

# **Waters ACQUITY Advanced Polymer Chromatography (APC) System**

## ***Site Preparation Guide***

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## General information

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This guide helps you prepare your laboratory facility for installation of your Waters system. Proper site preparation is critical to successful operation of the system.

### Related information

[ACQUITY APC System User Guides](#) (Waters website)

### Customer support

If you have questions about this document or preparation of your site, contact your local Waters sales representative.

### Safety advisories

- ! **Warning:** Failure to completely read and closely follow the site preparation guide may result in damage to the products, injury to persons, and damage to other property.
- ! **Important:** Observe Good Laboratory Practice (GLP) at all times. When working with hazardous materials, consult the safety representative for your organization.
- ! **Warning:** To avoid contact with solvents, wear suitable gloves and safety glasses.

## Glossary of abbreviations

Table 1 lists product name abbreviations.

**Table 1: Glossary of abbreviations**

Abbreviation	Component name
CM-30S	30-cm Column Manager–Single Zone
CM-S	Column Manager–Single Zone
ELS	Evaporative Light Scattering Detector
MS	Mass spectrometer
PDA TS	PDA Detector with TaperSlit
pISM	Isocratic Solvent Manager
pQSM	Quaternary Solvent Manager
RI	Refractive Index Detector
SM-pFTN	Sample Manager-Flow Through Needle
TUV	Tunable UV Detector

## Responsibilities

The customer must prepare the site as required before the Waters-certified engineer can install the system.

### *Customer responsibilities (storage and site preparation)*

**!** **Important:** It is essential that you prepare the site correctly and complete the checklist accurately. If a Waters service engineer arrives to begin your installation and cannot proceed because of inadequate site preparation or lack of necessary supplies, you may be charged for all travel costs incurred.

Please contact Waters if you have questions about preparing your site.

1. Provide appropriate storage for Waters equipment before it is installed.
2. Prepare your laboratory to meet the requirements specified in the site preparation guide.
3. Verify that each requirement has been met by marking the check box in each section of the guide.
4. Ensure that the person designated to operate and maintain the system is present at the installation for training in basic system operation.

**Note:** If the designated person cannot be present at the installation, please notify Waters so that we can reschedule the installation for a more convenient time.

### *Waters responsibilities (installation)*

1. Unpack the system.
2. Install the system.
3. Test system performance to ensure that it is properly installed and operational.
4. Train the customer on basic operation of the system hardware and software.

## Relocating shipping containers

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Follow the guidelines in this section to lift, relocate, and store shipping containers.

**!** **Important:** Do not unpack the equipment before lifting or moving it.

### Lifting

Before lifting, lowering, or moving the shipping containers:

- Assess the risk of injury
- Take action to eliminate risk
- Plan the operation—both ahead of the installation and in conjunction with the Waters engineer at the time of installation
- Adhere to appropriate country and company regulations

**!** **Important:** If your system includes a mass spectrometer, refer to the appropriate site preparation guide for additional lifting requirements.



**Warning:** To avoid injury, use appropriate lifting equipment to lift the mass spectrometer. Do not lift it manually.



**Warning:** To avoid skeletal or muscle injury associated with lifting heavy objects, use the appropriate number of people to lift the instrument. If necessary, use lifting equipment that can raise the instrument to the height of the laboratory bench.

### Moving

If you move the shipping containers, transport them to the laboratory designated for system use. Follow these guidelines:

- Ensure that all passageways accommodate the largest component.
- Keep shipping containers on the pallet. If you must transport shipping containers individually (without the pallet), ensure that all containers are moved, and retain all packing slips.

**!** **Caution:** To avoid damaging the system, do not bump or jolt it during transport. If you must transport the instrument across an uneven surface, carry it on a forklift truck or trolley.

### *Doorways*

Doorways must be wide enough to accommodate the largest component. For system dimensions, see [Table 2](#) and [Table 3](#).

### *Elevators, corridors, and staircases*

Elevators and corridors must be wide enough to negotiate corners. If you plan to move the system via staircase, you are responsible for moving the system.

