XENITH

NFL/NFLPA 2018 HELMET LABORATORY PERFORMANCE RESULTS

KEY POINTS

- Xenith designs, produces, and sells only Top-Performing helmets
- Xenith is supportive and encouraged by the NFL's efforts to improve head health outcomes for NFL athletes
- The laboratory performance of Xenith helmets is not statistically different than the top-ranked helmet (i.e., low certainty that a meaningful difference exists)
- Our understanding of mechanisms and prevention of brain injury continues to evolve; as it does, the test methodology will evolve with it
- Xenith helmets are between ~$600 and $1,400 less expensive than three of four higher-ranked helmets
- The laboratory test does not directly assess fit, comfort, and weight; areas in which Xenith helmets excel, and important factors in athlete protection
- By designing for the athlete and their on-field protective needs, we have produced helmets that also excel in standardized laboratory testing

Xenith is proud to offer only Top-Performing helmets on the NFL/NFLPA Laboratory Testing Performance Results (page 3).

We are encouraged by the resources the NFL is dedicating to the understanding of helmet performance, and are supportive of their research to improve head health outcomes for NFL athletes.

It should be noted that these results come exclusively from laboratory testing. While significant efforts have been made to replicate on-field impact scenarios, the reality of laboratory testing is that simplifications and assumptions need to be made that may reduce field relevance.

Briefly, the NFL protocol utilizes a pneumatic ram (Figure 1) to impact a headform fitted with the helmet of interest. When impacted, sensors within the headform quantify linear and rotational velocity and acceleration. Through a series of impacts at eight locations (Figure 2) at three representative speeds, and an outcome metric that combines resultant velocity and acceleration, the test assesses the helmet's ability to reduce head velocity and acceleration after an impact. The science is still evolving as to whether these are the right metrics for assessing risk of brain injury. As the science progresses, the test methodology, measurements, and outcomes will change to reflect the state-of-the-art understanding of mechanisms and prevention of injury.

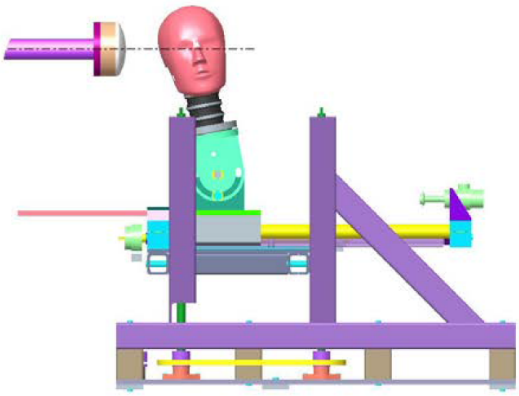

Figure 1. Schematic of pneumatic ram.

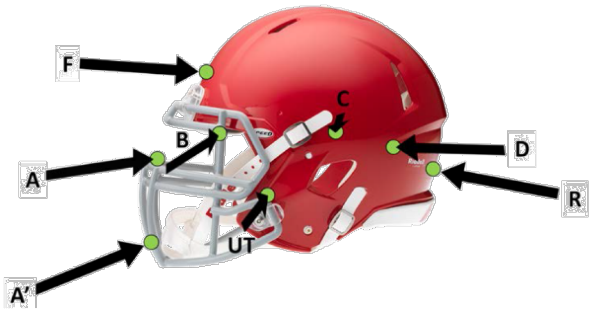

Figure 2. Impact locations.

The two current Xenith helmet models (EPIC+ and X2E+) reside within the top half of the Top-Performing Group. It's important to note, however, that there is no *statistically significant* difference in laboratory performance between helmets #1 and #17 on the chart. *Significance* is a statistical term that tells us how sure we are that a difference exists. Without it, it's challenging to draw conclusions. Additionally, statistical significance only tells half the story; it does not tell us if the difference is *meaningful*. For example, we do not have data correlating ranking on the chart to injury outcomes on the field. That being said, we are supportive of the scientific rigor with which the NFL is approaching helmet performance; it will help fuel continued innovation in the industry, as well as provide transparency into helmets that may not be adequate for play.

