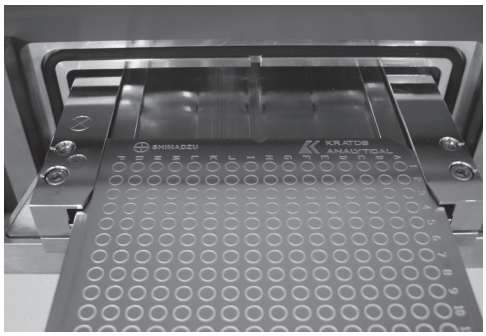
AXIMA

Target plate user guide



Change history

This guide has the following change history:

Issue	Date	Change
Issue 1	Sept 2005	First issue.
Issue 2	April 2006	Sample plate numbers corrected.
Issue 3	Aug 2007	QuickMass glass slides obsolete. New FlexiMass graduated steel slides, TO-487, added.
Issue 4	Sept 2007	Additional 2.8 software instructions for changing the Plate carrier.
Issue 5	July 2009	Updated including new images. Sample plates are now Target plates. Fleximass disposable targets and Precis*ion* adaptor added.
Issue 6	June 2010	Discontinued target plates removed. Minor text changes.
Issue 7	Feb 2014	Changes to Shimadzu branding.
Issue 8	Mar 2015	New target plates added. Discontinued target plates removed.
Issue 9	Oct 2016	New Adaption-II MALDI imaging slide adaptor added.

Ordering additional copies

You can obtain additional copies of this guide from your local Kratos or Shimadzu office, or distributor, quoting:

- Part number: *96-454R00*
- Description: *Target plate user guide*

Contact details

Kratos Analytical Limited,
Wharfside,
Trafford Wharf Road,
Manchester,
M17 1GP,
United Kingdom

Tel: +44 (0) 161 888 4400

Fax: +44 (0) 161 888 4401

Web site: www.shimadzu.com/an

Email: maldi.support@kratos.co.uk

For details of oversea offices, visit the web site(s) or contact the UK office.

Contents

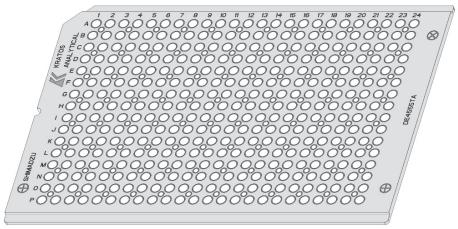
Introduction

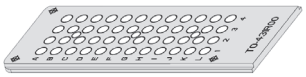
About this user guide

This user guide describes the *target plates/slides*, *slide adapters* and *plates carriers* that are available for use with a Shimadzu MALDI TOF mass spectrometer. It also describes how to change *plate carriers* and how to use plate files within the software.

Target plates/slides:

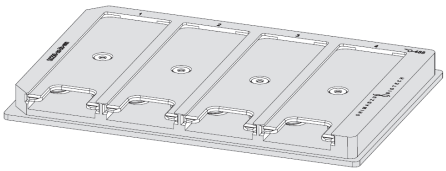
- AXIMA 2mm target plates, see page 4;
- UniMass 10mm target plates, see page 9;
- FlexiMass target slides, see page 11.

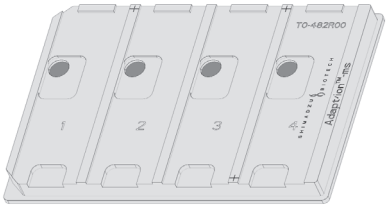




Slide adapters:

- Precis*ion* slide adapter, see page 13;
- Adaption-II MALDI imaging slide adaptor, see page 15;
- Adapt/ion slide adapter, see page 18.





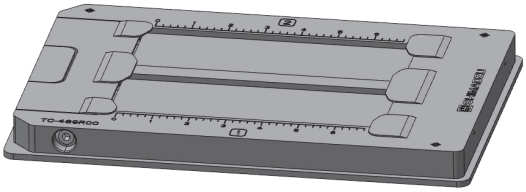
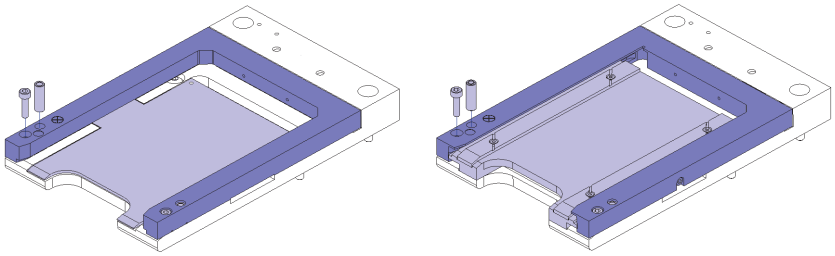


Plate carriers:

- Kratos plate carriers, see page 20;



Cleaning target plates/slides:

- Cleaning, see page 30.

Plate files:

- Loading plate files, see page 33.

Performance

The performance of the instrument may vary slightly depending on the type of target you are using. All instrument specifications were performed on a 384-well 2mm thick stainless steel *Target plate* (DE1580TA) unless otherwise stated.

Disclaimer and copyright

Trademarks

Adapt/ion, AXIMA, FlexiMass, FlexiMass-DS, FlexiMass_SR targets, Launchpad, Precis*ion* and UniMass are trademarks of Kratos Analytical Limited and Shimadzu Corporation.

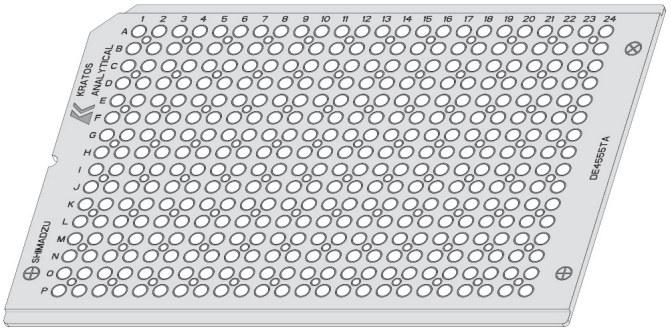
AXIMA 2mm target plates

The target plates described are for use with AXIMA MALDI TOF instruments only.

All 2mm thick target plates use the *Kratos 2mm plate carrier*, see page 21.