**!** **Important:** For safety reasons, Waters is not responsible for moving products via staircases.

## **Storage**

Maintain the following storage conditions before Waters installs your system:

- Unopened shipping crates
- Storage area temperature 0 to 40 °C (32 to 104 °F)
- Humidity <80%, noncondensing

## **Verify relocating shipping containers requirements**

Mark the check box below to verify that all requirements are met. After you complete all check boxes, return the site preparation guide to Waters.

**!** **Important:** Installation cannot proceed unless all site preparation requirements are met.

**All relocation requirements met**

## Space and load requirements

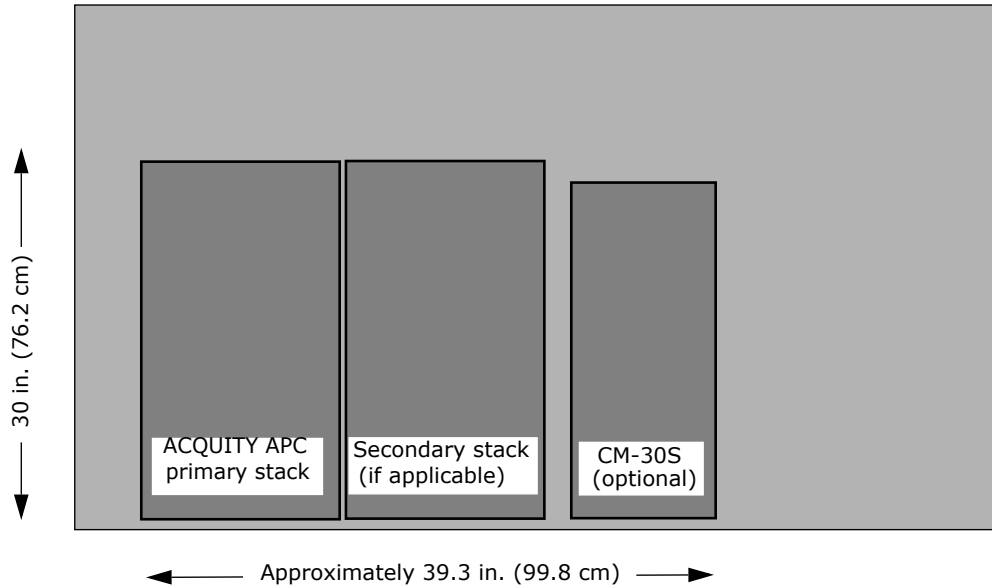
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Ensure that the laboratory bench has sufficient space for system configuration and installation, and that it can support the weight of all components.

### Recommended configurations

The figures below show recommended layouts for your system as configured in a single, double, or triple stack.

**!** **Important:** If you do not know which layout to prepare for, contact your Waters representative.



*Figure 1 - Minimum width and depth clearances (overhead view)*



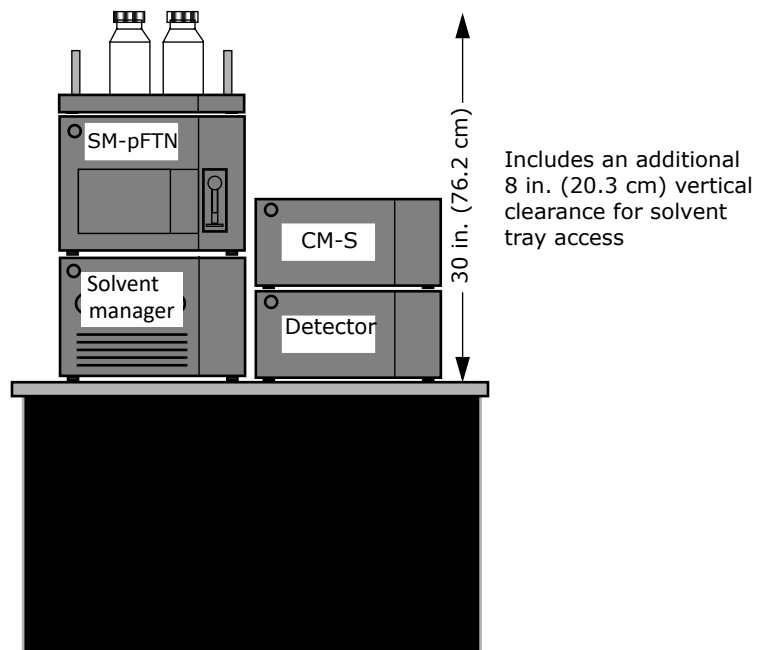


Figure 2 - Dual stack (front view)

