MSF
MOTORCYCLE
SAFETY FOUNDATION

Cycle Safety Information

What You Should Know About Motorcycle Helmets

Helmets Work

Most sport-type activities have their own suitable protective gear and equipment. Motorcycling is no exception. Every rider and passenger should wear over-the-ankle footwear, long pants, a long-sleeved jacket, full-fingered motorcycle gloves, and a helmet manufactured to comply with DOT (U.S. Department of Transportation) standards.

Helmets work. Helmet effectiveness has been confirmed by scientific studies, while helmet myths – "helmets break necks, block vision and impair hearing" – have been consistently disproved. Safety-conscious riders wear helmets as a sensible, responsible choice every time they ride; we know that you will, too.

What a Helmet Does for You

First, it is the most important protective gear you can wear while riding a motorcycle. Think of it at the same time you think of your ignition key: Pick up the key; pick up the helmet. They go together. Helmet use is not a "cure-all" for motorcyclist safety, but in a crash, a helmet can help protect your brain, your face, and your life.

Combined with other motorcycle-specific protective gear, rider-education courses, proper licensing and public awareness, the use of helmets is one way to reduce injury.

You hope your helmet never has an impact. But crashes do happen. We can't predict when or what kind they will be. You should not say to yourself, "I'm just running down to the store," and not wear your helmet.

Second, a good helmet makes riding a motorcycle more fun, due to the comfort factor: another truth. It cuts down on wind noise roaring by your ears, on windblast on your face and eyes, and deflects bugs and other objects flying through the air. It even contributes to comfort from changing weather conditions and reduces rider fatigue.

Third, wearing a helmet shows that motorcyclists are responsible people; we take ourselves and motorcycling seriously. Wearing a helmet, no matter what the law says, is a projection of your attitude toward riding. And that attitude is plain to see by other riders and non-riders alike.

How and Why a Helmet Works

Different helmets do different things. There are hard hats on construction and heavy-industry heads; football helmets on athletes' heads, and Kevlar® caps on military heads. None are interchangeable. Motorcycle helmets are very sophisticated and specialized for the activity. They've been developed carefully and scientifically over the years.

Four basic components work together to provide protection in the motorcycle helmet: an outer shell; an impact-absorbing liner; the comfort padding; and a good retention system.

What we see first is the **outer shell**, usually made from some family of fiber-reinforced composites or thermoplastics like polycarbonate. This is tough stuff, yet it's designed and intended to compress when it hits anything hard. That action disperses energy from the impact to lessen the force before it reaches your head, but it doesn't act alone to protect you.

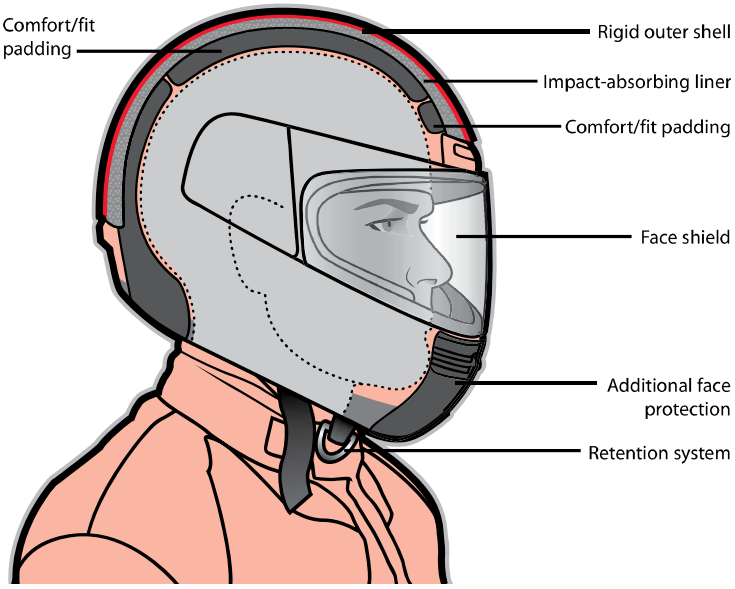
Inside the shell is the equally important **impact-absorbing liner**, usually made of expanded polystyrene (commonly thought of as Styrofoam). This dense layer cushions and absorbs shock as the helmet stops and your head wants to keep on moving.

