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How Snell tests motorcycle helmets

Motorcycle helmets in the United States must meet certain safety standards. The DOT standard is the base standard that ALL motorcycle helmets must meet. But there is a higher standard set forth by the **Snell Memorial Foundation**.



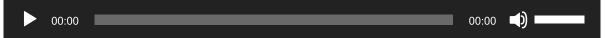
I spoke with **Snell's Executive Director**, Ed Becker, for over an hour. He made the complex sound so simple. My interview with Ed is in 3 parts below.

Note: The audio had a loud buzzing noise in the background. Fortunately, the second audio engineer I hired was able to remove most of it. There's still a some distortion... especially in Part 2 and 3. But trust me, it sounds wonderful compared to how it sounded originally.

Here is a link to each part of the interview:

MMP 14: Snell Motorcycle Helmet Testing — Interview with Snell Director Part 1 [Podcast]

MMP 15: Snell Motorcycle Helmet Testing — Interview with Snell Director Part 2 [Podcast]



In this session Ed steps us through the process a company must follow to have their helmets tested by Snell. He describes how they dispose of tested helmets (see video below). We talk about testing standards and he describes how helmets have changed over time. This session is jam packed with useful information.

MMP 16: Snell Motorcycle Helmet Testing — Interview with Snell Director Part 3 [Podcast]



In this session Ed tells us how much Snell charges to test/certify a series of helmets and he tells us how much the manufacturer has to pay for each Snell certified helmet they sell. He also explains which Snell test gives manufactures the most grief. We also talk about helmet maintenance, helmet modifications and how often we should replace our motorcycle helmets. I also ask Ed if we should replace our motorcycle helmet if we drop it. You've gotta hear his answer.

Snell Staff



On a personal note...

I want to thank Ed for coming on the show. When we started emailing back and forth about potential questions we both agreed to talk for up to 2 hours, hoping to get 25 minutes of good content. As it turns out, I couldn't find much to edit out. It was all valuable information.

If you'd like to be a part of the **Motorcycle Mentor community**, put your first name and email address in form on the right column (or the form below). If you are viewing on a smart phone, the form will be below.

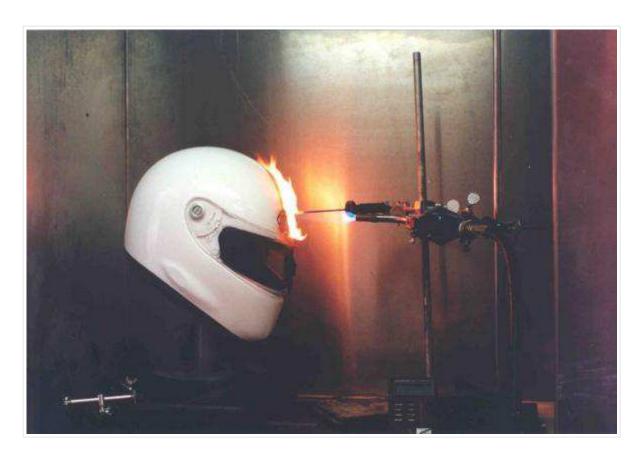
This is how Snell destroys tested helmets...



Transcript for the entire interview...

coming soon...

Photos from Snell







Leave feedback or ask a question

Ed has agreed to answer your questions section at the bottom of this page. You can learn more about Snell by visiting the Snell Memorial Foundation website.

Help the Motorcycle Mentor Podcast

And lastly, if you haven't already done so, would you take a minute to leave a quick **rating and review of the podcast on iTunes** by clicking on the link below. It would be extremely helpful for the show and I'm aiming for 100 5-star ratings before the end of the year. That would be awesome for a motorcycle related podcast.

To leave a review on iTunes.

- 1. Click here to open the podcast page.
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- 3. Then select the "Ratings and Reviews" tab.
- 4. Then select the gray "Write a Review" button.

Thank you in advance for doing this. And thank you for listening. I hope you enjoyed this episode. Please let us know what you think in the comment section below.

Stay connected...

✓ MMP 13: The best riders never stop learning – Interview with Randy Smith [Podcast] Riding under the influence >

42 Responses to How Snell tests motorcycle helmets

Jeremy May 2, 2014 at 2:36 am #

I was wondering if it was ever discussed at SNELL to try manufacturing their own helmets. It would seem logical, for SNELL to take this step since they are professionals in safety. If there was never a discussion, was it because of concerns about a conflict of interest?



