preparation**:

**Mix Design**: Determine the right mix of materials (cement, aggregates, water, and any additives) based on desired properties.

**Mould Preparation**: Clean moulds or forms where the concrete will be poured.

**Batching and Mixing**:

**Batching**: Measure and combine materials in specific proportions.

**Mixing**: Thoroughly mix materials to create a uniform concrete mixture. Various mixers, such as drum or pan mixers, can be used.

**Pouring and Spreading**:

**Pouring**: Pour the mixed concrete into the prepared moulds or forms.

**Spreading**: Use tools like shovels or rakes to spread the concrete evenly within the mould and ensure a consistent thickness.

**Compaction and Vibration**:

**Compaction**: Remove air pockets and ensure the concrete is dense and uniform, often achieved using vibrating tables or handheld vibrators.

**Vibration**: Proper vibration is crucial to prevent air pockets and achieve a dense, high-quality slab. Vibrating tables shake the mould to settle the concrete.

**Finishing**:

**Surface Finishing**: Smooth the surface of the concrete using tools like trowels or screeds. This step can also include texturing or other surface treatments.

**Edging and Jointing**: Create clean edges and control joints to prevent cracking.

**Curing**:

**Initial Curing**: Allow the concrete to set and gain strength; this involves maintaining appropriate moisture and temperature conditions.

**Final Curing**: Continue to ensure the concrete reaches its full strength. Methods include water curing, using curing compounds, or covering with wet materials.

**Demolding and Inspection**:

**Demolding**: Carefully remove the forms or moulds after the concrete is set.

**Inspection**: Inspect the slab for defects, such as cracks or air pockets, and perform any necessary quality control tests.

**Quality Control**:

**Testing**: Conduct tests to ensure the slab meets specified standards and requirements. Common tests include compressive strength tests and surface quality assessments.

**Documentation**: Maintain records of the manufacturing process, test results, and any corrective actions taken.

Fresh concrete usually contains a honeycomb of air pockets, significantly affecting the finished product. External vibration, using specially constructed electromagnetic steel tables, is often used to eliminate these pockets from the finished product; these generate levels of vibration or shaking at the desired amplitude and frequency to reduce slab defects. These often utilise electromagnets such as REO Type WI21 and are controlled using sophisticated variable voltage/frequency controllers like the REOVIB MFS368 range

Standards like BS EN123890-2:2019 and ASTM C192 provide guidelines for this process. Manufacturers also implement quality control measures to complement these standards, tailored to their specific processes and product requirements. These internal standards often involve detailed protocols for operating and monitoring vibrating tables to ensure consistent product quality.

A repeatable method for monitoring the vibration and recording any data is essential, and a handheld measurement device like the REO SWM4000 Handheld Vibration monitor can be indispensable.

The SWM4000 allows easy reading and storing of several instantaneous measurements, such as Frequency [Hz], oscillation amplitude [mm], oscillation speed [cm / s] and oscillation acceleration [g]

As a handheld device with integrated rechargeable batteries, it can be used quickly on-site and in all weather, eliminating the requirement for additional software or mobile devices.

The SWM4000 builds on the lessons learned from the design and development of its previous version, the SWM3000. ‘We learnt quite quickly that the SWM4000 needed to be much tougher than the old version’, Said Steve Hughes, MD of REO UK LTD. ‘When we designed the product originally, we expected that most units would be used in nice clean laboratories, and the reality could not be further from the truth’, he continued. ‘The new unit is much more rugged, with a rubberised case and higher environmental protection. The user interface is much more robust, and the battery life is much longer.’

The SWM4000 interfaces with an accelerometer that can be clamped or attached magnetically to the vibrating table to provide data quickly. The data can be stored and exported to a PC for further analysis.

As the drive toward increased efficiency gathers pace, the use of precast products will increase due to their reduced energy and raw material burden. However, as with all concrete products, ensuring quality standards are set and maintained remains essential.

**Ends:** 721 words

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**About REO:** REO specialises in providing an extensive array of electronic power controllers and resistive and inductive wound components tailored for industrial use, particularly in demanding environments. As the company expands its footprint in renewable energy technology, ensuring exceptional power quality has become a paramount focus. With manufacturing facilities in Germany, the US, China, and India, REO stands at the forefront of innovation across the globe.