When we consider that the performance of Xenith helmets is firmly within the Top-Performing Group, along with some of our competitors, it becomes important to consider additional differentiators. Specifically, taking helmets that have higher-ranked performance, our highest priced model (EPIC+) is, at minimum, $600 less (MSRP) than three of the four helmets, and up to ~$1,400 less. Importantly, we also excel in the areas of fit, comfort, and weight; factors that are not currently directly assessed in the testing. Taken together, Xenith helmets offer superior performance in the lab and on the field, at a compelling price.

Through continued research and development, and our commitment to ***design for* the athlete**, not for a test, we will continue to offer helmets that enable athletes to take the field with confidence and play at their best.

Grant C. Goulet PhD
Vice President, Product Innovation

BETTER LABORATORY PERFORMANCE

TOP-PERFORMING GROUP

- VICIS ZERO1 (2018)[1]
- VICIS ZERO1 (2017)
- Riddell Speedflex Precision (R41156)[2]
- Schutt Air XP Pro VTD II (789902)
- Schutt Air XP Pro VTD (789901)
- Xenith Epic+ (EPIC+)
- Schutt F7 (208000)
- Xenith X2E+ (X2E+)
- Xenith Epic (EPIC)
- Riddell Speed (R41190)
- Schutt DNA Pro+ (202201)
- Schutt Vengeance DCT (204001)
- Xenith X2E (X2E)
- Riddell Speed Icon (R41197)
- Riddell Foundation/Revolution Speed Classic (R41179)
- Schutt Vengeance VTD (204800)
- Riddell Speed Classic Icon (R41198)

- Riddell SpeedFlex (R41195)
- Schutt Vengeance Z10 (204101)
- Schutt Vengeance VTD II (204801)
- Schutt Air XP Pro Q10 (788900)
- Schutt Vengeance Pro (204301)
- Riddell Revolution (R41139)
- Schutt Vengeance Pro (204300)

PROHIBITED HELMETS[3]

- SG Varsity
- Rawlings Quantum
- Schutt Vengeance Z10 (204100)
- Rawlings Impulse +
- Rawlings Tachyon
- Schutt Air XP Pro (789102)
- Riddell VSR-4 (R41133)
- SG 2.0
- Rawlings Impulse
- Schutt Air XP (789002)

[1]New models not previously worn by NFL players

[2]Results shown are for the Speedflex Precision with interior padding customized for the testing headform. Actual performance and ranking may vary since these helmets are customized for each player's head shape

[3]These helmets have been prohibited for new players and players who did not wear them during the 2017 NFL season. Rawlings helmets are not supported by an active manufacturer and are prohibited for all players

NFL

NFLPA

2018 HELMET LABORATORY TESTING PERFORMANCE RESULTS

THE NFL, IN COLLABORATION WITH THE NFLPA, THROUGH THEIR RESPECTIVE APPOINTED BIOMECHANICAL EXPERTS, COORDINATED EXTENSIVE LABORATORY RESEARCH TO EVALUATE WHICH HELMETS BEST REDUCE HEAD IMPACT SEVERITY. THE RESULTS OF THOSE TESTS, WHICH ARE SUPPORTED BY ON-FIELD PERFORMANCE, ARE SET FORTH ON THIS POSTER.

The helmet models are listed in order of their performance in the laboratory testing, with a shorter bar representing better performance. The rankings are based exclusively on the ability of the helmet to reduce head impact severity measures in laboratory testing. Issues with helmet fit, retention, and long-term durability are not addressed in these rankings. The Top-Performing Group consists of helmets whose performance was not statistically different from the two top-ranked helmets. The information presented here is based solely upon the results of this research and the expert opinions of the scientists involved.

The laboratory test conditions were intended to represent potentially concussive head impacts in the NFL. The results of this study should not be extrapolated to collegiate, high school, or youth football.

NO HELMET SYSTEM CAN COMPLETELY PROTECT AGAINST SERIOUS BRAIN AND/OR NECK INJURIES A PLAYER MIGHT SUSTAIN WHILE PARTICIPATING IN FOOTBALL.