

Waters Autosampler Vials, Plates, and Seals for use with the ACQUITY UPLC Systems Family

The ACQUITY UPLC® Systems family continues to evolve and expand, providing a number of solutions for improved resolution, sensitivity, and throughput. A number of different UPLC® Sample Managers are available, each of which offer a choice of needle type to meet the requirements of your laboratory's workflow. This document is intended to guide you to the approved selection of vials, plates, and plate seals for the current ACQUITY UPLC Systems.



Compatibility Tables

The following tables recommend vials and plates for the ACQUITY UPLC System configurations:

Fixed Loop Needle

Vials: ACQUITY UPLC and ACQUITY UPLC I-Class FL; Sample Managers

Plates: ACQUITY UPLC and ACQUITY UPLC I-Class FL; Metal and Metal Tip Needles

ACQUITY UPLC and ACQUITY UPLC I-Class FL; PEEK and PEEKsil Needles







Flow Through Needle

Vials: ACQUITY UPLC H-Class and ACQUITY UPLC I-Class FTN

Plates: ACQUITY UPLC H-Class and ACQUITY UPLC I-Class FTN



Table 1: Recommended Vials for ACQUITY UPLC and ACQUITY UPLC I-Class FL; Sample Managers

	Clear	Amber	Max Recovery	Amber Max	300 µL PP	750 µL PP	Clear Glass with Septumless Cap	Total Recovery
For PEEK and Metal-Tipped Needles								
Vial Number	1	2	3	4	5	6	7	8
TruView LCMS Certified Combination Packs	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
Vial, Cap, and Pre-Slit Silicone/PTFE Septum	186005666CV	186005661CV	186005662CV	186005670CV	—	—	—	186005663CV
LCMS Certified Combination Packs								
Vial, Cap, and Pre-Slit Silicone/PTFE Septum	600000668CV	600000669CV	600000670CV	600000755CV	—	—	—	600000671CV
LC/GC Certified Combination Packs								
Bonded Pre-Slit Silicone/PTFE Septum	186000307C	186000847C	186000327C	186003886C	—	—	—	186000385C
Combination with PE Septumless Cap	186004132C	186004133C	186004168C	—	—	—	186004132C	186004167C
Combination Packs								
Bonded Pre-Slit Silicone/PTFE Septum Deactivated	186000307DV	186000847DV	186000327DV	—	—	—	—	186000385DV
Bonded Pre-Slit Silicone/PTFE Septum	—	—	—	—	186002639	186005221	—	—
Combination with PE Septumless Cap	—	—	—	—	186004112	—	—	—
Injectable Volumes								
Max	1600 µL	1600 µL	1100 µL	1100 µL	210 µL	530 µL	1600 µL	950 µL
Residual	165 µL	165 µL	22 µL	22 µL	20 µL	70 µL	165 µL	4 µL
Plate Selection from ACQUITY® Sampler Manager	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder

When (DV) appears beside a number, a deactivated version of the part can be ordered by adding a DV to the right of the part number.

Table 2: Recommended Plates for ACQUITY UPLC and ACQUITY UPLC I-Class FL; Metal and Metal Tip Needles

