



The Newsletter of the Snell Foundation

<b>HeadsUp</b> In this issue...	
M2020 Final .....	1
SA2020 Final.....	1
FIM Helmet Standard.....	1
Rotational Testing .....	2
Snell Educational Outreach .....	2
Snell Test Methods and Equipment.....	2
Contacting Snell .....	2

This is the 72<sup>nd</sup> of the Foundation's newsletters to the helmet manufacturing industry. The 71<sup>st</sup> went out in late July of last year. Comments and items for inclusion in subsequent issues are invited.

**M2020 Final**

As of last August, M2020 is out in its final form and testing has been underway for a while now. However, the first helmets certified to M2020 will not be available for sale or use until October of this year.

M2020 allows two different impact test options: one based on the current M2015 standard and called M2020D for its demonstrated DOT compatibility; and the other taken from the recent third draft and called M2020R for its intended Regulation 22 (ECE 22-05) compatibility. However, Snell will recommend helmets certified to either with equal confidence.

Comparable helmets built to M2020D and M2020R are expected to have similar weight and bulk. However, M2020D calls for more impact energy management while M2020R is structured to demand the softer liners implied in European requirements. Some helmet experts will favor M2020D's greater energy management capability while others will prefer M2020R's softer liners but any real difference in protective capability will be

slight and could go either way. Both these options demand much more protective capability than that required by DOT or ECE 22-05.

A more technical discussion of these impact test options and the basis for them is included in the standard and the accompanying explanatory cover. Both are posted on the Snell web site.

**SA2020 Final**

SA2020 was published in its final form last month. It and an accompanying cover are posted on the Snell website. Testing is already underway but the first helmets certified to SA2020 will not be available for sale or use until October 2020.

SA2020 is more compatible with the requirements of FIA 8859-2015 than SA2015 had been. The impact test requirements are now generally more demanding in terms of either severity or attenuation. The differences with SA2015, however, are slight. Snell will continue to recommend SA2015 headgear in good condition to drivers and to racing officials and safety inspectors for years to come.

**FIM Helmet Standard**

The International Motorcycling Federation (FIM), the European authority for motorcycle racing, has established a standard and program for helmets used in their events. The current FIM helmet standard is available at:

[http://www.fim-live.com/en/library/download/74046/no\\_cache/1/](http://www.fim-live.com/en/library/download/74046/no_cache/1/).

The FIM helmet standard relies on other programs for some aspects of helmet performance. That is, FIM certification requires that the helmet must also comply with at least one of three other standards: Snell M2015, ECE R 22-05 or JIS T8133-2015.

The current FIM requirement is called FRHPhe#1 but there were plans for a second phase, FRHPhe#02. However, the demands of the second phase would seem to pose problems all current helmets including those that meet Snell M2015, ECE R 22-05 or JIS T8133-2015. Snell's directors have drafted a letter to FIM urging against the implementation of FRHPhe#2. A copy of this letter is available for review on the Snell website at:

<http://www.smf.org/docs/articles/SnellFoundation-FRHP.pdf>

### Rotational Testing

FIM FRHPhe#01 includes a rotational testing component; a head is placed inside a helmet which is then dropped onto a flat surface tilted at 45°. Helmet and head form are then free to rebound from the impact unconstrained. A novel instrumentation package inside the head form captures its motion, three axes of acceleration and three more of angular velocity, and stores it for download later, after testing is complete.

FIM is probably the first organization to incorporate this sort of test into a formal standard and program. They invoke two separate test criteria, the Brain Injury Criterion, BrIC, come from an NHTSA proposal for dummy tests of car interiors and the limit on angular acceleration is likely based on test from the 1980's on rhesus monkeys scaled up to human dimensions. However, the validity of these criteria is questionable. When similar criteria were applied to results obtained for young Navy volunteers undergoing sled testing in the 1970's, they predicted serious injuries where none were actually observed. Still, the instrumentation package, the iCONO-6C from MASDE in Madrid, is an engineering marvel. It requires only a much better understanding of human tolerance for shock rotation to become a useful tool for the evaluation of protective headgear.

Engineers and technicians at the Snell lab have been working with one of these instrumentation packages. The current concerns deal mostly with good lab practice rather than helmet impact performance testing. We're looking to determine whether we can obtain reliable, repeatable results with it and demonstrate its accuracy with quick, efficient confidence checks. Impact severities and injury criteria for helmet testing must still wait on definitive statements from medical and

epidemiological experts but once we're confident in these, we hope to be ready to go.

### Snell Educational Outreach

Ms. Hong Zhang supervises Snell's public outreach. She schedules and conducts tours of Snell's lab facilities, provides materials and generally assists writers preparing articles on Snell. Ms. Zhang also makes presentations at shows and gatherings wherever riders and drivers congregate in order to spread the word about proper head protection. Hong will represent Snell at consumer shows in New York, Long Beach and Cleveland later this year and will discuss motorcycle helmets and standards at the AIMExpo in Columbus. Please look for her Snell page on Facebook at [www.facebook.com/snellorg](http://www.facebook.com/snellorg).

### Snell Test Methods and Equipment

An important part of the mission here is showing each helmet maker how to test to Snell standards. We want everyone to know just what their helmets are in for when they submit them to us for testing. In that way they can do the testing themselves, before they submit samples, and maybe spare themselves some disappointment. Even more important, they can run the same tests on production samples and guard against getting an ugly shock in Snell's standards enforcement testing once their helmets are certified.

Helmet makers submitting samples for testing are always welcome to come in and observe. Snell techs will still give the samples the toughest test permitted in the standard but they'll smile while they do it and conduct a tutorial on the ins and outs of Snell testing. If you're interested, contact Steve Johnson and set up a visit.

### Contacting Snell

Snell Foundation, Inc.		
3628 Madison Avenue, Suite 11		
North Highlands, CA 95660		
Phone: 916-331-5073; Fax: 916-331-0359;		
Email:	Office	<a href="mailto:info@smf.org">info@smf.org</a>
Testing:	Steve Johnson	<a href="mailto:sdj@smf.org">sdj@smf.org</a>
Decals:	Bonnie Adams	<a href="mailto:bonnie@smf.org">bonnie@smf.org</a>
Education:	Hong Zhang	<a href="mailto:hong@smf.org">hong@smf.org</a>
All Other:	Ed Becker	<a href="mailto:ed@smf.org">ed@smf.org</a>

Editor: Hong Zhang