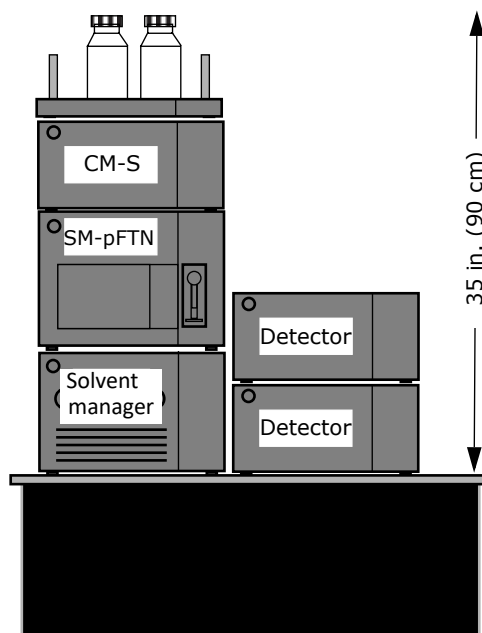


Figure 3 - Dual stack with optional second detector

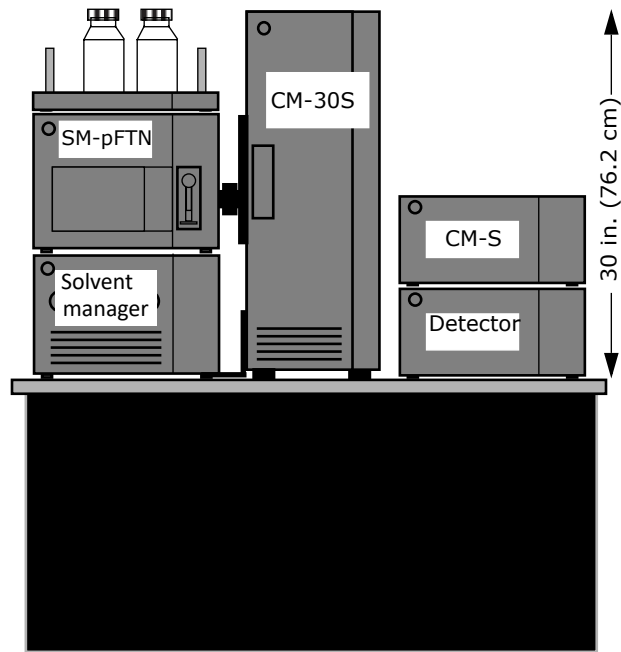


Figure 4 - Dual stack with optional CM-30S

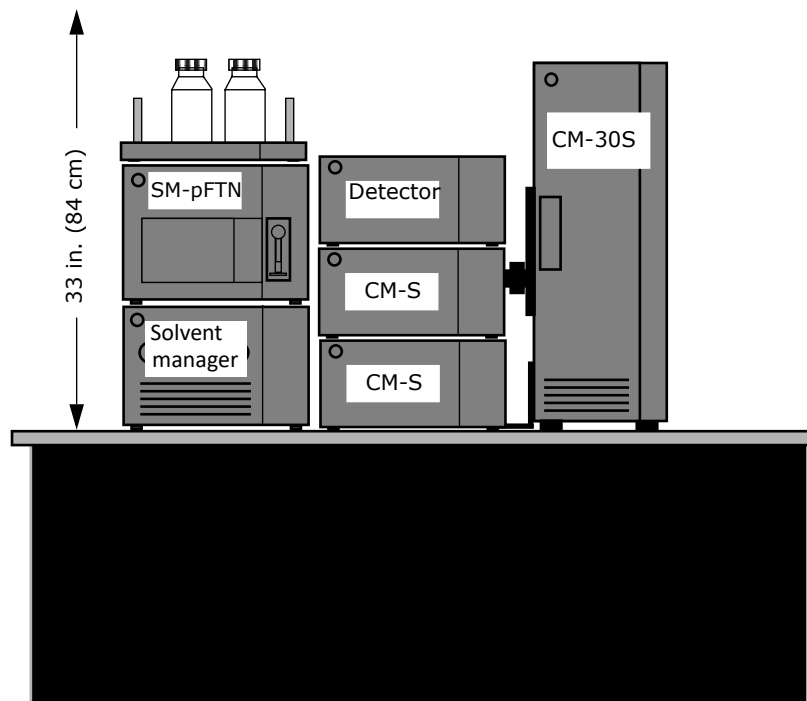


Figure 5 - Triple stack with optional CM-30S

## Component dimensions

Ensure that your laboratory bench has sufficient space and that it can support the weight of all system components (see [Table 2](#)).