	96-Well Plates				384-Well Plates	
Plates	186002643	186005837	186002481	186002482	186002632	186002631
Pack Size	100	25	50	50	50	50
Well Volume	350 µL	700 µL	800 µL	2 mL	250 µL	100 µL
Sealing Options						
PTFE/Silicone Pre-slit, 5/pk	186006332	186006332	186006332	186006335	—	—
Polypropylene Cap Mat, 50/pk	—	186002483	186002483	186002484	—	—
Clear Polyester Heat Seal, 100/pk	186002788	186002788	186002788	186002788	186002788	186002788
Aluminum Foil Laminate Heat Seal, 100/pk	186002789	186002789	186002789	186002789	186002789	186002789
Adhesive Seal, 100/pk	186006336	186006336	186006336	186006336	186006336	186006336
Number of Plates in Sample Organizer	21	10	10	7	10	21
Shape	round	round	round	square	square	square
Bottom	round	conical	conical	conical	conical	conical
Material	PP	PP	PP	PP	PP	PP
Height of Plate	14 mm	31 mm	31 mm	42.5 mm	22 mm	15.5 mm
Well Depth	11.25 mm	27 mm	27 mm	39 mm	19.5 mm	12.3 mm
Residual Volume in ACQUITY at default needle placement of 2 mm	35 µL	8 µL	15 µL	20 µL	15 µL	15 µL
Plate Selection from Chromatography Data System	ANSI-96well350uL	ANSI-96well1mL	ANSI-96well1mL	ANSI-96well2mL	ANSI-384well250uL	ANSI-384well100uL
96-Well Glass Inserts						
Glass Insert 96-Well Plates	700 µL	1 mL	—	—	—	—
Plate for Quick Load Inserts, 20/pk	186001438	186001438	—	—	—	—
Quick-Load Glass Insert, 1/pk	186001437(DV)	186001436(DV)	—	—	—	—
96-Well Plate with Inserts	186000349(DV)	186000855(DV)	—	—	—	—
Pre-Slit PTFE Silicone Seal, 5/pk (blue) - seals against plate wall	186000857	—	—	—	—	—
Pre-Slit PTFE Silicone Seal, 5/pk (clear) - seals against plate wall	186006335	—	—	—	—	—
Pre-Slit PTFE Silicone Seal, 10/pk (blue) - seals inside glass insert	—	186000856	—	—	—	—
Pre-Slit PTFE Silicone Seal, 5/pk (clear) - seals inside glass insert	—	186006332	—	—	—	—
Clear Polyester Heat Seal, 100/pk	186002788	—	—	—	—	—
Aluminum Foil Laminate Heat Seal, 100/pk	186002789	—	—	—	—	—
Adhesive Seal*, 100/pk	186006336	—	—	—	—	—
Residual Volume in ACQUITY at default needle placement of 2 mm	15 µL	15 µL	—	—	—	—
Plate Selection from Chromatography Data System	ANSI-96Well 700uLGlassInsert	ANSI-96Well 1mLGlassInsert	—	—	—	—

When (DV) appears beside a number, a deactivated version of the part can be ordered by adding a DV to the right of the part number.

Table 3: Recommended Plates for ACQUITY UPLC and ACQUITY UPLC I-Class FL; PEEK and PEEKSiI Needles









	96-Well Plates				384-Well Plates	
Plates	186002643	186005837	186002481	186002482	186002632	186002631
Pack Size	100	25	50	50	50	50
Well Volume	350 µL	700 µL	800 µL	2 mL	250 µL	100 µL
Sealing Options						
Polypropylene Cap Mat, 50/pk	—	186002483	186002483	186002484	—	—
Clear Polyester Heat Seal, 100/pk	186002788	186002788	186002788	186002788	186002788	186002788
Aluminum Foil Laminate Heat Seal, 100/pk	186002789	186002789	186002789	186002789	186002789	186002789
Adhesive Seal*, 100/pk	186006336	186006336	186006336	186006336	186006336	186006336
Number of Plates in Sample Organizer	21	10	10	7	10	21
Shape	round	round	round	square	square	square
Bottom	round	conical	conical	conical	conical	conical
Material	PP	PP	PP	PP	PP	PP
Height of Plate	14 mm	31 mm	31 mm	42.5 mm	22 mm	15.5 mm
Well Depth	11.25 mm	27 mm	27 mm	39 mm	19.5 mm	12.3 mm
Residual Volume in ACQUITY at default needle placement of 2 mm	35 µL	8 µL	15 µL	20 µL	15 µL	15 µL
Plate Selection from Chromatography Data System	ANSI-96well350uL	ANSI-96well1mL	ANSI-96well1mL	ANSI-96well2mL	ANSI-384well250uL	ANSI-384well100uL
96-Well Glass Inserts						
Glass Insert 96-Well Plates	700 µL	—	—	—	—	—
Plate for Quick Load Inserts, 20/pk	186001438	—	—	—	—	—
Quick-Load Glass Insert, 1/pk	186001437(DV)	—	—	—	—	—
96-Well Plate with Inserts	186000349(DV)	—	—	—	—	—
Clear Polyester Heat Seal, 100/pk	186002788	—	—	—	—	—
Aluminum Foil Laminate Heat Seal, 100/pk	186002789	—	—	—	—	—
Adhesive Seal*, 100/pk	186006336	—	—	—	—	—
Residual Volume in ACQUITY at default needle placement of 2 mm	15 µL	—	—	—	—	—
Plate Selection from Chromatography Data System	ANSI-96Well700uLGlassInsert	—	—	—	—	—