Ed Becker May 2, 2014 at 4:27 pm #

Snell never considered manufacturing their own helmets just for the reason you mention, conflicts of interest. Snell's directors and staff are bound from any financial involvement in the helmet industry and also from any outside employment as consultants or experts. We're helmet

critics here at Snell but our judgment is useful only while we retain the public's trust. We need to avoid conflicts and even the appearance of conflicts in order to serve our mission: to encourage the development, production and use of superior protective helmets.

Bob Harrington May 2, 2014 at 3:41 am

Thanks for making the effort and taking the time to produce this series of interviews with Ed.

Prior to this I thought that ECE was the toughest standard followed by SNELL, then DOT in the rear with the weakest standard. I was surprised to learn that's not the case. I was also very happy and surprised at Ed's response to the "dropped helmet" question!

In the future I'm going to require SNELL certification for any helmet that I purchase. I understand that not being SNELL certified does not mean it's a bad helmet, but in my way of thinking, If SNELL is the tougher standard, and a particular helmet is SNELL certified, buying that helmet assures me the best possible protection. And when it comes to my brain....the best protection is what I want.



MotorcycleMentor May 2, 2014 at 3:56 am

@ Bob

I too was unclear how ECE standards compared to Snell and DOT. Ed's response about ECE standards surprised me too. I'm glad you enjoyed the series.

David

Ed Becker May 2, 2014 at 4:45 pm

Thanks very much for your comments; the issue of dropped helmets is one or our most frequent questions. Thanks also for your faith in our programs. I figure that Snell can continue only as long as we deserve and enjoy the faith of the riding public. If we ever lose that, Snell dries up and blows away.

Quentin Lewis May 2, 2014 at 6:52 am

Hi Ed,

I listened to your interview with David Mixson, and appreciate the insight into the work of SNELL and all your experience and insights into helmet safety. I found your description of some of the tests

and methodologies to be quite interesting as I never really consider the aspects of helmet design that contribute most to safety / impact mitigation.

There were two things that I have some question about, and I suppose the first I might be able to get some insights via a google search, but I would like to hear your opinion / experience. You noted that the inner impact absorption material is dramatically affected by gasoline and other solvents, and that compromising this layer has the most impact of motorcycle helmet effectiveness.

I often fill my tank with my riding gloves on. At times, the fuel nozzle will "overflow" or "squirt" fuel at the end of the tank fill, with my gloves sometimes getting gasoline on them, My question is regarding my other routine of "storing" my gloves inside my helmet when I remove it. Would the small amount of gasoline fumes from the gasoline soaked gloves compromise the impact absorption material to the point where it materially affects the helmet's performance? (and compliance with SNELL standards)

Second question.....your answer about the "automatic" replacement of dropped helmet makes a lot of sense. My only comment there would be that I would think it would be important to inspect the helmet outer surface for cracks which might affect the structural integrity of the outer shell. The inner impact material may still be fine, but I would think that even that would relay on the structural integrity and strength to operate to specification.

Thanks for the great interview!

-Quentin Lewis



Ed Becker May 2, 2014 at 5:10 pm

Thanks for your questions. I don't believe there's much to fear from storing your gloves inside your helmet. The damage I've seen has been from small amounts of gasoline and solvents spilled inside the helmet and pooling between the shell and liner. If the vapor from your gloves has done any damage, I'd expect it would be visible somewhere just under the helmet's cloth comfort liner. If you see anything, please let me know and I'll refine my advice to riders. As for inspecting dropped helmets for cracks in the shell, I have seen cases in which very fine cracks were visible in the paint but there was no damage to the shell structure itself. Evidently the shell had flexed slightly and recovered with no damage but the paint was too brittle to follow suit. In general, the shell stresses are far less when an empty helmet hits the floor. If the helmet is effective with a head inside, it ought to laugh at a simple drop.

George Brown May 2, 2014 at 11:19 am #

Very well done - I enjoyed the thorough coverage.



MotorcycleMentor May 3, 2014 at 1:15 pm

@George

Thanks for the feedback. I hope to do others like this. Ed was gracious with his time and a pleasure to interview.

