1 **4027 Determination for Thermal Tensile Ratio of Pharmaceutical Sheets**

2 This method is used to determine thermal tensile ratio of various types of
3 pharmaceutical sheets.

4 Thermal tensile ratio is the dimensional change of the sample after experiencing a
5 certain environmental temperature in a certain period. It is expressed as a percentage
6 of the ratio of the change in distance between punctuation points to the initial
7 distance.

8 **Instruments**

9 Heating device, oven or environmental testing chamber with the temperature
10 accuracy of ±2□.

11 Measuring ruler, with the measuring accuracy of at least ±0.2mm.

12 **Determination**

13 Samples shall be conditioned for a minimum of 4 hours in the atmosphere of
14 23□±2□, relative humidity 50%±5% before test.

15 Two square test samples shall be prepared with the slide length 120mm±1mm
16 along the longitudinal direction (Fig.1). Mark the longitudinal direction and the
17 transverse direction two lines AB, CD mutually perpendicular through the center point,
18 each of the line length is 100mm±1mm. Carve marks at the ends of the two lines.
19 After measuring the line lengths on each test sample accurately, take the arithmetic
20 mean value (L_1) of line AB and CD separately.
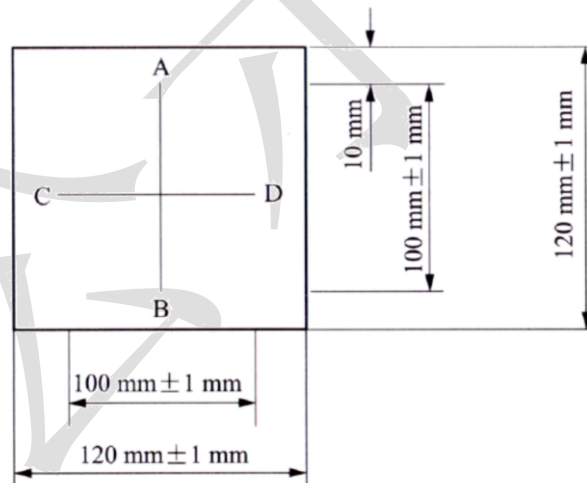

21 Fig. 1 Specimen dimensions

22 Lay the test samples flat on glass or mental plates so that the free form shall not
23 be influenced. Place them into the heating device with the temperature of 100□±1□
24 horizontally, hold a period of 10 minutes. Take them out, cool and condition them for
25 at least 30 minutes in the same atmosphere as used to condition the sample. Measure
26 the line lengths on each specimen again, take the arithmetic mean value (L_2) of line
27 AB and CD separately.

28 **Result representation**

29 Calculate thermal tensile ratio (S) according to the following equation:

30
$$S=\frac{L_2-L_1}{L_1}\times100\%$$

31 Where S is the thermal tensile ratio, %;

32 L_1 is the arithmetic mean value of AB or CD before heating, mm;

33 L_2 is the arithmetic mean value of AB or CD after heating, mm.