Corrosion Cells

Description

Metrohm Autolab

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1 – 1 L Corrosion Cell

The 1 L corrosion cell has been designed according to ASTM standards (e.g., G5, G59, G61), the sample holder can fit samples with a diameter between 14.7 and 16 mm and a thickness between 0.5 and 2 mm. The exposed surface area is 1.0 cm^2. The holder is made of Polypropylene (PP) with a seal of rubber.

1.1 – Presentation and part list

The cell has the following positions available: One position for the sample holder, two positions for the Stainless steel counter electrode holders, one position for the thermometer, one position for the gas in- and outlet, and finally one position for the Luggin capillary and the reference electrode (see Figure 1).

Figure 1 – Overview of the 1 L corrosion cell

Carefully unpack the cell and the accessories supplied with it and make sure all parts are present.

Carefully inspect all parts for damage. If damage is observed on any parts, please contact Metrohm Autolab for a replacement.

Warning

Never use damaged glass parts! It can cause injury.

Table 1 provides a list of items included with the 1 L corrosion cell.

Table 1 – Overview of the items included with the 1 L corrosion cell

Item code	Description
CORR.1LCELL.S	Complete 1 L corrosion cell
6.0733.100	Single junction Ag/AgCl reference electrode
CORR.1LSTL	Stainless steel (SS 316) counter electrode (2)
6.1241.030	Counter electrode holder (2)
CORR.THERM	0-150 °C thermometer
CORR.1LHLD	Polypropylene sample holder
CORR.1LMSH	Mount for sample holder
CORR.1LVESSEL	Corrosion cell vessel (one liter)
CORR.1LLUG	Luggin capillary
CORR.1LBJ	Ball joint for Luggin capillary
CORR.1LCLMP	Stainless steel clamp for ball joint
CORR.1SEAL	Rubber sample seal (set of 2)

CORR.1LRNG	Polypropylene locking ring
GAS.INLET.FRIT	Gas inlet/outlet
6.2106.020	Cable with two banana plugs
4.739.0230	Metrohm open top cap
CORR.GL14	Open top cap size 14 (3)
CORR.GL32	Open top cap size 32
CORR.TB	Water bath tube connection

1.2 – Glass cell vessel

The jacketed cell vessel has a content of one liter. There is an inlet and an outlet present for water or other heating or cooling liquid. On the top side of the vessel there is a position available for the Polypropylene (PP) sample holder and a small drain is available to empty the cell.

1.3 – Ag/AgCl reference electrode

The reference electrode is filled with 3 M KCl solution. Please make sure that the electrode contains enough solution during the measurement. This electrode is connected to the blue banana plug (RE) of the cell cable. The electrode should be placed inside the capillary. The Luggin capillary is fitted with a spherical ball joint which allows positioning of the capillary tip with respect to the sample holder.

Please make sure that when mounting the sample holder, the position of the Luggin capillary is such that the tip of the capillary is located directly in front of the sample holder.

The standard reference electrode potential is 210 mV ± 5 mV with respect to the Standard Hydrogen Electrode (SHE).

Other reference electrodes can be used in combination with the corrosion cell. Please contact your Autolab distributor for more information.

1.4 – Stainless steel counter electrodes

The stainless steel counter electrodes can be inserted in the supplied electrode holders. The electrode diameter is 2 mm. The two electrodes are connected by a short lead. The cell cable of the Autolab is then connected with one of the two electrodes. The standard counter electrodes delivered with the cell are made from SS316.

The counter electrode holders are made of Polypropylene (see Figure 2).

Note

Glassy Carbon counter electrodes are also optionally available.

The stainless steel rods are replaceable with Glassy Carbon rods (GC.ROD.90) while the same electrode shafts can be used.

Figure 2 – Counter electrode holder

1.5 – Polypropylene sample holder

The sample holder is made of Polypropylene (PP). This is a lightweight, low-friction, and wear-resistant material with good physical and processing properties and capable of operating in temperatures more than 90 degrees Celsius.

The chemical resistance table of PP is provided at the end of this document. Please consult this table carefully before exposing the sample holder to a solution.

The sample holder [1] is used to mount the small flat metal sample on which corrosion analysis needs to be performed (see Figure 3). The sample can be mounted and unmounted by removing the locking ring [3] by hand. Two rubber seals [2] and [3] are used to limit the exposed surface of the sample [4] to 1 cm^2.

The sample holder can fit samples with a diameter between 14.7 and 16 mm and a thickness between 0.5 and 2 mm