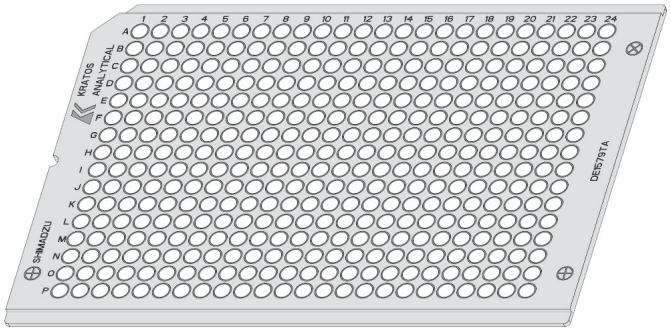
AXIMA 384 well (2.8mm I.D.) plus 96 calibration well plate

Number of wells:	Sample = 384 Calibrant = 96
Internal diameter of well:	Sample = 2.8mm Calibrant = 1.5mm
Order number:	TO-456R00 (DE4555TA)



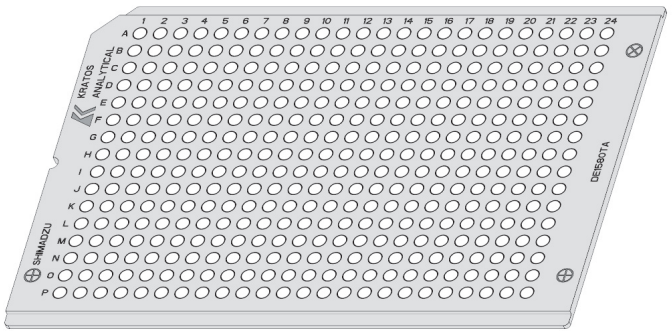
AXIMA 384 well (3.4mm I.D.) plate

Number of wells:	384
Internal diameter of well:	3.4mm
Order number:	TO-455R00 (DE1579TA)



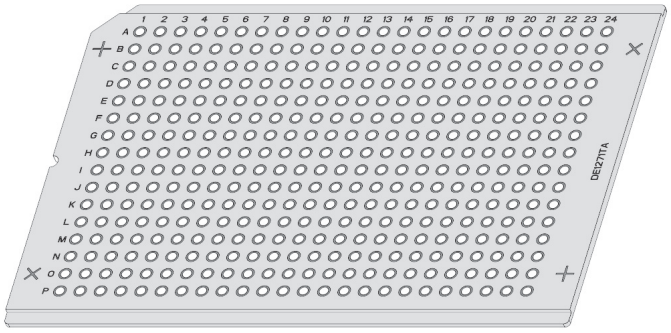
AXIMA 384 well (2.8mm I.D.) plate

Number of wells:	384
Internal diameter of well:	2.8mm
Order number:	TO-454R00 (DE1580TA)



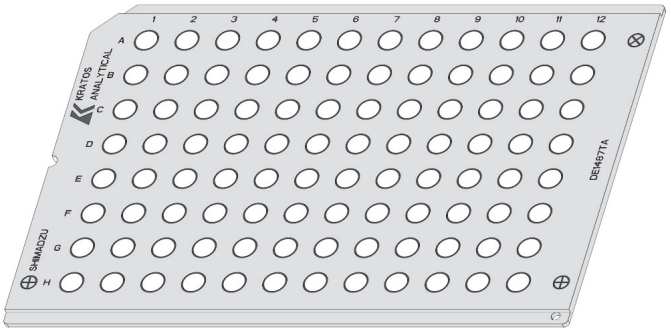
AXIMA 384 well (2.0mm I.D.) plate

Number of wells:	384
Internal diameter of well:	2.0mm
Order number:	TO-453R00 (DE1271TA)



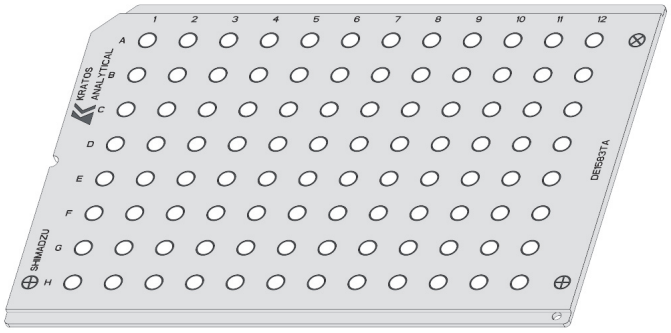
AXIMA 96 well (4.7mm I.D.) plate

Number of wells:	96
Internal diameter of well:	4.7mm
Order number:	TO-452R00 (DE1487TA)



AXIMA 96 well (3.4mm I.D.) plate

Number of wells:	96
Internal diameter of well:	3.4mm
Order number:	TO-451R00 (DE1583TA)



AXIMA plain graduated plate

A plain plate with graduations, useful for tissue samples, etc.	
Order number:	TO-450R00 (DE1798TA)

AXIMA plain plate

A plain plate, useful for tissue samples, etc.	
Order number:	TO-449R00 (DC7865TA)

UniMass10mm target plates

The target plates described are for use with:

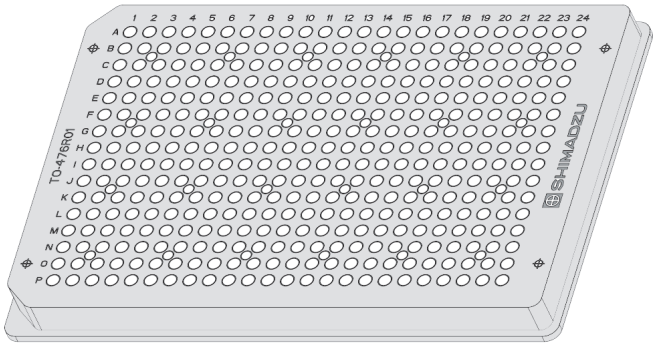
- AXIMA MALDI TOF instruments;
- MALDI-7090 instruments.

For AXIMA MALDI TOF instruments, 10mm thick target plates use the *Kratos 10mm plate carrier*, see page 21.

For MALDI-7090 instruments, the plates insert directly into the instrument.

