

# [The USP Performance Test and the Dissolution Procedure Statement](#)

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**Topic:** The USP Performance Test and the USP Periodic Performance Verification Test.

## Summary

Both USP's Performance Verification Test (formerly termed Apparatus Suitability Test) with allied reference standard tablets (formerly termed calibrators) and mechanical calibration support integrity of the USP Performance test when the procedure described in General Chapter Dissolution <711> is used. Both approaches satisfy CGMP and ISO approaches, and neither alone is sufficient. USP has concluded studies to document these assertions and also to document the quality of USP's reference standard tablets (Salicylic Acid, Prednisone, and Chlorpheniramine Reference Standard Tablets).

## Background

For a nonsolution orally administered dosage form, an important test in the public or private specification is the USP Performance test. USP provides instructions for the procedure in General Chapters Dissolution <711> and Disintegration (<701>), which can be adapted by a manufacturer to a specific dosage form. The dissolution procedure relies on an assembly that an analyst uses to collect samples for measurement of percent released from a dosage form over time.

## Performance Qualification

Given that dissolution is the only indicator of continuing dosage form performance batch to batch over time—and also because of its increasing use to document bioequivalence—execution of the dissolution procedure should accord with CGMPs and with principles of sound metrologic science. CGMPs emphasize instrumental qualification (IQ), operational qualification (OQ), and performance qualification (PQ). For the dissolution procedure, OQ is performed by mechanical calibration, usually at six-month intervals. PQ is performed by conduct of a USP Performance Verification Test (previously termed Apparatus Suitability Test in <711>), again usually at six-month intervals. USP supplies the following reference standards for a PVT: Salicylic Acid, Prednisone, and Chlorpheniramine Reference Standard Tablets. When used with a technical data sheet and troubleshooting guide, results from a PVT are used by first parties (manufacturers), second parties (purchasers), and third parties (independent or governmental laboratories) to determine whether results within their laboratories are comparable to results from USP's collaborative studies.

## Proficiency Testing

From the standpoint of sound metrologic science, the general approach is that of proficiency testing, which assesses a laboratory's ability to conduct a procedure competently. A key objective of proficiency testing is to ensure that measurements made at different times, by different analysts, or with different methods can be confidently compared. With this assurance, appropriate administrative and legal decisions are supported.

## Nomenclature

Proficiency testing is not calibration per se, and USP's reference standard tablets are not calibrators. Therefore, USP will cease using the term calibrator as a descriptor for its reference standard tablets. Also, the title "Apparatus Suitability Test" in <711> does not accurately reflect the nature of the test and will be replaced with the term "Performance Verification Test."

## ISO and Mechanical Calibration

USP's increasing alignment with ISO approaches—and specifically ISO standards 9001 and 17025 (for which USP is certified and accredited, respectively), as well as the ISO 43.1 and 5725 series—accords well with recent regulatory emphasis on quality system approaches as a means of meeting CGMPs.

USP supports mechanical calibration as a means of enhancing experimental results through OQ; however, mechanical calibration alone is not adequate to assess performance across laboratories. In the terms of ISO 5725, mechanical

calibration by itself cannot detect accuracy (trueness and precision). For this reason, USP does not support the ASTM-I mechanical calibration standard now reaching consensus.

## **USP Lot P Prednisone Tablets**

USP is exploring selected apparatus variables using new Lot P Prednisone Tablets. The data from these studies will allow better advice to laboratories by determining acceptable limits for mechanical calibration beyond which decreased precision or trueness could be expected. USP Lot P Prednisone Tablets are now in commerce, replacing Lot O, as of July 2006. Quality attribute data for these tablets are similar to those expected for a manufactured therapeutic product. These data refute claims that high inter-laboratory variability was caused by USP's reference standard tablets.

USP has engaged in extensive laboratory tests to support the assertions in this Statement. The results of these laboratory studies have been submitted for publication, and further studies are planned. USP looks forward to working with regulators, manufacturers and others in the scientific community to enhance the dissolution procedure and ensure its integrity.