David

Gary Ruuska May 2, 2014 at 3:36 pm

I'd like to thank Ed Becker and the Snell Memorial Foundation for making our rides safer. And thanks, David, for arranging a really informative interview.

I have a few questions for Mr. Becker:

I have heard, and wonder if it is true, that Snell does not test helmets with integrated sun shields that drop down behind the visor.

I didn't hear polycarbonate helmet shells mentioned in the interview. Are there any Snell approved polycarbonate helmets?

Many years ago I had a Snell approved helmet with a metal clasp instead of D-rings on the chinstrap. Do any Snell approved helmets use clasps on their chin straps?



Ed Becker May 2, 2014 at 5:43 pm

We'd be delighted to have a helmet with an internal drop-down shield in the Snell program but, so far, none have been submitted for certification. When one comes in, we'll hold it to all the standard tests though. We like the convenience but don't want to give up any protective performance to get it. There are quite a few polycarbonate shelled helmets in the Snell program these days. We hold them to all the same requirements as for fiberglass, carbon fiber and all the other shell technologies. The same goes for chin strap closures although some of us prefer D-rings. The thinking is that a rider may fail to readjust a buckle carefully after getting a haircut but D-rings may get readjusted every time the helmet is worn.

MotorcycleMentor May 5, 2014 at 11:48 pm

@Gary,

Thanks for the feedback.

David

Sandy May 2, 2014 at 6:01 pm

I'm listening to the interview now, with my husband, as we drive to AL. I had heard of the Snell certification, but really didn't know much about it. It is very interesting to learn about the testing and standards involved. It makes me thankful the new helmets we purchased are Snell certified. Thank you for the interview and all your efforts.



Ed Becker May 2, 2014 at 10:25 pm #

Thanks very much for your comment; I wish you and your husband many happy miles in your new helmets.

MotorcycleMentor May 5, 2014 at 11:56 pm

@Sandy,

On your way to my great state of Alabama... perfect.

I'll be looking for the Snell sticker on my next helmet, too.

David

George May 2, 2014 at 6:42 pm #

Hello Ed,

I work in a company that has certain product certified and we make sure those products will pass the test before we submit them. This is standard practice on any industry.

With this in mind, has SNELL tested non-lisenced helmets in the market to "bust" inferior products that would fail the test? I would like to know how safe (or unsafe) are low-end helmets that won't bother to try for the SNELL certification which makes me wonder if they would fail and shouldn't be sold at all.

REPLY

Ed Becker May 2, 2014 at 11:10 pm #

You're right about industry practice. Our long time clients rarely have any problem with certification testing and the newer ones, if they stay with us, get some serious schooling in Snell testing and procedures. We organize the tests so that the only sure way to pass is to meet ALL the requirements. That way, our clients not only know what to expect in certification but what to expect when we do our enforcement tests on helmets we acquire directly from distributors and dealers later on. That way, they are encouraged to perform the same tests and verifications as part of their quality control when their certified helmets go into production.

We have tested non-Snell helmets, not so much to "bust" them as to see what they can do and how differences in the various standards affect performance. Some Snell critics have stated that Snell's demands for protection in severe crash impacts means that Snell helmets will transmit more shock in less severe impacts, our testing has demonstrated that this is not the case. Snell/DOT helmets and DOT-only helmets perform almost identically in less severe tests but as the severity increases, the non-Snell helmets get used up. Essentially, the test head form collapses the liner completely and the remaining shock is transmitted straight through the shell and into the head form. All this is at crash severities that might reasonably happen in the field and to a real rider.

What I haven't seen is any real correlation between helmet performance in our tests and helmet price. There are inexpensive Snell certified helmets and they are held to all the same tests and requirements as the top shelf headgear. But then again, there are a lot of helmet features we don't consider in our testing. Fit quality, comfort, ventilation, good looks and so on are all important helmet features and can make the difference whether a helmet is worn or gets left in the garage; no one will put up for very long with a helmet that hurts or sets his friends laughing at him. But for these judgments, you can tell us much better than we could ever tell you.

Sandy May 2, 2014 at 6:54 pm

I'm listening and I heard the topic of helmet modifications effecting the integrity of the helmet. What are your thoughts on aftermarket Bluetooth communication devices added to the helmet? Thank you.



