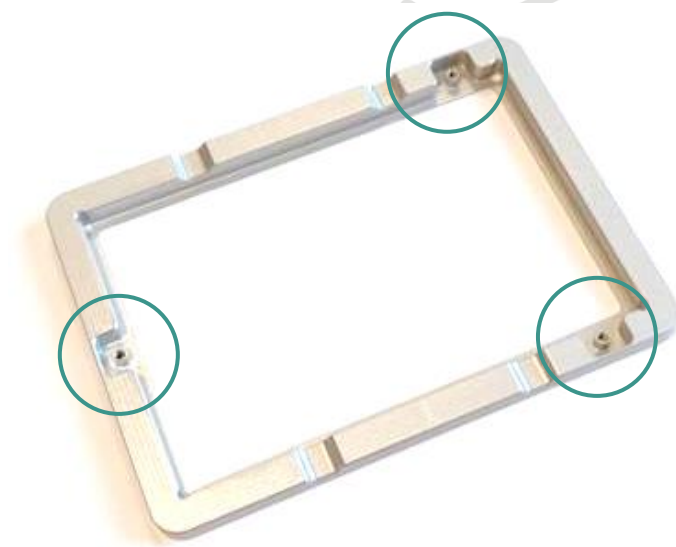


Adjustment of Universal Adapter Frame for the zenCELL owl

**Instructions refer to devices with S/N: zCo1002...*

Description

The adjustable adapter gives the opportunity to support different cell culture vessels with one single adapter. It consists of a frame with three mounting points for washers. These washers are fixed by a screw.

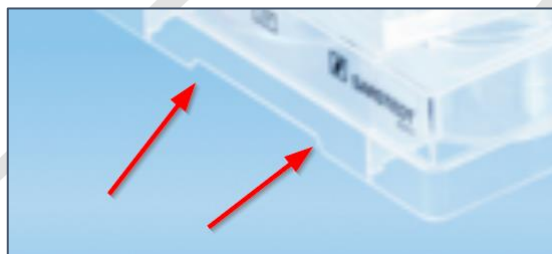


*The circled areas show the three mounting points.

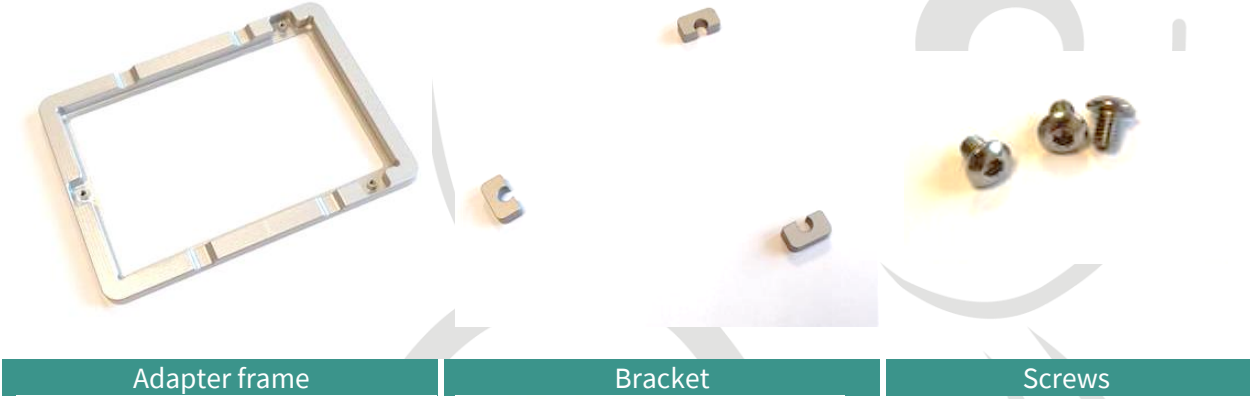
Most common multi well dishes have a base area that will touch these three points. So, the distance between the microscope and the cell culture vessel can be adjusted by adding or removing washers.

For adjusting the adapter, you will need a cell culture vessel with cells. If you do not have a cultivated vessel, you will need to fill in something to focus on. We recommend using a thin layer of powder like salt or spraying paint into the plate.

Please consider: If your vessel has a recess, e.g. for a robotic gripper, the third washer will not touch the vessel. In this case you will need to add some extra washers to compensate the recess.



