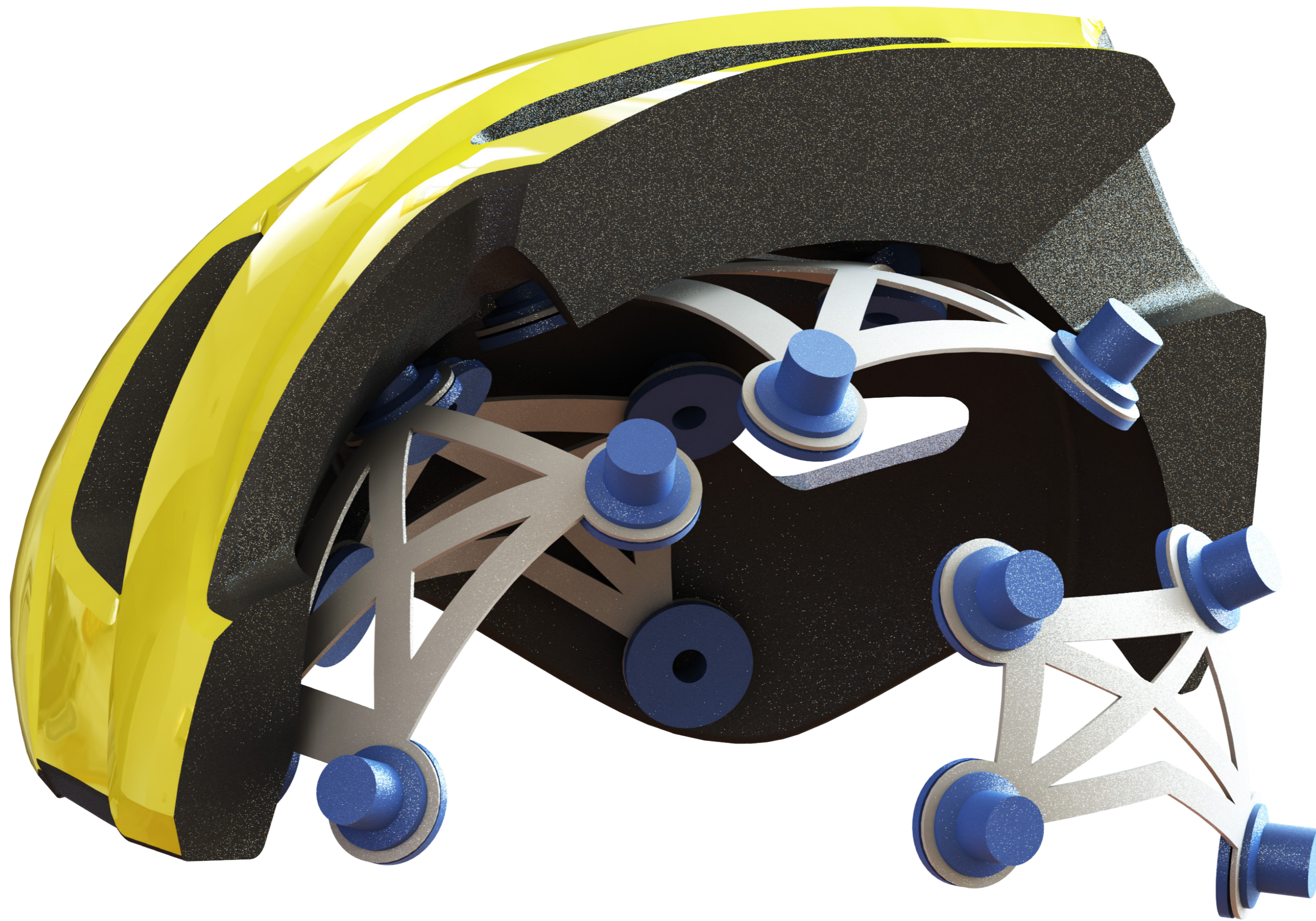


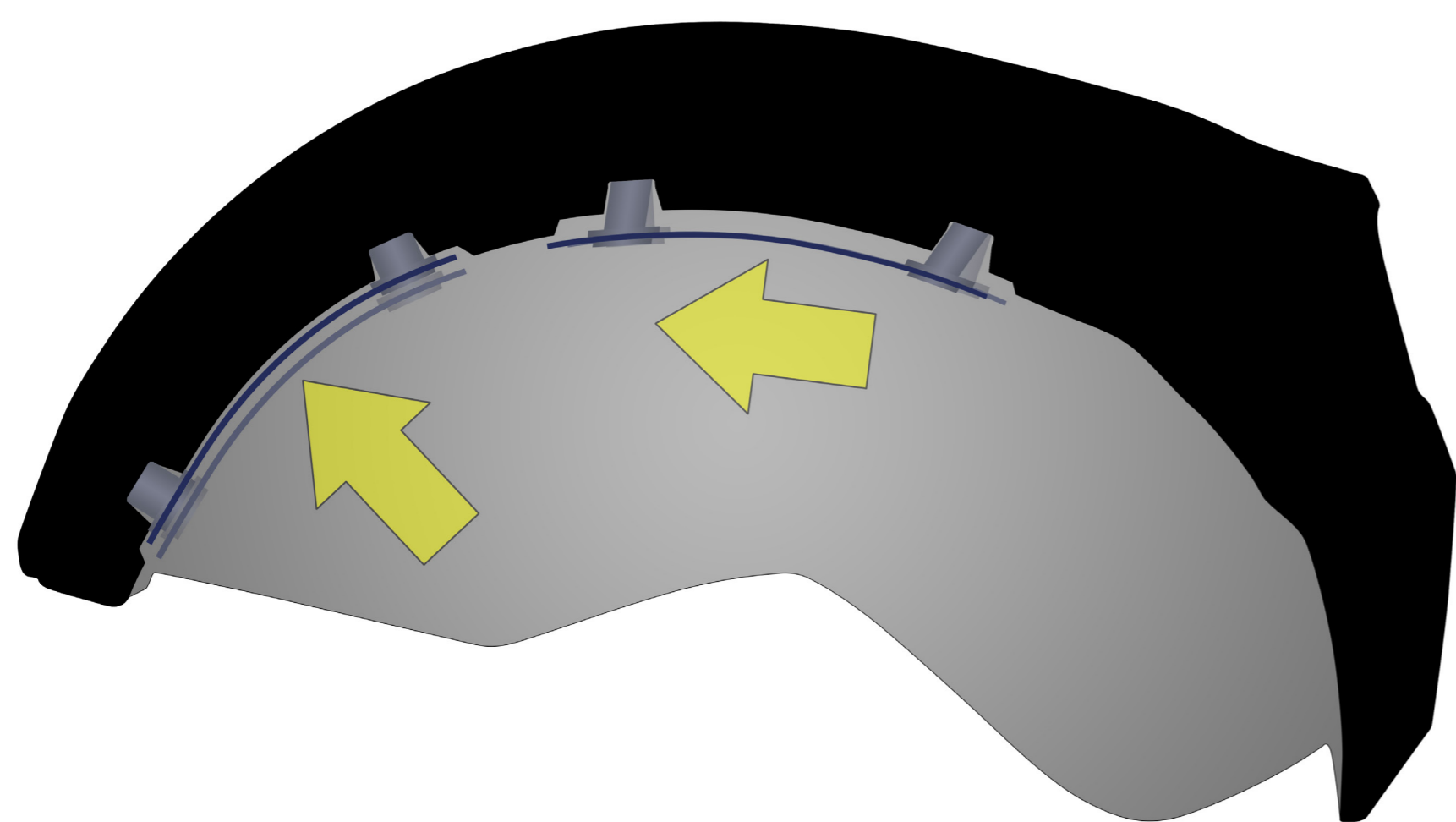
Design of an Additional Impact Protection Mechanism

