

Seven Flip-Face Motorcycle Helmets Compared

These modular motorcycle helmets with flip-up face sections could be the best of both worlds for many motorcyclists. . . if you can accept the compromises. We assembled the Arrow Mono Convertible, HJC Symax, Lazer Century, Nolan N100, Schubert Concept, Sh

By Art Friedman

Photography by James Brown



Photography by James Brown (email: Kingosoul@aol.com)

Somewhere between the open-face helmet and the full-face helmet is the modular motorcycle helmet -- also called a flip-up helmet, flip-face helmet, system helmet and other names. This style helmet permits the wearer to raise the facial section out of the way, allowing him to eat, drink, smoke or simply remove a barrier to conversation without going through the rigmarole of unfastening and removing his helmet and then replacing it and reattaching the strap. We know some eyeglass wearers who feel these motorcycle helmets are their only option for full facial coverage, although our experience indicates this isn't true. Modular motorcycle helmets are perceived as providing the benefits of an open-face helmet with the protection of a full-face helmet.

But do they? We rounded up seven modular motorcycle helmets to find out how well they fulfill this proposition. We found current models from Arrow, HJC, Lazer, Nolan, Schubert, Shoei and Zeus.

We wanted to know how they feel on your head, how they work on your motorcycle at speed, and what sort of protection they offer. All our staffers road-tested them, and then we took them to the Head Protection Research Laboratory in Paramount, California, to see what would happen when we smashed them.



This is the Nolan that went through our complete battery of lab tests. While others showed the scars of their experiences there, the Nolan shell only had this small scratch. This shows how well its unique finish holds up if you drop or scuff the helmet, but it's also a reminder why a helmet should be inspected if you do fall in it. The liner no longer offers the protection it was born with.

On Your Head

Modular helmets fall between open-face and full-coverage motorcycle helmets in some areas and below them both in others. For example, you might expect that the additional complication of the mechanisms that permit the facial section to pivot up and latch in place would make them more expensive and heavier than full-face helmets. But while they are heavier than most full-coverage helmets, they mostly fall toward the low or middle end of full-face-helmet pricing. (At the top end, the Shoei Syncrotec carries a list price of \$415, with the Zeus ZS-508 Liftech available for less than \$90 at some outlets.)

Our wearers began the test by attempting to roll the helmets off their heads. They pulled hard up and forward on the back lower edge of the helmet with the face section latched closed. The results show why it's so important to perform this test on your own head. On one tester, all but the Schubert failed. However, we should note that the medium Nolan, though technically his regular size, was actually too big for him, so that result is uncertain. At the other end of the spectrum, another rider could not get any of the seven to roll off his head, though he observed that with the face piece open, the Zeus probably could roll off after breaking his nose. That is one reason you aren't supposed to ride a motorcycle with the face sections of these helmets open. Other reasons for this prohibition include lack of protection, disastrous aerodynamics and the possibility that the extended section could create unwanted leverage in a crash.



Lazer's pinch-together latch control is easy to use one-handed but isn't likely to open in a crash.

The latching mechanisms vary in location and action. Although users preferred single-button systems for one-handed ease of operation, we were concerned that some of the one-button designs, notably the HJC's, could possibly be deployed in a crash. Our testing reinforced that concern. A related issue was whether a would-be rescuer who needed to remove the helmet would be able to recognize and operate the latches as easily as the helmet buckle, especially since many of these helmets are reluctant to come off with the face section closed and latched.

None of these seven motorcycle helmets was as quiet, in terms of ambient wind noise on the highway, as a good full-coverage helmet.

Overall, they are slightly less comfortable than the full-face motorcycle helmets we normally use; of course this depends on your head. For example, one rider was uncomfortable in the Nolan after just a short ride, while others rated it among the most comfortable. We noted similar disparities in the Lazer's comfort and the Arrow's noise level. We will repeat the advice we have offered before: Always try a helmet on before buying it, and don't just slip it on and take it back off. Put it on, fasten it snugly and wear it for a while. Better still, go ride in it if you can.



Ease of shield changes vary. The Shoei uses the same excellent system as its other helmets, which permits you to change shields immediately with no tools. We can even do it while wearing it.

After spending time riding in all of these, our testers' reactions ranged from enthusiastic ("I think they provide the best of both worlds. While I feel vulnerable in an open-face, the flip-face gives me the flexibility

to breathe more freely at gas stops, drink a beverage or converse.") to indifferent ("I can't see trading the quietness of a full-face or the confidence in its integrity so I can momentarily feel as if I'm not wearing a helmet."). Our suggestion, as always, is to shop carefully. After your motorcycle itself, there is nothing that can contribute to or detract from the pleasure of a ride like the helmet you choose.