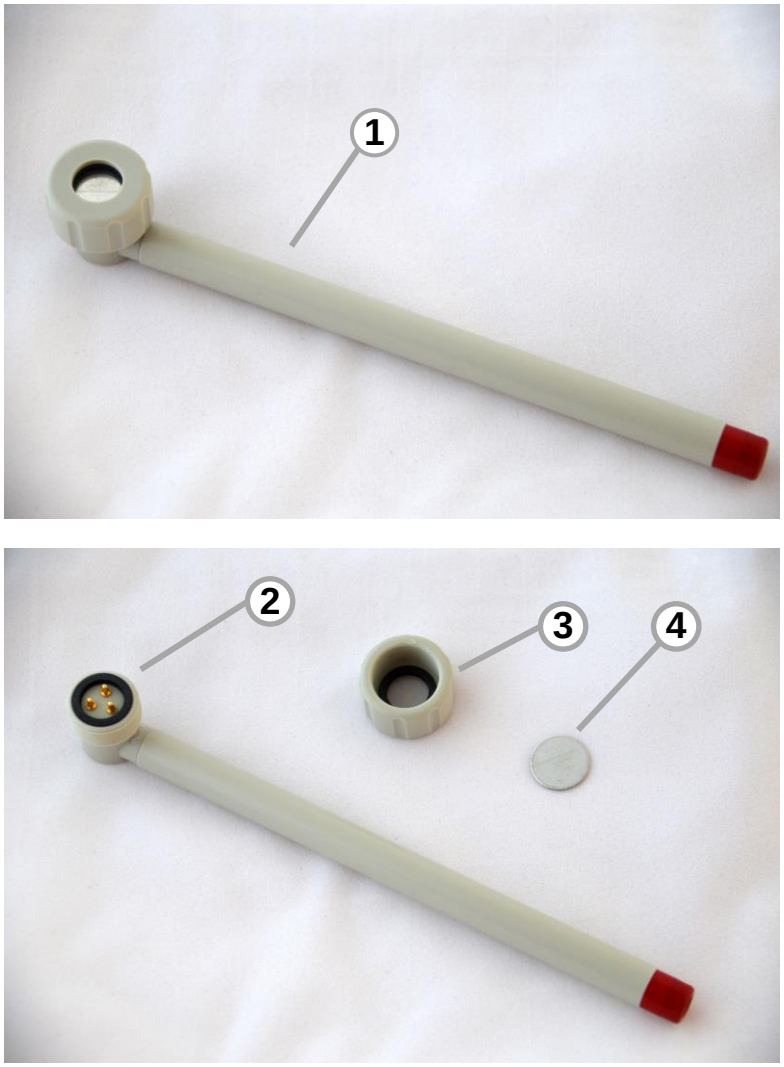

Figure 3 – Overview of the sample holder and the mounting/unmounting procedure

The sample holder can then be placed into the cell in such a way that the distance between the sample and the Luggin capillary is minimized. Connection to the

sample is made by connecting the WE cable of the Autolab to the sample holder. On delivery the sample holder contains one test sample[1].

1.6 – Thermometer

On the top of the cell lid one space is available to place a thermometer.

1.7 – Gas inlet

A gas inlet with valve is standard supplied with the cell. The valve can be used to purge through the electrolyte or to cover the liquid with a Nitrogen blanket.

[1] The test-sample is made of Sn coated steel. The test procedure for this sample is a potential scan from - 0.2 V vs the open circuit potential to + 0.1 V vs the open circuit potential, with a sweep rate of 1 mV/s in a 0.1 M KCl solution at room temperature. The resulting curve should give a polarisation resistance of approximatively 300 Ω

2 – 400 mL Corrosion Cell

The 400 mL corrosion cell has been designed for most corrosion experiments. The sample holder can fit 14 mm diameter samples. The exposed surface area is 0.785 cm^2. The holder is made of Polyoxymethylene (POM) with a seal of PTFE.

2.1 – Presentation and part list

The cell has the following positions available: two for the Stainless steel counter electrode holders, one for the thermometer, one for the gas in- and outlet, and one for the Luggin capillary and the reference electrode (see Figure 4).

Figure 4 – Overview of the 400 mL corrosion cell

Carefully unpack the cell and the accessories supplied with it and make sure all parts are present.

Carefully inspect all parts for damage. If damage is observed on any parts, please contact Metrohm Autolab for a replacement.

Warning

Never use damaged glass parts! It can cause injury.

Table 2 provides a list of items included with the 400 mL corrosion cell.

Table 2 – Overview of the items included with the 400 mL corrosion cell

Item code	Description
CORR.CELL.S	Complete 400 mL corrosion cell
6.0733.100	Single junction Ag/AgCl reference electrode
CORR.STEEL	Stainless steel (SS 316) counter electrode (2)
6.1241.030	Counter electrode holder (2)
CORR.THERM	0-150 °C thermometer
CORR.HOLD	Polyoxymethylene sample holder
CORR.CAP	Corrosion cell lid
CORR.VESSEL	Corrosion cell vessel (400 milliliter)
CORR.CLAMP	Stainless steel clamp
CORR.LUGG	Luggin capillary
CORR.GAS	Gas inlet/outlet
CORR.GL14	Open top cap size 14 (3)
CORR.TB	Water bath tube connection (2)

CORR.GL32	Open top cap size 32 (2)
6.2106.020	Cable with two banana plugs
CORR.SILC	Silicon O-ring

Note

A Polyvinylidene difluoride (PVDF) sample holder is available on request (CORR.HLD.PVDF).

2.2 – Glass cell vessel

The jacketed cell vessel has a content of 400 milliliter. There is an inlet and an outlet present for water or other heating or cooling liquid. On the side of the vessel there is a position available for the Polyoxymethylene (POM) sample holder and a small drain to empty the cell.

2.3 – Glass cell lid

The cell lid has the following positions available:

- Two for the stainless steel counter electrode holders
- One for the thermometer
- One for the gas in- and outlet
- One for the Luggin capillary and the reference electrode

Note

It is possible to apply some Vaseline on the rim of the corrosion cell to make it air tight.

2.4 – Steel clamp

The stainless steel clamp can be used to keep the cell lid in its position on top of the cell vessel.

2.5 – Ag/AgCl reference electrode

The reference electrode is filled with 3 M KCl solution. Please make sure that the electrode contains enough solution during the measurement. This electrode is connected to the blue banana plug (RE) of the cell cable. The electrode should be placed inside the capillary. The Luggin capillary can be positioned in height with respect to the working electrode.

Please make sure that when mounting the sample holder that the position of the Luggin capillary is such that the tip of the capillary is located directly in front of the sample holder.

The standard reference electrode potential is 210 mV ± 5 mV with respect to the Standard Hydrogen Electrode (SHE).

