TABLE 104. SIZE OF CONNECTIONS FOR WOOD-WORKING MACHINERY

TYPE OF MACHINE	DIAMETER OF CONNECTIONS IN INCHES
Circular Saws, 12-in. diam.	4
Circular Saws, 12-24-in. diam.	5
Circular Saws, 24-40-in. diam.	6
Band Saws, Blade under 2 in. wide	4
Band Saws, Blade 2-3 in. wide	5
Band Saws, Blade 3-4 in. wide	6
Band Saws, Blade 4-5 in. wide	7
Band Saws, Blade 5-6 in. wide	8
Small Mortisers	6
Single End Tenoners	6
Double End Tenoners	7
Double End, Double Head Tenoners	10
Planers, Matchers, Moulders, Stickers, Jointers, etc.—	
With Knives, 6-10 in.	5–6
With Knives, 10-20 in.	6–8
With Knives, 20-30 in.	6–10
Shapers, Light Work	4–5
Shapers, Heavy Work	8
Belt Sander, Belt less than 6 in. wide	5
Belt Sander, Belt 6-10 in. wide	6
Belt Sander, Belt 10-14 in. wide	7
Drum Sander, 24 in.	5
Drum Sander, 30 in.	6
Drum Sander, 36 in.	7
Drum Sander, 48 in.	8
Drum Sander, over 48 in.	10
Disc Sander, 24 in. diam.	5
Disc Sander, 26-36 in. diam.	6
Disc Sander, 36-48 in. diam.	7
Arm Sander	4

TABLE 105. SIZE OF CONNECTIONS FOR GRINDING AND BUFFING WHEELS

DIAMETER OF WHEELS	MAX. GRINDING SURFACE SQ. IN.	MIN. DIAM. OF BRANCH PIPES IN INCHES
Grinding—		
6 in. or less, not over 1 in. thick	19	3
7 in. to 9 in., inclusive, not over 1½ in. thick	43	3½
10 in. to 16 in., " " " 2 in. "	101	4
17 in. to 19 in., " " " 3 in. "	180	4½
20 in. to 24 in., " " " 4 in. "	302	5
25 in. to 30 in., " " " 5 in. "	472	6
Buffing—		
6 in. or less, not over 1 in. thick	19	3½
7 in. to 12 in., inclusive, not over 1½ in. thick	57	4
13 in. to 16 in., " " " 2 in. "	101	4½
17 in. to 20 in., " " " 3 in. "	189	5
21 in. to 27 in., " " " 4 in. "	338	6
27 in. to 33 in., " " " 5 in. "	518	7

TABLE 106. SUCTIONS REQUIRED AT HOODS FOR CONNECTIONS OF USUAL PROPORTIONS

WORK	STATIC SUCTION IN IN. OF WATER
Exhausting from Grinding and Buffing Wheels	1–2
Exhausting from tumbling barrels	1–2
Exhausting from wood-working machinery—light duty	1–2
Exhausting from wood-working machinery—heavy duty	2–4
Shoe Machinery Exhaust	2–3
Exhausting from rubber manufacturing processes	1–2
Flint grinding exhaust	1–2
Exhausting from pottery processes	1–2
Lead dust and fume exhaust	1–4
Fur and Felt Machinery Exhaust	2–3
Exhausting from textile machinery	1–3
Exhausting from elevating and crushing machinery	1–2
Conveying bulky and heavy materials	3–5

Velocities commonly employed are: 2,500 to 3,000 ft. per min. for light dusts, cotton, shavings and sawdust from dry wood, and similar substances. Heavy dusts, wool, shavings and sawdust from wet wood, rags, waste paper and similar materials 3,000 to 4,000 ft. per min. Lead dust, hog waste, pulp chips, etc., 4,000 to 6,000 ft. per min.

In choosing the pipe sizes consideration must be given to the way and manner in which the machines will be operated, as in case a considerable number of machines, all discharging into one main, should be shut off at the same time, the velocity in the main might easily be lowered to the point where it would not be sufficient to carry the material from the machines still in operation, and thus result in clogging the pipes. Accordingly, it is sometimes desirable to use velocities higher than the minimum to allow a factor of safety to cover this contingency.

The resistance of a round pipe to the flow of air is inversely proportional to the fifth power of the diameter of the pipe. Therefore, handling a given quantity of air through a larger pipe at a lower velocity decreases the frictional resistance very materially and correspondingly decreases the horse-power required at the fan, and thus it is very desirable to keep the air velocities throughout the system as low as possible, consistent with the major requirement that the material must be taken away as fast as made, without clogging the pipes, under the varying operating conditions met with from day to day in the plant.

The static suction required at the hood connections varies from 1 to 5 in. of water. The suction required depends upon many factors such as the relative size of the hoods and connections, kind and quantity of material handled, as well as its physical condition. In some states codes have been issued specifying suctions to be maintained for the more common dusts.

A suction standard should always be considered in conjunction with the shape of hood, and size connection, as these factors together determine the volume of air exhausted and its velocity which in turn are a measure of the effectiveness of the exhaust system.