When (DV) appears beside a number, a deactivated version of the part can be ordered by adding a DV to the right of the part number.

Plate Selection

Chromatographic Data System: Plate Selection' indicates a preprogrammed geometric plate configuration with the proper x, y, and z dimensions for the plate. Select the proper plate from the drop-down menu.

Table 4: Recommended Vials for ACQUITY UPLC H-Class and ACQUITY UPLC I-Class FTN

	Clear	Amber	Max Recovery	Amber Max	300 μ L PP	750 μ L PP	Clear Glass with Septumless Cap	Total Recovery
For PEEK and Metal-Tipped Needles								
Vial Number	1	2	3	4	5	6	7	8
TruView LCMS Certified Combination Packs	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
Vial, Cap, and Pre-Slit Silicone/PTFE Septum	186005666CV	186005661CV	186005662CV	186005670CV	—	—	—	186005663CV
LCMS Certified Combination Packs								
Vial, Cap, and Pre-Slit Silicone/PTFE Septum	600000668CV	600000669CV	600000670CV	600000755CV	—	—	—	600000671CV
LC/GC Certified Combination Packs								
Bonded Pre-Slit Silicone/PTFE Septum	186000307C	186000847C	186000327C	186003886C	—	—	—	186000385C
Combination with PE Septumless Cap	186004132C	186004133C	186004168C	—	—	—	186004132C	186004167C
Combination Packs								
Bonded Pre-Slit Silicone/PTFE Septum Deactivated	186000307DV	186000847DV	186000327DV	—	—	—	—	186000385DV
Bonded Pre-Slit Silicone/PTFE Septum	—	—	—	—	186002639	186005221	—	—
Combination with PE Septumless Cap	—	—	—	—	186004112	—	—	—
Injectable Volumes ACQUITY UPLC								
Max	1450 μ L	1450 μ L	1365 μ L	1365 μ L	290 μ L	610 μ L	1450 μ L	940 μ L
Residual	360 μ L	360 μ L	135 μ L	135 μ L	10 μ L	90 μ L	360 μ L	10 μ L
Plate Selection from ACQUITY Sampler Manager	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder	ANSI-48Vial2mL-Holder

When (DV) appears beside a number, a deactivated version of the part can be ordered by adding a DV to the right of the part number.

