

After making the decision to enter autocross (AX) or driver education (DE) events, the next decision an entrant needs to make is what kind of helmet to use as these events require such use. While AX events usually have top speeds ranging from 40-50 mph it is quite possible for many Porsches to easily reach speeds between 120 and 200 mph during DE events at expansive road courses like Road America. Performance driving requires additional protection.

If we analyze basic physics of a vehicular accident, assuming no safety devices are present, the following happens. There are actually three progressive collisions that occur when a vehicle contacts another vehicle or immovable object. The first collision is that of the vehicle striking another vehicle or object. The second collision occurs when an unrestrained occupant, with continuing inertia in the same vector as the vehicle, impacts the interior of the vehicle. (In the cases of ejection from the vehicle impact is with the environment.) The third collision happens when the internal organs and soft tissues impact the structural portion of the body such as the skull and rib cage. Ouch!

A helmet is one of the many devices a driver relies on to mitigate the final collision of the brain with the inside of the skull. Engineers reduce the impact on a person during a collision by distributing the forces and increasing the time of de-acceleration by fractions of a second.

Two main components of a helmet proper protect the driver. One is the outer shell of rigid material consisting of resin impregnated fiberglass, Kevlar, carbon fiber or a combination. The purposes of the shell are to deter penetration of acutely shaped items and to distribute the impact force over a larger surface area transferring force into the other main component: inner foam padding.

Impact force continuation to the inner foam padding, usually an expandable beaded polystyrene, progressively crushes and ultimately increases the time of head and brain de-acceleration. The cloth liner over the foam padding is for comfort and absorption of perspiration.

Most PCA Regions allow two basic helmet configurations. One is an open face style and the other is referred to as a full face style.



Figure 1 BELL "Mag 4" Open Face Helmet

Open face helmets (Fig. 1) are iconic of early stock car and open wheel racing and are still available. They are more comfortable on hot days and may be desirable for drivers who have claustrophobic tendencies. The open face helmet is adequate for AX events and is allowed in PCA Milwaukee Region Novice and Intermediate DE Groups. But, if a driver anticipates progressing to the DE Advanced Group and possibly onto PCA Club Racing (CR) it is recommended that a full face helmet be purchased.



Figure 2 BELL "M3 Pro-Series" Full Face Helmet

Full face helmets (Fig. 2) differ from open face helmets in that the chin area is protected. This is important because more severe frontal impacts may cause the seat harness to stretch enough allowing the driver's chin to impact the steering wheel. If the car does not have an airbag, this would be problematic with an open face helmet.

The face shield also adds eye protection. Race tracks are littered with debris that sometimes can enter the driver compartment. A face shield also deters flames from reaching one's face and if tinted reduces fatigue on bright days.

Helmets_{,continued}

Various supplementary head and neck restraints (HANS Device) require the use of a full face helmet. The open face helmets will not contain the head and it will simply extrude out the front of the helmet in a crash.

Full face helmets do retain a lot of heat and some models have provisions for air ventilation by connecting a flexible hose to a vehicle inlet vent. Be sure that some screening is present for any air ducting to deter wasps and bees from becoming co-drivers inside your helmet! Some air supply systems use blowers to increase air flow ranging from 135 to 235 CFM and offer HEPA 4 Micron filters. Cool Shirt offers a hooded shirt that includes cool water circulation via small diameter tubing to the neck and head.

The PCA Milwaukee Region follows recommendations of PCA National to require all helmets to meet SNELL SA rated helmets for AX and DE. Ratings are issued every five years and PCA allows the current year issuance and the previous year issuance. For example, for driving seasons of 2008-2011 the PCA Milwaukee Region will allow SNELL SA 2005 and SNELL SA 2000 rated helmets. Indication of helmet compliance is a reflective decal affixed to the semi-rigid foam padding in the rear inside portion of the helmet. One may need to gently pry the cloth liner away from the foam padding to read the decal.

PCA National does allow the use of SNELL M helmets meeting fore mentioned year compliance for AX and DE events only. SNELL M standards refer to motorcycle use. SNELL SA refers to automobile use. There are three major differences between SA and M ratings:

- 1.) SA standard requires flammability test while the M standard does not;
- 2.) SA standard allows narrower visual field than M standard (Some SA helmets may not be street legal);
- 3.) SA standard has roll bar impact test while M standard does not.

Note that PCA Club Racing (CR) Rules require SNELL SA rated full face helmets or FIA 8860-2004, SFI 31.2A and BS6658-85 Type A/FR (2008 season ref.).

Some drivers borrow or share a helmet for their first AX or DE event. This is a valid option, but be aware there is a low to moderate probability that the helmet will properly fit the novice driver. Also, a helmet is a personal item, similar to a tooth brush or comb. If it is shared and the weather is hot, be prepared to strap-on a helmet with a perspiration soaked inner liner.

Proper fit of a helmet is very important and it is recommended that one tries a helmet prior to purchase. If ordering online, verify with the retailer that you can exchange the helmet until proper fit is achieved.

Getting an approximate helmet size is easy. Simply use a flexible tape measure and determine the distance around the head, horizontally about the widest points of the forehead and rear area. A string can also be used and transferred to a scale (Fig. 3). Take several measurements and use the largest number to begin fitting.

INCHES	20	21	22	23	24	25								
CENTIMETERS	51	52	53	54	55	56	57	58	59	60	61	62	63	64
HAT SIZE	6 5/8 - 6 3/4		6 7/8 - 7		7 1/8 - 7 1/4		7 3/8 - 7 1/2		7 5/8 - 7 3/4		7 7/8 - 8			
HELMET	XS		SM		MD		LG		XL		XXL			

Figure 3 Typical helmet sizes
(Not to Scale)

It is highly recommended that one seeks fitting by a knowledgeable person. BELL Racing has an excellent guide on their web site documenting procedures for helmet fitting. In summary, the helmet should fit snug about the head and face, not have any uncomfortable pressure points and with the chin strap fastened the helmet should not be able to be dislocated or removed by pulling up and forward from the back lower edge.

Over time, helmets deteriorate due to exposure to UV, ozone, perspiration and mechanical wear and tear. Be sure to monitor chin strap condition and attach points. If the chin strap begins to fray, it can be replaced by most manufacturers. It is recommended that helmets be reconditioned and preferably replaced every five years.

If you paint your helmet, refrain from removing the chin strap rivets. Opt for masking. Use acrylic enamel-based paints not lacquer based to avoid compromising integrity of the hard shell resin.

If your helmet experiences impact, inspect it for cracks, strap integrity and compressed inner foam. If damage is present, it must be replaced.

The good news is nothing is finer than a shiny new helmet with that new car smell!