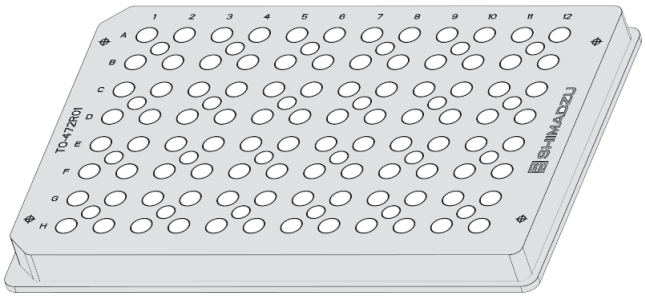
UniMass 384 well (2.8mm I.D.) plus 24 calibration well plate

Number of wells:	Sample = 384 Calibrant = 24
Internal diameter of well:	Sample = 2.8mm Calibrant = 2.2mm
Order number:	TO-476R01 (DF3805TA)



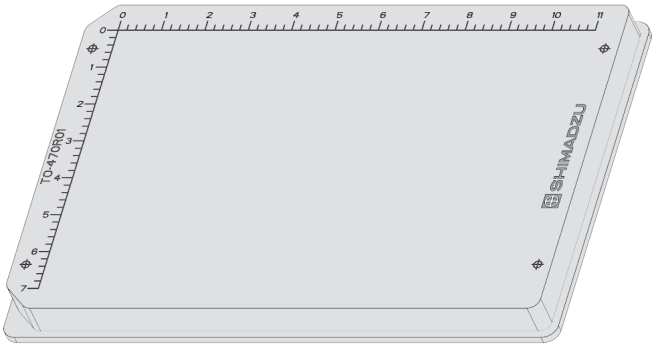
UniMass 96 well (4.7mm I.D.) plus 24 calibration well plate

Number of wells:	Sample = 96 Calibrant = 24
Internal diameter of well:	Sample = 4.7mm Calibrant = 4.0mm
Order number:	TO-472R01 (DF3794TA)



UniMass plain graduated plate

A plain plate with graduations, useful for tissue samples, etc.	
Order number:	TO-470R01 (DF3796TA)



FlexiMass target slides

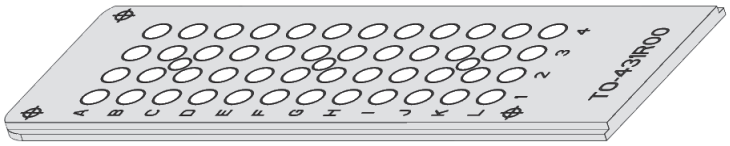
The target slides described are for use with:

- AXIMA MALDI TOF instruments;
- MALDI-7090 instruments.

All FlexiMass plates use the *Precision slide adapter*, see page 13.

FlexiMass-SR48 steel targets

Pack of 16 targets used in conjunction with the *Precision slide adapter*, see page 13.	
Number of wells:	Sample = 48 Calibrant = 3
Internal diameter of wells:	Sample = 2.8mm Calibrant = 2.2mm
Order number (four packs of four targets):	TO-431R00 (CE9233TA)



FlexiMass-SR0 plain steel targets

Pack of four targets used in conjunction with the *Precision slide carrier*, see page 13. Useful for tissue samples, etc.	
Order number (pack of four targets):	TO-432R00 (CF2316TA)

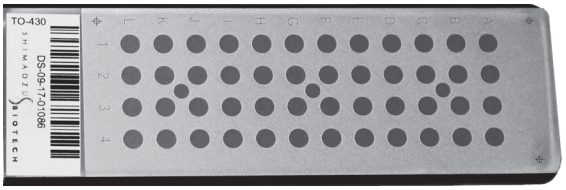
FlexiMass-DS disposable targets

These polymeric slides are disposable (single use) alternatives to the FlexiMass steel targets. The slides can be used as supplied and do not require cleaning prior to use.

It is strongly recommended that the slides should not be cleaned after use in an attempt to reuse them. Doing so will compromise the surface characteristics and performance of the product and possibly damage the instrument.

Please dispose of used slides in accordance with local, state and federal regulations.

Pack of 16 targets used in conjunction with the *Precision slide adapter*, see page 13.	
Number of wells:	Sample = 48 Calibrant = 3
Internal diameter of wells:	Sample = 2.8mm Calibrant = 1.5mm
Order numbers:	TO-430R00 (pack of 16 targets) TO-488R00 (starter kit containing the Precis*ion* slide adapter and 16 targets)

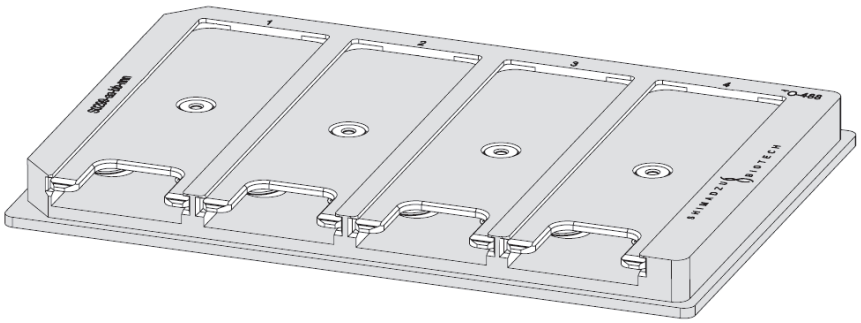


Precis*ion* slide adapter

Introduction

The Precis*ion* slide adapter (order number TO-488R00 which includes 16 FlexiMass-DS disposable targets) holds up to four slides:

- FlexiMass-DS disposable targets (TO-430R00);
- FlexiMass-SR48 steel targets (TO-431R00);
- FlexiMass-SR0 plain steel targets (TO-432R00).



This slide adapter operates with the 10mm *plate carrier*.

Handling

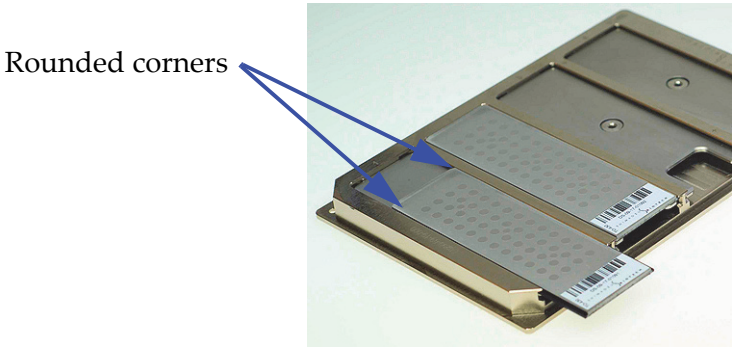
The adapter is supplied chemically clean. Wear powder-free nitrile gloves when handling the carrier. To clean the adapter, wipe with methanol.

Plate files

The Launchpad software includes plate files that define the sample positions on the slides, see page 33.