Other reference electrodes can be used in combination with the corrosion cell. Please contact your Autolab distributor for more information.

2.6 – Stainless steel counter electrodes

The stainless steel counter electrodes can be inserted in the supplied electrode holders. The electrode diameter is 2 mm. The two electrodes are connected by a short lead. The cell cable of the Autolab is then connected with one of the two electrodes. The standard counter electrodes delivered with the cell are made from SS316.

Note

Glassy Carbon counter electrodes are also optionally available.

The stainless steel rods are replaceable with Glassy Carbon rods (GC.ROD.145) while the same electrode shafts can be used.

The counter electrode holders are made of Polypropylene (see Figure 5).

Figure 5 – Counter electrode holder

2.7 – Polyoxymethylene sample holder

The sample holder is in POM (Polyoxymethylene), or Delrin as it is known commercially. This is a lightweight, low-friction, and wear-resistant thermoplastic material with good physical and processing properties and capable of operating in temperatures more than 90 °C.

The chemical resistance table of POM is provided at the end of this document. Please consult this table carefully before exposing the sample holder to a solution.

The sample holder is used to mount a metal sample on which a corrosion analysis needs to be performed. The sample holder can be disassembled by removing the screw on one side and taking out the contact pin. The sample can be placed in the holder itself, on top of the Viton O-ring that is present at the end of the holder. The contact pin can be placed back and tightened with the screw. A spring mechanism inside the pin ensures that the pressure on the sample is such that leakage is avoided. The sample holder can then be placed into the cell in such a way that the distance between the sample and the capillary is minimized. Connection to the sample is made by connecting the WE cable of the Autolab to the sample holder. On delivery the sample holder contains one test sample. The diameter of the sample is 14 mm. The surface area exposed to the solution is 0.785 cm^2.

The test-sample is made of Sn coated steel. The test procedure for this sample is a scan from - 0.2 V vs the open circuit potential to + 0.1 V vs the open circuit potential, with a sweep rate of 1 mV/s in a 0.1 M KCl solution at room temperature.

The resulting curve should give a polarization resistance of approx. 300 Ω.

2.8 – Thermometer

On the top of the cell lid one space is available to place a thermometer.

2.9 – Gas inlet

A gas inlet with valve is standard supplied with the cell. The valve can be used to purge through the electrolyte or to cover the liquid with a Nitrogen blanket.

3 – 250 mL Corrosion Cell

The 250 mL Corrosion cell is designed for general electrochemical corrosion experiments where there are no specific requirements for large volumes of electrolyte. The cell vessel has a thermostatic jacket, and the sample holder can fit samples with a diameter between 14.7 and 16 mm and a thickness between 0.5 and 2 mm. The exposed surface area is 1.0 cm^2. The holder is made of Polypropylene (PP) with a seal of rubber.

3.1 – Presentation and part list

The 250 mL Corrosion cell can accommodate up to six electrodes and accessories (with five standard NS14/15 fittings) such as: One position for the sample holder (special, large opening), counter electrode, reference electrode, thermometer, gas in- and outlet. A complete, recommended cell setup is presented in Figure 6.

Figure 6 – Overview of the complete setup of the 250 mL corrosion cell

For the scope of delivery of the 250 mL Corrosion cell please see Table 3 and the corresponding Figure 7.

The Autolab 250 mL Corrosion cell (CORR250.CELL) includes a 300 mL glass vessel [1] with a thermostatic jacket for temperature control, hose connectors [2] and a lid consisting of an anodized aluminum clamp [3] and a PTFE insert [4] which can be easily removed for cleaning purposes. The lid is clamped on the glass cell by using a removable nylon ring [5] on the cell. To assure a tight fit of the lid on the

glass cell, a Viton O-ring is also included (not shown in Figure 7). Additionally, an Ag/AgCl reference electrode [6], two Stainless Steel counter electrodes with shafts [7], a gas inlet for purging [8], a glass thermometer [9] with adapter [10] and a base with support rod which can be used to fix the cell during the experiment (see Figure 6, not shown in Figure 7) are included.

Carefully unpack the cell and the accessories supplied with it and make sure all parts are present. Carefully inspect all parts for damage. If damage is observed on any parts, please contact Metrohm Autolab for a replacement.

Warning

Never use damaged glass parts! It can cause injury.

Figure 7 – Individual parts (scope of delivery) of the complete setup of the 250 mL corrosion cell

Table 3 provides a list of items included with the 250 mL corrosion cell.

Table 3 – Overview of the items included with the 250 mL corrosion cell

Item code	Description
CORR250.CELL.S	Complete 250 mL corrosion cell
CORR250.LID	Corrosion lid insert including adapter plug and O-ring [4]

CORR.1LHLD	Polypropylene sample holder. To be used with the 250 mL and 1L corrosion cells [11]
6.0733.100	Single junction Ag/AgCl reference electrode [6]
6.1241.030	Counter electrode shafts (2) [7]
CORR.1LSTL	Stainless steel (SS316) counter electrode (2) [8]
RRDE.VESSEL	Corrosion cell vessel, 250 mL [1]
RRDE.CLAMP	Aluminum clamp for fixing the lid [3]
RRDE.RING.NYLON	Lid fixing Nylon ring [5]
RRDE.THERM.ADAPT	Thermometer adapter [10]
RRDE.HOSE.CONN	Hose connection adapters, (2) [2]
GAS.INLET.FRIT	Gas inlet/outlet including stopcock [12]
CORR.THERM	0-150 °C thermometer [9]
62026010	Base plate with support Rod [not shown in figure 7]

3.2 – Glass cell vessel

The jacketed glass cell vessel (RRDE.VESSEL) has a total volume of 300 mL. There is an inlet and an outlet with hose connectors (RRDE.HOSE.CONN) present for water or other heating or cooling liquid circulation. The two hose connectors are identical but, for the most efficient temperature control, it is recommended to

have the inlet at the bottom and the outlet at the upper part of the cell. The scope of the "200 ml" marking is only for information and guidance for the user.

