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The Newsletter of the Snell Memorial Foundation, Inc.

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This is the sixty-sixth of the Foundation's newsletters to the helmet manufacturing industry. The sixty-fifth went out last August. Comments and items for inclusion in subsequent issues are invited.

**Workshop on Angular Head Motion**

Snell was one of the sponsors for the IRCOBI-SNOCSAE-PDB-Snell Workshop titled "Angular Head Motions: their importance and measurement." last September 8<sup>th</sup> in Lyon, France. A report is expected shortly and will be posted on the Snell website.

**Snell Manufacturers Meeting**

Where and when should the next Snell Manufacturer Meeting be held? Previous meetings have been held in conjunction with motorcycle industry shows such as the Powersports Expo or the AIMExpo. But attendance at these shows and the Snell meeting in recent years has been disappointing. So what particular where and when would persuade you and your colleagues to participate? Your suggestions will be gratefully received.

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**Impact Test Criteria**

When SA2010 and M2010 were published more than seven years ago, they were the first Snell standards to call out head form masses which varied with head form circumference: instead of all the test head forms weighing the same, the weights increase with size.

The reason for the change is that human head weight also increases with size as demonstrated in a report from Dr. Ching, one of Snell's directors. However, it is important to remember that while Snell was shifting to new head forms, human heads remained pretty much the same as before. So it became important to look at how shifting to new head forms might change Snell helmets. We wanted to be absolutely sure the shift would not push helmets in dangerous directions.

The larger sized headforms became heavier but these heavier head forms imply lower peak G criteria. The concerns are that the old peak G criteria would allow harder helmet liners with greater shock transmission than Snell allowed previously. So out of reasonable caution, Snell reset the peak G criteria to 264 G for helmets sized 60 through 61 cm in circumference, and to 243 G for helmets 62 cm in circumference and up.

The larger sized head forms also imply lower test velocities for helmets meeting previous Snell standards. Testing at the old impact velocity specifications would demand bigger, heavier or more expensive helmets. And since Snell already demands

as much helmet as people might reasonably be expected to wear, neither the industry nor the public would be willing to consider anything beyond that.

On the other hand, the medium and smaller sized head forms became lighter implying higher peak G criteria and higher test velocities for the medium and smaller helmets which met previous Snell standards. We found that we could adopt current, widely accepted peak G requirements and manage as much or more impact velocity than previously with no significant increase in helmet weight, bulk or cost.

As a result, the helmet liners for the medium and smaller sized Snell certified helmets have become softer, especially for the smallest helmet sizes. But we're testing those helmets at slightly higher impact speeds than before. The larger helmets, 60 cm in circumference and greater, have hardly changed at all.

So medium and smaller sized heads will get softer Snell helmets which will still manage a little more impact velocity than we demand for the largest sizes. And larger sized heads will get the same Snell performance which has worked so well previously. To do any better, we'd have to demand bigger, heavier or more costly helmets than ever; something neither we, the public nor the industry wants. Or we'd have to gamble on allowing greater, potentially dangerous levels of shock transmission through the helmets; a risk no one should be willing to take.

### **New and Revised Programs**

EA2016, E2016 and CM2016 will take effect October 1, 2016. The programs are described briefly in the following paragraphs. Standards for them as well as schedules for their implementation will be posted on Snell's website.

### **EA2016 - for Elite Auto Racing**

Snell's directors have voted to proceed with a program for auto racing helmets incorporating advanced shell technology. Such helmets have been available since the start of the FIA 8860 program in 2004. Snell's EA2016 program draws on the FIA experience but brings it forward to incorporate current practices and criteria and also streamlines the testing by cutting away redundant and non-productive procedures.

The technology on which EA2016 depends is costly; the helmets are likely, at first, to be more expensive than most drivers and teams might reasonably afford. However, it is hoped that in time new efficiencies and growing volume might bring costs down to levels appropriate for most amateur racing as well as, we hope, for street motorcycle use.

### **E2016 for Horseback Riding**

Snell is also revising its E2001 equestrian helmet program. E2016 is based on E2001 but incorporates current procedures and criteria. Helmets meeting E2016 are expected to look and weigh much the same as comparable E2001 headgear. They will be the most protective headgear current horseback riders might reasonably be expected to wear.

### **CM2016 for Children's Motor Sports**

Snell and FIA will proceed with a revised CM2016 program for children's motor sports helmets. The CM2016 standard is almost identical to the CM2007 requirements. Testing services for CM2016 may also be sought at Newton Laboratories in Milan, Italy.

### **Error Correction - M2015 and SA2015**

Through an oversight, the M2015 Standards booklet and previously posted drafts of SA2015 failed to include the impact site separation policy adopted back in 2010. In fact, the correct site separations for both M2015 and SA2015 will continue to be at least 130 mm for helmets tested on the A and C head forms, 140 mm for the E and J head forms and 150 mm for the M and O head forms.

### **Contacting Snell**

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