Table 5: Recommended Plates - ACQUITY UPLC H-Class and ACQUITY UPLC I-Class FTN

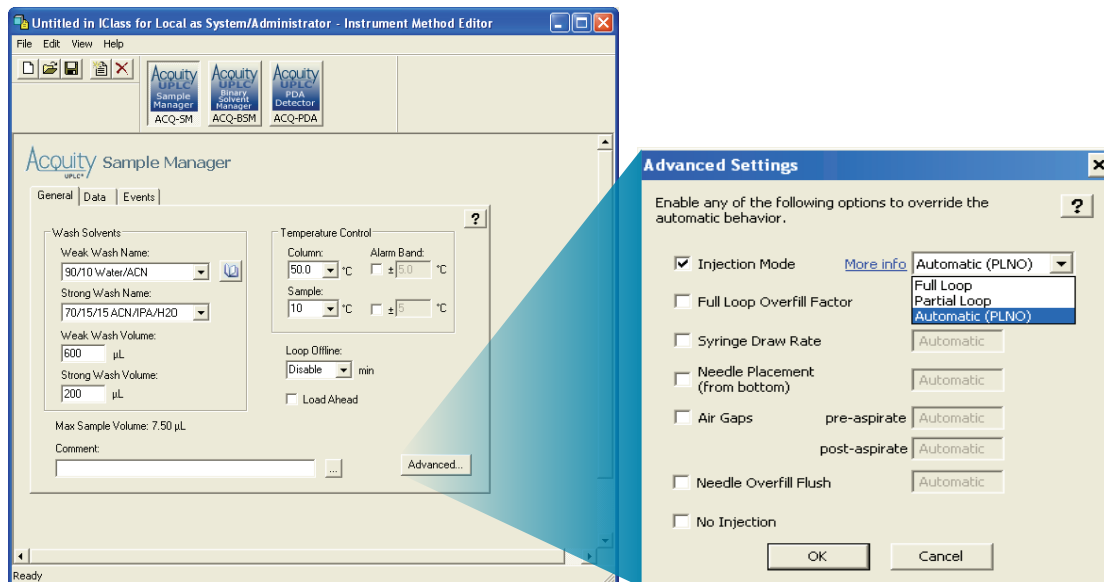
	96-Well Plates			384-Well Plates	
Plates	186002643	186005837	186002481	186002482	186002632
Pack Size	100	25	50	50	50
Well Volume	350 µL	700 µL	800 µL	2 mL	250 µL
Sealing Options					
PTFE/Silicone Pre-Slit, 5/pk	186006332	186006332	186006332	186006335	—
Clear Polyester Heat Seal, 100/pk	186002788	186002788	186002788	186002788	186002788
Aluminum Foil Laminate Heat Seal, 100/pk	186002789	186002789	186002789	186002789	186002789
Adhesive Seal*, 100/pk	186006336	186006336	186006336	186006336	186006336
Number of Plates in Sample Organizer	21	10	10	7	10
Shape	round	round	round	square	square
Bottom	round	conical	conical	conical	conical
Material	PP	PP	PP	PP	PP
Height of Plate	14 mm	31 mm	31 mm	42.5 mm	22 mm
Well Depth	11.25 mm	27 mm	27 mm	39 mm	19.5 mm
Residual Volume in ACQUITY at default needle placement of 2 mm	35 µL	8 µL	15 µL	20 µL	15 µL
Plate Selection from Chromatography Data System	ANSI-96well350uL	ANSI-96well1mL	ANSI-96well1mL	ANSI-96well2mL	ANSI-384well250uL
96-Well Glass Inserts					
Glass Insert 96-Well Plates	700 µL	1 mL			
Plate for Quick Load Inserts, 20/pk	186001438	186001438	—	—	—
Quick-Load Glass Insert, 1/pk	186001437(DV)	186001436(DV)	—	—	—
96-Well Plate with Inserts	186000349(DV)	186000855(DV)	—	—	—
Pre-Slit PTFE Silicone Seal, 5/pk (blue) - seals against plate wall	186000857	—	—	—	—
Pre-Slit PTFE Silicone Seal, 5/pk (clear) - seals against plate wall	186006335	—	—	—	—
Pre-Slit PTFE Silicone Seal, 10/pk (blue) - seals inside glass insert	—	186000856	—	—	—
Pre-Slit PTFE Silicone Seal, 5/pk (clear) - seals inside glass insert	—	186006332	—	—	—
Clear Polyester Heat Seal, 100/pk	186002788	—	—	—	—
Aluminum Foil Laminate Heat Seal, 100/pk	186002789	—	—	—	—
Adhesive Seal*, 100/pk	186006336	—	—	—	—
Residual Volume in ACQUITY at default needle placement of 2 mm	15 µL	15 µL	—	—	—
Plate Selection from Chromatography Data System	ANSI-96Well 700uLGlassInsert	ANSI-96Well 1mLGlassInsert	—	—	—

When (DV) appears beside a number, a deactivated version of the part can be ordered by adding a DV to the right of the part number.

