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2.9.5. UNIFORMITY OF MASS OF SINGLE-DOSE PREPARATIONS

Weigh individually 20 units taken at random or, for single-dose preparations supplied in individual packaging, the contents of 20 units, and determine the average mass. Unless specified in the individual monograph, not more than 2 of the individual masses deviate from the average mass by more than the percentage deviation shown in Table 2.9.5.-1 and none deviate by more than twice that percentage.

For capsules and for powders for injections or infusions, proceed as described below.

CAPSULES

Weigh an intact capsule. Open the capsule without losing any part of the shell and remove the contents as completely as possible. Weigh the shell. For soft shell capsules, wash the shell with a suitable solvent and allow to stand until there is no evidence of solvent left (constant mass reached). The mass of the contents is the difference between the weighings. Repeat the procedure with the remaining 19 capsules.

POWDERS FOR INJECTIONS OR INFUSIONS

Take 1 container; remove any labels. Wash and dry the outside. Open the container and immediately weigh the container and its contents. Gently tap the container to empty it as completely as possible. If necessary, rinse with *water R* and then with a suitable solvent (e.g., *methanol R*, *ethanol (96 per cent) R*), dry in an oven at 100-105 °C for 1 h, or, if the nature of the container does not permit heating at this temperature, dry at a lower temperature to constant mass, and allow to cool in a desiccator. Weigh the container. The mass of the contents is the difference between the weighings. Repeat the procedure with the remaining 19 containers.

Table 2.9.5.-1

Dosage form	Average mass	Percentage deviation
Tablets (uncoated and film-coated)	Not more than 80 mg	10
	More than 80 mg and less than 250 mg	7.5
	250 mg or more	5
Powders for injections or infusions*	More than 40 mg	10
Suppositories and pessaries	All masses	5
Other dosage forms unless other limits are specified in the dosage form monograph, including but not limited to capsules, uncoated granules, powders, powders for eye drops and powders for eye lotions	Less than 300 mg	10
	300 mg or more	7.5

* When the average mass is not more than 40 mg, the test for uniformity of content of single-dose preparations (*2.9.6*) is performed instead of the test for uniformity of mass.

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2.9.38. PARTICLE-SIZE DISTRIBUTION ESTIMATION BY ANALYTICAL SIEVING(1)

Sieving is one of the oldest methods of classifying powders and granules by particle-size distribution. When using a woven sieve cloth, the sieving will essentially sort the particles by their intermediate size dimension (i.e. breadth or width). Mechanical sieving is most suitable where the majority of the particles are larger than about 75 µm. For smaller particles, their light weight provides insufficient force during sieving to overcome the surface forces of cohesion and adhesion that cause the particles to stick to each other and to the sieve, and thus cause particles that would be expected to pass through the sieve to be retained. For such materials other means of agitation such as air-jet sieving or sonic-sifter sieving may be more appropriate. Nevertheless, sieving can sometimes be used for some powders or granules having median particle sizes smaller than 75 µm where the method can be validated. In pharmaceutical terms, sieving is usually the method of choice for classification of the coarser grades of single powders or granules. It is a particularly attractive method in that powders and granules are classified only on the basis of particle size, and in most cases the analysis can be carried out in the dry state.

Among the limitations of the sieving method are the need for an appreciable amount of sample (normally at least 25 g, depending on the density of the powder or granule, and the diameter of the test sieves) and the difficulty in sieving oily or other cohesive powders or granules that tend to clog the sieve openings. The method is essentially a two-dimensional estimate of size because passage through the sieve aperture is frequently more dependent on maximum width and thickness than on length.

This method is intended for estimation of the total particle-size distribution of a single material. It is not intended for determination of the proportion of particles passing or retained on 1 or 2 sieves.

Estimate the particle-size distribution as described under Dry sieving method, unless otherwise specified in the individual monograph. Where difficulty is experienced in reaching the endpoint (i.e. material does not readily pass through the sieves) or when it is necessary to use the finer end of the sieving range (below 75 µm), serious consideration must be given to the use of an alternative particle-sizing method.

Sieving is carried out under conditions that do not cause the test sample to gain or lose moisture. The relative humidity of the environment in which the sieving is carried out must be controlled to prevent moisture uptake or loss by the sample. In the absence of evidence to the contrary, analytical test sieving is normally carried out at ambient humidity. Any special conditions that apply to a particular material must be detailed in the individual monograph.

Principles of analytical sieving. Analytical test sieves are constructed from a woven-wire mesh, which is of simple weave that is assumed to give nearly square apertures and is joined to the base of an open cylindrical container. The basic analytical procedure involves stacking the sieves on top of one another in ascending degrees of coarseness, and then placing the test powder on the top sieve. The nest of sieves is subjected to a

(1) This chapter has undergone pharmacopoeial harmonisation. See chapter *5.8. Pharmacopoeial harmonisation*.