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By the combined measurement of different physical and chemical data the corrosion behaviour of structures can be interpreted and assessed much more precisely than just by measuring single parameters (such as open circuit potentials at the reinforcement). Furthermore, the reinforcement layout and structural damage of the concrete can be visualized and numerically evaluated. Thereby the results of non-destructive testing and conventional surveys are added and united.

The measurement data are related to reproducible coordinates in a grid of 60 x 60 cm and can be compared between different parameters and measurement times. The database has an open design and can be customized.

CITec Survey supports the assessment of corrosion damage to a new standard, makes relationships visible and offers a best possible decision base to the qualified user for the determination of the very complex processes of reinforcement corrosion and for an appropriate maintenance design.

The following data can be measured, inserted, displayed, assessed and presented:

- general data of the structure (list of administrative data)
- data of structural parts (e.g. concrete composition data)
- layout of reinforcement (interface to HILTI Ferroskan): csv, bmp
- minimum concrete cover (interface to HILTI Ferroskan): csv
- **open circuit potential**: manually, **online**, csv-import
- **surface resistivity**: manually, **online**, csv-import
- **surface temperature**: manually, **online**, csv-import
- carbonation depth (vs. 2 indicators)
- chloride content (in up to 5 layers of scalable thickness)
- concrete humidity (in up to 5 layers of scalable thickness)
- rebound values by Schmidt Hammer (median calculation according to EN 12504-2)
- concrete strength
- concrete delamination (areas per 0.1 m² - 4 quadrants per grid cell)
- spalls (with spall depth, areas per 0.1 m²)
- cracks (with crack width)
- documentation (link of bmp and jpg files)
- information (unformatted comments at all levels)

scope of supply:

- software CITec Survey (single license)
- optional: notebook (make and equipment adjustable) with installed system CITec Survey, under Windows XP or Windows 2000
- electrochemical handheld device for the simultaneous measurement of open circuit potential, surface resistivity and temperature
- multi electrode with sensors for the resistivity and temperature measurement
- Cu/CuSO_{4, sat} reference electrode (CSE)
- telescopic bar for handheld device and multi electrode (1,0 - 2,8 m)
- cable connections
 - handheld device - multi electrode
 - multi electrode - reinforcement connection
 - notebook - handheld device
- current grip for the reinforcement connection
- digital multimeter for the verification of the reinforcement connectivity
- dish and water reservoir for moistening the sensors of the multi electrode
- 2 spray indicators for measuring the carbonation depth
- 2 documentation cards
- transport case

optional (in preparation) :

- software CITec PocketSurvey (single license)
- PDA (make and equipment adjustable) with installed CITecPocketSurvey, under Windows CE
- protection case for PDA
- additional battery for PDA

assessment:

- relationship of open circuit (half cell) potentials using **3 different reference systems** (CSE_{sat}, Ag/AgCl_{sat}, SCE)
- offset from the calibration of the reference electrode used
- temperature compensation of the resistivity measurements (in preparation)
- **data comparison** of a parameter at different measurement times (differential graphics)
- assessment of the **corrosion risk caused by chloride** by the cumulative frequency of the open circuit potentials of an inspection
- assessment of the **corrosion risk caused by carbonation** by superposition of c_{min}, carbonation depth and surface resistivity
- sum of structural damage (categorized areas and length of delamination, spalls and cracks) for **quantity calculations** and tracing of damage improvement
- free adjustable intervals and colour selection for the graphical displays

data presentation:

- spreadsheet style summary and documentation for projects (structures), sections (structural parts) and inspections (time-dependent data)
- grid (60 x 60 cm based) with
 - visualized, scaled top reinforcement layer
 - all numerical data (selectable)
 - bargraph display per grid cell for chloride and humidity profile
 - structural damage (selectable)
- contour graphics (2D, 3D) for
 - reinforcement density [m² per grid cell]
 - average and minimum concrete cover
 - minimum concrete cover from detection scan or manual input
 - open circuit potentials
 - surface resistivity
 - surface temperatures
 - chloride content and humidity per selected depth layer
 - carbonation depth
 - rebound values by Schmidt-Hammer and concrete strength
- spreadsheet style summary of all different parameter data for selected grid cells per inspection (e.g. concrete cover, open circuit potential, surface resistivity, carbonation depth, chloride profile)