Residual Volumes

All residual volumes recorded in the tables are calculated from the needle stopping at the default needle placement setting. For sample limited applications, go to the advanced setting screen in the Sample Manager Instrument Method Editor to change needle placement. For the flow through needles (FTN), care should be taken when lowering the needle placement setting. Needle tips can be damaged by striking against hard surfaces, causing sealing or carryover issues.

ACQUITY UPLC Sample Manager – FL



ACQUITY UPLC Sample Manager – FTN

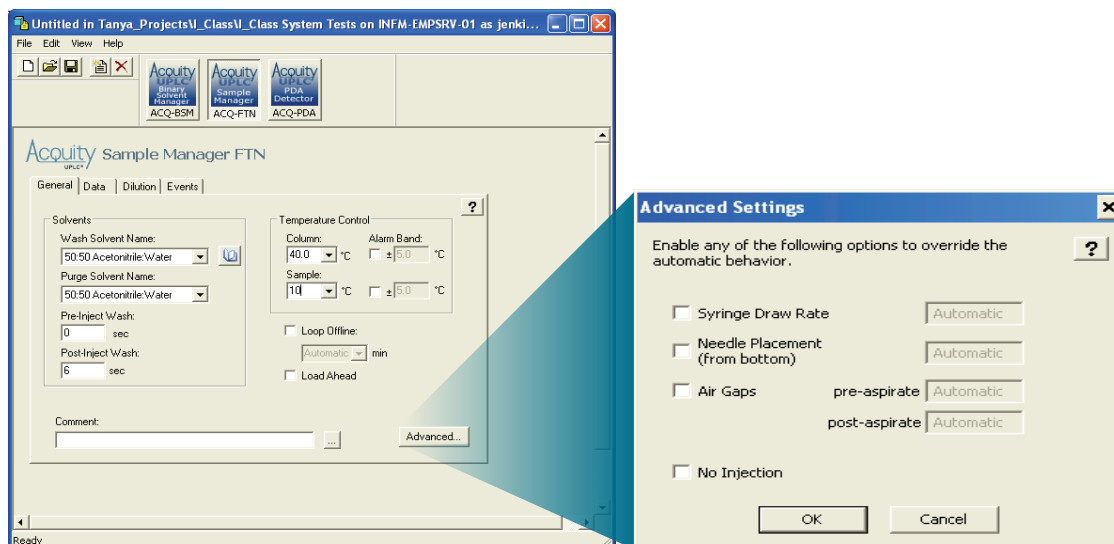


Figure 1: How to change needle depth within the instrument method

Vials

Certified Vials Product Lines

Waters offers three lines of certified vials: LC/GC Certified Vials, LCMS Certified Vials, and TruView LCMS Certified Vials. All lines are certified as being within dimensional tolerances and are tested for chemical cleanliness by instrumentation methods.

LC/GC Certified Vials

LC/GC Certified Vials are tested by HPLC using UV detection. The HPLC test was developed to look for trace levels of chemicals used in the manufacturing and packaging process. These chemicals include lubricants, surfactants, antistatic, and antioxidants from packaging. The tests are run on each batch of vials, after they have been packaged for several days, to ensure cleanliness. An additional headspace GC test is done to look for proper curing of the silicone septa.

LCMS Certified Vials

LCMS certified vials are tested using MS detection. In this test, we took an unbiased approach and look for any ionized masses regardless of the source. The test is run in scan mode with specifications set on total ion count and presence of clusters in the high mass range.