- ! **Important:** Ensure that there is at least 152 cm (5 ft) of vertical clearance above the laboratory bench.
- ! **Important:** For specific height and weight restrictions, contact your Waters service representative.
- ! **Important:** For MS requirements, refer to the appropriate mass spectrometer site preparation guide.

**Table 2: Component dimensions and weights**

System component <sup>1</sup>	Width	Depth	Height	Weight
pISM	34.3 cm (13.5 in.)	61.5 cm (24.2 in.)	23.8 cm (9.38 in.) with 2.2 cm (0.875 in.) feet	25.9 kg (57 lb)
Allow at least 6 in. (15.2 cm) clearance at the rear for ventilation and connections.				
pQSM	34.3 cm (13.5 in.)	61.5 cm (24.2 in.)	23.8 cm (9.38 in.) with 2.2 cm (0.875 in.) feet	27.7 kg (61 lb)
Allow at least 6 in. (15.2 cm) clearance at the rear for ventilation and connections.				
SM-pFTN	34.3 cm (13.5 in.)	61.5 cm (24.2 in.)	27.1 cm (10.7 in.)	25.9 kg (57 lb)
CM-S	34.3 cm (13.5 in.)	61.0 cm (24.0 in.)	20 cm (7.8 in.)	21 kg (46 lb)
Allow at least 6 in. (15.2 cm) clearance at the rear and 3 in. (7.6 cm) to the right for ventilation and connections.				
CM30-S	23.6 cm (9.3 in.)	61.5 cm (24.2 in.)	71.9 cm (28.3 in.)	43.2 kg (95 lb)
The mounting bracket provides a 3-in. (7.6-cm) ventilation clearance to the left side of the column manager.				
PDA TS	34.3 cm (13.5 in.)	61 cm (24.0 in.)	19.4 cm (7.6 in.)	13.6 kg (30.0 lb)
TUV	34.3 cm (13.5 in.)	53.4 cm (21.0 in.)	20.8 cm (8.2 in.)	9.3 kg (20.5 lb)
ELS	34.3 cm (13.5 in.)	51.8 cm (20.4 in.)	21.6 cm (8.5 in.)	14.7 kg (32.5 lb)
RI	34.3 cm (13.5 in.)	61 cm (24.0 in.)	20.8 cm (8.2 in.)	34 lb (15.4 kg)
Allow at least 6 in. (15.2 cm) clearance at the rear for ventilation and connections.				
Solvent Tray Module	34.3 cm (13.5 in.)	52.1 cm (20.5 in.)	12.7 cm (5.0 in.)	2.3 kg (5 lb)

1. Unless otherwise specified, all instruments are equipped with 0.25 in (0.64 cm) high feet.

## Clearances

Ensure that the laboratory space provides sufficient clearance (working space) for all necessary components (Table 3).

**!** **Important:** For MS requirements, refer to the appropriate mass spectrometer site preparation guide.

**Table 3: System clearances**

System/component	Clearance
Customer's laboratory bench	• Vertical: 152 cm (5 ft)
System components <b>Note:</b> Refer to the appropriate mass spectrometer site preparation guide for additional requirements.	• Rear: 15.2 cm (6 in.) • Right: 7.6 cm (3 in.)
Solvent tray (top-mounted)	• Vertical: 20.3 cm (8 in.)

## Verify space and load requirements

Mark the check box below to verify that all requirements are met. After you complete all check boxes in the site preparation guide, return it to Waters.

**!** **Important:** Installation cannot proceed unless all site preparation requirements are met.



All space and load requirements met

## Solvent requirements

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**Caution:** To ensure proper performance of the LC/MS system, use clean, high-purity (LC/MS-grade) solvents. Failure to provide clean solvents and glassware can cause significant delays to the installation.