Both the shell and the liner compress if hit hard, spreading the forces of impact throughout the helmet material. The more impact-energy deflected or absorbed, the less there is of it to reach your head and brain and do damage. Some helmet shells delaminate on impact. Others may crack and break if forced to take a severe hit; this is one way a helmet acts to absorb shock. It is doing its intended job. Impact damage from a crash to the non-resilient liner may be invisible to the eye; it may look normal, but it may have little protective value left and should be replaced.

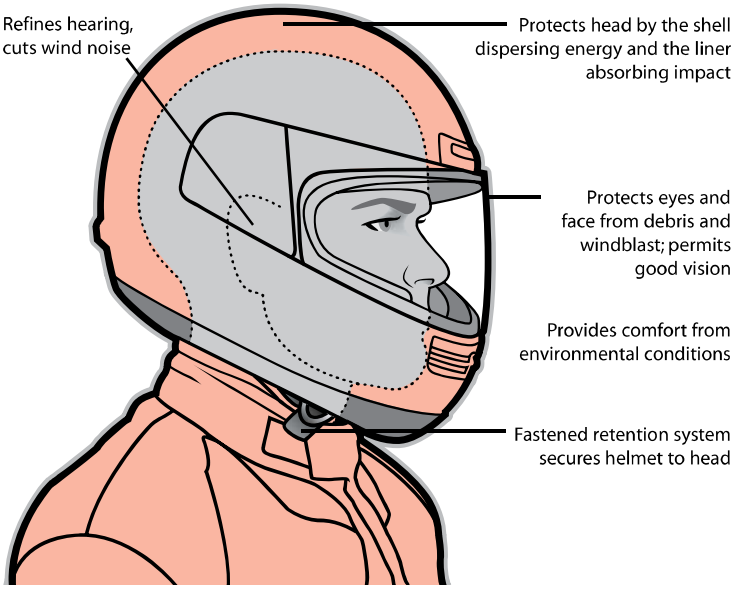
The **comfort padding** is the soft foam-and-cloth layer that sits next to your head. It helps keep you comfortable and the helmet fitting snugly. In some helmets, this padding can even be taken out for cleaning.

The **retention system**, or chin strap, is very important. It is the one piece that keeps the helmet on your head in a crash. A strap is connected to each side of the shell. Every time you put the helmet on, **fasten the strap securely**. It only takes of couple of seconds. To ride without your helmet secured would be as questionable as driving without your seatbelt fastened.

Basic Construction



Protective/Comfort Attributes



See and be seen. Be prepared. Enjoy the ride.

Choosing a Helmet

While color, design and price may be a part of your decision about which helmet to buy, think first about protection and comfort. A full-face helmet gives the most protection since it covers more of your face. It usually has a moveable face shield that protects the eyes when it is closed.

A three-quarter, open-face helmet is also a choice of some riders. It is constructed with the same basic components, but doesn't offer the face and chin protection of full-face helmets. If you use an open-face helmet, you should have a snap-on face shield in place when you ride, or buy a pair of goggles that can withstand the impact of a stone or other debris. Prescription eyeglasses or sunglasses are not sufficient protection, and they might move or fly off.

A "shorty" half-helmet protects even less of your head. It is more likely to come off your head upon impact. Therefore, "shorty", half-shell helmets are not recommended. Novelty helmets – characterized by a thin or non-existent liner – must be avoided.

A lot of good helmets are available today, in a range of prices. One look around your dealer's helmet display will convince you that nearly any look you could want from a helmet is readily available. Many manufacturers are color-coordinating their helmets with the newest motorcycle models. And the days of heavy or cumbersome helmets are over. They're made of lightweight, modern materials and are improved each year. Manufacturers are also working to make them less expensive, stronger and more comfortable.

