Corrosion cells

Descriptions and specifications

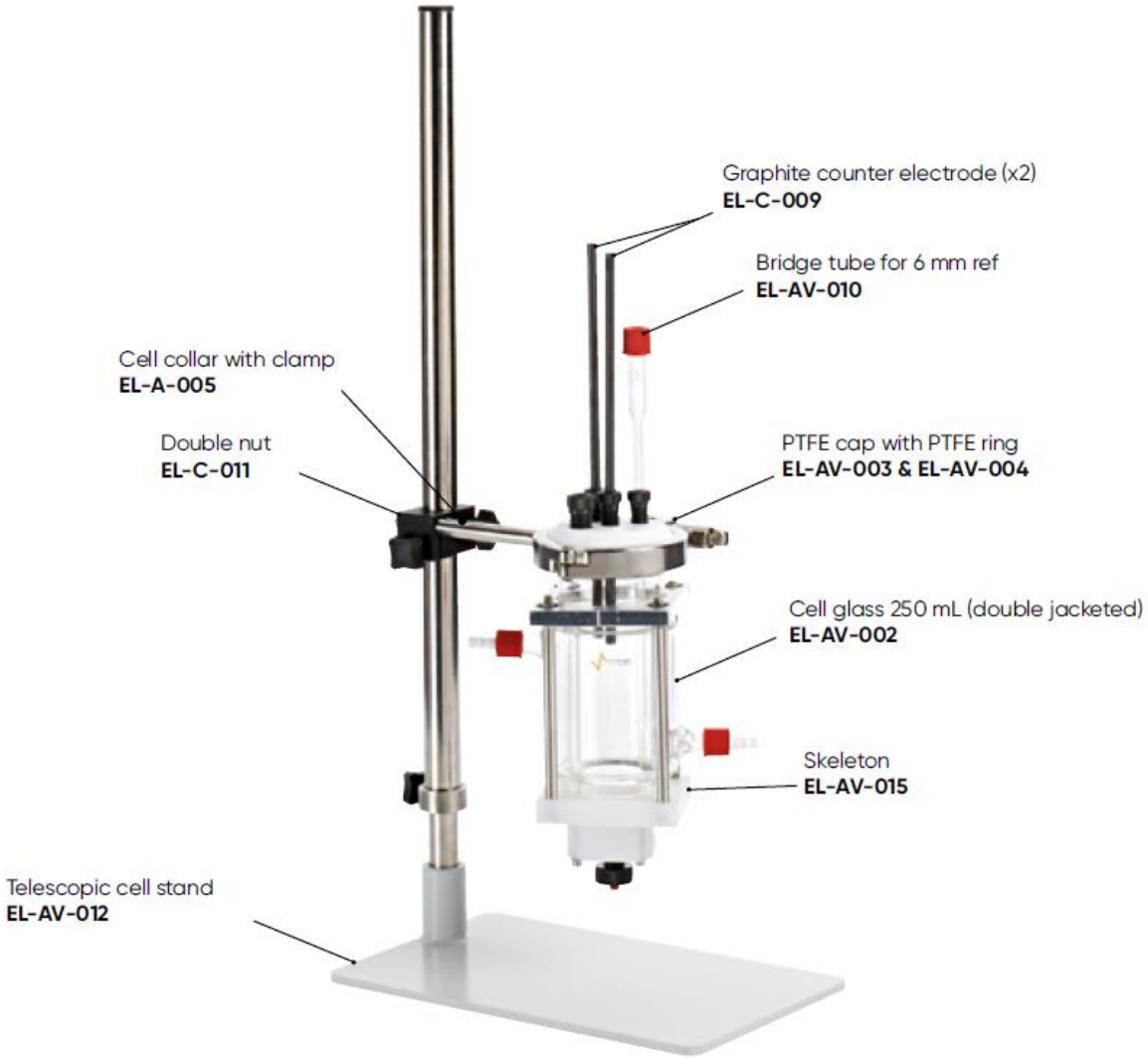
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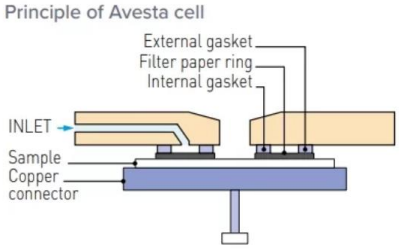
1. Avesta cell "EL-AVESTA"

1.1. Description

The Avesta Cell is an electrochemical cell developed for pitting corrosion testing (ASTM G150).