Have the following solvents available for the installation:

- Water
- Acetonitrile
- Methanol
- Isopropanol
- Tetrahydrofuran (THF) (stabilized for Refractive Index detector)
- Tetrahydrofuran (THF) (unstabilized for PDA TS)



**Important:** For details on solvent brands, glassware requirements, and procedures to control contamination, see the following:

- [Controlling Contamination in UltraPerformance LC/MS and HPLC/MS Systems](#) (715001307), located in the Waters Support Center
- The [safety data sheets \(SDSs\)](#) for your products

### Verify solvent requirements

Mark the check box below to verify that all requirements are met. After you complete all check boxes, return the completed site preparation guide to Waters.



**Important:** Installation cannot proceed unless all site preparation requirements are met.



All solvent requirements met

## Gas requirements

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### Gas for the ELS detector

#### *Use air or nitrogen*

The ELS detector requires a suitable supply of nitrogen gas or zero-grade air with the following conditions:

- Gas flow of approximately 3 to 4 L/min
- 65 to 90 psi at the regulator

**Note:** Gas cylinders are not recommended because of their limited capacity.

#### *Air/gas quality*

Air/gas quality should meet the highest possible standards for particle diameter, moisture, and oil density.

### Verify gas requirements

Mark the check box below to verify that all requirements are met. After you complete all check boxes, return the site preparation guide to Waters.

**!** **Important:** Installation cannot proceed unless all site preparation requirements are met.

<input type="checkbox"/>	All gas requirements met
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## Power requirements

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Refer to the following power requirements when preparing your laboratory.

### **Electrical safety**

Follow all local electrical safety requirements in preparing your laboratory.

### **Over-voltage rating**

The laboratory environment must comply with installation (over-voltage) category II.

### **Power source/receptacles**

All system components require a dedicated, earthed (grounded) power source. The receptacles from this power source must be accessible to the system components, and they must share a common ground. Use [Table 5](#) as a guide for determining the receptacles required for the components in your system.

#### *Optional valves*

If your system includes optional valves, be aware that each valve includes a power supply that requires a power receptacle that uses a common, earthed (grounded) power source.

#### *Systems with a mass spectrometer*

If your system includes a mass spectrometer, refer to its site preparation guide for specific power source requirements.

## Power summary

See [Table 4](#) for a summary of component power requirements. For more information on power terminology, see [“Power source/receptacles” on page 15](#).

**!** **Caution:** Never use an extension cord to connect the instrument to an AC power source.

**Table 4: System power requirements**





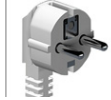










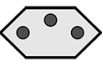




Component	Nominal rated voltage	Maximum power consumption
pISM	100 to 240 VAC 50/60 Hz	200 VA
pQSM	100 to 240 VAC 50/60 Hz	200 VA
SM-pFTN	100 to 240 VAC 50/60 Hz	400 VA
CM-S	100 to 240 VAC 50/60 Hz	400 VA
CM30-S	100 to 240 VAC 50/60 Hz	500 VA
PDA TS	100 to 240 VAC 50/60 Hz	185 VA
TUV	100 to 240 VAC 50/60 Hz	200 VA
ELS	100 to 240 VAC 50/60 Hz	200 VA
RI	100 to 240 VAC 50/60 Hz	145 VA
Data system	100 to 240 VAC 50/60 Hz	1000 VA
Mass spectrometer	See the mass spectrometer site preparation guide	



## Plug/receptacle types

- ! **Requirement:** Ensure that one receptacle is available for each system component (including the data system).

**Table 5: Power cords supplied by Waters**

Region	Plug	Receptacle	Receptacle type
US/ Canada/ Japan/ Taiwan			NEMA 5-15R
UK			BS 1363
Europe			CEE 7
Australia			AS/NZS 3112
Brazil			NBR 14136
China			CPCS-CCC
Denmark			107-2-D1
Switzerland			SEV 1011
India			UK2-15R
Korea			SK1-16R

## Verify power requirements

Mark the check box below to verify that all requirements are met. After you complete all check boxes, return the site preparation guide to Waters.