What you must know when choosing a helmet is that it meets minimum safety standards. The way to find a well-made, reliable helmet is to look for the DOT sticker on the inside or outside of the helmet. The sticker means the helmet complies with the safety test standards of the U.S. Department of Transportation. A Snell sticker may also appear on a helmet, meaning the helmet also complies with standards set by the Snell Memorial Foundation.

Each organization has rigid procedures for testing:

Impact – the shock-absorbing capacity of the helmet.
Penetration – the helmet's ability to withstand a blow from a sharp object.
Retention – the chin strap's ability to stay fastened without stretching or breaking.
Peripheral vision – the helmet must provide a minimum side vision of 105 degrees to each side. (Most people's usable peripheral vision is only about 90 degrees to each side.)

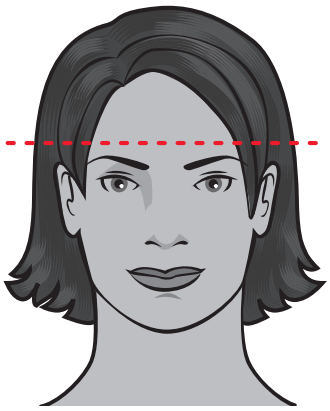
ALL new adult-sized helmets for on-highway use must meet DOT standards. Helmet dealers and distributors must ensure that all the helmets they sell bear the DOT sticker. Whatever your helmet choice, be sure it has this certification. You don't want an inferior helmet or one designed for another purpose. If someone tries to sell you one without it, don't buy it. If your helmet has no DOT sticker, do not wear it, regardless of its age.

Snell has been testing helmets for decades. The use of Snell standards by helmet manufacturers is voluntary. Unlike DOT standards, Snell testing is revised (most recently in 2010) as helmet design and technology improve.

Both agencies attempt to reproduce, under test conditions, the situations that are hazardous to motorcyclists. Their testing methods differ, but the intent is the same: to make certain any helmet they recognize has life-saving, shock-absorbing minimums.

Since head injuries account for a majority of motorcycle fatalities, protection is vital. (Head injury was specified on 42 percent of the death certificates for motorcycle operators and passengers in California in 1987-88; Romano PS, McLoughlin E. (1991). Helmet use and fatal motorcycle injuries in California, 1987-88. *Journal of Head Trauma Rehabilitation*. May 1991; 6(2):21-37.) Even the best helmet is no guarantee against injury. However, without a helmet you are more likely to have serious head injuries than a rider who is wearing one.

Getting the Right Fit



inches	cm	Hat Size	Helmet Size
20 1/8 – 20 1/2	51 – 52	6 3/8 – 6 1/2	XX-Small
20 7/8 – 21 1/4	53 – 54	6 5/8 – 6 3/4	X-Small
21 5/8 – 22	55 – 56	6 7/8 – 7	Small
22 3/8 – 22 7/8	57 – 58	7 1/8 – 7 1/4	Medium
23 1/4 – 23 5/8	59 – 60	7 3/8 – 7 1/2	Large
24 – 24 3/8	61 – 62	7 5/8 – 7 3/4	X-Large
24 7/8 – 25 1/4	63 – 64	7 7/8 – 8	XX-Large

Size

There's more to fitting a helmet than just buying the one that matches your hat size or guessing at "small, medium or large." However, hat size is a good starting point. If you don't know your size, you can use the chart above. Measure your head at its largest circumference – usually just above your eyebrows in front, above your ears and around in back. Try it several times so you know you've gotten the largest number. If your head size falls between the numbers listed, try the smaller size first and give it time to conform to your head. Most helmets are marked and sold as XXS, XS, S, M, L, XL or XXL, so you may need to contact the manufacturer for size equivalents. Helmet sizes vary among manufacturers and model types.

The Best Way to Try on Your Helmet

- Hold it by the chin straps. The bottom of the helmet should face you with the front pointing down.
- Put your thumbs on the inside of the straps, balancing the helmet with your fingertips.
- Spread the sides of the helmet apart slightly and slip it down over your head using the chin straps.

The helmet should fit snugly and may even feel a bit tight until it is in place correctly. Be sure it sits squarely on your head. It shouldn't be tilted back on your head like a hat. Remember, if your helmet is too large, several things could happen: it will move around and up and down on your head when you least want it to; it can be noisy and let in wind; worst of all, it may come off in a crash!