3.3 – Lid

The lid consists of an anodized aluminum clamp (RRDE.CLAMP), a removable PTFE insert (CORR250.LID) includes the adapter for fixing the sample holder in the cell and a Viton O-ring which assures the tightness of the lid mounted on the cell. A nylon ring (RRDE.RING.NYL) is used on the glass cell clamp the on the cell.

Figure 8 – 250 mL corrosion cell lid consisting of: aluminum clamp, PTFE insert, O-ring and Nylon fixing ring

Figure 9 – The sample holder and the corrosion lid insert

The PTFE removable insert has 5 standard SGJ 14/15 inlets which will hold directly and conveniently the Metrohm reference and counter electrodes, the thermometer with the adapter, the gas inlet and any other additional accessories which might be needed for the measurement. The sample holder is fixed in the cell with a special adapter which fits in the large opening of the insert.

Note

The lid of the Autolab 250 mL Corrosion cell is also compatible with the Metrohm titration vessels. Therefore, the Metrohm titration vessels can be also used (6.1415.xxx or 6.1418.xxx) for applications when thermostatic jacket is not needed.

The lid insert of the Autolab RRDE cell is compatible with the lid of the 250 mL Corrosion cell providing additional flexibility for the user[2].

[2] Details of the Autolab RRDE cell are available in the dedicated RRDE cell user manual

3.4 – Polypropylene sample holder

The sample holder is made of Polypropylene (PP). This is a lightweight, low-friction, and wear-resistant material with good physical and processing properties and capable of operating in temperatures more than 90 degrees Celsius.

The chemical resistance table of PP is provided at the end of this document. Please consult this table carefully before exposing the sample holder to a solution.

The sample holder is used to mount the small flat metal sample on which corrosion analysis needs to be performed (see Figure 10). The sample can be mounted and unmounted by removing the locking ring by hand. Two rubber seals are used to limit the exposed surface of the sample to 1 cm^2.

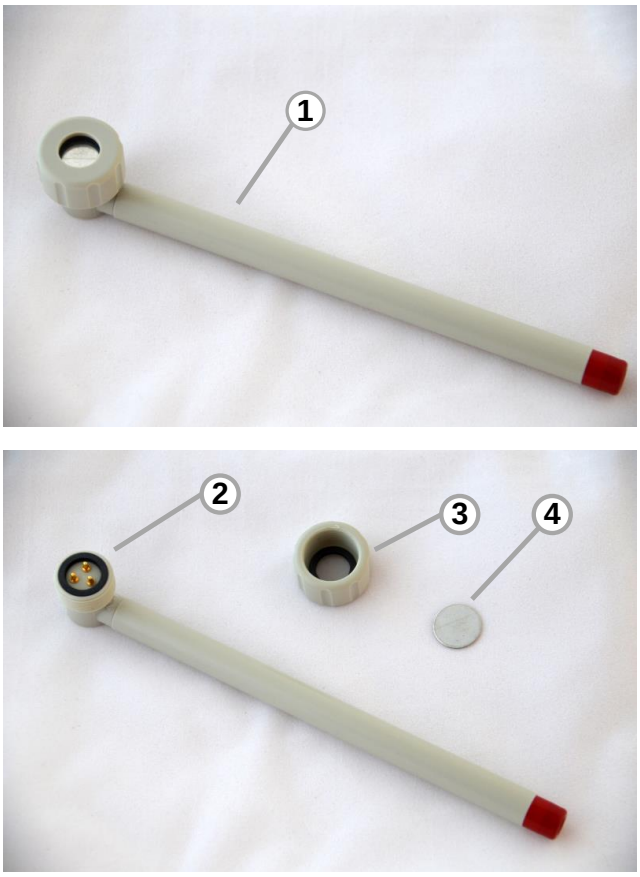

Figure 10 – Overview of the 250 mL and 1L corrosion cell sample holder and the mounting/unmounting procedure

The sample holder can then be placed into the cell in such a way that the distance between the sample and the tip of the reference electrode is minimized. Connection to the sample is made by connecting the WE cable of the Autolab to the sample holder. The sample holder is delivered with one test sample[3].

[3] The test-sample is made of Sn coated steel. The test procedure for this sample is a potential scan from - 0.2 V vs the open circuit potential to + 0.1 V vs the open circuit potential, with a sweep rate of 1 mV/s in a 0.1 M KCl solution at room temperature. The resulting curve should give a polarisation resistance of approximatively 300 Ω.

3.5 – Ag/AgCl reference electrode

The Metrohm reference electrode (6.0733.100) is filled with 3 M KCl solution. Please make sure that the electrode contains enough solution with the correct concentration during the measurement.

The standard reference electrode potential is 210 mV ± 5 mV with respect to the Standard Hydrogen Electrode (SHE).

Other reference electrodes can be used in combination with the corrosion cell. Please contact your Autolab distributor for more information.

Figure 11 – Reference, counter electrode and SGJ 14/15 intermediate sleeves

3.6 – Stainless steel counter electrodes

The stainless steel counter electrodes can be inserted in the supplied electrode holders. The electrode diameter is 2 mm. The two electrodes are connected by a

short lead. The cell cable of the Autolab is then connected with one of the two electrodes. The standard counter electrodes delivered with the cell are made from SS316.