It is designed to avoid micro crevice corrosion formed between the working electrode and the gasket at the bottom aperture of the cell. A filter paper ring placed between the sample and the gasket is flooded by distilled water in order to eliminate crevice corrosion. The water flow is controlled by a peristaltic pump (EL-AV-008) which delivers 0.5 to 5 mL/h.



- **Sample size**
  - Min diameter: 30.5 mm
  - Max. thickness: 6 mm

- **Cell size with cap and without graphite electrodes, bridge tube and corks**
  - 90 x 90 x 190 mm
  - Volume: 250 ml

1.2. Kit content and spare parts

	Catalog n°
Avesta cell kit	EL-AVESTA

- **Content**

	Catalog n°
Double jacketed cell glass 250 mL	EL-AV-002
PTFE cap 5 holes	EL-AV-003
O-ring PTFE silcone encapsulated	EL-AV-004
Cell collar with clamp	EL-A-005
Double purge tube	EL-AV-006
Filter paper ring (100 pieces)	EL-AV-007
Graphite counter electrode rods (2 pieces) ρ = 1.070 µΩ cm	EL-C-009
Bridge tube for RE 6 mm	EL-AV-010
Double nut	EL-C-011
Telescopic cell stand	EL-AV-012
Skeleton	EL-AV-015

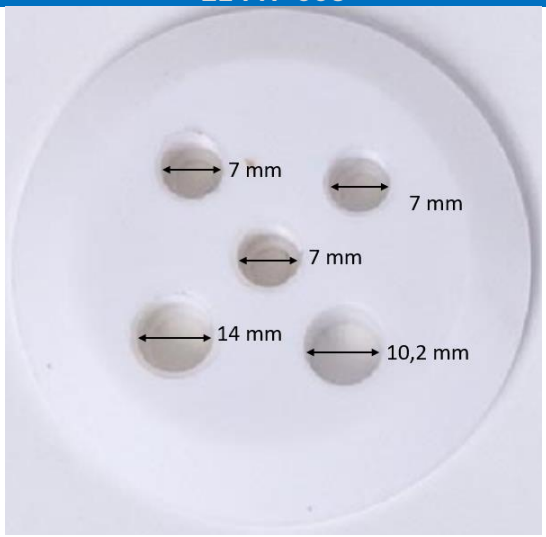
- **Options**

	Catalog n°
Peristaltic pump for low flow	EL-AV-008
Bridge tube for reference electrode with OD of 8 mm	EL-AV-013
Single purge tube	EL-AV-014
Temperature probe PT100	EL-C-014
Set of 10 porous frit (4 mm CoralPor™) with PTFE heat shrink (200 mm)	092-VYC4

The reference electrode must be purchased separately. CoralPor is a porous glass frit like Vycor.