**!** **Important:** Installation cannot proceed unless all site preparation requirements are met.

<input type="checkbox"/>	All power requirements met
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## Environmental requirements

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### Air quality

Ensure that the laboratory is not exposed to excessive dust.

**!** **Important:** The laboratory environment must comply with pollution category 1 and installation category 2.

### Humidity

Ensure that the relative humidity of the laboratory is lower than 80%, noncondensing.

### Air flow

Ensure that air flow from heating or air-conditioning diffusers is not directed on the system.

### Temperature

The ambient temperature in the laboratory must be from 15 to 28 °C (59 to 82 °F).

The optimum temperature range in the laboratory is 19 to 22 °C (66 to 72 °F).

Short-term thermal variations should be no more than 2 °C (3.6 °F) per 1.5 hours.

**!** **Caution:** Failure to operate in the recommended temperature ranges will compromise system performance and can result in instrument failure.

**!** **Important:** If your system includes a mass spectrometer, refer to its site preparation guide for specific information on thermal variations.

## Vibration

Ensure that the laboratory is located away from heavy machines such as compressors and generators, which can create excessive floor vibration.

## Magnetic fields

If using the system with a mass spectrometer, ensure that the laboratory is located away from strong magnetic fields such as those generated by NMR systems or magnetic sector mass spectrometers.

## Radio emissions

Minimize radio frequency (RF) emission from nearby sources. Possible sources of RF emission include RF-linked alarm systems, mobile telephones, and hand-held transmitters.

**!** **Caution:** If any of these devices causes interference, discontinue its use.

## Verify environmental requirements

Mark the check box below to verify that all requirements are met. After you complete all check boxes, return the site preparation guide to Waters.

**!** **Important:** Installation cannot proceed unless all site preparation requirements are met.

<input type="checkbox"/>	All environmental requirements met
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## Waste collection requirements

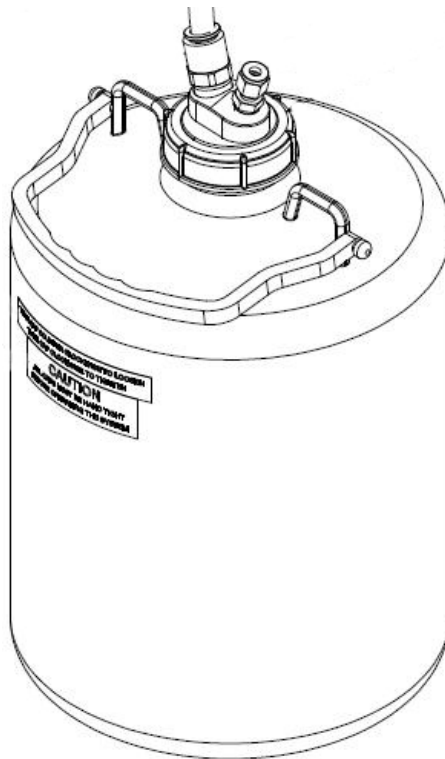
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The waste management system is a closed-architecture, gravity-driven drainage system that effectively collects and removes any solvent leaks and process waste from the system. Each instrument uses a drip tray to collect and route the waste from one module tray to the one beneath it.

**!** **Important:** To maintain proper drainage and leak control, ensure that the system is level.

### Waste container

Position a suitable waste container ([Figure 6](#)) below the bench top.



*Figure 6 - Example waste container*

## Exhaust outlets

**!** **Important:** Venting of the system is the responsibility of the customer.

An in-line degasser, integral to the solvent manager, exhausts dissolved gases from the eluents and condensate from the exhaust system through a vent line on the front of the instrument.

### *Exhaust outlet for systems with a mass spectrometer*

If your system includes a mass spectrometer, refer to its site preparation guide for detailed pump and source exhaust outlet information.

## Verify waste collection requirements

Mark the check box below to verify that all requirements are met. After you complete all check boxes in the site preparation guide, return it to Waters.

**!** **Important:** Installation cannot proceed unless all site preparation requirements are met.

<input type="checkbox"/>	<b>All waste collection requirements met</b>
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## Test sample requirements

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The Waters service engineer uses the samples supplied with the system. If the test samples were received in a separate shipment, you must make the samples available to the Waters engineer at the time of installation. If a Waters service engineer arrives to begin your installation and cannot proceed because test samples are unavailable, the installation may be delayed. Waters may ask for reimbursement of the costs incurred due to the extra time required to complete the installation.