Fitting FlexiMass slides

1. Wear powder-free nitrile gloves.
2. Insert the slide; edge with the rounded corners fits first.

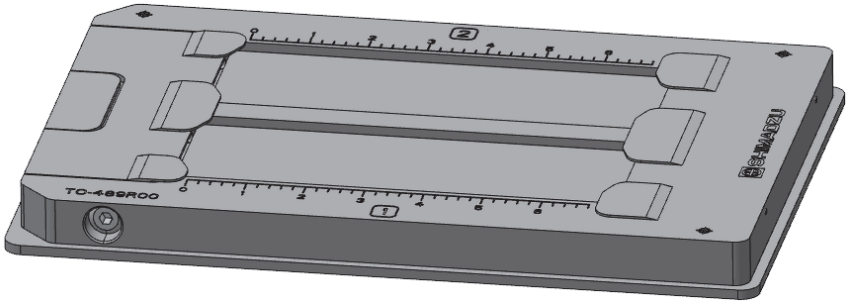


3. Push the slide up as far as it will go.
4. After use:
   - FlexiMass-DS disposable targets, dispose of the slides in accordance with local, state and federal regulations.
   - FlexiMass-SR48 and SR0 steel targets, see “Cleaning target plates/slides” on page 30.

Adaption-II MALDI imaging slide adaptor

Introduction

The adaptor (order number TO-489R00) is specifically for use with one or two ITO-coated glass slides measuring 25mm x 75 mm and between 0.7 and 1.1 mm thick.



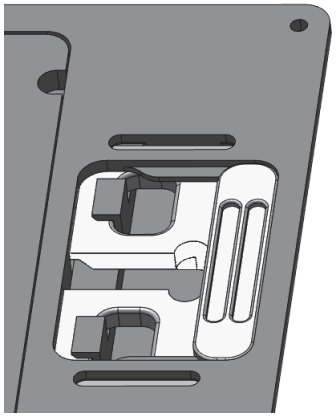
Handling

The adaptor is supplied chemically clean. Wear powder-free nitrile gloves when handling the carrier.

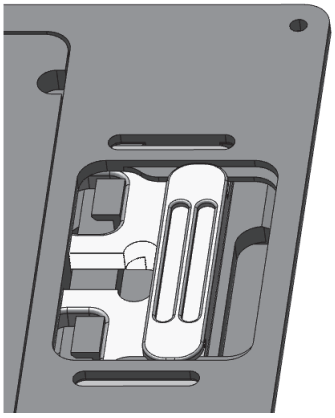
Fitting ITO-coated glass slides

1. Wear powder-free nitrile gloves.
2. Wipe the ends of the slides with a tissue and solvent to remove any matrix, etc. This ensures that there is good electrical contact between the ITO coating on the slide and the clamping plates on the adaptor.

3. Underneath the adaptor, push the white plastic clamp to the open position (releases the clamping plates on the top surface).



Clamp in the closed position

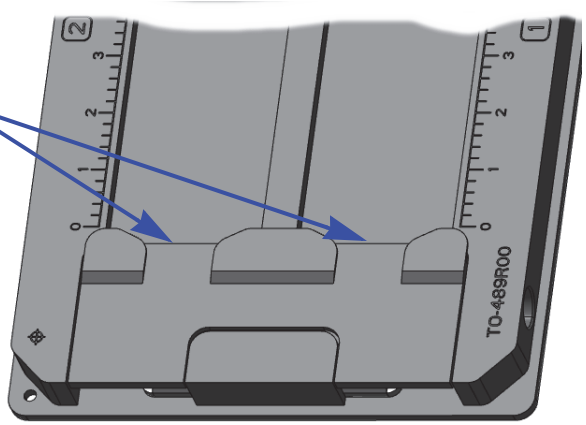


Clamp in the open position

4. Insert the glass slides under the clamping plates.
5. Push the white plastic clamp to the closed position (clamping plates hold the glass slides in position).
6. Carefully push the slides forward to ensure they touch the edge of the adaptor shown below. Take care not to touch any samples, deposited on the slides, in the process.

   This ensures that the slides will not move when the adaptor is placed in the instrument. If you scan the adaptor/slides, and the slides subsequently move, the optical image will not match the actual position of the slides.

Glass slides touch this edge



Cleaning the Adapt*ion*-II adaptor

The following instructions can also be found at:
http://shimadzu.com/an/lifescience/maldi/support.html

Items required

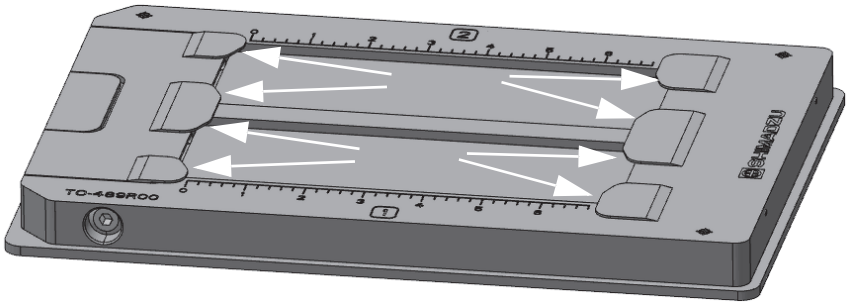
When handling solvents, wear suitable PPE (e.g. safety glasses, lab coat and gloves).

Refer to manufacturers MSDS for instructions on safe handling and disposal.

- Ultrasonic bath for target cleaning;
- HPLC grade methanol;
- Optional, small oven for drying targets (up to 40°C).

Cleaning procedure

1. Remove any slides from the adaptor.
2. Using a lint-free tissue moistened with methanol, wipe the main body of the adaptor and carefully clean under the clamping plates:

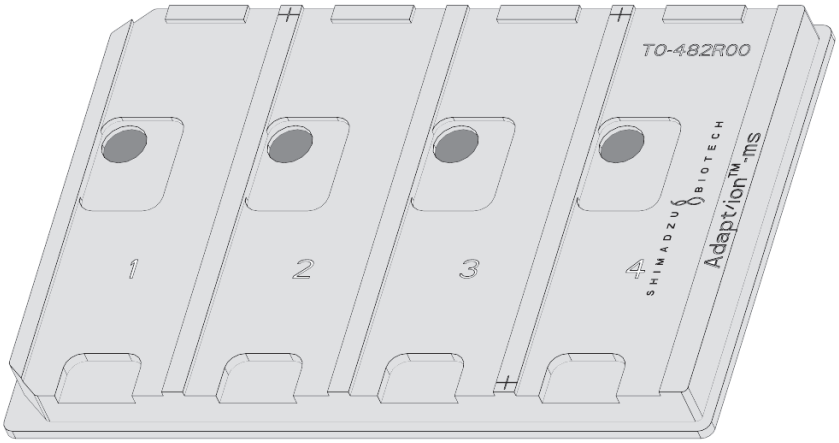


3. Place the adaptor face-up into a small container and immerse (cover) with methanol.
4. Cover the container and place into an ultrasonic bath. Sonicate the adaptor for 3 minutes.
5. Remove the adaptor from the cleaning solution and allow any excess solution to drain from the adaptor.
6. Allow the adaptor to dry overnight (>12 hours) either at room temperature or (optional) in an oven at 40°C.