1.3. Cap specifications

EL-AV-003

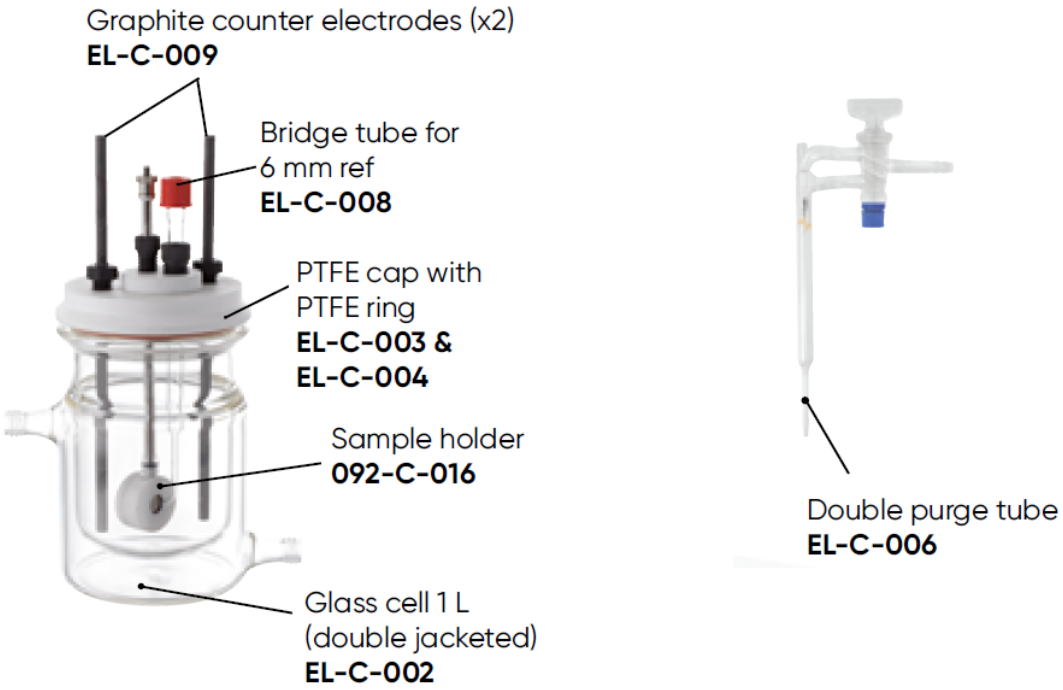


- **Cap specification**
  - Height: 20 mm
  - Diameter: 90 mm
  - Material: PTFE

2. Standard corrosion cells "EL-CORR"

2.1. Description

The standard corrosion cell is a one-liter cell that can accommodate oversized samples and is specially designed for uniform corrosion experiments.



The standard corrosion cell is available with a single or double jacket glass cell for temperature control. It is provided with two graphite rods to be used as counter electrodes, a bridge tube, to ensure the minimum distance between the reference and the working electrode, and purge tubes, to maintain a controlled gaseous environment.

Two kits are offered: a standard one and a complete one with telescopic cell stand, sample holder and double purge tubes. More details are given in the specifications.

The reference electrode must be purchased separately.

- **Sample size**
  - Sample holder 1 cm^2
  - Max sample thickness 3.4 mm
  - Max diameter 14.6 mm

- **Cell size without electrodes and bridge tube**
  - single jacketed (without cap) – height: 185 mm – diameter: 120 mm
  - Double jacketed – height: 207 mm – diameter: 140 mm
  - Cap – diameter: 120 mm – height: 20mm

2.2. Kit content and spare parts

	Basic corrosion cell kit EL-CORR-1	Complete corrosion cell kit EL-CORR-1DJ
Glass cell 1 L	EL-C-001	EL-C-002 (double jacketed)
PTFE cap	EL-C-003	
PTFE ring, silicon encapsulated, OD 102 mm	EL-C-004	
Cell collar with clamp	EL-C-005	
Graphite counter electrode rod (2 pieces) ρ = 1.070 µΩ cm	EL-C-009	
Bridge tube for 6 mm diameter reference electrode	EL-C-008	
Purge tube	EL-C-016	-
Double purge tube	-	EL-C-006
Double nut 25 mm and 12 mm diameter	-	EL-C-011
Telescopic cell stand	-	EL-C-012
Sample holder 1 cm^2 (max sample thickness 3.4 mm and max diameter 14.6 mm)	-	092-C-016

➢ **Options**

	Basic corrosion cell kit EL-CORR-1	Complete corrosion cell kit EL-CORR-1DJ
Bridge tube for 8 mm diameter reference electrode	EL-C-017	
PT100 probe (indicate connector type)	EL-C-014	
Magnetic stirrer & heater, without PT100 probe 200V	EL-C-015A	
Magnetic stirrer & heater, without PT100 probe 11V	EL-C-015B	
Aluminum base holder for magnetic stirrer and 1 L cell vial	EL-C-018	
Set of 10 porous frits (4 mm CoralPor™) with PTFE heat shrink (200 mm)	092-VYC4	

The reference electrode must be purshased separately.

CoralPor is a porous glass frit like Vycor.

