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The Quarterly Newsletter of the Snell Memorial Foundation

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This is the thirty-ninth of the Foundation's quarterly newsletters to the helmet manufacturing industry. The thirty-eighth was sent out in March. Comments and items for inclusion in subsequent issues are invited.

**M-2005 & SA/K-2005 Standards**

M2005 and SA/K2005 Standards have been finalized and certification testing to these Standards have begun. Helmet models that meet all the requirements of M2005 and SA/K2005 will be given certification certificates for M2000, SA2000 and K-98. Certification to the M2005 and SA/K2005 Standards for those helmets will be granted just before October 1, 2005 when the new Standards become effective. Certification stickers for the new Standards will be available on July 1, 2005. However, helmets with the new certification stickers

cannot be shipped until October 1, 2005. Please contact the Snell lab for 2005 certification testing schedules.

The final draft of the 2005 Snell M and SA/K Standards are available in digital format and may be downloaded from the Snell web site ([www.smf.org](http://www.smf.org)). Printed booklets of the Standards will be available after the Summer of 2004.

**Production and Distribution Reports**

Random Sample Testing (RST) is an essential part of the Snell certification program. This checks the manufacturer's quality control and assures the consumer that the same quality of head protection that we saw in certification process will be found in follow-on production. Riders can buy with confidence because they know our RST program gets and tests helmets from the same stores they use. Your company's quarterly report on production and distribution of Snell products are required by the Snell licensing agreement. This information helps us make timely decisions to conduct RST on specific models and quantities. Hong Zhang will be contacting your company to submit these reports every three months.

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## Flip-Up Chin Bar Helmets

There have been numerous inquiries about the lack of Snell certified helmets with the flip-up chin bar configuration. Many riders told us that although they would like the convenience offered by the flip-up design but would not buy one because none was Snell certified. Snell will waive fees for prototype testing to encourage development of Snell certified models with the flip-up chin bar design.

## Certified Products Lists

Whether you are a consumer, a helmet designer, a manufacturer, a distributor, or a Snell staffer, helmet names can be very confusing. A single Snell certified helmet may be sold under several different model names, size designations and even brand names. If well chosen names help helmets onto people's heads, we're in favor. But, please let us know.

The Foundation posts lists of Snell certified products on its web site, [www.smf.org](http://www.smf.org). Snell recently has received information from you to update the name, size, and production status of certified products on this list. Please help us keep this list current by checking frequently and pointing out any errors and omissions.

Since many people check these lists, missing or misspelled entries may represent lost sales while entries for discontinued items will create frustration and disappointment. Once we certify a helmet, we want everyone to know about your products. Please help us get it right.

## Certified Products Lists: Definitions

When we first certify a helmet, we know it by its **CertID**, 8 alphanumeric plus a hyphen that identify the Snell lab, test number and year for the certification. We add to this the **Manufacturer**, **Cert Model** and **Cert Size** information that we recorded when the helmets were first scheduled for testing. These are usually the brand, model and size designations that will first appear on our lists of certified products. However, manufacturers often want to sell the same headgear under a different

model name and, perhaps, pad it out to accommodate a broader range of head sizes. More than a few manufacturers are also providing Snell certified headgear as OEM items for distributors to sell under their own brand names. So we've added the terms **Brand**, **SoldAs Model** and **SoldAs Size** to our database to help us keep track.

Whenever a manufacturer wishes, we're ready to add new helmet designations to our lists. However, the manufacturer must advise us in writing with the following information:

1. **CertID** - from the lower right corner of the original Snell Certificate. The Cert Model and Cert Size may be helpful but the CertID is the necessary information.
2. **Brand** - usually but not always the manufacturer name
3. **SoldAs Model** - the new model designation
4. **SoldAs Size(s)** - the consumer size designations

The new designation is likely to have two or more shell sizes. If this is the case, all the different CertID's should be listed and the SoldAs Size(s) for each.

The application should also state that the helmets themselves will be identical to the samples first submitted for certification. Any structural changes may require a new certification test.

## Shell Penetration Test

The shell penetration test in the first Snell standards could more reasonably have been called a shell deflection test. A four pound, pointed impactor was dropped through three feet onto a section of helmet that was supported on an upright hollow cylinder with an inner diameter of one and three quarter inches. If the shell deflected more than 3/8 of an inch into the hollow, the helmet was rejected.

The current shell penetration test drops a heavier impactor, 3 kg, from considerably higher, 3

meters but requires only that the penetrator not break through to make direct contact with a headform placed inside the helmet. Excepting only the 1985 Snell motorcycle helmet standard, this test has been in place in Snell motorsports standards since 1970 and also appears in the DOT motorcycle helmet standard, FMVSS 218, as well as a host of other national and international standards.

The 2005 Snell M and SA/K standards include some revisions for the shell penetration test which do not change the test materially but which define more precisely how the test is to be applied. For the first time in Snell standards, the penetration test sites is limited to points on or within a specified test line as drawn on the helmet shell. Also, these sites are now required to be no closer than 6 cm to the center of any previous impact or penetration test.

