

Notes on the Terminology and Units of Measurement employed in Tablet Hardness Testing

Traditionally, the **breaking force** of tablets has always been referred to as hardness. However, as the United States Pharmacopoeia (USP) points out, this term is really a misnomer since **hardness** refers to the resistance of a surface to penetration or indentation by a probe, e.g. penetrometer.

For this reason, in its Chapter <1217>, USP refers to **Tablet Breaking Force** not hardness describing the breaking force of a tablet as being the force required to cause it to fail (i.e. break) in a specific plane.

The European Pharmacopoeia (Ph.Eur.), on the other hand, in its Chapter 2.9.8 uses the term **crushing strength**. Purists would, no doubt, argue that, in many cases, the tablet is not actually crushed, merely fractured, and that the term **strength** implies tensile strength as opposed to compressive load. Suffice it to say, all Copley Testers comply with the relevant Pharmacopoeia irrespective of the terminology employed.

The units of force normally employed to quantify breaking force are Kiloponds or Newtons.

Comparative values for these are as follows:

1 kilopond (kp) = 1 kilogram-force (kgf) = 9.80665 Newtons (N)

A kilopond is the force exerted by a mass of one kilogram in earth's gravity.



Tablet Hardness Tester Model TH3 ▲

TABLET HARDNESS TESTER TH3

A portable semi-automatic electronic tester with LCD display designed to accept tablets up to 30 mm in diameter - ideal for the tablet production area as a quick check as to compression force settings.

The tablet is placed on the test platform between the test jaw and the load cell plunger.

A multi-turn, low-friction hand-wheel similar to the type used on machine tools, is used to apply load to the tablet until it fractures. The resulting breaking force is displayed on the LCD display in either newtons (N), grams (g), pounds (lbs) or ounces (oz).

To test another tablet, simply press <Zero> to zero the load cell and proceed as above.

Two models are available, the TH3/200 having a range of 200 Newtons +/- 0.04N or the TH3/500 having a range of 500 Newtons +/- 0.1 N respectively.

The TH3 is provided with RS232, Mitutoyo and analogue data output facilities as standard. All displayed readings can be transmitted to peripheral devices, for example, a PC or printer, by pressing the <TXD> key. Alternatively, a PC can request data from the unit by sending a <?> character via the RS232 interface.

The unit measures 450 x 70 x 80 mm and weighs approx. 2 kig and can be operated in either mains or battery modes. It includes a calibration certificate and mains adaptor/charger as standard.

The instrument performs an automatic self test (zero calibration routine) on switch on.



Cat. No. Description

7801	Tablet Hardness Tester Model TH3/200
7802	Tablet Hardness Tester Model TH3/500
7803	Re-Calibration Certificate
7804	Calibration Verification Hanger & Weight