2.1. Cap specifications



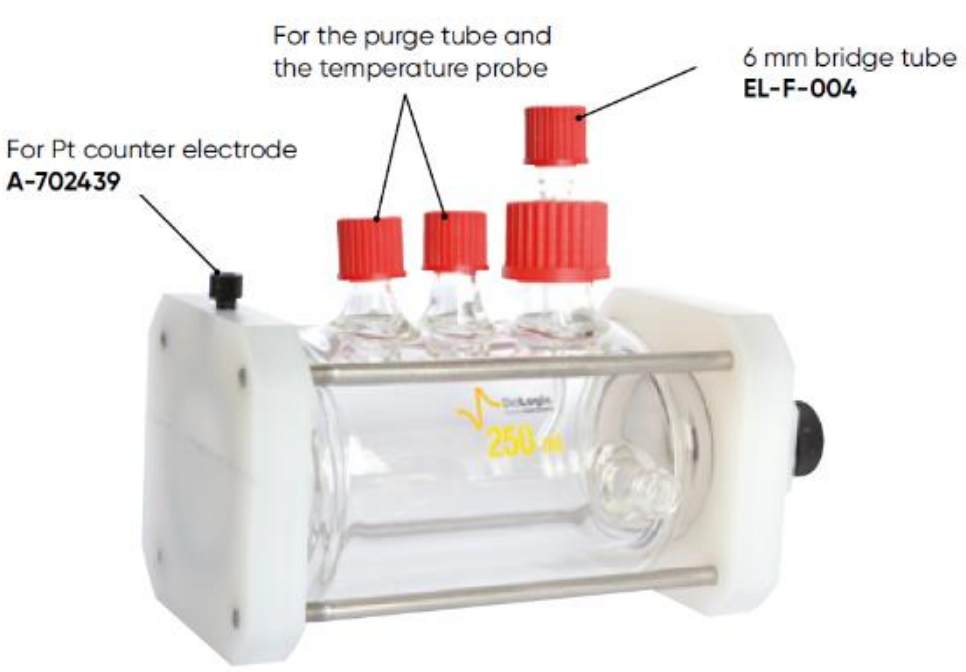


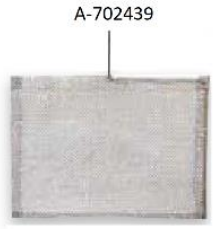


3. Flat cells "EL-FLAT"

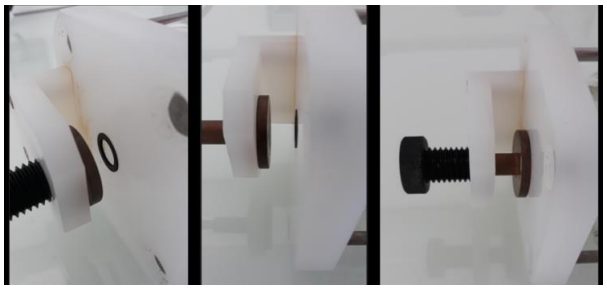
3.1. Description

A cell designed for studying corrosion on flat samples. The flat cell is a double-jacketed 250 mL cell designed to perform standard corrosion experiments on large flat samples of any size with a maximum thickness of 1 cm. The exposed area can be 1 or 10 cm².









This cell has a double jacket for temperature control and three holes for reference electrodes, purge tubes and temperature probes, with an inner diameter of 17.6 mm and the two others of 8.3 mm.

- **Sample size**
  - 30.5 mm min. diameter (EL-FLAT-1CM)
  - 40.5 mm min. diameter (EL-FLAT-10CM)
  - 6 mm max thickness

- **Cell size (HxWxD):** 90 x 205 x 90 mm (height with bridge tube: 180 mm)

