BEP2 with Cylinder Attachment

FLOWABILITY TESTER MODEL BEP2

INTRODUCTION

The Flowability Tester BEP2 has been specifically designed to address the specifications in and comments raised by the **European Pharmacopoeia Chapter 2.9.36** and **US Pharmacopoeia Chapter <1174>** on **Powder Flow.**

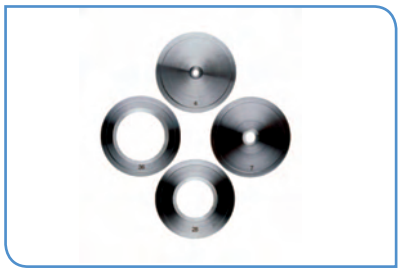
The widespread use of powders in the pharmaceutical industry has led to a proliferation of test methods for measuring powder flow.

The new harmonised chapters in the Pharmacopoeias on Powder Flow (USP Chapter <1174> and Ph.Eur. Chapter 2.9.36) list four well-defined methods for powder testing aimed at trying to bring about some degree of standardisation within the existing test methodology:

- Flow through an orifice
- Angle of Repose
- Shear Cell
- Compressibility Index and Hausner Ratio

The new Flowability Tester BEP2 from Copley Scientific provides a range of options for testing pharmaceutical powders including three of the four methods quoted in the Pharmacopoeias – flow through an orifice, angle of repose and shear cell – in a single, cost effective unit. In addition to providing the test methods detailed in the harmonised pharmacopoeia chapters, it is also suitable for flowability testing according to Ph.Eur. 2.9.16. An optional balance/timer simplifies time vs mass testing.

The BEP2 is an easy to use, small footprint instrument with interchangeable cylinder, funnel, angle-of-repose and shear cell attachments. A description of each attachment can be found below.



Interchangeable Disks

CYLINDER ATTACHMENT (FLOW THROUGH AN ORIFICE)

Measuring the ability and the time taken for a powder to flow through an orifice of known size is a useful method of quantifying powder flow.

At the same time, it is important to recognise that the ability of the powder to flow through the orifice can be affected by factors other than the characteristics of the powder itself. Such factors include the shape and material employed in the construction of the powder container, the diameter and height of the powder bed and the shape of the orifice concerned.

The Pharmacopoeias suggest that the use of a circular cylinder as the powder container encourages powder over powder flow as opposed to powder over container wall, minimising any effect brought about by differences in the material used to produce the powder container.

As the title suggests, this technique is only suitable for materials that flow – **not** cohesive materials. Assuming this to be the case, then the Pharmacopoeias suggests that providing:

a) The height of the powder bed (the "head") is much greater than that of the orifice
b) The diameter of the opening is greater than 6 times the diameter of the particles and
c) The diameter of the cylinder is greater than 2 times the diameter of the opening

then any difference in results brought about by either powder bed or orifice can be considered negligible.

The cylinder attachment has been designed to take all of these factors into account.

The **cylinder attachment** comprises a stainless steel cylinder measuring 76 mm long x 57 mm i.d. and having a capacity of 200 mL. The bottom of the cylinder is sealed with a collar designed to accept disks having various orifice diameters.

The attachment comes complete with a set of 20 interchangeable stainless steel disks each containing a precision drilled hole in the centre covering the following sizes: 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34 and 36 mm. A shutter covers the hole during filling. This can be smoothly removed without vibration to allow the powder to flow through the selected hole.

The cylinder attachment can be used in two ways (a) to carry out **quantitative flowability tests** based on mass vs time or (b) to determine the **intrinsic flowability** of the powder concerned in the form of a flowability index based on comparative measurements.