Adapt/ion slide adapter

Introduction

The Adapt/ion slide adapter (order number TO-482R00) holds up to four slides.



This slide plate adapter operates with the 10mm *Plate carrier*.

Handling

The adapter is supplied chemically clean. Wear powder-free nitrile gloves when handling the carrier. To clean the adapter, wipe with methanol.

Plate files

The Launchpad software includes plate files that define the sample positions on the slides, see page 33.

Fitting slides

1. Wear powder-free nitrile gloves.
2. Insert the slide.
3. Push the slide up against the top and left-hand sides.

Kratos plate carriers

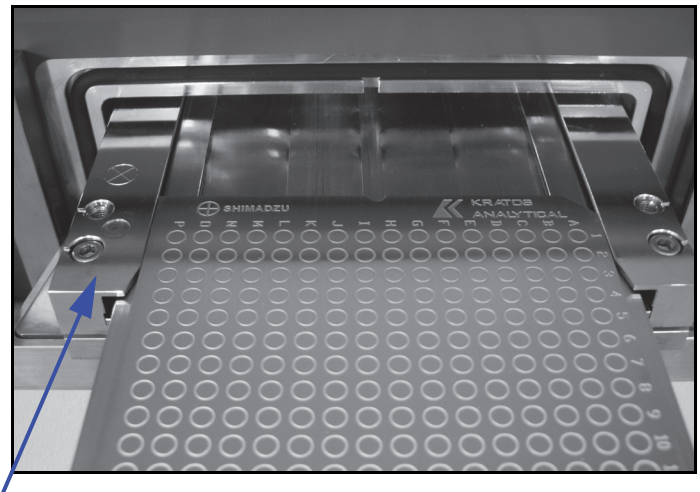


Plate carrier

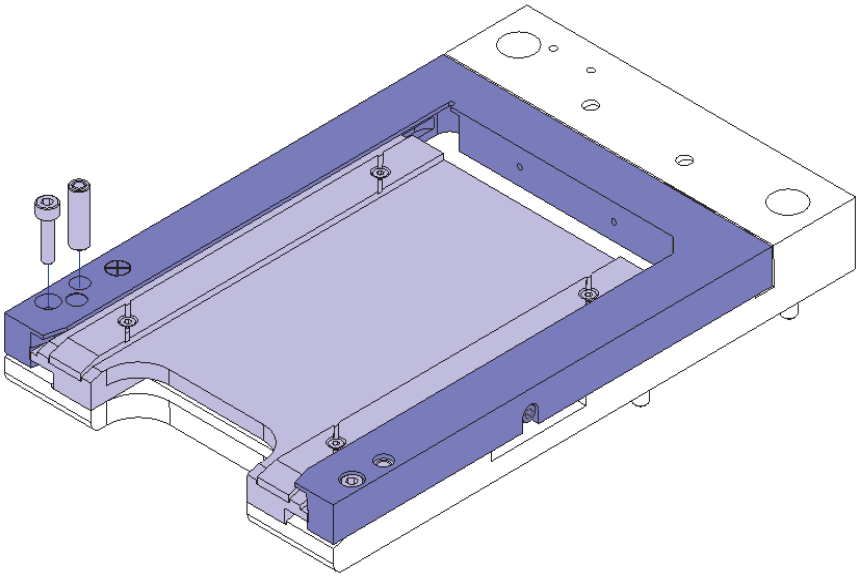
Introduction

Two *Plate carriers* are available:

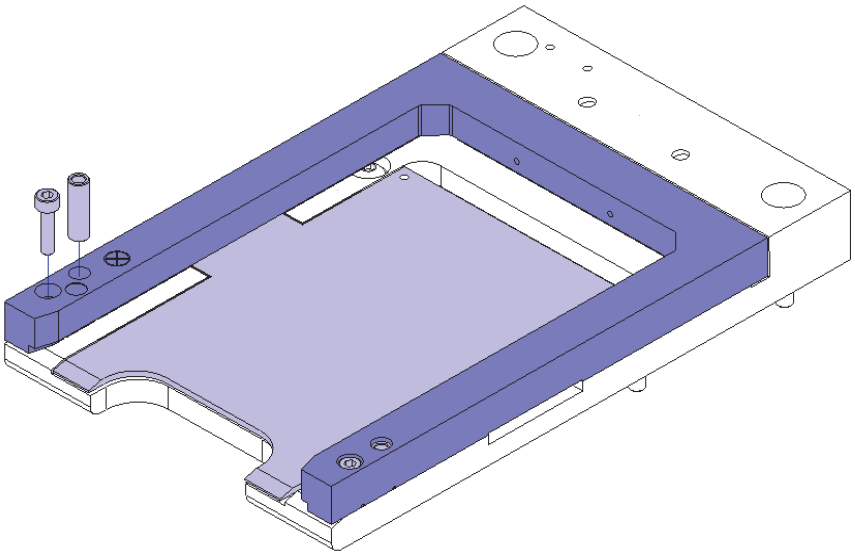
- Kratos 2mm *plate carrier* (order number TO-715R00) for use with 2mm *target plates*.
- Kratos 10mm *plate carrier* (order number TO-722R00) for use with:
  - *Slide adapters*.
  - 10mm *target plates*.

One of the *plate carriers* is fitted to your AXIMA; the other is either provided with the AXIMA, or you can order it separately. You can inter-change the *plate carriers*.

Kratos 2mm plate carrier



Kratos 10mm plate carrier



Handling

The *plate carrier* is supplied chemically clean. Wear powder-free nitrile gloves when handling the carrier. To clean the carrier, wipe with methanol.

Removing

These instructions apply to both *plate carriers* and assume that the AXIMA and PC are switched on and operational.

Tools

- 2.5mm hexagonal key (supplied with the AXIMA).

At the PC (pre 2.8 software)

If you have pre 2.8 Launchpad software, follow this procedure. To check the software version click Help => About Launchpad.