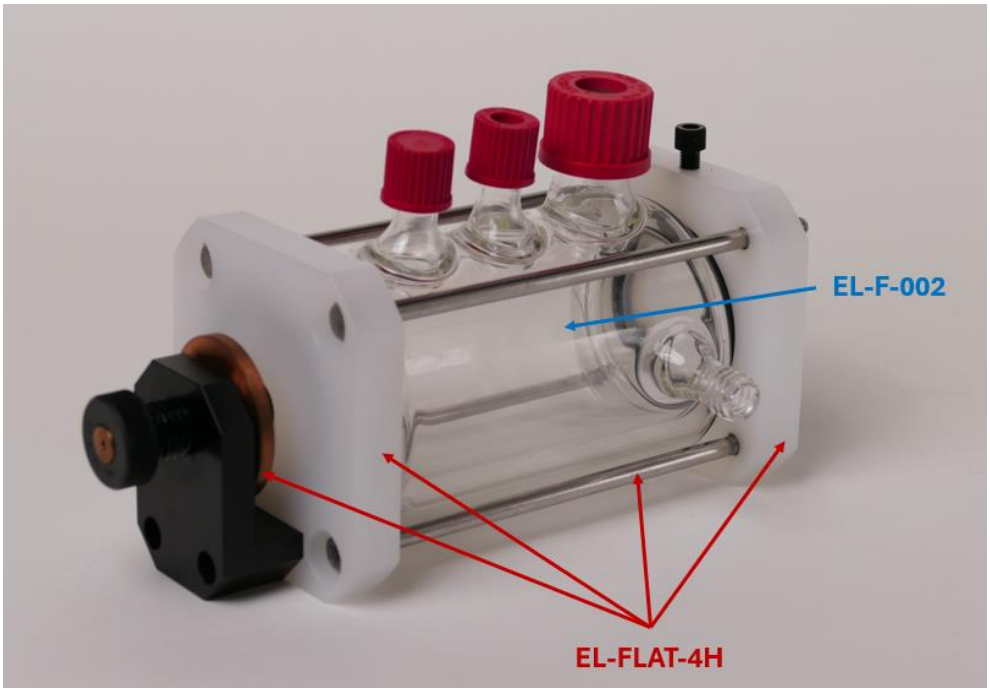
3.2. Kit content and spare parts

➢ **Glass kits**

	Flat cell 1 cm² EL-FLAT-1CM	Flat cell 10 cm² EL-FLAT-10CM
Platinum gauze counter electrode	A-702439	
Bridge tube for ref. electrode (6 mm diameter)	EL-F-004	
Glass cell for flat cell (250 mL) Double jacketed.	EL-F-002	
Mechanical parts	EL-FLAT-3H	EL-FLAT-4H

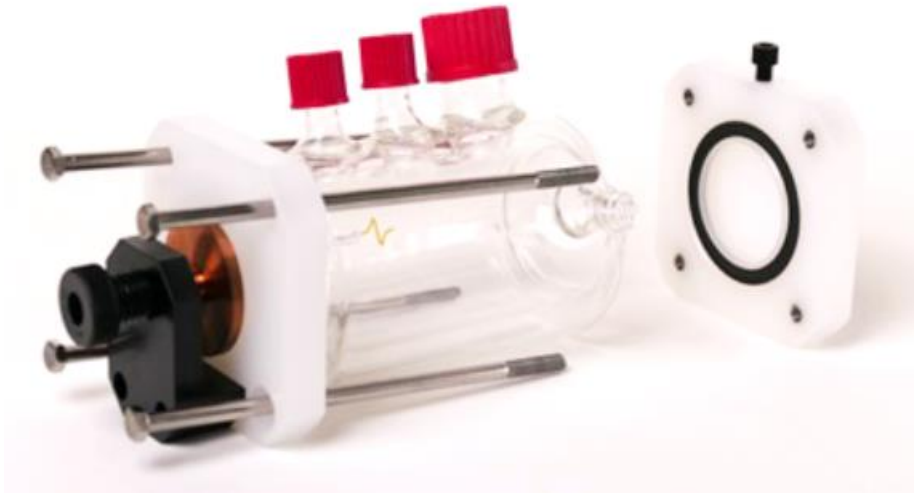
➢ **PVDF kits**

	Flat cell 1 cm² EL-FLAT-1CM-PVDF	Flat cell 10 cm² EL-FLAT-10CM-PVDF
Platinum gauze counter electrode	A-702439	
Bridge tube for ref. electrode (6 mm diameter)	-	
Glass cell for flat cell (250 mL) Double jacketed.	EL-F-PVDF	
Mechanical parts	EL-FLAT-3H	EL-FLAT-4H



3.3. Assembly

Check that the seals are correctly seated in their seats on each PTFE part. Place the glass cell body against the sample holder (fitted with its copper press). Insert the screws into the dedicated perforations.



Place the platinum mesh counter-electrode in the end of the PTFE cell (the one without the copper press). The stem of the counter-electrode should protrude through the black plastic insert.





Position the bottom of the cell with the platinum counter-electrode against the glass cell body, which must fit into the grooves of each PTFE part. Tighten the screws until the cell is closed and the seals are compressed. Be careful to not overtighten.





Unscrew the larger red perforated plug from the cell's upper ducts. Insert plug and gasket around bridge tube and insert the tube into his conduit.



Screw the red perforated plug back onto its thread.



The cell is now ready to use.

4. Galvanic cells "EL-GAL"

4.1. Description

This cell allows to have two large metallic samples as working electrodes and to perform experiments such as Evans diagram or galvanic corrosion current determination.