Banging Heads

Our research into the protective qualities of modular helmets started at the Department of Transportation's website, where the results of testing for compliance with the DOT motorcycle helmet standard (officially known as Federal Motor Vehicle Safety Standard 218) are posted. [This site](#) has results going back to 1994, and it is an easy way for any helmet user to check how his helmet has performed in this solid evaluation of protection.



All seven helmets went to the Head Protection Research Laboratory to see how well they withstand impacts. We performed drop tests (on the rig seen here), roll-off tests, and chinbar-deflection tests.

The DOT office concerned with FMVSS 218 buys motorcycle helmets and pays independent labs to examine them to see if they comply with such things as labeling requirements. The labs also test them to ensure they meet the DOT impact and other performance standards (such as chinstraps). The results are then listed on the site in the form of Pass or Fail and a notation as to whether it was for labeling (perhaps the required "DOT" sticker was placed too far up on the helmet) or performance. There are quite a few labeling failures, but they don't really concern us. Some failures are considered "inconsequential," but the DOT site does not tell if the failure was trivial or major or what caused it.

We found test results for five of our modular helmets. There were no results for the Lazer Century, and just one Zeus was listed (as failing

for labeling) with no indication as to the model. The 2002 results showed that the Arrow Mono Convertible, the Nolan N100e, the Shoei Syncrotec and the Schuberth Concept all passed. The HJC Symax failed for performance in 2001.

For our performance testing we started with a new and critical test, a roll-off simulation. This lab test uses a standard headform and a standard force (created by dropping a specified weight from a predetermined height) to try to roll the helmet off the head. Since we see riders riding with the front of these helmets open (against manufacturers' instructions), we also decided to perform this test with the face sections unlatched and open. All except the Symax passed with some movement in both configurations. However, the HJC's inside-the-chinbar faceplate latch contacted the headform's rigid neck, allowing the face piece to open, which permitted the helmet to rotate over and off the headform with some resistance. With the front open, it rolled right off.



As the first victim is strapped to the torture device, the rest watch and helplessly await their own fates. (Note the reflective material on the Schuberth.)

To determine how strong the chinbars are, we also performed a chinbar-deflection test, similar to a Snell test for shell rigidity. We wondered whether the chinbars had the integrity to pass this test without being an integral part of the helmet shell. It turns out that they do. None approached the allowed 60mm deflection. The most deflection we measured was 47mm on the Arrow, with the Schuberth close behind at 43mm. The HJC, Lazer and Shoei deflected the least, all at 28mm. We also tested the chinbars for impact absorption by removing them from the helmets, placing them on the headform and subjecting them to a six-foot drop. There is no applicable U.S. standard for motorcycle helmets that any of them claim to meet here, but the Zeus transferred notably more energy, which isn't surprising because it has no padding in its chinbar. The headform felt 660gs, compared to 200 for the best-performing Shoei and 201 for the Lazer, both of which have substantial padding in the impact area. The second worst was the HJC (409gs), but it has an excuse because we impacted the exact center of the chinbars, where the HJC has its latching

mechanism. Its chinbar has substantial padding on either side of the latch and would have almost certainly performed well if we had attacked it there.



Though there is no chinbar-performance standard that applies to these helmets, we used used this rig to test chinbar deflection in a crash.



Sensors inside the headform tell the computer how much energy was transferred to it, both in terms of force and duration. Early helmet tests were conducted by swinging a pendulum (at much lower force levels) against the heads of test subjects and asking, "How did that feel."



Guided by the wires, the headform and helmet plummet onto the anvil below. To pass the DOT standard, they have to do this twice and still provide good energy absorption. Your head won't survive the first trip unprotected.

Hit Me

The most important impact test was the six-foot DOT drop onto a flat anvil, and we picked the area above the forehead for this test. Although disparaged by the anti-helmet faction because of its seemingly moderate 13-mph impact speed, the test is actually pretty demanding, representing a 90-percentile protection scenario in a crash. And that is just for the first impact. What makes the DOT motorcycle helmet standard so demanding is that it requires two hits

in the same place. The shell and the liner must have enough shock-absorption capability left to handle a second 90-percentile whack in the same place, something that you can just about be certain will never happen to you. We were mostly interested in how these helmets absorbed the first hit, but we conducted the second drop just to see how they fared in the full DOT impact regimen.