Once the helmet is on your head, make a few other fit checks before fastening the straps.

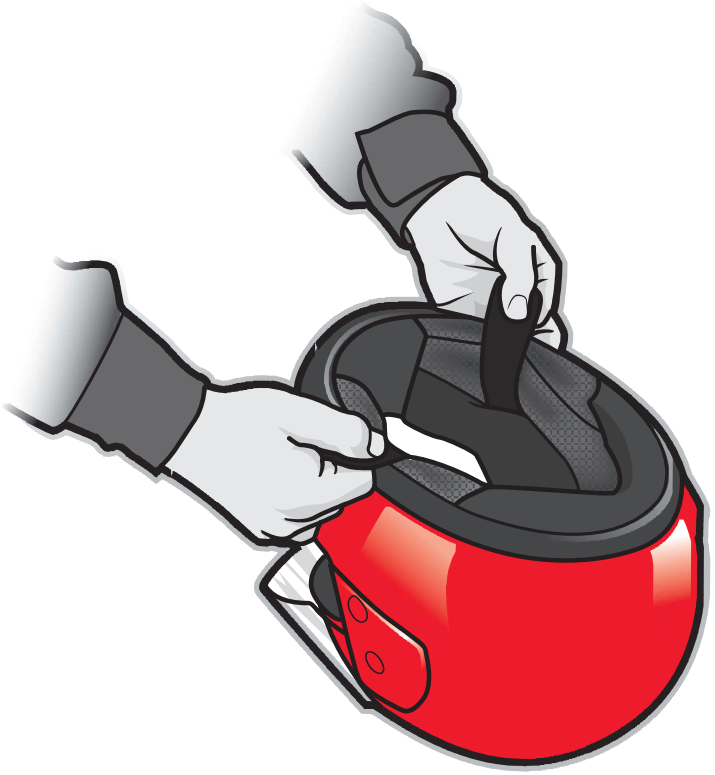
- The cheek pads should touch your cheeks without pressing uncomfortably.
- There should be no gaps between your temples and the brow pads.
- If the helmet has a neck roll, it shouldn't push the helmet away from the back of your neck.
- On full-face helmets, press on the chin piece. The helmet or face shield should not touch your nose or chin. If it does, it will surely do so at speed from wind pressure.

With the helmet still on and the straps securely fastened, move it from side to side and up and down with your hands. If it fits right, your skin should move as the helmet is moved. You should feel as if a slight, even pressure is being exerted all over your head. Remember, too, that a helmet loosens up a bit as the comfort liner compresses through use. A new helmet should be as tight as you can comfortably wear it.

Now, with the chin strap still securely fastened and your head straight, try rolling the helmet forward off your head. You shouldn't be able to pull it off. If you can, the helmet is too big.

Take off the helmet. Does your head feel sore anywhere? Are there any red spots on your forehead? Pressure points can be uncomfortable and can cause a headache after a long ride, so be sure your helmet isn't causing any. If it is, choose the next largest size or try a different brand of helmet. Human heads are not all the same shape; neither are helmets.

If you are still unsure about the helmet's fit, wear it around the store for a while to see if it remains comfortable. A helmet is an important investment, no matter what its price. Be sure the one you choose is right for you.



Helmet Care

Follow the manufacturer's care instructions for your helmet. Use only the mildest soap recommended. Avoid any petroleum-based cleaning fluids, especially if you own a polycarbonate helmet. Exposure to strong cleaning agents can cause the helmet to decompose and lose protective value.

Keep your helmet's face shield clean. Normally, mild soap and warm water with a soft cloth will do the job. If it gets scratched, replace it. A scratched face shield can be difficult to see through. At night, it could dangerously distort your vision and your view of oncoming lights.

A helmet looks tough and sturdy, but it should be handled as a fragile item. This means that you don't want to drop your helmet onto hard surfaces. It could ruin your helmet. Remember that its function is to absorb impacts, which can affect its integrity and effectiveness.