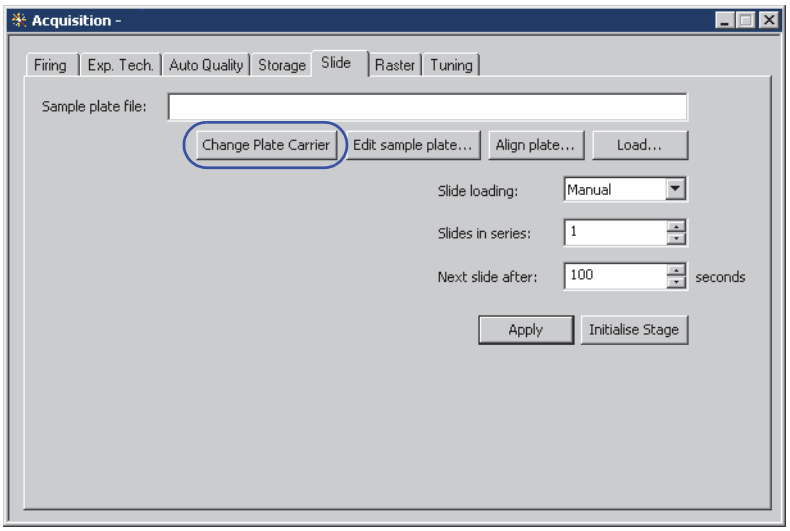
1. From Launchpad, open the *Experimental Technique* window (Instrument => Acquisition => Exp. Tech.).
2. Select the Open Door button; the AXIMA door opens and the *carriage* emerges.
3. Close the Launchpad software (File => Exit). This prevents the software automatically retracting the *carriage* and closing the door after 5 minutes.

At the PC (2.8 software or upwards)

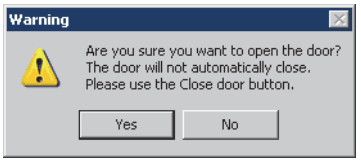
If you have 2.8, or upwards, MALDI-MS software, follow this procedure. To check the software version click Help => About Launchpad.

If you use the Open Door button within the *Experimental Technique* window (Instrument => Acquisition => Exp. Tech.), the software will attempt to close the door automatically after five minutes. This version of software includes a button that keeps the door open until you tell it to close; allowing you time to change the *plate carrier*.

1. From MALDI-MS, open the *Slide* window (Instrument => Acquisition => Slide):



2. Select the Change Plate Carrier button:

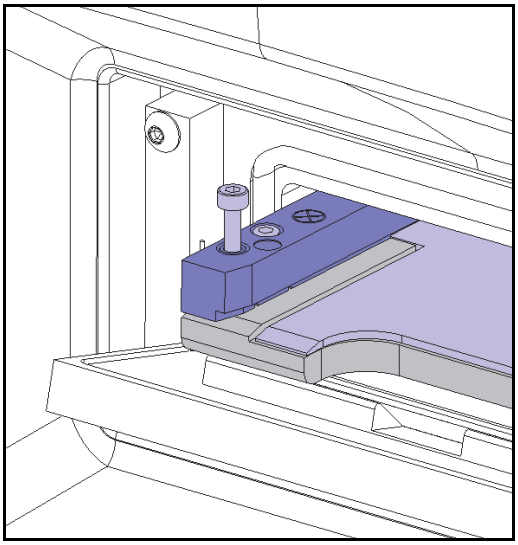


3. Select the Yes button; the AXIMA door opens and the *carriage* emerges.

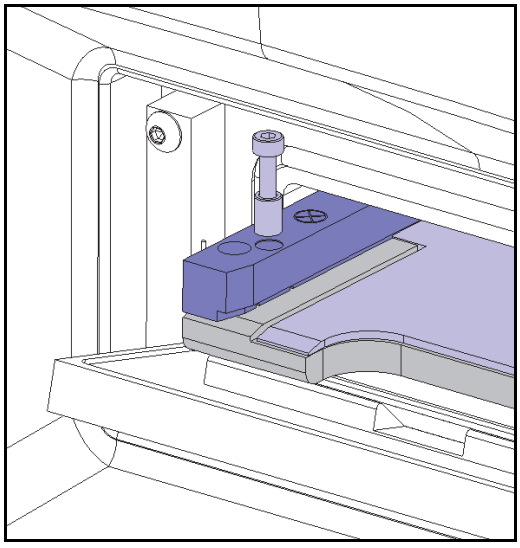
At the AXIMA

Wear powder-free nitrile gloves to prevent contaminating the *carriage* and the *plate carrier*.

1. Remove the front two bolts using a 2.5mm hexagonal key:



2. Behind each bolt position is a dowel. Remove each dowel by screwing in one of the bolts and using it to pull out the dowel:



3. Pull the *plate carrier* forwards and remove from the *carriage*.

The 10mm *plate carrier* includes a *spacer plate*, which is loose and usually comes out as you remove the *plate carrier*.

4. Use the packaging from the *plate carrier* to store the removed *plate carrier*.

Fitting a 10mm plate carrier

These instructions follow on from removing a *plate carrier*.

At the rear of the *carriage*, there are two locating pins that support the rear of the *plate carrier*. As these pins are at the rear, you cannot see them.

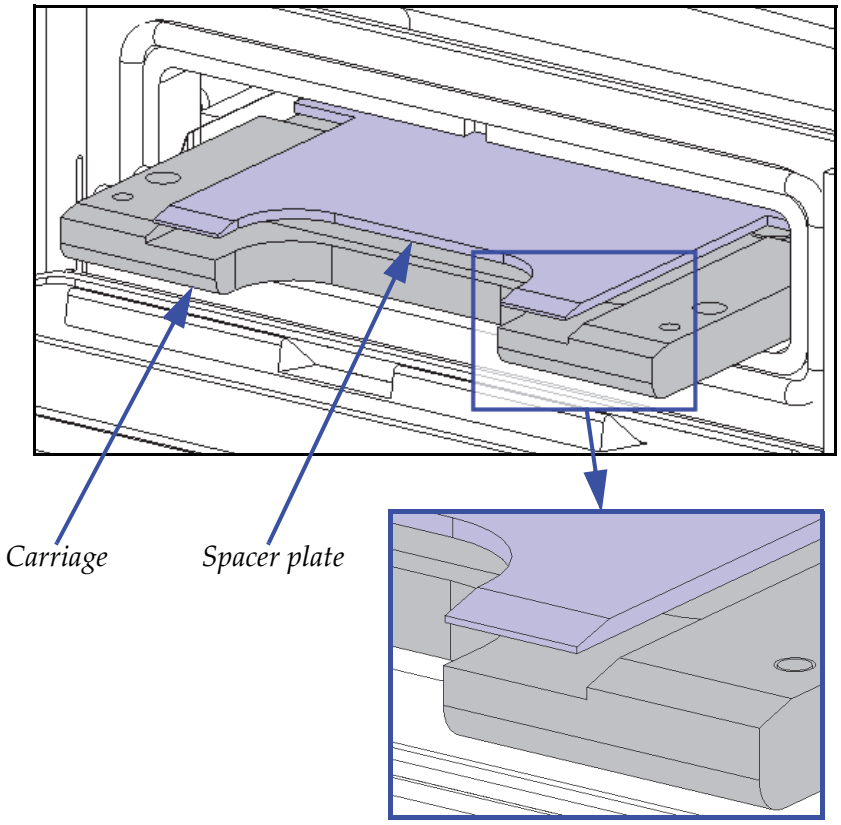
In addition to fitting the *plate carrier*, you will need to fit the *spacer plate*.