The DOT standard specifies a maximum acceleration that the helmet can transfer, but it also has a dwell-time limit; it may not exceed 200g for more than 2.0 milliseconds. In that critical first hit to the front crown area, the Lazer and Shoei, at 142gs and 144gs, respectively, were the top performers, followed by the Arrow (158), Nolan (163), HJC (168), Zeus (183) and Schuberth (210gs and .8ms). When we dropped them again just as hard on the same place, the order changed in the middle of the pack as the Gs went up a bit and the dwell time became a factor: Lazer (166) and Shoei (178) remained on top, but HJC (196) moved into third, followed by Nolan (205gs and .8ms), Zeus (207gs, 1.1 ms), Arrow (209gs, 1.2 ms) and Schuberth, which at 237gs had a dwell time over 200gs of 2.1ms, one of those trivial DOT failures. We didn't regard this as too troublesome because it was the second hit. We also suspected that the Schuberth was handicapped by our choice of impact locations because its retractable sunscreen needed space precisely in that area. All of these impacts came in far below the DOT's 400g maximum limit.



The roll-off test was performed by strapping the helmet (with the face section locked closed) to the headform, then dropping the blue weight attached to the rear edge. This recreates the rolling-off forces that can occur. Some helmets had problems.

Next, we repeated the test, dropping each helmet twice on its left side. This time, the Shoei at 174gs was best, followed by the HJC (184gs) and Nolan (192gs). Dwell time became a factor for the Lazer (202gs, .4ms), Zeus (204gs, .3ms), Arrow (209gs, .8ms) and Schuberth

(209gs, 1.1ms), but all passed the 2.0ms dwell-time requirement. The second drop on the left side had an interesting twist. The Shoei was still best at 177gs, but the Lazer (189gs) and Schuberth (197gs) moved up to second and third, probably because their partially crushed shells actually became better energy absorbers. The order for the rest was HJC (218gs, 1.7ms), Nolan (22gs, 1.6ms), Arrow (233gs, 1.5ms) and Zeus (234gs, 1.9ms).

None of these helmets claim to meet the Snell standard, but just to see how they would fare in terms of the basic Snell impact, we dropped each twice from the Snell-standard 10-foot height onto a flat anvil. Each drop was to a different spot on the helmet; one to the right side, one to the rear. Only the Zeus, at 316gs in its right-side drop, permitted more than the Snell-allowed 300gs through to the headform on one hit. The Shoei, Lazer and Nolan were the best in the heavy hits, while the Schuberth, HJC and Arrow turned in solid performances in the middle.

At the end of the day we had learned that all of these modular motorcycle helmets provide acceptable crash protection, as long as you make sure they will stay on your head by performing a roll-off test before you buy. For the motorcyclists who wants the best protection in this crowd, we suggest looking at the Nolan, Lazer or Shoei.



ARROW MONO CONVERTIBLE, \$225

The pretty metallic blue of our Mono Convertible's polycarbonate shell consistently caught the eyes of people scanning our modular helmet collection and helped earn testers' top marks for appearance. The pivot hardware hides behind small faired-in covers, and the Italian stylists obviously took some time to fashion the two swooping top vents. However, the result requires that you adjust each vent separately instead of with a single control, and they have little discernible effect. The small chin vent does help defog on cold rides. A

single chin button opens the plastic latch for the flip face, and it appears unlikely to open in a crash. Some testers complained that the latch movement was slightly stiff. The shield worked easily, even with heavy gloves, sealed well and may be removed with a coin. The eyeport provided a wider-than-average view. A unique option is a kit that lets you convert it to an open-face helmet.



In order to put the helmet on, you must first open the face, and we found the D-ring-buckled strap stiff, short and awkward to fasten. This was the most annoying of the minor cost-cutting shortcuts we noted. Most testers complained that it was noisy, perhaps because it runs slightly large, though one gave it his top marks (in this group) for quietness. The CoolMax liner has removable cheek pads and contributed to better-than-average comfort. The helmet rolled off a tester's head -- one usually has that problem -- but showed no inclination to depart the laboratory headform. It performed about average in our other lab testing and should provide both solid protection and eye-catching style for a street price of about \$190. Our testers scored it as a B- average overall.

ARROW HELMETS
Giali USA (Protec Q Inc.)
5024F Departure Drive
Raleigh, NC 27616
(919) 877-8108



HJC SYMAX, \$240

This Korean helmet maker has a well-established reputation for making solid helmets at attractive prices. The conservatively styled and well-finished Symax combines a fiberglass main shell with an ABS/polycarbonate face section. The face plate opens smoothly after you pull up on the single large latch button in the bottom of the chinbar, and it latches closed easily. Based on what we saw in the lab, we strongly advise any potential buyer to be certain that the Symax latch button does not open the facial section when the helmet rolls forward forcefully against the chin, neck or chest, as it might in a crash. The latch mechanism itself is plastic.