It is not wise to store helmets near gasoline, cleaning fluids, exhaust fumes, or excessive heat. These factors can result in the degradation of helmet materials, and often the damage goes unnoticed by the wearer. Read the information that comes with the helmet so you know how to care for it.

Definitely read the instructions about painting, decorating, pinstriping, or applying decals to your helmet.

When you take your helmet off, find a flat, secure place for it. You could set it on the ground, secure it on a rack, or stow it on a shelf. On some bikes, putting it on the fuel tank may expose it to fumes. If you place it on the seat, make sure it won't fall off.

If you plan to use a communication device when you ride, find a model that doesn't require drilling speaker holes in the outer shell. Before you purchase your speakers, check with your state's laws regulating their use in helmets. Some states prohibit them.

Replacing Your Helmet

Replace your helmet if it was involved in a crash; it probably absorbed some impact shock. Some helmet manufacturers will inspect and, when possible, repair a damaged helmet. If you drop your helmet and think it might be damaged, take advantage of this service.

Most helmet manufacturers recommend replacing your helmet every few years. If you notice any signs of damage before then, replace it sooner.

Why replace your helmet every few years if it doesn't appear damaged? Its protective qualities may deteriorate with time and wear. The chin strap may fray or loosen at its attaching points; the shell could be chipped or damaged. The best reason is that helmets keep improving. Chances are that the helmet you buy in a couple of years will be better – stronger, lighter, and more comfortable – than the one you own now. It might even cost less!

Can't remember when you bought your present helmet? Check the chin strap or permanent labeling. New helmets must have the month and date of production stamped on it. If there's no date at all, you should definitely replace your helmet – now!

State Helmet Requirements

Reflectivity

Many states require a specific amount of retroreflective material on a helmet. Thoroughly read the manufacturer's information. Your local motor-vehicle department can give you exact information on the location and number of square inches of retroreflective material required in your state.

Helmet Laws

Wearing a helmet properly strapped on your head is mandatory in many states. But that's a moot point, because as a responsible, safety-minded motorcyclist, you'll be wearing your helmet every time, and everywhere, you ride.

Getting More Information

You've now read that there are many things to consider when buying a helmet. Get all the information you can. Contact helmet manufacturers and read their literature. Consult recent motorcycle-enthusiast magazines for up-to-date information to help in your decision. Two authorities you may contact are:

National Highway Traffic Safety Administration
Office of Traffic Injury Control Programs
1200 New Jersey Ave, SE West Building
Washington, D.C. 20590
(888) 327-4236; nhtsa.gov

Snell Memorial Foundation, Inc.
3628 Madison Avenue, Suite 11
North Highlands, CA 95660
(916) 331-5073; smf.org; info@smf.org

While gathering information on protecting your head, why not get good tips on other personal protective gear? Read MSF's **Cycle Safety Information** (CSI) sheet, "Personal Protective Gear for the Motorcyclist," available from the MSF at no charge. While you're at it, pick up a copy of MSF's Motorcycling Excellence. And be sure to complete an MSF *RiderCourse* to keep your skills and strategies sharp.

Wear your helmet,
every time you ride.

The Motorcycle Safety Foundation is a national, not-for-profit organization promoting the safety of motorcyclists with programs in rider training, operator licensing and public information. For the Basic or Basic *RiderCourse*2 - License Waiver nearest you, call the national toll-free telephone number: (800) 446-9227. The MSF is sponsored by the U.S. distributors and manufacturers of BMW, BRP, Ducati, Harley-Davidson, Honda, Kawasaki, KTM, Piaggio, Polaris Motorcycles, Suzuki, Triumph and Yamaha motorcycles.

The information contained in this publication is offered for the benefit of those who have an interest in riding motorcycles. The information has been compiled from publications, interviews and observations of individuals and organizations familiar with the use of motorcycles, accessories and training. Because there are many differences in product design, riding styles; and federal, state and local laws, there may be organizations that hold differing opinions. Consult your local regulatory agencies for information concerning the operation of motorcycles in your area. Although the Motorcycle Safety Foundation will continue to research, field test and publish responsible viewpoints on the subject, it disclaims any liability for the views expressed herein.

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