SEVERITY INDEX FAQS

What is NOCSAE's helmet standard Severity Index?

NOCSAE's Severity Index (SI) is a threshold value for a general category of head injuries based on scientific research and published data. SI is a method for measuring a helmet's ability to reduce impact forces to the head, integrating acceleration over time. SI provides an accurate way to assess head injury risk that can be replicated across laboratories and under different impact scenarios. NOCSAE standards are performance-based and are design neutral so that manufacturers are not restricted in design or engineering, allowing innovation in design.

How is SI determined?

Football helmet SI values are determined by measuring performance against a range of different impacts from various angles, accelerations and temperatures. The NOCSAE helmet standard uses a pass/fail threshold of 1200 SI to determine whether a helmet meets the standard performance criteria. A helmet must test below 1200 SI in all 16 designated and random impact locations. The SI value tends to vary from impact to impact because it places more emphasis on the duration of the impact than the peak acceleration force. The human brain can withstand very high accelerations if the duration is very short. Head injury tolerance decreases, in general, as the duration of the impact increases.

Why does NOCSAE use a pass/fail threshold instead of a rating value?

The SI number is a cutoff point for head injury probability overall. There is no measurable difference in safety of helmets with scores below the 1200 SI threshold. For example, a helmet scoring 400 SI isn't more likely to reduce injury than one scoring 800 SI. Once the SI value gets below approximately 800 to 900, the change to the risk of injury is essentially immeasurable. Because of the very strict and demanding quality control and quality assurance requirements specified in the NOCSAE standard, helmets certified to the NOCSAE standard will test substantially below 1200 SI, typically in the 400 to 600 SI range.

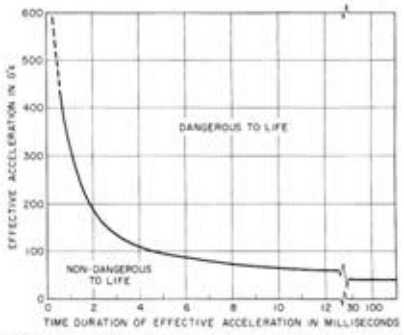

Fig. 1 - Impact Tolerance for the human brain in forehead impacts against plane, unyielding surfaces

Why doesn't NOCSAE release SI values for helmets it certifies?

SI figures can be misleading when it comes to helmet performance. NOCSAE does not prevent helmet manufacturers from sharing their SI testing data; however NOCSAE does not allow licensees to make SI-related safety claims about one model or brand over another. There is no single SI score for any helmet model. A single football helmet model has potential 29 different and separate SI values generated by a single certification test, and the numbers for that helmet model will vary from other helmets of the same model, and even from the same production line.

Will helmets with low SI scores prevent concussions?

No football helmet can prevent concussions. Because the SI units are not concussion specific, it is impossible to compare the SI scores of one helmet with another and determine which helmet provides better protection. Variables such as helmet fit, the condition and integrity of the padding and energy attenuation system inside the helmet, the current health and concussion history of the player wearing the helmet, and the athlete's style of play with regard to the use of the head are far more related to the likelihood of concussion than are differences in SI values from one helmet to the next.