You can pull the helmet on or off without opening the face, and it fastens easily with a nicely D-ringed strap, which has an elastic band to prevent flapping. A removable breath deflector is standard. Two obvious but integrated top vents with exits are controlled by a single large slider and produced noticeable cooling, though the chin vent had little effect. Its top-rated interior padding is removable and washable and has a plush neck roll, contributing to high marks for comfort.



Some riders felt the helmet was noisy at highway speeds on a motorcycle, while others just said it was quietly windy -- which

prevented fogging. The optically excellent face shield has a tool-less quick-detach system, seals well and operates easily. The eyepoint restricts peripheral vision slightly more than the others, though top-to-bottom vision is good. One user rated the Symax as her favorite modular helmet overall to wear, and testers gave it an overall B grade. That score did not include lab testing, where it generally displayed solid protection except for rolling off the headform. Street prices start about \$175.

HJC HELMETS
HJC America
16918 Edwards Avenue
Cerritos, CA 90703
(562) 407-2186
HJChelmets.com



LAZER CENTURY, \$170

With less integrated styling than the other modulars and unimpressive detailing and features, the Lazer Century received indifferent marks for appearance. The protruding chinbar is visibly separate from the IMAC composite shell and pivots on big, obvious aluminum pivot screws. The back features a large, lenticular reflective panel inset into the shell. Two squeeze-together buttons operate the plastic latching mechanism for the flip-up section and ensure that it can't be deployed accidentally, but it must be opened to don the helmet. The retention strap closes with a quick-release buckle, which is nicely padded and comfortable.

The shield is easy to operate but seals somewhat ineffectively. The stick-on seals around the eyepoint look cheap and may eventually peel off, and the eyepoint itself is smaller than others. The only vent is in

the chinbar, but it is an effective defogger. The lack of a top vent or perhaps the fact that the Century extends farther down than most others (and has a chin dam) may be why two testers rated it as the quietest helmet here. The chinbar is heavily padded and fits closer to the wearer's mouth than most others. Modest, removable padding and a less-than-plush material made some users uncomfortable with the interior. The somewhat flimsy faceshield requires a coin or screwdriver to replace. (Lazer conveniently sells shields and other parts through its website.)



Overall, it got mixed reviews from wearers, ranging from A- to D, but it excelled in the protection area, with consistently strong results in all our lab tests. With street prices starting at \$150, it is a great protection buy in a motorcycle helmet.

LAZER HELMETS
AGV/Lazer USA
3201 E. Mulberry Street, Suite D
Fort Collins, CO 80524
(970) 221-2630
LazerHelmets.com



NOLAN N100E, \$215-\$265

This updated version of the popular Italian N100 retains the unremarkable styling but features a new, all-steel two-lever latching system at the sides of the chinbar. The system may be operated with both hands or just the left, but it does not appear vulnerable to accidental opening. The articulated face-section pivot system keeps the face section close to the front of the helmet, giving it a low profile when open. You won't need to lift the face section to put the helmet on or take it off, but the flimsy chin dam gets in the way.

Most testers were impressed by its appearance and smooth finish. The chin strap uses a ratcheting buckle, permitting quick fastening and adjustability but with a slight comfort penalty. The eyepoint is large. The faceshield has no apparent positioning system but seems to stay put anyway. It can be changed without tools. Two intakes and an exhaust opening serve the useful top vent. The cat's eyes chinbar vents made effective shield defoggers.



Our Classic model (\$245 retail, \$190 street) and the multicolored Rapid have a removable and washable interior padding that snaps in place, making it easy to position properly, though it sometimes fell out as we slid the helmet off. Sizing tends to run large.

The Nolan is a classic example of why it's important to wear a helmet before you buy. Two of our editors found it very comfortable and continued to use the N100E after the test was done. However, one staffer was miserable in this helmet and gave it failing marks for comfort. Those who the helmet fit well gave it high marks, but the one low rating overall pulled the wearer's score down to a C+. The Nolan was one of the stronger protectors in our lab tests.

NOLAN HELMETS

Cima International
399 Wall Street, Unit L
IL 60139 Glendale Heights
(630) 690-3162
Nolan.it



SCHUBERTH CONCEPT, \$399

Although somewhat big, heavy and bulky, the German-made Concept (from the firm that introduced the first modular motorcycle helmet under the BMW brand in 1978) provides a few unique features, including a small compartment on the right side for first-aid information and a retractable tinted shield that eliminates the need for sunglasses. The carbon-fiber shell features a spoiler on the back to reduce lift along with a barely effective top vent with an exit. The single large rocking chinbar vent was more useful, but not for defogging the faceshield.