**!** **Important:** Please contact Waters if you have questions about providing test samples.

**Note:** If your laboratory practices require full sample certification documentation, Waters Analytical Standards and Reagents provide ready-to-use reference materials and reagents that are fully traceable and certified.

### Verify test sample requirements

Mark the box check below to verify that all requirements are met. After you complete all check boxes in the site preparation guide, return it to Waters.

**!** **Important:** Installation cannot proceed unless all site preparation requirements are met.

<input type="checkbox"/>	All test sample requirements met
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## Items you must supply

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Supply the following items for the installation:

- Solvent
- Mobile phase bottles
- Pipette
- Non-glass waste container that can be vented to an exhaust system

**!** **Important:** If your system includes a mass spectrometer, refer to the mass spectrometer site preparation guide for other required items.

**!** **Caution:** Ensure that the supplied items have never been washed with detergent, washed with other glassware, or washed in facilities that might have detergent residue. Washing glassware in a common dishwashing facility can contaminate glassware with detergent residues, which may contain polyethylene glycol and other “sticky” substances. Vinyl-coated steel racks can be additional sources of contamination.

### Verify items you must supply requirements

Mark the check box below to verify that all requirements are met. After you complete all check boxes in the site preparation guide, return it to Waters.

**!** **Important:** Installation cannot proceed unless all site preparation requirements are met.

<input type="checkbox"/>	All items we (the customer) must supply are available
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## Workstation requirements

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### Software/operating system requirements

If you are providing your own computer for a Waters chromatography data system, contact your Waters sales representative for details on the required computer hardware, software, and operating system specifications.

**!** **Important:** Refer to the [Release Notes](#) for additional information and restrictions. The Release Notes contain important information about known and fixed issues, installation, configuration, and recommendations for requalification and revalidation.

### Verify computer requirements

Mark the check box below to verify that all requirements are met. After you complete all check boxes in the site preparation guide, return it to Waters.

**!** **Important:** Installation cannot proceed unless all site preparation requirements are met.

<input type="checkbox"/>	All computer requirements met
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## Customer confirmation

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**!** **Important:** It is essential to prepare the site correctly and complete the checklist. If a Waters service engineer arrives to begin your installation and cannot proceed because of inadequate site preparation or lack of necessary supplies, you may be charged for all travel costs incurred.

**Important:** Please contact Waters if you have questions about preparing your site.

<input type="checkbox"/>	<p><b>I confirm that all supplies are now available.</b></p>
<input type="checkbox"/>	<p><b>I confirm that all facility requirements have been met and all Requirement check boxes have been completed. (See the list of check box items below.)</b></p> <ol style="list-style-type: none"> <li>1. All relocation requirements met, page 7</li> <li>2. All space and load requirements met, page 12</li> <li>3. All solvent requirements met, page 13</li> <li>4. All gas requirements met, page 14</li> <li>5. All power requirements met, page 18</li> <li>6. All environmental requirements met, page 20</li> <li>7. All test sample requirements met, page 23</li> <li>8. All items we (the customer) must supply are available, page 24</li> <li>9. All computer requirements met, page 25</li> </ol>
<input type="checkbox"/>	<p><b>I confirm that an operator will be available for demonstration and training by a Waters engineer during the installation.</b></p> <p><i>Indicate availability (check one):</i></p> <p><input type="checkbox"/> During the entire installation</p> <p><input type="checkbox"/> During part of the installation: approximately _____% of the time</p> <p><b>Important:</b> If the designated person cannot be present at the installation, please notify Waters so that we can reschedule the installation for a more convenient time.</p>

Customer signature: \_\_\_\_\_

## Customer summary

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Please complete the summary table below in block letters.

<b>Job title</b>	
<b>Name</b>	
<b>Organization</b>	
<b>Street</b>	
<b>City/state</b>	
<b>Zip/postal code</b>	
<b>Country</b>	
<b>Telephone</b>	
<b>Fax</b>	
<b>Email</b>	

**!** **Important:** The installation of your system cannot begin until the site preparation guide has been fully completed and returned to your local Waters representative.