The description of the Snell penetration test headform is also modified. Realistically, all that is required of the headform is that it conform to the inner surface of the helmet beneath the site of the penetration test, that it support the helmet with no discernible deflection throughout the shock delivered by the falling impactor, and that it accommodate some telltale to identify instances of direct contact with the impactor point. The modified headform description allows simpler, more efficient test hardware enabling testing over all the legitimate sites throughout all the size ranges of helmets expected to be submitted for Snell testing.

Previous test gear limited the Snell penetration test sites to the crown area of most helmets. Although no surprises are expected, there is, at least, a chance that some helmets that once performed well may fail in these new procedures. However, manufacturers of DOT qualified motorcycle helmets must deal with similar test requirements as specified in FMVSS 218 and manufacturers of helmets to be used in automotive racing may soon have to deal with an even more stringent test as specified in the FIA Advanced Helmet Test Specification.

This FIA Advanced Helmet Test Specification requires, among other things, that helmets withstand a 4 kg penetrator dropped through 3 meters and allow no direct contact between the penetrator and the supporting headform.

### Single Impact Testing

FIA has promulgated a set of requirements for headgear for use in their Formula 1 events. The FIA 8860-2004 Advanced Helmet Test Specification which will go into effect this July, is currently supplementary to Snell SA2000. Effectively, a helmet must already be Snell SA2000 capable in order to be considered a candidate for 8860-2004. However, the question remains, how much more demanding are the FIA tests over and above Snell SA2000.

There are a number of tests in FIA 8860 that might give an SA2000 helmet trouble: the shell penetration test as discussed earlier in this issue, the shell hardness test which seems set to select for carbon fiber shells, the dynamic crush test and, of course, the tether loading tests for the HANS system which is now a requirement for Formula 1. However, one of the most critical and certainly the most interesting is the FIA 8860 impact testing.

FIA calls out impact test procedures almost precisely identical to SA2000 except, instead of two impacts at a particular site, FIA demands a single but much more severe impact. The dual impact method seemed serviceable and most laboratory ceilings were not much higher than the minimum necessary for the first Snell impact. However, no one seems to know just how much single impact capability is implied in meeting Snell dual impact test requirements.

The Foundation proposes to find out. We hope to test a range of current SA2000 and M2000 headgear in order to determine the most severe single impact they might be able to withstand at particular test sites. The immediate question is whether current Snell configurations can be made to meet FIA single impact requirements. However, the most

important question is whether single impact testing would lead to better standards and more protective helmets.

The dual impact method is time tested and the helmets that have evolved along with Snell standards are a proven benefit to competition racing and street motorcycling as well. Single impact must undergo a lot of careful scrutiny both in its effectiveness assessing current headgear as well as its implications for future development.

With this in mind, the Foundation requests that interested manufacturers provide samples for an extensive investigation. We're looking for sets of four or more identical samples to be tested on the ISO J headform.

Interested manufacturers should please contact this office to discuss providing samples. However, we need to keep these samples well separate from our ongoing certification and RST testing. So please call first so that we can anticipate your samples and deal with them correctly. We will provide detailed test reports at no charge to each manufacturer. We also expect to produce a report discussing the overall testing and findings. This report will likely include tables and graphs based on test results but which will be presented in such a way as to conceal the identities of the specific models tested and each manufacturers proprietary information.

### **HANS® Attachments Testing**

There has been considerable interest in head/neck motion limiting devices in recent years. The Foundation's directors have been watching these developments but feel that the Foundation, as yet, has no reliable basis for establishing a program or for making recommendations to consumers. However, since quite a few helmets submitted for SA type certification are equipped with hardware for attaching HANS® system tethers and since there is an existing test protocol, FIA Standard 8858-2002, the Foundation's directors are considering whether to offer that test as a service to helmet manufacturers and to the auto racing community.

The Foundation already makes judgements concerning whether tether attachment hardware interferes with the traditional protective functions of auto racing helmets. We propose to provide an additional service to evaluate HANS® equipped headgear according to existing standards.

This service will only be offered for manufacturer installed systems. The directors realize that many of the current systems have been installed by aftermarket modifiers and quite often by the helmet buyer himself. However, there is no reasonable way in which the Foundation could evaluate them. If a manufacturer builds 10,000 HANS® equipped helmets, we might reasonably test a few of them and claim to know something about the rest. But if 10,000 individuals do their own installations, we'd have to look at all 10,000. Since our tests are destructive, there wouldn't be much point.

### **Contacting Snell**

Snell Memorial Foundation, Inc.  
3628 Madison Avenue, Suite 11  
North Highlands, CA 95660

Phone: 916-331-5073; Fax: 916-331-0359;  
Email: [info@smf.org](mailto:info@smf.org)

Internet:	Steve Johnson	<a href="mailto:sdj@smf.org">sdj@smf.org</a>
Testing:	Gib Brown	<a href="mailto:gib@smf.org">gib@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, Dir. of Program Development*