NEW TruView LCMS Certified Vials

TruView LCMS Certified Vials include the stringent dimensional tolerances and UV and MS cleanliness tests required of the LC/GC and LCMS Certified Vials lines. The glass surface of TruView vials exhibits low polar analyte adsorption. TruView vials are manufactured under tightly controlled process conditions (patent pending) that limit the concentration of free ions on the surface of glass which often lead to analyte adsorption. Waters TruView LC/MS Certified Vials are tested for high recovery of analytes at 1 ng/mL concentration, using UPLC/MS/MS (MRM). TruView Vials exhibit the lowest surface adsorption of any LC autosampler vial on the market.

Certified Vial Selection Guide

The proper selection of an autosampler vial is related to the concentration of the analyte as well as detection source used.

Table 6: Recommended Certified Vial for Detection Source and/or Analyte Concentration

Analyte Concentration	Detection Source	Recommended Product
µg/mL	UV, RI (non MS)	LC/GC Certified Vials
100's ng/mL	single quadrupole and older MS/MS	LCMS Certified Vials
1 ng/mL and lower	MS/MS, TOF	TruView LCMS Certified Vials

Well Plates

All sample plates listed in the tables in this document meet ANSI/SBS standards for robot compatibility. All the plates are made with polypropylene for solvent and sample resistance.

What's New

Part # 186005837 is a 96-well, 700 µL per well plate made from a clean grade of polypropylene. The wells are designed to maximize sample recovery for all ACQUITY UPLC Systems. The plate has the same dimension (height and well depth) as the ANSI 1 mL plate for ease of programming use. Select "ANSI-96well1mL plate" from the plate select screen in the ACQUITY UPLC Sample Manager.

Plate Seals

Waters offers a selection of plate seals and cap mats for use with ACQUITY plates.

Heat Seals

Clear Polyester Heat Seal

A non-conductive seal good for most sample solvents. The seal can be used over the temperature range from -80 to 80 °C. Position the seal with the shiny side facing up. Apply heat using the Waters heat sealer for 2 to 3 seconds in both directions following the instructions found on page 9 in the heater manual (download instructions at www.waters.com/chemcu using literature code: 720001330en).

Aluminum Foil Heat Seal

Good for most solvents used in laboratories. The seal can be used over the temperature range from -200 to 90 °C. Position the seal with the white side facing up. Apply heat using the Waters Heat Sealer for 2 to 3 seconds in both directions following the instructions found on page 9 in the heater manual (download instructions at www.waters.com/chemcu using literature code: 720001330en).

Cap Mats

Waters offers a range of cap mats for sealing plates. Cap mats made of polypropylene and/or PTFE/silicone are approved use with certain ACQUITY UPLC configurations. Refer to Tables 2, 3, and 5 for approved cap mats.

Polypropylene (PP)

Offer a wide range of solvent resistance and have good sealing properties. Best operating temperatures for PP cap mat covered plates, filled with 100% organic solvent or 50/50 organic/water is between 10–15 °C. Temperatures closer to ambient can give inconsistent results. Cap mats can become brittle when cooled below ambient temperatures.

Heat Seal for ACQUITY UPLC Systems

Heat Sealer	Part No.
115 Volt	186002786
240 Volt	186002787

Heat Sealer Operating Guidelines

For more information regarding heat sealers, download the manual, literature code 720001330EN at www.waters.com/library

Heat Seal	Temperature Range	Solvent Range	Recommendation
Clear Polyester	From -80 °C to 80 °C	Good for Most Lab Solvents	—
Aluminum Foil Laminate	From -200 °C to 90 °C	Good for Most Lab Solvents	Best for Long Term Storage

NEW Adhesive Seal

Part # 186006336 is a polyolefin film with a synthetic rubber adhesive. This seal is ideal for protein and peptide customers with samples in buffers. The adhesive is resistant to small concentrations of acetonitrile and alcohol in buffers. The film can be used between -80 to 80 °C, and requires no heat sealing equipment to apply.

NEW Pre-slit PTFE/Silicone

Part # 186006332 and 186006335 are made from a cleaner grade of silicone. The PTFE/silicone mats can be used for plates and glass inserts. These mats are translucent in color. Refer to Tables 2, 3, and 5 for approved application.



Waters

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