This cell is based on the same design as the Flat Cell. Instead of having one working electrode and graphite rod as a counter electrode, this cell allows to have two different materials at each end of the cell. The exposed area can be 1 or 10 cm^2, independently on each side. Using this cell all the investigations around galvanic corrosion can be performed: Evans diagram, galvanic potential and current measurements, galvanic I vs. E characteristic…

- **Sample size**
  - Min diameter: 30.5 mm (EL-GAL-1); 40.5 mm (EL-GAL-10)
  - Max. thickness: 6 mm

- **Cell size (HxWxD): 90 x 240 x 90 mm (height with bridge tube: 180 mm)**

4.2. Kit content and spare parts

	Content:	Catalog No.
Galvanic cell of 1 cm^2	• EL-FLAT • 092-FLAT/1	EL-GAL-1
Galvanic cell of 10 cm^2	• EL-FLAT-2 • 092-FLAT/10	EL-GAL-10

5. Coating cell EL-COAT

5.1. Description

This simple cell is designed to perform electrochemical experiments on large, coated samples, with no restriction of sizes.



A part of the working electrode must be outside of the nylon base in order to connect the sample to the potentiostat (electrical contact with alligator clip). Because of the short length of the reference electrode, it is recommended to use a bridge tube if the volume of solution inside the Coating Cell is lower than 50 mL.

➢ **Specifications**

- Vial volume: 50 mL
- Active area: 1 cm^2, 3 cm^2 and 10 cm^2
- Sample size: square sample with a side length higher than L_{min} = 6 cm
- Materials: Nylon base and glass cell
- Material: The O-ring is made of NITRILE (NBR). This material is widely used in laboratory applications. It has a better resistant against acids, oils and solvents than natural rubber or silicone and it's stronger too.
- Cell size: Height 96 mm – diameter: 54,2 mm (inner diameter: 41,2 mm)

5.2. Kit content and spare parts

	Catalog No.
Coating Cell Kit	EL-COAT

➢ **Content**

	Catalog No.
Glass for Coating cell	EL-P-002
Nylon base with three feet	EL-P-003
Rubber cup with two holes	EL-P-004
Metallic clamp	EL-P-005
O-ring for Coating Cell	EL-P-006
Graphite rod counter electrode (L 145 mm, OD 6 mm)	EL-P-009

➢ **Options**

	Catalog No.
Ag/AgCl reference electrode (OD = 6 mm)	A-012167
Bridge tube for 6 mm reference electrode	EL-P-008
Mask for 1 cm^2 (20 units)	EL-P-011
Mask for 3 cm^2 (20 units)	EL-P-012
Mask for 10 cm2 (20 units)	EL-P-013

6. Plate material evaluating cells

6.1. Description

A simple easy-to-use cell to study large plate samples up to 1 cm^2. This quite handy cell is developed to evaluate plate material such as metal, semi-conducting plate, etc. In evaluation, a sample plate is sandwiched between cell blocks.



➢ **Specifications**

- Applicable plate dimensions:
  - width: from 10 to 23 mm
  - length: approximately 25 mm (depends on the connection way)
  - thickness: until 3 mm

- Liquid contact area:
  - approximately 7.8 mm
  - (It is the inner diameter of the O-ring (ID: 7.8 mm). Due to the deformation when squeezed between the blocks, the area will vary slightly.)

- Material: Teflon

6.2. Kit content and spare parts

	Catalog No.
Plate material evaluating cell	A-011951

➢ **Content**

	Catalog No.
PTFE cell (body &base)	included
O-ring	included
Screw 20 mm	included
Purging tube, 1 m	included
Pt counter electrode	A-002222

➢ **Options**

	Catalog No.
O-rings (10 pieces)	A-012022
RE-1B Reference electrode Ag/AgCl for aqueous electrolyte	A-012167
RE-7N Ag/Ag+ Reference electrode for non-aqueous electrolyte	A-013848

6.3. Assembly

The assemble will be shown below, where each step will be explained with the photo switches.

1 - Prepare the required parts.



2 - Set the plate on the bottom Teflon block.



3 - Set the Teflon block which contains the o-ring over the plate, and tight the screw left/right uniformly (the surface of the plate in contact with the solution will depends of the inner diameter of the o-ring)



4 - Confirm whether the plate is fixed adequate, and fill with the electrolytic solution (approximately 1 mL).



5 – Set the counter electrode and a reference electrode on the battery cover, then fix it to the cell. The Pt counter electrode, from the kit is a little long, please wind before use.



6 - Do the connection using the alligator clip.

