

ANSI/ASAE S424.1 MAR1992 (R2017)

Method of Determining and Expressing Particle Size of Chopped Forage Materials by Screening



American Society of Agricultural and Biological Engineers

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Developed by the ASAE Forage Harvesting and Utilization Committee; approved by the ASAE Power and Machinery Division Standards Committee; adopted by ASAE April 1986; revised editorially March 1988; approved as an American National Standard June 1988; revised March 1992; revision approved by ANSI September 1992; reaffirmed by ASAE December 1996; reaffirmed by ANSI March 1998; reaffirmed January 2007, February 2012, January 2017.

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1 Purpose and Scope

1.1 The purpose of this Standard is to define a test procedure to determine the particle size distribution of chopped forage materials and to define a method of expressing the particle length of the material. The determined particle size distribution can be used to evaluate forage harvesting machine and handling equipment variables and to define forage physical length in animal feeding trials.

1.2 This Standard shall be used to determine the particle size of chopped forage materials where the reduction process yields particles such as that material produced by shear-bar type forage harvesters. It is not intended for use on material produced by flail-type harvesters where substantial fractions of the material may be extremely long.

1.3 This Standard is intended for use in the field as well as in the laboratory. It is intended to separate chopped forage samples without drying them first.

2 Test Equipment

2.1 For particle measuring purposes, a set of square-hole screens having widths of 406 mm (16.0 in.) lengths of 565 mm (22.25 in.) and specifications shown in Table 1 shall be used. The screens shall be supported in frames with depths of 63.5 mm (2.50 in.) and arranged horizontally in a stack such that the screen with the largest opening size is at the top. Those with smaller openings shall be arranged with progressively smaller hole sizes below each other. If screens with different size openings from those listed in Table 1 are used, the actual dimensions for the openings shall be used in the data analysis and shall be reported. Pertinent screening dimensions should be in geometric progression with the smallest selected to be appropriate to the particle size spectrum of the sample.

Table 1 – Dimensions of square hole screens for testing purposes

Screen No.	Nominal Size Opening		Square Hole Diagonal		Screen Thickness		Open Area %
	mm	in.	mm	in.	mm	in.	
1	19.0	0.75	26.9	1.06	12.7	0.50	45
2	12.7	0.50	18.0	0.71	9.6	0.38	33
3	6.3	0.25	8.98	0.35	4.8	0.19	33
4	3.96	0.156	5.61	0.22	3.1	0.12	39
5*	1.17	0.046	1.65	0.065	0.64	0.025	41.5
Pan	-	-	-	-	-	-	-

* 14 mesh woven wire cloth with 0.64 mm (0.025 in.) diameter wires. All others are aluminum sheets or plates.