Tools

- 2.5mm hexagonal key (supplied with the AXIMA).

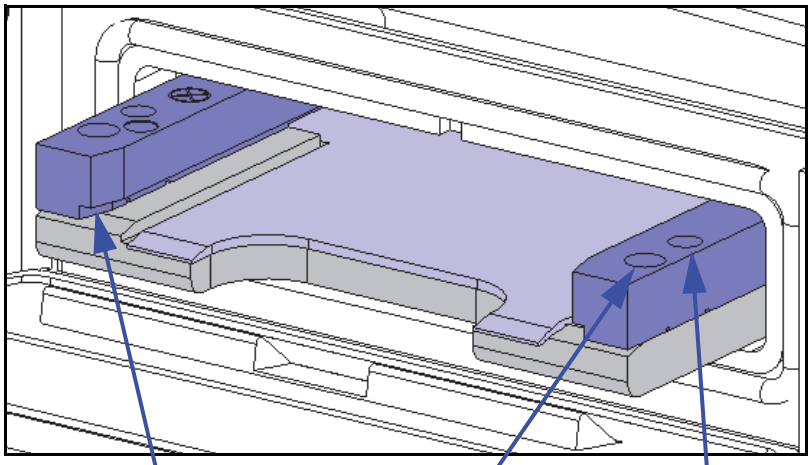
At the AXIMA

1. Wear powder-free nitrile gloves to prevent contaminating the *carriage*, *plate carrier* and *spacer plate*.
2. Place the *spacer plate* on to the *carriage* with the:
   - fingers facing forwards;
   - chamfered edges on top;
   - aligned with the front of the *carriage*.



3. The next series of steps requires "trial-and-error":
   a. With one hand, push the *spacer plate* down against the springs on the *carriage*.
   b. With the other hand, place the *plate carrier* on top of the *spacer plate*.

c. Push the *plate carrier* in to the AXIMA so that it engages on to pins at the rear of the *carriage*. You may need to move the *plate carrier* from side-to-side to engage the pins. When the pins are engaged, the front-edge of the *plate carrier* aligns with the front-edge of the *carriage*.



4. Fit the two dowels, behind the bolt positions. (The dowels can be fitted either way round.)
5. Push the dowels down as far as they can go so that they are below the surface of the *plate carrier*.
6. Screw in the two bolts using a 2.5mm hexagonal key. Do not over-tighten.

At the PC (pre 2.8 software)

1. Restart Launchpad software.
2. Open the *Experimental Technique* window (Instrument => Acquisition => Exp. Tech.).
3. Select the Close Door button; the carriage retracts and the door closes.

At the PC (2.8 software or upwards)

1. Open the *Experimental Technique* window (Instrument => Acquisition => Exp. Tech.).

2. Select the Close Door button; the carriage retracts and the door closes.

Fitting a 2mm plate carrier

These instructions follow on from removing the *plate carrier*.

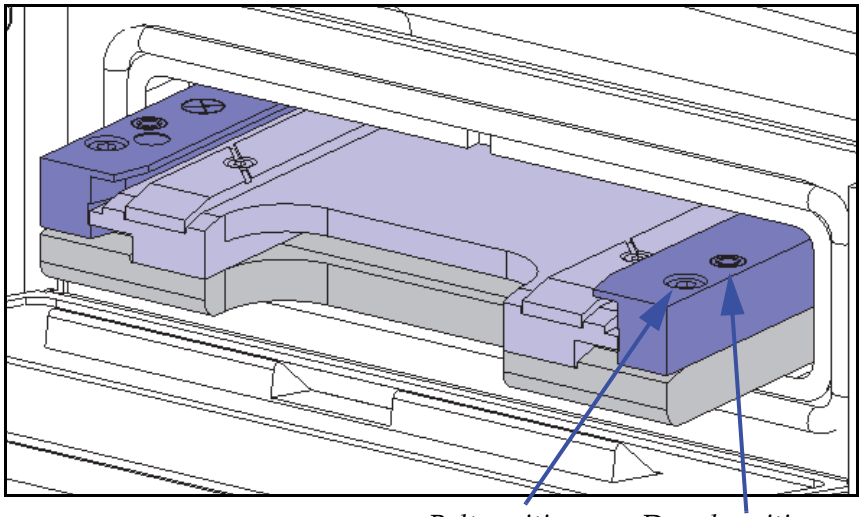
At the rear of the *carriage*, there are two locating pins that support the rear of the *plate carrier*. As these pins are at the rear, you cannot see them.

Tools

- 2.5mm hexagonal key (supplied with the AXIMA).

At the AXIMA

1. Wear powder-free nitrile gloves to prevent contaminating the *carriage* and *plate carrier*.
2. Push the *plate carrier* in to the AXIMA so that it engages on to pins at the rear of the *carriage*. You may need to move the *plate carrier* from side-to-side to engage the pins. When the pins are engaged, the front-edge of the *plate carrier* aligns with the front-edge of the *carriage*.



3. Fit the two dowels, behind the bolt positions. (The dowels can be fitted either way round.)
4. Push the dowels down as far as they can go so that they are below the surface of the *plate carrier*.
5. Screw in the two bolts using a 2.5mm hexagonal key. Do not over-tighten.

At the PC (pre 2.8 software)

1. Restart Launchpad software.
2. Open the *Experimental Technique* window (Instrument => Acquisition => Exp. Tech.).
3. Select the Close Door button; the carriage retracts and the door closes.