Joe O'Handley May 2, 2014 at 7:17 pm

Hey David,

Great interview with Snell, I was wondering if Snell has gotten any of the helmets with the liner that is adjustable by pumping air into them and what their stance is on that type of helmet.



Ed Becker May 2, 2014 at 11:28 pm

We're cautious about any after market modifications mainly because we don't get to see them first hand during certification testing. However, if the modification is useful and doesn't reasonably affect protective performance, we'd be okay with it. I'd be against anything that might hang up as the helmet slid along a surface or that might concentrate impact loading on the shell or, worse, the wearer's head. However, a well designed Bluetooth unit need not raise any such concern and would certainly be a worthwhile feature.

This question comes up often in competitions where safety inspectors rule on the admissibility of helmets as well as many other items of equipment. Our advice to them has been to accept appropriately certified helmets in good condition along with modifications that seem worthwhile, competently done and which raise no immediate safety concerns. Since we haven't seen the helmets and modifications, their judgment is going to be much more reliable.

Ed Becker May 2, 2014 at 11:35 pm

We have seen a few helmet models with pump systems. The air bladders seem mostly to be located around the cheek pads and the lower edge of the shell so they don't affect test performance at all. This is also true for the soft foam fit pads that some manufacturers use to accommodate different head shapes. You can tell us much better than we could ever tell you about fit quality but, if these air bladders make for improved comfort and stability, we're in favor.

James Dauer May 3, 2014 at 12:53 am

I was interested in your comments about Michael Schumacher's ski accident, inferring that he may have been wearing a GOPRO camera on his helmet. Was he wearing a helmet? was it a Snell certified helmet? What is the consensus that went wrong?



Ed Becker May 5, 2014 at 6:09 pm

I confess I know very little about the actual circumstances of the accident. I have heard that it involved a rental ski helmet with an EC homologation and that there was a camera mounted on the helmet. I'm very leery of any external projections on helmets and also modification that might add even a few ounces of off-axis weight or weight above the head c.g.. But I absolutely do not know whether the injuries or the outcome would have been any different had any other helmet or gear been used. As much as I believe in helmets, I know that the best of them may not be enough to protect me. I figure that once you know what you want to do, you should

select the gear that gives the best chance of doing it uninjured. It's either that or pack yourself in cotton and let old-age get you. I admire Michael Schumacher's spirit and courage and I hope for a complete recovery.

Stan Smith May 5, 2014 at 1:46 pm #

Ed and David,

Thanks for the great interview. I learned so much about Snell. I am definitely going to start looking for helmets with the higher Snell rating.

Ed, you mentioned that the you start seeing differences between Snell and DOT standards at higher impact velocities. Specifically, I believe you said at 8 meters/second. If I did my calculations correctly, 8 m/s is about 18 mph. This seems very slow to me.

Stan

REPLY

Ed Becker May 5, 2014 at 7:38 pm #

Many people are surprised at the low sounding impact velocities used to test helmets. But even Formula 1 helmets which run to \$3000 and more are only tested at a little more than 21 mph in the FIA's Advanced Helmet Specification. It's fortunate that most motorcycle crash impacts are against the surface parallel to the cruising velocity. The helmet must manage the fall to the pavement but, with a little luck, the rider's cruising speed gets scrubbed off sliding along the pavement afterwards. I hope that, in addition to a good helmet, the rider will also have good boots, gloves and leathers. Of course, if the crash is into a bridge abutment or if the slide is into a wall or some other massive obstruction, the helmet may still be overwhelmed. The best helmet is still not a guarantee but an 18 mph helmet can improve your chances significantly and, we figure, a 20 or 22 mph helmet may do even better.

Kevin P May 5, 2014 at 6:25 pm #

Thanks for taking the time to make this podcast series about snell certification. I learned a lot and it was very helpful in understanding the differences in the different types of helmet certification. I appreciate the time that was taken to put this together!

REPLY

Thanks for your comment and thanks also to David Mixson for the opportunity and for the focus. Once I get rolling, it takes a strong hand to keep my disquisition from devolving into a swamp of inconsequential arcana.

MotorcycleMentor May 6, 2014 at 12:02 am

@Kevin,

Thanks for the feedback. Ed has been gracious with his time, not only by spending time talking with me, but also by answering all the questions presented here.