Note

Glassy Carbon counter electrodes are also optionally available.

The stainless steel rods are replaceable with Glassy Carbon rods (GC.ROD.100) while the same electrode shafts can be used.

The counter electrode holders are made of Polypropylene (see Figure 16).

Figure 16 – Counter electrode holder

3.7 – Thermometer

In the PTFE insert of the lid, one insert is available for a glass thermometer (CORR1L.THERM) by using the SGJ 14/15 thermometer adapter (RRDE.THERM.ADAPT).

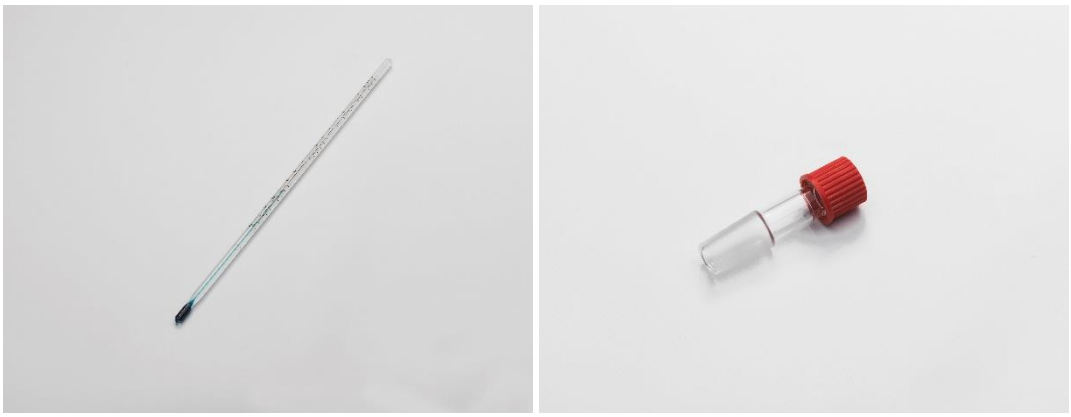

Figure 13 – Thermometer with adapter.

3.8 – Gas inlet

A gas inlet with frit and PTFE stopcock (GAS.INLET.FRIT) is part of the complete 250 mL corrosion cell.

During the purging process, the gas is dispersed through the frit creating microbubbles which assure the most efficient purging of the electrolyte.

The valve can be used switch between purging through the electrolyte and covering the liquid with an inert gas blanket.

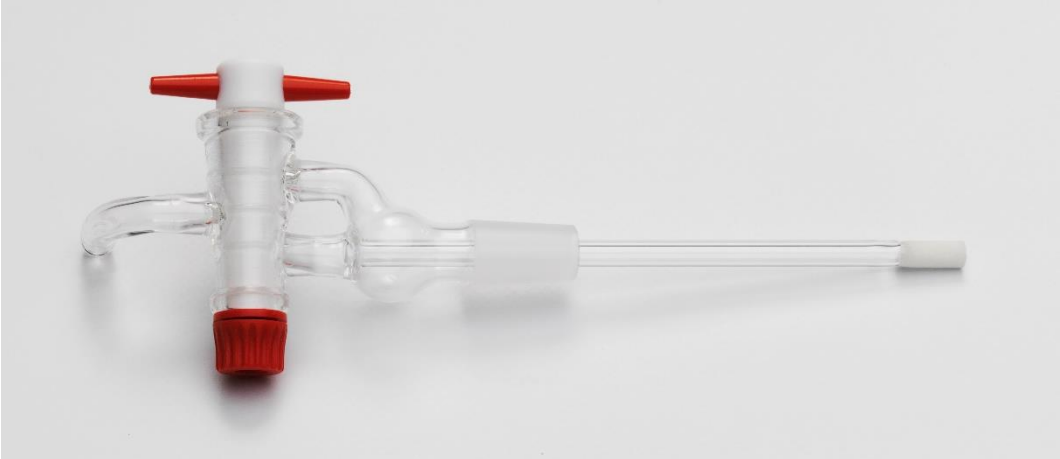

Figure 14 – Gas inlet with frit and PTFE stopcock

Warning

If the gas inlet including PTFE stopcock needs to be cleaned in chemically aggressive media, make sure the red plastic parts and the Viton O-ring are firstly removed from the stopcock.

4 – Flat Sample Platform cell

The Flat Sample Platform cell has been designed to measure corrosion properties of large, flat, coated, or bare metal samples in contact with an electrolyte solution. The flat sample platform cell is compatible with the existing (industry standard) salt-spray chamber samples (e.g., 19 x 10.5 cm Gardobond® type samples)

4.1 – Presentation and part list

The Flat Sample Platform cell consists of a flat cell glass vessel clamped to a PVC holder. Leakage of electrolyte is prevented by using a Viton O-ring. The exposed surface area of the sample is 16.9 cm^2 and the thickness of the sample can be up to 5 mm. The Flat Sample Platform cell is supplied with a large area stainless steel counter electrode and an Ag/AgCl reference electrode (see Figure 16).

