Magnel laboratory for Concrete Research

// Website research infrastructure

www.ugent.be/ea/structural-engineering/en/service
www.concrete.ugent.be

Sampling, observation & survey infrastructure

Experimental facilities & analysis capacity

Data & information management and computing infrastructure

Infrastructure Categories		Infrastructure
	Field instrumentation	• NDT testing (e.g.: Corrosion potential mapping, Concrete resistivity measurements, Rebar detection) [2] • Concrete core drilling [2] • Chloride content measurements (by means of RCT or potentiometric titration) [2]
	Overview	PSA
	Type of laboratory / analyses	The Magnel Laboratory for Concrete Research offers scientific services in various sectors of the construction industry (civil construction, industrial and domestic buildings, producers of construction materials, certification committees, public authorities, designers, contractors and owners). • Specialised laboratory tests [2] • In situ assessments [2] • Specialised calculations [2] • Valorisation [2]
	Class or accreditation	The Magnel Laboratory is certified according to EN ISO 17025 (accreditation certificates BELAC no 220-TEST and 220-CAL).
	Marine land-based facilities for engineering	With a large central testing hall of about 1,000 m² and numerous testing equipment, the Magnel Laboratory for Concrete Research is one of the biggest laboratories internationally (more information: *www.ugent.be/ea/structural-engineering/en/research/magnel/services/labotests*). [2] Instruments relevant for marine research: • Rapid Chloride Migration (RCM or CTH) [2] • Chloride resistance testing [2] • Chloride profiles (RCT, potentiometric titrations) [2] • Sulphate resistance testing [2] • Testing apparatus for accelerated degradation tests (TAP) [2] • Scanning Electron Microscopy (SEM) [2] • Optical microscopy and analysis of thin sections [2] • Water permeability setups [2]
	Other experimental facilities and analysis capacity	• A large number of hydraulic jacks for static and dynamic loading tests [2] • Special equipment for measurements and data acquisition [2] • Climate rooms (up to 50 °C, 30% - 95% RH – CO_2 concentration: 0 - 10 vol%), ovens (up to 1160 °C) and freeze chambers (up to -20 °C) [2] • Test configurations for durability tests: Carbonation (climate chamber) / Alkali-silica reaction (Oberholster test) / Frost-resistance (in combination with de-icing salts) / Acid resistance / Degradation by aggressive liquids / Roughness measurements (ALM) / etc. [2] • Concrete mixing and testing of fresh concrete properties (slump, flow, air content, etc.), equipment for monitoring of concrete setting and hardening (continuous ultrasound transmission, isothermal and (semi-)adiabatic calorimetry, traditional methods), equipment for porosity measurements (MIP, AirVoid, etc.), equipment for characterising cement (laser diffractometer, Blaine, etc), equipment for characterising aggregates (sieve analysis, water absorption, shape factor, density, etc.), gas permeability setups, etc. [2] • Numerous equipment for testing the characteristics of various building materials such as cement, aggregates, concrete, masonry, reinforcement, etc. [2]
	Num. models, spec. software and comp. IR	Specialised software in order to simulate the behaviour of concrete (more information: *www.ugent.be/ea/structural-engineering/en/research/magnel/services/calculation*): • COMREL, SYSREL and STATREL (RCP GmbH) (Risk Analysis Software which can be used for probabilistic service life assessment in marine environments in accordance with DuraCrete or fib Bulletin 34) • ATENA (Cervenka Consulting) (Nonlinear Finite Element Analysis of Concrete Structures) • FreET and SARA (Cervenka Consulting) (Risk Analysis Software) • Matlab (Technical Computing Software) • Numerous in-house developed software packages for specific purposes

Magnel

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