

# FC 1 FIELD CELL FOR CORROSION MEASUREMENTS ON SITE

When corrosion tests on site are required, the object usually is a pipe, a vessel or any kind of metallic wall. To measure its corrosion behaviour, without destroying it, you need a special corrosion cell, which allows to use the wall material directly as working electrode of your system.

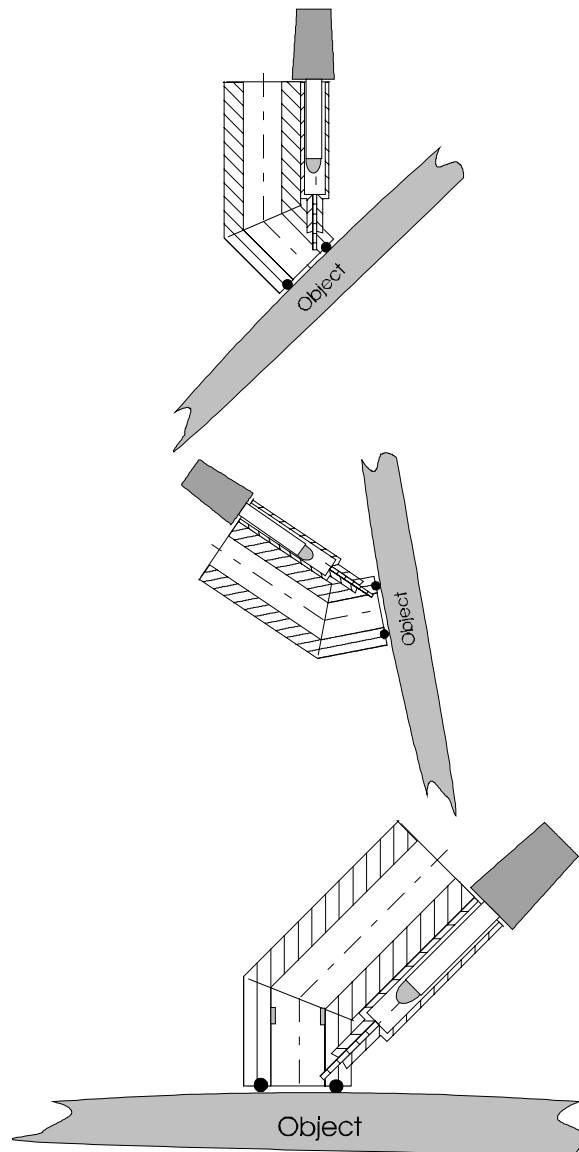
The FC 1 Field Cell is a special cell for corrosion tests on site. Its small size and the novel shape gives access to walls at any angle between  $-110^\circ$  and  $+110^\circ$ .

The cell is made of perspex, so you see what is developing inside. A magnetic vice is used to keep the cell in place when working on ferritic steels. For work on other metals, a vacuum vice is available to clamp the cell to smooth surfaces. Only on very rough surfaces, the cell needs silicon rubber sealing.

The platinum counter electrode is mounted within the cell, the reference electrode is separated in an attached container. A fine frit between reference electrode container and the bulk solution acts both as salt bridge and Haber - Luggin capillary, as its tip ends close to the wall which is used as working electrode.

## Technical data:

Overall length:	ca. 75 mm
Diameter:	50 mm
Measured area:	2 cm <sup>2</sup>
Reference electrode	AgCl
Counter electrode:	Pt



No problems with vertical or curved walls!

## General

The Field Cell FC1 can be mounted at any wall provided its surface is flat enough (e.g. pipe radius  $> 80$  mm), and the angle of deflection to the horizontal plane is not beyond  $105^\circ$ .

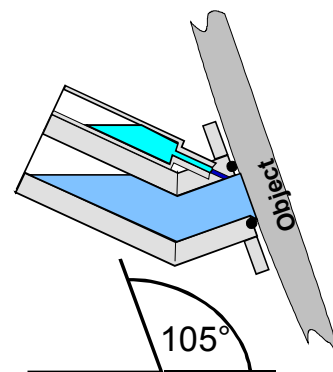
Clean the wall surface (unless the state of the surface is to be demonstrated) according to the electrochemical process you want to perform.

Attach the cell (see below).

Fill the reference electrode compartment with salt water (recommended: 1 M KCl) before inserting the reference electrode. Be sure not to bring salt water into the main compartment. Note: The neck of the reference electrode is fragile. A piece of filter paper wrapped around it before inserting it into its compartment protects the neck.

Then fill the main compartment with the electrolyte which shall be used for the experiments.

Connect the counter electrode cable to the 4 mm banana terminal of the field cell, the reference electrode cable to the reference electrode and the working electrode cable to the wall which is to be measured.



## Mounting the Field Cell on magnetic materials:

Clamp the brass bolt of the cell to the magnetic clamp stand. Attach the stand to the wall which shall be measured. Turn the magnet switch to fix the clamp.

The arms of the clamp are fixed by turning the black big clamp screw clockwise.

Use the Viton - O - ring to prevent leakage at the bottom of the cell.

**Note:** On very rough or curved surfaces, it may be recommended to seal the cell bottom by a silicon rubber paste annulus instead of using the Viton O ring.

## Mounting the Field Cell on non - magnetic materials:

Provide an annulus of silicon rubber paste around the cell bottom hole on the perspex mounting ring.

Press the cell to the wall which shall be measured and fix it there using e.g. scotch tape. Wait until the silicon paste has cured. Rinse the cell with clean water several times to remove monomers which may be residuals from the silicon curing process.

The face of the bottom plate of the cell can be used to fix the cell using plasticine or similar soft materials.

## Cleaning the Field Cell FC1:

Use clean water and usual detergents to clean the cell immediately after use. If the MgO frit becomes "cloggy", immerse the lower part of the cell for some hours in warm distilled water ( $T$  max  $50^\circ\text{C}$ ).

The counter electrode banana terminal is only slightly screwed into the cell: You can remove it if acids shall be used to remove rust layers or other oxides.