The adjustable adapter frame consists of following parts:



Option A – Fast adjustment for a listed cell culture vessel

InnoME© can provide a list of common cell culture vessels, that were measured by us in advance. If the vessel you want to use is listed, please perform the following steps – otherwise perform the instructions in option B :

- Determine the right adjustment distance for your vessel in the provided table (see below)
- Select the right combination of washers, so the sum of washers matches the adjustment distance
- Place the right washers into each of the three mounting points
- Place the brackets on the washers with the recess pointing inside the adapter (one bracket on each mounting point)
- Mount the three hex screws into their holes
- Tighten the screws gently with the hex key
- Mount the adapter into the microscope and check whether a focused image is achievable with each of the 24 cameras
- If focus cannot be achieved move the focus setting slider up and down, while watching the image
 - If the Image seems to get sharp while moving the slider down and the most achievable focus is for values near 0: remove one 0.1mm washer at each screw to move the vessel closer to the microscope.
 - If the Image seems to get sharp while moving the slider up and the most achievable focus is for values of 1000 and above: add one 0.1mm washer beneath each screw to move the vessel away from the microscope.

No	Supplier	Typ	Part. Nr.	Suggestion		Suggestion (for single mounting, when the plate has a recess)	
				0.5mm	0.1mm	0.5mm	0.1mm
1	Sarstedt	24 well	833.922	1	1	5	2
2	Falcon	24 well	353226	3	1		
3	Costar	Corning CellBind Surface 24 well		3	3		
4	TPP	24 well	92024	1	1	5	2
5	NUNC	24 well	142475	1			
6	Greiner	24 well	15206	3		3	1
7	Greiner	24 well	662160	3		3	1
8	Falcon	24 well	353047	3	1		
9	Falcon	6 well	353046	2	4		
10	Eppendorf	24 well		1	2		

Option B – Manual adjustment, suitable for most cell culture vessels

Prearrangement

- Remove the three screws and brackets that hold the adjustment washers down.
- Use the provided hex key.
- Put the washers back in the right bag (there are two different washer thicknesses: 0.1mm and 0.5mm).

Rough adjustment

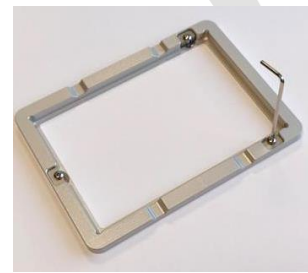
- Place the cell culture dish within the adapter into the microscope
- Start the microscopes software and connect the device
- Select one of the corner wells, e.g. D6 for live view
- Gently lift the cell culture vessel above the adapter while watching the live view window
- Consider that you should lift the same corner, that you selected for live view
- Lifting the vessel should lead to a focused image
- Estimate how far you lifted the vessel. Advice: Use a laboratory marker to mark both positions on the vessels edge, then you can measure the distance more precise.
- Select the right number of washers to match the distance (round down in 0.1 mm steps). Example: Your estimated distance is 0.85, so you will need one 0.5 mm and three 0.1 mm washers ($0.5 + 0.1 + 0.1 + 0.1 = 0.8$ mm)
- Place the same combination of washers in each of the three mountings and fix them with the screw and the provided hex key. Plates with a recess in the short side may need another combination of washers (see first part of this document)
- Place the cell culture dish within the adapter into the microscope again
- Check the live view of several different well and try to focus them by moving the focus slider
- If the live view shows focused or nearly focused images: proceed with fine adjustment
- If the images are out of focus by far proceed as follows:
 - Gently lift the cell culture vessel above the adapter while watching the live view window
 - If the image gets sharper by lifting the plate you need to add more washers
 - If the image loses sharpness by lifting the plate you need to remove washers
- We recommend keeping the number of washers equal at the three mountings, for most cell culture plates. Nevertheless, exceptions may exist.



Insert washers



Insert bracket



Screw

Fine adjustment

- Place the cell culture dish within the adapter into the microscope again
- Mount the adapter into the microscope and check whether a focused image is achievable with each of the 24 cameras.
- The focus value should be within 300 and 700 for a microscope that is warmed up to 37°C and within 150 and 550 for a microscope at room temperature. Higher deviations are possible due to poor dimensional accuracy of the used vessel
- If focus cannot be achieved move the focus setting slider up and down, while watching the image
 - If the Image seems to get sharp while moving the slider down and the most achievable focus is for values near 0: remove one 0.1mm washer at each screw to move the vessel closer to the microscope.
 - If the Image seems to get sharp while moving the slider up and the most achievable focus is for values of 1000 and above: add one 0.1mm washer beneath each screw to move the vessel away from the microscope.
- Adding a 0.1 mm washer will shift the focus settings (for a sharp image) to values that are about 300 steps higher (300 → 600 after adding 0.1 mm)
- Removing a 0.1 mm washer will reduce the focus setting about 300 steps

This document is subject to changes and may be invalid for future hardware versions of the zenCELL owl

Version 1

July 2021

© innoME GmbH

All rights reserved.