Basketball Resilience Tests

The 1937-38 basketball rules will provide that the legality of a basketball will be determined by its bouncing reaction. A simple way to determine this reaction is to drop the ball from about head height and observe the percentage of rebound. This method has been in common use in connection with handball and tennis. It is a common practice for a handball player to test balls in this fashion before each contest. If the ball appears to have low rebounding qualities, it is thrown out.

In the case of a basketball, most of this testing must be done at the factory. Each ball manufacturer will test the ball to determine the air pressure at which the required reaction will be secured. The ball will then be stamped with the air pressure which will make the ball legal. As far as the school is concerned it will only be necessary for them to inflate the ball at the stamped pressure. However, if rough tests should be desired by any coach, he may make these tests by dropping a ball from a height of six feet and observing the height of the rebound.

In order to determine the optimum bouncing reaction extensive tests have recently been made. In these tests, balls made by various manufacturers were used. The general method was to arrange a platform six feet above a solid wood floor. Each ball was then dropped a great number of times and the height of the rebound was measured. It is obvious that some spots on a ball have greater resilience than others. This is especially true of balls whose panels are sewed together. At the poles of such a ball there are five heavy seams which come together in a small circle. In addition there are four thicknesses of lining at such a circle. The mechanics of making the sewed ball are such that it is impossible to eliminate this deadening factor. Hence when a ball strikes on a pole, its bouncing reaction is considerably less than when it strikes on some other part of the surface. Likewise the ball is slightly deadened if it strikes on a seam. The spot of greatest resilience is the middle of a panel. Because of these facts it has been found that a considerable tolerance must be allowed between minimum and maximum resilience if balls of the sewed type are to remain legal. It will be noted that this tolerance is considerably less for the molded basketballs which have no heavy seams and which have no particular dead spot.

Data secured from one of these series of tests are shown in the following table:

TESTS TO DETERMINE RESILIENCE OF BASKETBALLS

	G1 Laced	S1 Laced	S2 Laceless	W1 Laced	W2 Laceless	G.W. Laced	D Laced	W1 Molded Comp.	S Molded	R Molded	W2 Molded Leather
(Resilience Percentage at 13 POUNDS PRESSURE)											
Minimum Rebound	60.5%	54.3%	52.9%	54.2%	54.2%	56.0%	61.5%	65.4%	71.0%	69.6%	63.9%
Maximum Rebound	64.7%	63.8%	59.8%	65.4%	58.2%	65.2%	65.5%	69.6%	72.1%	72.3%	64.2%
(Resilience Percentage at 10 POUNDS PRESSURE)											
Minimum Rebound								64.0%	71.0%	66.1%	59.4%
Maximum Rebound								66.1%	72.3%	68.1%	59.6%
(Resilience Percentage at 8 POUNDS PRESSURE)											
Minimum Rebound								57.0%	65.3%	64.0%	
Maximum Rebound								60.4%	68.1%	65.4%	

The above table should be interpreted as follows: When the G1 laced ball, listed in the first column. was inflated to 13 pounds pressure and dropped from a height of six feet it rebounded 60.5% of this height when it struck on its least resilient spot (probably a pole) and it rebounded 64.7% of this height when it struck on its most resilient spot. Another illustration is: When the W2 molded leather ball was inflated to 13 pounds pressure and was dropped from a height of six feet it rebounded 63.9% of that height when it struck on its spot of least resilience and it rebounded 64.2% when it struck on its spot of greatest resilience. When this same ball was inflated to a pressure of 10 pounds its bouncing reaction ranged from 59.4% to 59.6%.

It will be noted that the tolerance for the molded ball need not be greater than approximately one percent while the tolerance for the sewed ball must be 11 percent if present balls are to remain legal.

If it is assumed that the optimum resilience of a ball is approximately 60% most of the present sewed balls should be inflated at a pressure of approximately 12 pounds (at least less than 13) and the various types of molded balls should be inflated to a pressure ranging from approximately 7 pounds to 10 pounds.

Through these and similar tests the National Basketball Committee hopes to arrive at what is considered the best reaction of a ball. During the first year, the tolerance which will be permitted will be great in order that no present top grade official ball will be made illegal provided the proper air pressure is used. It is quite probable that this tolerance will be gradually reduced so that there will be a narrow range in the bouncing reaction regardless of the spot on which it happens to strike the floor or backboard.

It should be noted that in making a resilience test, if the ball is dropped from a height such that its lower surface is six feet above the floor, then the rebound should be measured to the lower surface. Probably the rules will deal in linear measure rather than percentages and for ease of testing these measurements may be made from the bottom of the ball when it is dropped and to the top of the ball on the rebound. This is because the height from which it is dropped is above the level of the eye and the rebound is always below the level of the eye. It would be easy to correlate such figures with the percentages given in the table above by merely adding 9 inches (the diameter of the ball) to the linear figures.

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