Figure 15 – Overview of the Flat Sample Stage cell[4]

[4] the flat sample is not included

Figure 16 shows the scope of delivery of the Flat Sample Platform cell

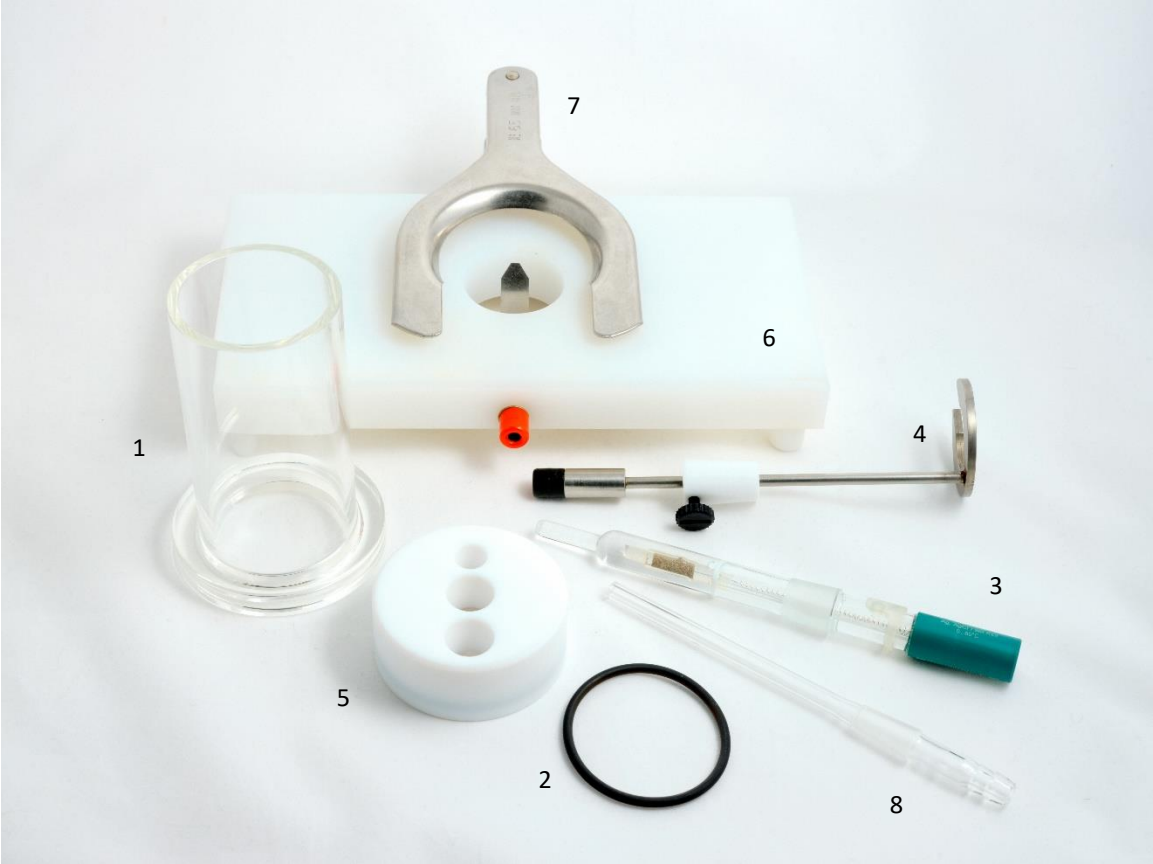

Figure 16 – Individual parts included with the Flat Sample Platform cell

Table 4 provides a list of items included with the flat cell.

Table 4 – Overview of the items included with the Flat Sample Platform cell

Item code	Description
FLAT.PLATFORM.CMPL.S	Complete flat platform cell
FLAT.PLATFORM	Sample platform for large flat samples with 4 mm female banana socket [6]
FLAT.VESSEL	Flat cell vessel with Viton O-ring [1]
FLAT.CLAMP	Clamp for fixing the glass vessel to the flat sample and platform [7]
FLAT.TOP	PTFE lid for the flat cell vessel including adaptor plug for the CE and O-ring [5]
FLAT.COUNTER	Stainless steel (SS 316) counter electrode [4]
FLAT.GAS	Gas inlet [8]
FLAT.RING	Viton O-ring (set of 3) [2]
6.0733.100	Single junction Ag/AgCl reference electrode [3]

4.2 – Glass cell vessel

The glass vessel included in the Flat Sample Platform cell has a diameter of 43 mm [1]. The lower end of the cell is fitted with a 1 cm thick flange. At the bottom of this flange, a groove accommodating a Viton O-ring [2] is located. The diameter of the flange is 68 mm. The diameter of the O-ring located at the bottom of the glass vessel is 52 mm.

4.3 – Ag/AgCl reference electrode

The Ag/AgCl reference electrode [3] is filled with 3 M KCl solution. Please make sure that the electrode contains enough solution during the measurement. This electrode is connected to the blue banana plug (RE) of the cell cable.

The standard reference electrode potential is 210 mV ± 5 mV with respect to the Standard Hydrogen Electrode (SHE).

Other reference electrodes can be used in combination with the corrosion cell. Please contact your Autolab distributor for more information.

4.4 – Stainless steel counter electrode and cell cover

The stainless steel counter electrode [4], is fitted into the PTFE flat cell cover [5] by using a dedicated NS14/15 adapter. The counter electrode is located close to the working electrode. The counter electrode connection is a 4 mm banana plug to which the CE (black) connector of the Autolab cell cables is connected. The counter electrode position can be adjusted by unscrewing the fixing screw and sliding the shaft of the electrode up or down.

Note

Do not over tighten the fixing screws to avoid damaging the fittings and the threads.

4.5 – Sample Stage holder

The sample holder [6] is made out PVC and incorporates a stainless steel springy contact which is connected to a 4 mm (red) female banana connector. The 4 mm (red) male WE/S cell cable connectors fit directly into the sample platform.

As shown in Figure 15, the sample is fixed between the Sample stage and the glass vessel by using a clamp [7].

Note

To avoid leakage of the electrolyte, please make sure that the clamp is properly fitted to the flange of the glass vessel and the stage, the Viton O-ring is fixed in the designated groove in the glass vessel and the clamp is tightened.