I can only assume his Snell team is just as professional and passionate about making motorcycle helmets safer. Comforting.

David

Christy May 5, 2014 at 8:39 pm

This is a great series of interviews! Thanks to Ed for sharing so much about the Snell Foundation and explaining their testing standards. It's great to see you and your team in action here in the extra photos and video. It's really interesting and meaningful work you do!

Thank you for sharing, and thanks to David for his perseverance to bring us this series!

REPLY

Douglas Mailly May 5, 2014 at 11:01 pm

I'm a skier, and I understand the ski industry maintains an injury/accident registry, and there is a process by which ski bindings are "de-listed" as approved bindings, at which time ski technicians will not work on, or even touch the bindings in any way. To a great degree this is related to wear and tear over time. Is there, or could there be a similar registry for helmets?



Ed Becker May 6, 2014 at 4:04 pm

Thanks for you comment and bringing up the idea of a registry. A detailed injury/accident registry for motorcycle crashes is one of our dreams here at Snell. People have been wearing Snell certified helmets for some fifty years now; I would dearly love to know what has been happening to them. There have been a number of studies over the years demonstrating the effectiveness of helmets in general and showing that full face helmets are more effective than

three quarter open face models which in turn are more effective than shorty helmets and that all of these are far better than novelty helmets or going bareheaded altogether. But most all the long term efforts at data collection lack the detail to break out helmet effectiveness by brand and model or by certification or helmet age. This kind of data collection would be a massive effort and well beyond our resources here. It's the sort of thing that might only be done well by government. But if it were done, I thing the benefits to motorcyclists would be tremendous. It might not work out to well for Snell though. If, as I think it would, the effort demonstrated a clear superiority for Snell certification, DOT might revise itself to look just like our current Snell M2015. Once every helmet met Snell requirements, there'd be no point to seeking Snell certification so we'd just dry up and blow away. And of course, if I turned out to be altogether wrong and the study showed no superiority for Snell, we'd also dry up and blow away. But even if I and my colleagues wind up unemployed as a consequence, I'd really like to know what a detailed study would reveal.

Stan Smith May 5, 2014 at 11:45 pm #

Ed,

You mentioned that a 2010 Snell sticker cost \$.75 each. I looked at your website and it looks like the 2015 stickers are going up to \$1.25 each. Fifty cents doesn't sound like much of an increase, but it's a pretty significant percentage increase.

Are helmet manufacturers pushing back on price increase? Thanks.

REPLY

Ed Becker May 6, 2014 at 4:18 pm #

The Snell sticker fee has been bumped to \$1.25 for M2015 and, you're right, there has been some pushback. Snell's directors have also set up a program for volume discounts. Helmet makers producing 50,000 or more Snell certified units a year need only pay \$1.00 each and for those producing 100,000 or more units, the price drops to \$0.90 each. The downturn since 2006 in motorcycle accessories has hit us and the industry pretty hard. I'm sure most riders have felt it as well and are looking to get a few more years of use out of their helmets. Still, even as a not-for-profit, Snell must pay rents, utilities and salaries. And even with this bump in sticker fees, our not-for-profit status will be in no danger.

Kevin B. May 6, 2014 at 12:16 am #

Ed and David,

Thanks for getting this podcast out...I, and others, really appreciate the time and your willingness to share your knowledge and experiences. I, too, was surprized by the seemly low speed that the

helmets are tested. I believe the Hurt report stated that the average motorcycle crash was around 21 mph. The fact that most tracks require a Snell certification for helmets led me to believe they were better at higher speed and multiple impact crashes...is this the case, in your experience?



Ed Becker May 7, 2014 at 5:05 pm

Thanks for your comment. I looked into the Hurt Report just now and you're spot on. However, head impact severity probably depends more on other crash circumstances than cruising speed. Dr. Snively figured that street riders needed as much protection if not more than riders in well organized competition. The potential is certainly there in the stew of ordinary traffic for a thump well in excess of what even the best helmets can manage. Fortunately, though, there's a broad distribution of head impact severities in motorcycle incidents so that, as Professor Hurt and his colleagues pointed out, almost any sort of protective helmet would demonstrate some positive benefit in injury reduction statistics. The case for DOT compliant helmets is that they will be more effective than many other kinds of headgear and I believe that Snell certified helmets will be even more effective than that. The unhappy news is that no helmet can guarantee absolute safety. But some can tilt the odds of against injury a little more to a rider's advantage than others.