At the PC (2.8 software or upwards)

1. Open the *Experimental Technique* window (Instrument => Acquisition => Exp. Tech.).
2. Select the Close Door button; the carriage retracts and the door closes.

Cleaning a plate carrier

Wipe clean with methanol.

Cleaning target plates/slides

These instructions are for cleaning *target plates* and *target slides* (not FlexiMass-DS disposable targets).

Basic cleaning

To wipe off any fibres, etc., use a lint-free cloth.

To remove any finger marks, etc., wipe using HPLC grade acetone.

Chemical cleaning

The following instructions can also be found at:
http://shimadzu.com/an/lifescience/maldi/support.html

Important notes

- For targets intended for lipid or low molecular weight (<800Da) analyses omit all steps that include Micro 90.
- Do not use this protocol for single-use polymeric FlexiMass-DS targets. Doing so will compromise the characteristics and performance of the product and may ultimately lead to damage of the instrument.
- Shimadzu accepts no liability for any damage caused by improper handling of FlexiMass-DS targets.

Items required

When handling solvents, wear suitable PPE (e.g. safety glasses, lab coat and gloves).

Refer to manufacturers MSDS for instructions on safe handling and disposal.

- Ultrasonic bath for target cleaning.
- Cleaning solution concentrate: Micro 90 (available from Sigma Aldrich).
- Hotplate or oven capable of heating a 5% Micro 90 solution to approx. 60°C.

- HPLC grade methanol and acetone.
- Deionised or HPLC grade water.
- Small oven for drying targets (up to 50°C).

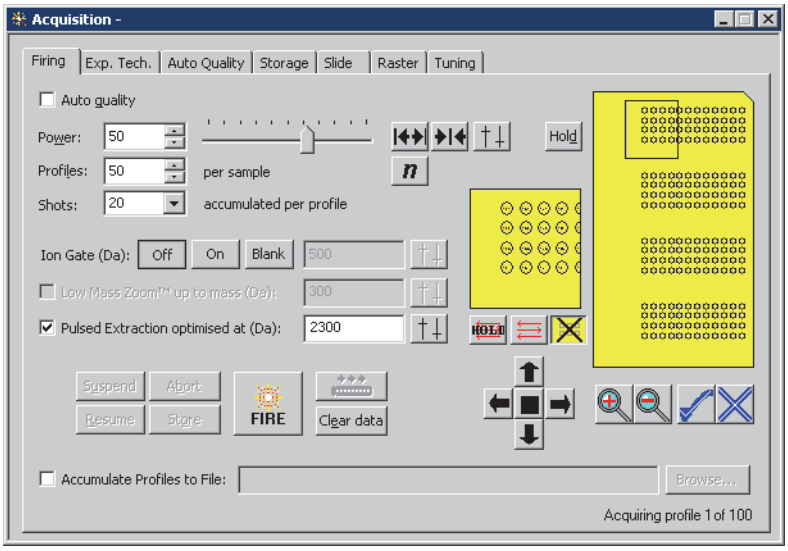
Cleaning procedure

1. Prepare 100 ml of a 5% (v/v) solution of Micro 90 in deionised or HPLC grade water (5% (v/v) = 5 ml of Micro 90 concentrate + 95 ml water).
2. Heat the 5% Micro 90 solution to approx. 60°C.
3. Using a tissue and a suitable solvent (e.g. methanol), remove any visible signs of samples from the surface of the target.
4. Place the target face up into a small container and immerse (cover) with acetone.
5. Cover the container and place into an ultrasonic bath.
6. Sonicate the target in acetone for 15 minutes. Sonication is performed at room temperature.
7. Discard the used acetone. Rinse the target (x2) with 100 ml deionised or HPLC grade water. Discard rinsing solutions.
8. Place the target face up into a small container and immerse (cover) with the heated 5% (v/v) Micro 90 solution.
9. Cover the container and place into an ultrasonic bath.
10. Sonicate the target in the 5% Micro 90 cleaning solution for 15 minutes. Sonication is performed at room temperature.
11. Discard the used 5% Micro 90 solution. Rinse the target (x2) with 100 ml deionised or HPLC grade water. Discard rinsing solutions.
12. Cover the target with approx. 100 ml of deionised or HPLC grade water. Sonicate target for 5 minutes at room temperature.
13. Cover the target with approx. 100 ml of methanol. Sonicate target for 15 minutes at room temperature. Discard the rinsing solution.
14. Cover the target with approx. 100 ml of deionised or HPLC grade water. Sonicate target for 15 minutes at room temperature. Discard the rinsing solution.
15. Shake the target to remove excess water from the rinsing step.

16. Flood the target with methanol and allow excess to evaporate.
17. Place the target in an oven at 50°C for at least 6 hours (e.g. overnight). This oven drying step is necessary to minimise unwanted sample spreading during use.
18. Prior to use, allow the target to adjust to room temperature.

Loading plate files

The Launchpad software includes specific plate files that defines the sample positions on the plate. For example, the image below (from an AXIMA Performance model) shows the sample positions for the slides fitted to an Precis*ion* slide adapter.



NOTE - If you are using the optional software feature *Imaging*, usually with graduated plate or slides, you do not need to load a plate file. (You use the software to align the plate.)

To load the required plate file:

1. From the *Acquisition* window, select the *Slide* tab; the *Slide* window is displayed.
2. In the *Slide* window, select the Load ... button; a list of .plt files is displayed. (The required .plt file may be located within a sub-directory.)

3. Select the required file; choose the file name that corresponds to the part number engraved on the plate:

Target plate	Plate file to use
DE1271TA	384x2000+00-de1271ta.plt
DE1487TA	96x4700+00-de1487ta.plt
DE1579TA	384x3400+00-de1579ta.plt
DE1580TA	384x2800+00-de1580ta.plt
DE1583TA	96x3400+00-de1583ta.plt
DE1798TA	plain-de1798ta.plt
DE4555TA	384x2800+96-de4555ta.plt
Precis*ion* slides	4x48-fleximass-ds-to-430r00.plt
Adapt/ion slides	4x48-fleximass-to-483r00.plt

   Other plate files may exist that include pre-defined positions for calibrants, although the *Target plate* does not have wells for these. For example, plate file 384x2800+**06**-de1580ta.plt includes six calibrant positions.

4. Select the Open button; the *Slide* window is displayed.
5. Select the Apply button.
6. Select the *Firing* tab; the *Firing* window is displayed showing the sample positions for the required plate.

If the plate file does not exist, you can create one using the *Sample plate editor* in the *Slide* window. Refer to the electronic *User guide* supplied with the AXIMA.