Do not apply excessive force when tightening the clamp.

The minimum sample diameter of the sample must be larger than the diameter of the Viton O-ring (i.e., 55 mm).

To assemble the cell, position the sample on the sample stage, position the glass vessel and the O-ring to the area of the sample which needs to be investigated and then clamp the stage, sample, and cell together by using the included clamp. Make sure that the sample is in contact with the electrode connector spring.

Note

If the samples are coated on both sides, in order to assure that the electrode connector spring makes good contact with the sample, the contact area of the metal sample must be clean, and the coating must be removed from the sample-spring contact area.

Note

The sample is not part for the scope of delivery.

4.6 – Gas inlet

A gas inlet [8] is also supplied with the cell. This inlet can be used to purge the cell with an inert gas for de-aeration purposes.

5 – Flat cell

The flat cell has been designed to measure corrosion properties of large flat coated or bare metal samples immersed in an electrolyte solution.

5.1 – Presentation and part list

The flat cell consists of a glass vessel fitted on a PVC holder. Leakage of electrolyte is prevented by using a Viton O-ring and three wing nuts. The exposed surface area of the sample is 16.9 cm^2. The thickness of the sample can be up to 5-7 mm. The flat cell is supplied with a large area stainless steel counter electrode and an Ag/AgCl reference electrode (see Figure 17).

Figure 17 – Overview of the flat cell

Table 5 provides a list of items included with the flat cell.

Table 5 – Overview of the items included with the flat cell

Item code	Description
FLAT.CELL.S	Complete flat cell
6.0733.100	Single junction Ag/AgCl reference electrode
FLAT.COUNTER	Stainless steel (SS 316) counter electrode
FLAT.GAS	Gas inlet/outlet
FLAT.RING	Viton O-ring (set of 3)

FLAT.HOLDER	Flat cell sample holder
FLAT.TOP	PTFE cell cover
FLAT.VESSEL	Flat cell vessel with Viton O-ring

5.2 – Glass cell vessel

The flat cell consists of a glass vessel with a diameter of 43 mm. The lower end of the cell is fitted with a 1 cm thick lid. At the bottom of this lid, a groove accommodating a Viton O-ring is located. The diameter of the lid is 68 mm. The diameter of the O-ring located at the bottom of the glass vessel is 52 mm.

5.3 – Ag/AgCl reference electrode

The reference electrode is filled with 3 M KCl solution. Please make sure that the electrode contains enough solution during the measurement. This electrode is connected to the blue banana plug (RE) of the cell cable.

The standard reference electrode potential is 210 mV ± 5 mV with respect to the Standard Hydrogen Electrode (SHE).

Other reference electrodes can be used in combination with the corrosion cell. Please contact your Autolab distributor for more information.

5.4 – Stainless steel counter electrode and cell cover

The stainless steel counter electrode [1], is embedded into the PTFE flat cell cover [2]. The counter electrode is located close to the working electrode. The counter electrode connection located on the top cover of the cell is a 4 mm banana plug to which the CE (black) of the Autolab is connected [3]. The counter electrode position can be adjusted by unscrewing the black fitting, [4] and sliding the shaft of the electrode up or down (see Figure 18).

A black screw is located on the side of the flat cell cover to allow the cover to be tightened against the cell vessel.

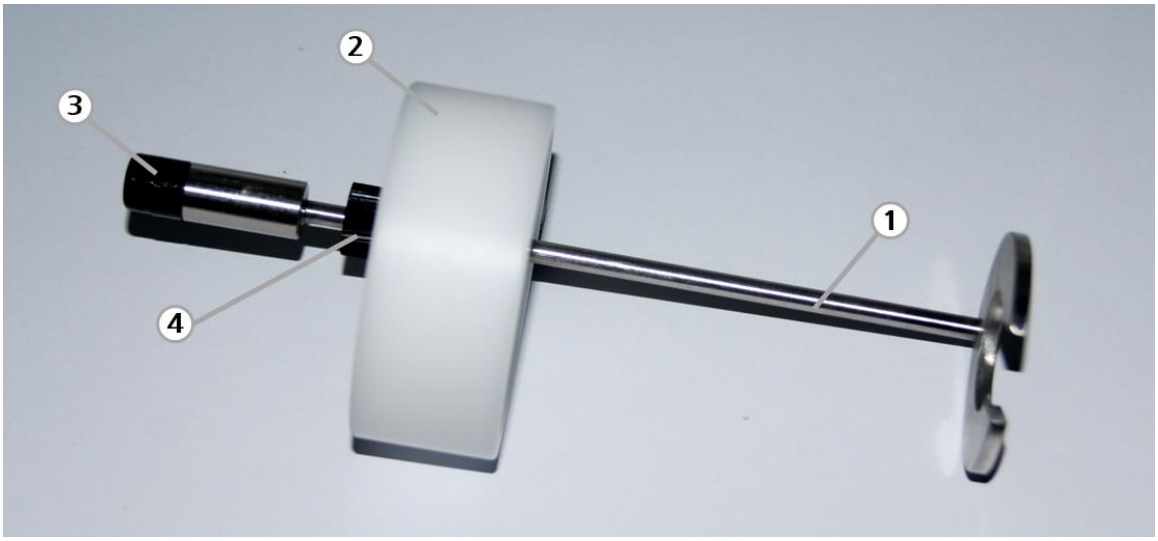

Figure 18 – The counter electrode and cell cover

Note

Do not over tighten the black screw located on the side of the flat cell cover to avoid damaging the cell vessel.