Gabe May 6, 2014 at 3:21 am

Wow, great podcasts, especially for a new rider like me looking to buy his first helmet! I learned more about helmets, testing and safety from these podcasts than I have in months of online research. Thanks for taking the time Ed and David to put these together! I'll be looking for a Snell approved helmet.

REPLY

Gabe May 6, 2014 at 3:27 am

As a new rider looking to buy his first helmet, I've had the impression that a Snell approved helmet would be out of my price range, but I see that Ed says that price doesn't necessarily correlate to safety and that there are affordable Snell approved helmets out there. I understand the conflict of interest for Ed, but does anyone have any recommendations for affordable (under \$300) Snell approved helmets?



Gabe May 6, 2014 at 3:31 am #

Never mind, I've looked at some online retailers and I can search for helmets that are Snell approved at various price points:) should have looked before I commented.

Joe O'Handley May 6, 2014 at 5:09 am

Gabe, I use an hjc helmet that is snell approved, it's very comfortable and affordable. I went and tried it on before I bought. It's very hard to buy online because the different manufacturers sizes are not the same necessarily. I recommend getting one from a local shop or at least trying them on at one before you buy online. The shop near me is really great about letting you try the gear on and also knowledgeable about what they sell.

Ken May 7, 2014 at 9:42 pm

Thanks for the great information on helmets on the four podcasts you have published to date. I am in the market for a new helmet and your timing has helped. I am a rider with 30+ years of experience. The podcast series so far has answered many old questions that I have had about types,age of helmets, materials used, casual drops and props,cost reasons etc.

I still was wondering about the new feature of flip down sunvisors inside some fullface helmets. Does this effect the integrity of the helmet and are the optics of good quality UVB/UVA resistant? Any studies or data on colors or designs as being more or less visible? I can make some good common sense guesses but sometimes scientifically controlled experiments or studies brings out unexpected results.

Ken

REPLY

Ed Becker May 9, 2014 at 9:34 pm

We don't really test for optical quality or UV capabilities of face shields, external or internal. They're important considerations but riders have other means of assessing them. We're mostly concerned with critical aspects of head protection riders cannot easily determine for themselves. I'd expect, though, that a well designed helmet could include an internal drop down shield and still meet Snell demands for head protection. The slot into which the shield would retract might necessarily add a few millimeters of wall thickness to the brow of the helmet, though, and this is probably why we have not, as yet, seen any Snell certified helmets with drop down shields even though there are quite a few DOT helmets with this feature.

Wall thickness is one of the critical elements in helmet design. The greater the impact severity, the more wall thickness the helmet must have in order to manage it safely. But riders seem willing to tolerate only so much before they reject a helmet in favor of something a little sleeker and lighter. Helmets were much sleeker when Snell first started to set helmet standards but when the industry discovered that race car drivers and riders were willing to accept them, helmets got bigger and heavier and Snell standards for helmets became more demanding. Currently, though, we're nearing the limits of rider acceptance if we're not there already. The question has become, if riders will only tolerate so much wall thickness, how should it be spent; on crash impact management or on comfort and convenience? I believe there's no single answer to this question. Extra energy management may tilt the odds a little in a rider's favor but it won't guarantee survival while a little extra comfort and convenience will be there every time the helmet is worn and may even be the difference between wearing the helmet faithfully or leaving it in the garage for some rides. As long as it's a choice, we'll recommend the extra energy management but I hope that there will be helmets in the future that will provide both the protective performance and the convenience in one neat package.

I have not seen any studies on motorcycle helmets and driver awareness. I suspect that bright colors and retro-reflective tapes on helmets may be enough to let most drivers know a motorcyclist is in the vicinity but there can be no guarantee. As much as I'm in favor of helmets, I look on them as a last resort to be used only when the rider's best skill, judgment and good luck have failed to prevent a crash.

Eric May 8, 2014 at 6:35 am #

Very informative, some queations I've always wondered about are finally answered. Keep up the great work and thank you for sharing your passion. Thanks you guys!



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