The Schubertsh has a "cracked open" or "city" setting that permits the shield to be opened just enough to provide some extra airflow. The depth required to accommodate the retracting tinted shield means that the helmet extends out at the top of the eyepoint, which is wide and fairly tall. The face section has all-steel latches and opens with a single button on the left of the chinbar; it must be opened to don or doff the

helmet. It may be quickly changed without tools, once you learn the trick.



The comfort padding is also removable and washable. A slightly awkward push-button buckle fastens the strap, which is plushly padded. It runs small, so plan on one size larger than you usually wear. Everyone was comfortable in the Schuberth even though it was somewhat noisy (projections like that first-aid-info pocket create wind noise), and it received a B- average wearer's score. Its performance in impact testing was unremarkable. Street prices run around \$360.

SCHUBERTH HELMETS
Intersport Fashions West, Inc.
15602 Mosher Avenue
Tustin, CA 92780
(714) 258-2120
(888) 311-5399
Schuberth-USA.com



SHOEI SYNCROTEC, \$415

Shoei's modular entry offers the firm's excellent quick-change shield system (just deploy a lever on each side and pop the shield off) with a

cam lever to unseal the shield for a bit more airflow. The face section's steel latching mechanism opens with a single control located on the outside center of the chinbar. It was slightly clumsy to operate with heavy gloves but seems unlikely to open unintentionally. It takes a bit of pressure to lift it to full open, but it closes and latches very smoothly. You can remove the helmet with the face section latched, but it is less awkward and painful just to open it. The face section is prominent, has large, unsightly pivot screws and is not integrated into the fiberglass shell, although the finish quality is excellent. A smallish brow vent offers little airflow and is slightly awkward to deploy because of its small control nubbin. The same sort of puny control operates the chinbar vent, which, with a large intake and elaborate four-point exhausts, is useful and effectively defogs the shield. There is also a small breath deflector. The eyeport is large, and the faceshield's optics, operation and seal are excellent.



The helmet fastens easily with D-rings, and a somewhat awkward clip on the strap's end can be used to prevent the strap from flapping. The interior is as nice as any here. Noise levels and fit comfort were above average for most riders, and one commented about its weight. It got a B average rating. With heavy force, the Syncrotec rolled off the head of our roll-off-prone rider, but it didn't roll off the standard headform in lab testing. It stood out in our protection-performance testing, with solid impact scores all around. Street prices run under \$370.

SHOEI HELMETS

Shoei Helmet Corp.
3002 Dow, Suite 128
Tustin, CA 92780
(714) 730-0941
Shoei-Helmets.com



ZEUS ZS-508, \$95-\$103

Made in Taiwan, the Zeus ZS-508, with street prices under \$90, is a reasonable no-frills choice for riders looking for flip-face function at an accessible price. The finish of the ABS shell had notable rough spots around the small, cheap, loose vents on the top and chin, and it had obvious chinstrap rivets. The vents were only minimally effective and virtually unusable with heavy gloves. However, it got compliments for its integrated appearance, with the face section fitting flush with the shell. The retaining strap fastens with D-rings and has a simple elastic band to prevent strap flapping. With no padding, it dug into riders' chins more than other retaining straps did. The face-section latch, operated by a single button inside the chinbar, was not very smooth and required two hands to close. However the helmet could be put on or removed with the face section latched.



The face section stuck out more than most when open. The faceshield operated easily, sealed well and stayed put. You need to remove two screws to change it. With no chin dam and a modest neck roll, riders found it noisier than average for these helmets, but the comfort rated a surprising B- average. Although the interior was a bit sparse and

padding was skimpy, the fit was average-to-good for our testers. The availability of an XXXL will be a plus for large noggins. It gets a low protective score because it could be rolled off the heads of two testers and came close on the third if opened. It also performed poorly on our chinbar-impact test, transferring a lot of energy, significantly more than any of the others because it has virtually no padding in the chinbar. Testers gave it an overall score of C-.

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(800) 747-6457



OTHER RESOURCES

HEAD PROTECTION RESEARCH LABORATORY
6409 Alondra Boulevard
Paramount, CA 90723
(562) 529-3295
HPRL.org

SNELL MEMORIAL FOUNDATION
3628 Madison Avenue, Suite 11
North Highlands, CA 95660
(916) 331-5073, (888) SNELL99
SMF.org