

Soccer Ball Rebound Speed Comparisons: Full90 Performance Headguard-Protected Head vs. Unprotected Head

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There have been suggestions that the Full90 Performance Headguard might absorb sufficient energy in a soccer ball impact to reduce the rebound characteristics, slowing the ball significantly to the point that the headguard might negatively affect the game, or put a protected player at a disadvantage in heading situations. On the contrary, research from two independent laboratories shows that a soccer ball rebounds from a Full90 protected head at the same speed as from a bare head. Both with and without the Full90 Performance Headguard, rebound speed is lower than incident speed, but is lower by the same amount in protected vs. unprotected conditions.

Ball impacts against a Hybrid III headform were filmed using high-speed photography, with and without Full90 protection. Putting a dimensional reference in the field of view, and knowing the speed of the film, calculation of ball speed as it approaches and as it leaves the headform is straightforward. By measuring the distance that the ball traveled in the time required for the camera to film from one frame to the next, ball speed is determined by simple division.

From the chart below and the following graph, you can see that rebound speeds are virtually identical whether or not the headform is wearing a Full90 Performance Headguard.

Incident speed	Rebound speed w/Full90	w/o Full90	Difference
6 mph*	5.6 mph	5.6 mph	0
31 mph**	24.0	25.2	-1.2 mph
32 mph**	25.1	25.4	-0.3 mph
42 mph**	37.3	36.3	+1.0 mph
43 mph**	38.0	38.5	-0.5 mph

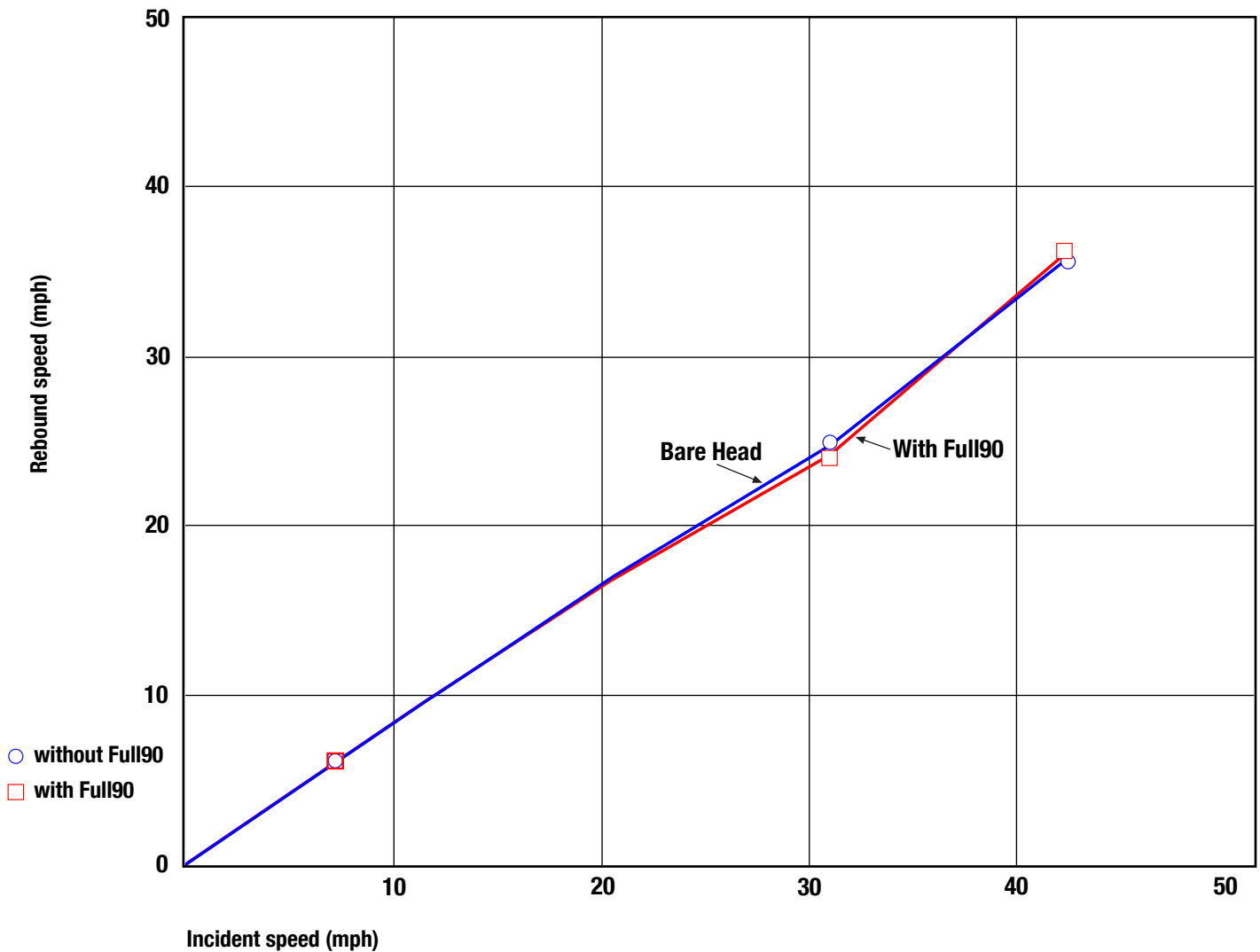
The indicated differences are not statistically relevant, and do not even show a consistent trend. This indicates that heading of the ball is virtually unchanged by the wearing of Full90 Performance Headguard.

*Data from Impact Biomechanics Lab, North Dakota State University

**Data from Dynamic Research Inc.

In graphic form:

Soccer Ball Rebound from Headform, Full90 vs Bare Head



The slope would be exactly a 45 degree line if rebound speeds were equal to incident speeds. The fact that the line does not rise as fast as it moves horizontally indicates that rebound speeds are lower than incident speeds, regardless of head coverage. The line for the Full90 protected head matches the line for the unprotected head almost identically, showing that there is essentially no difference in rebound from the protected head and the unprotected head.

From this research it can be concluded that Full90 Performance Headguards do not change the method or results of heading a soccer ball.