Increasing the Safety of the Modern Bicycle Helmet

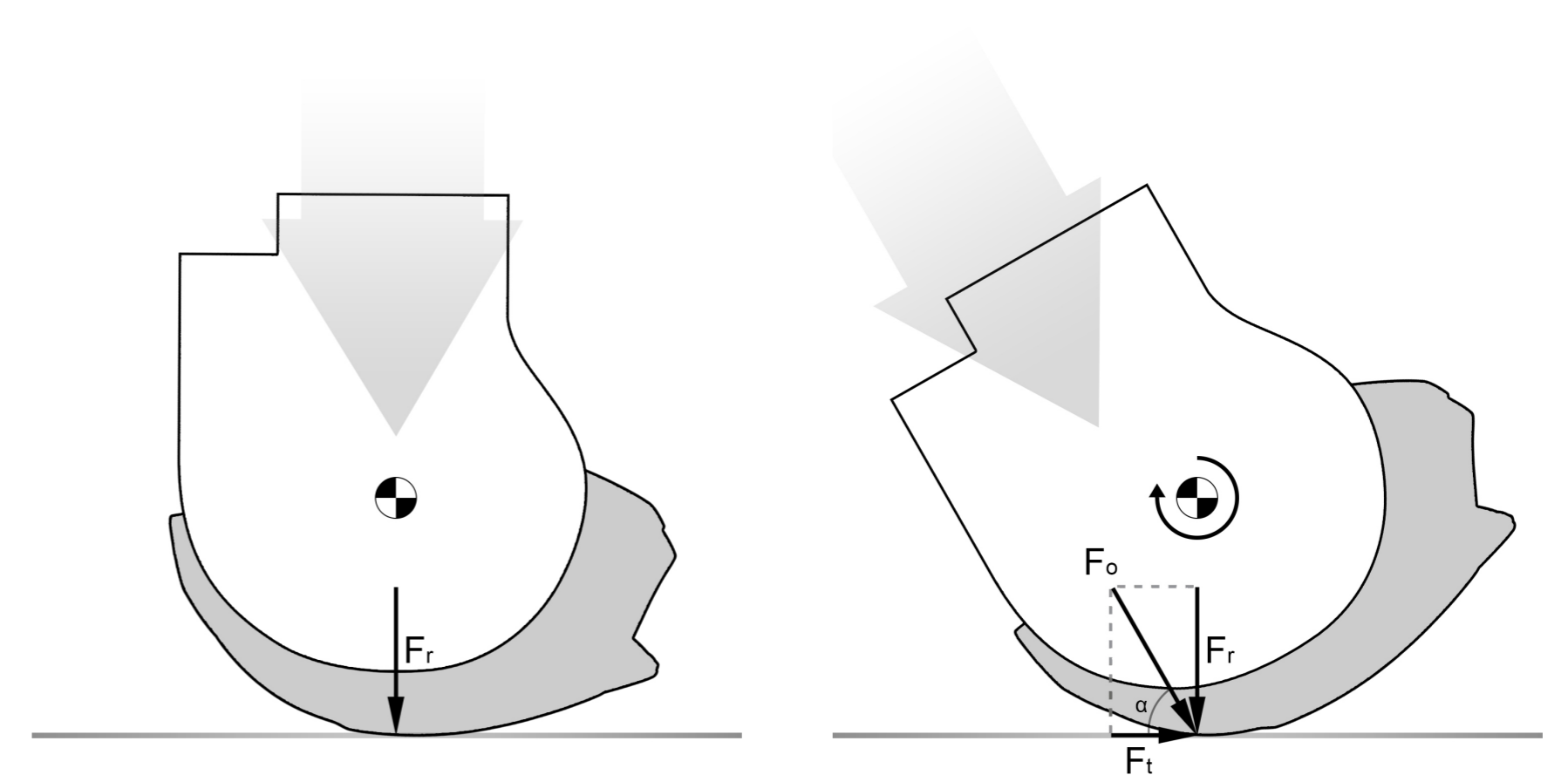
Today's bicycle helmets come in all shapes and sizes, but offer virtually the same level of protection. The reason for this is that they all have to pass the mandatory regulations specific to the country or region in which they are sold. For years, helmet manufactures have treated this limit as the bare minimum, leading to almost no progression in terms of safety.



To account for low speed and oblique impacts, an extra layer is added to the inside of the helmet. While keeping the traditional EPS foam liner to protect against high speed impacts, silicone cylinders are able to absorb low speed linear accelerations by compression, as well as angular accelerations (as a result of oblique impact) by shearing.



Test regulation vs a more realistic scenario:



On the left you see how helmets are currently tested: a perfect straight drop. In reality however, these kinds of impact scenarios rarely happen, if ever. Instead, angled (or oblique) impacts occur almost all of the time, resulting in different injuries currently unaccounted for.