



March, 2020

Advanced Instruments Osmometers
Japanese Pharmacopeia Compliance

Organization, region or country	Name of pharmacopeia	Effective Date(Latest Revision)
Japan	Japanese Pharmacopeia	March 7 th , 2016 (JP 17 th Edition)

Chapter 2.47 of the Japanese Pharmacopoeia (JP) provides quality standards for osmolality testing in the pharmaceutical industry to control the quality of medicines and the materials used to manufacture them.

Advanced Instruments certifies that our osmometers support compliance with the JP chapter on osmolality as described in Table 1. We remind customers that it is the responsibility of the end user to implement the necessary procedures in their laboratory to effectively achieve pharmacopeia compliance.

Sincerely,

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Attachments:

Table 1. Advanced Instruments Osmometers Support of JP Compliance



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Pharmacopeia Requirement ¹	Compliance Supported?	Advanced Instruments Comments
<p>APPARATUS — “Usually, the osmotic concentration of a solution can be obtained by measuring the extent of the freezing-point depression. The apparatus (osmometer) is composed of a sample cell for a fixed volume of sample solution and a cell holder, a cooling unit and bath with a temperature regulator, and a thermistor for detecting temperature.”</p>	Yes	<p>Advanced Instruments freezing point osmometers consist of:</p> <ul style="list-style-type: none"> - a tube or tip to contain the sample; - a thermoelectric cooling element to cool the sample; - a high precision thermistor to sense the sample temperature, to control the degree of supercooling and freeze induction, and to measure the freezing point of the sample; - stir wire vibration or a solenoid impact to induce solidification when supercooling occurs.
<p>PROCEDURE – “A fixed volume of the test solution is introduced into the sample cell, as indicated for the individual apparatus.”</p>	Yes	<p>The test solution volume of each Advanced Instruments freezing point osmometers are fixed and vary by instrument.</p> <p>For example: the sample size of the OsmoTECH[®] Single-Sample Micro-Osmometer and OsmoTECH[®] PRO Multi-Sample Micro-Osmometer are 20 µL and 30 µL respectively.</p>
<p>PROCEDURE – “The apparatus must first be calibrated by the two-point calibration method by using osmolal standard solutions. For the calibration, select two different standard solutions just covering the expected osmolar concentration of a sample solution. Other than the indicated osmolal standard solutions in the Table 2.47-1, water can also be used as a standard solution (0 mOsm) for measuring low osmolar sample solutions (0 - 100 mOsm).”</p>	Yes	<p>Advanced Instruments freezing point osmometers come with a built-in calibration function that by default guides you through testing five samples each of 50 and 850 mOsm/kg H₂O calibration standards.</p> <p>You can also configure the OsmoTECH[®] Single-Sample Micro-Osmometer and OsmoTECH[®] PRO Multi-Sample Micro-Osmometer to perform optional calibrations using the 0 and/or 2000 mOsm/kg H₂O calibration standards.</p>



<p>PROCEDURE – “Next, after washing the sample cell and the thermistor as indicated for the individual apparatus, measure the degree of the freezing-point depression caused by a sample solution. Using the above-mentioned relation of osmolar concentration m and ΔT, the osmolarity of a sample solution can be obtained, and it is assumed to be numerically equal to the osmolarity.”</p>	<p>Yes</p>	<p>Advanced Instruments osmometers are pre-programmed to calculate the osmolality from the measured freezing point depression. There is no calculation needed for osmolality by the end user to start at a defined temperature.</p>
<p>PROCEDURE – “In the case of higher osmolar solutions over 1000 mOsm, dilute the sample with water and prepare n'/n times diluted sample solution (n in n'). Measure the osmolarity of the diluted solution, as described above. In this case, it is necessary to state that the calculated osmolarity for the sample (see below) is an apparent osmolarity obtained by the dilution method. When the determination is performed using n'/n times diluted solution, the dilution number should be selected so that the osmolar concentration is near but not exceeding 1000 mOsm, and dilute in one step.”</p>	<p>Yes</p>	<p>For over 1000 mOsm /kg H₂O solutions, Advanced Instruments osmometers can test samples without the need for dilution. The Model 3250 and A₂O[®] osmometers can test osmolality level up to 4000 mOsm/kg H₂O.</p> <p>Advanced Instruments provides 2000 and 3000 mOsmol/kg H₂O standards for use as reference solutions.</p>
<p>PROCEDURE – “In the case of solid samples, such as freeze-dried medicines, prepare a sample solution by dissolving the solid using the indicated solution for dissolution.”</p>	<p>Yes</p>	<p>Advanced Instruments recommends dissolving the solid samples into an aqueous solution, then use it to perform the osmolality testing with the osmometers.</p>
<p>SUITABILITY OF THE APPARATUS - After the calibration of the apparatus, a suitability test must be done by repeating the measurement of osmolarity for one of the standard solutions not less than 6 times. In performing the test, it is advisable that the osmolarity of a sample solution and the selected standard solution are similar to each other. In this test, the repeatability of measured values and the deviation of the average from the indicated value should be less than 2.0% and 3.0%, respectively. When the requirement is not met, calibrate the apparatus again by the two-point calibration method, and repeat the test.</p>	<p>Yes</p>	<p>For less than 1000 mOsm /kg H₂O solutions, Advanced Instruments recommends following the manufacture’s recommended specification for suitability testing.</p>

¹ The requirements in the table have been extracted from the JP Compliance