5.5 – Polyvinyl chloride sample holder

The sample holder is in Polyvinyl chloride (PVC). It consists of two parts:

- A bottom part, which provides the electrical contact to the sample
- A top part which is used to clamp the glass cell

The sample [1] (shown in Figure 19), must have a diameter larger than the diameter of the Viton O-ring, [2] (55 mm). To assemble the cell, position the sample on top of the O-ring and then place the cell and sample on the bottom

part of the sample holder [3]. Make sure that the sample is in contact with the electrode connector spring [4] (see Figure 19).

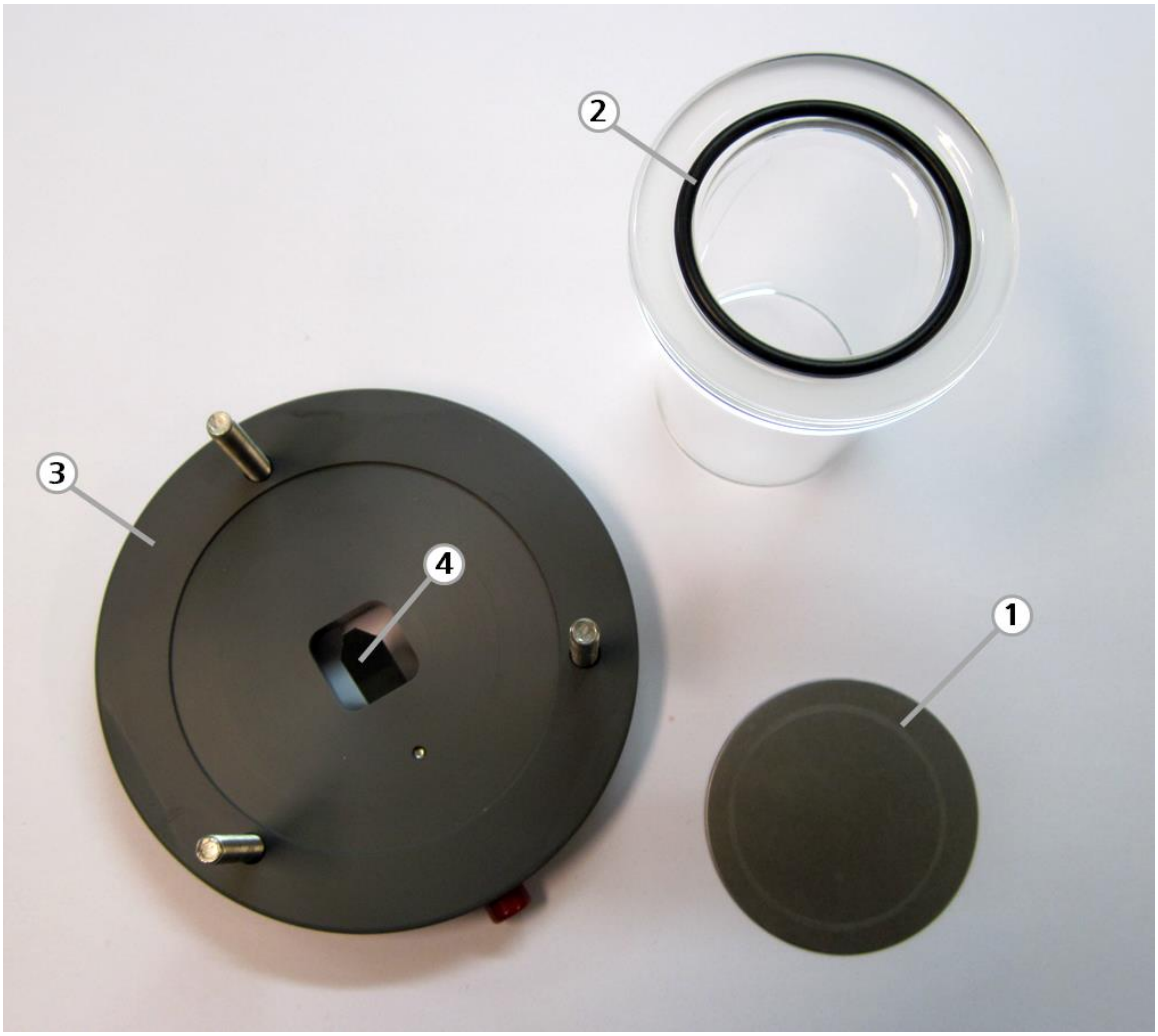

Figure 19 – Overview of the sample holder (bottom part), cell and sample

Close the sample holder by positioning the top part of the holder on the bottom part (see Figure 20). Position the washers on the bolts embedded in the bottom part of the sample holder. Close the cell using the wing nuts provided.

Figure 20 – Close the sample holder by positioning the top part on top of the bottom part of the sample holder

Note

Do not apply excessive force when closing the sample holder.

The test-sample is made of Sn coated steel. The test procedure for this sample is a potential scan from - 0.2 V vs the open circuit potential to + 0.1 V vs the open circuit potential, with a sweep rate of 1 mV/s in a 0.1 M KCl solution at room temperature. The resulting curve should give a polarization resistance of approximatively 300 Ω.

5.6 – Gas inlet

A gas inlet is standard supplied with the cell. This inlet can be used to purge the cell with Nitrogen.

Appendix – Chemical resistance of Polypropylene (PP), Polyoxymethylene (POM), PTFE and Viton

For the chemical resistance of polypropylene, polyoxymethylene and Viton, please refer to the following websites

Chemical	Website
Polypropylene, PTFE	http://www.coleparmer.com/Chemical-Resistance
Polyoxymethylene	https://calpaclab.com/acetal-polyoxymethylene-chemical-compatibility-chart/
Viton	https://www.aceglass.com/downloads/eccc.pdf

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