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Time to Test the Current Crop of Autocross Tires

Ask a group of autocrossers to name the most important part of a successful racing effort, and likely they'll have the same answer: the driver. Query these cone-dodging racers for the next most important part after the loose nut behind the steering wheel, and again there should be a general consensus: the tires.

It's not just mass hysteria and brainwashing by the tire companies that will lead a group of even the most frugal racers to spend most of their budget on tires and recommend that everyone do the same. Tires are just that important.

The state-of-the-art in autocross tires has evolved dramatically during the last five years, and the scene has quickly changed. While some might remember when DOT-approved competition tires were actually driven to an event, those days are long gone. The DOT stamp of approval on today's "R-compound" tires is now considered by many to be a joke, as the majority of these tires simply have two circumferential grooves as the only tread. These tires are now closer to true racing radials and are no longer seen as an offshoot of traditional street tires.

While thousands of car enthusiasts aren't even aware that these esoteric tires even exist, if you want to go fast in an autocross class that requires DOT-approved tires, then these are what you need.

But thanks to the recent advent of classes that require true street tires, these R-compound tires are no longer the only game in town when talking about autocross tires. Maximum-performance, summer-only street tires are what's required in the new Street Touring classes—and these models are also where the tire companies can make or break their reputations among the more general public. Seeing true street tires run in a competition environment has to make the tire companies happy, too.

The brand-elevated image of high-end performance tires can remain

even long after a tire's heyday is gone. For example, when Yokohama is mentioned, many enthusiasts still picture the company's breakout hit from back in 1982, the A008, and its then-funky asymmetric tread pattern. During roughly the same time period, the P7 cemented Pirelli's position as a builder of true performance tires. And today, the advent of the true street tire autocross classes less than 10 years ago has created a strong following in the grassroots community for these max performance tires.

At first, there was no real consensus as to which of these street tires was the fastest, as people experimented with different rim and tire combinations. Within a few short years, however, the slower tires were weeded out, and now the grids at national-level competitions are host only to the top two or three perceived "fast tires" and nothing else. This sounds very much like the atmosphere in the R-compound autocross classes, where essentially two manufacturers now have 99 percent of the current market at the highest level.

But which tire truly is the fastest? Which tires will we see on this year's national champions? What do we tell our readers when they ask the popular question, "What tire should I run?"

To get some answers, we gathered up the latest batch of R-compound tires and max performance street tires for our quasi-regular tire test. We've lost count of how many tire tests we've done at this point—it's somewhere around 10 or 11. Whatever the exact number, these tests are an extravaganza of burnt-up tires, worn-out helpers, smoking brakes and a mountain of data.

When looking at the gathered data, remember that sometimes there's more than just lap times to consider. In addition to the number of seconds it took a brand to circle the track, don't forget to consider price and wear when shopping for tires. Our drivers' comments should also help guide your choices.



Our Nissan Sentra SE-R Spec V test car was peppered with NISMO goodies, and served as the test mule for our street tire shootout. The friendly experts at The Tire Rack were our one-stop shop for tire busting and tread shaving; they also provided the test track.



scott r. lear photo



per schroeder photos

Tire Selection

One of the most difficult things to select in a tire test is also quite basic: What size? It can be tough to decide on the test tire size because manufacturers frequently will not all offer their competition tires in the same sizes. Some companies will make a 245/40R17, while others will only offer a similar-yet-still-different 245/45R17.

There are, however, a few sizes that at least come close to being reliable standards. One is the ubiquitous 205/50R15 that is used on many older, smaller cars like the Honda Civic; another is the 225/45R17, the tire used on many newer "compact" cars like the Subaru Impreza WRX. We used the former size for our R-compound tire test and the latter for the street tire portion of the test.

We tested the latest batch of maximum performance street tires that have been making waves in national Solo competition; this included the newest Yokohama, the Advan Neova, and the latest Hankook, the R-S2 Z212.

Our lineup also featured the "gold standard" of street touring autocross tires, the Falken Azenis RT-215 and its replacement, the Azenis RT-615. They were joined by the Kumho ECSTA MX (which is used by the current STS national champion) and the BFGoodrich g-Force T/A KD (which was the original equipment tire on our test vehicle and has racked up its share of wins in the Street Touring categories).

All of the street tires were shaved to $\frac{4}{32}$ -inch of tread. This was done for several reasons. When a tire is made, the builders will use a mold release compound so the completed tire easily pops out of the mold. This mold release is typically silicone based and keeps the tire from generating maximum grip until it is worn away.

Full-tread tires will also generate heat from tread squirm more rapidly than will shaved

or worn tires. This will lead to a loss of grip and will actually damage the tire if it is abused too much.

Tire manufacturers also use tricks like variable groove widths so a tire maintains its performance as it wears. This means that some tires have narrower grooves (or less void area, as it is called in the tire business) as the tread wears down. By shaving the tread down to $\frac{4}{32}$ -inch, the tires are faster and more consistent for testing.

Truth be told, most of the top-dog Street Touring autocrossers are now shaving their treads and using multiple sets of wheels and tires, just like their R-compound-using brothers and sisters.

Speaking of R-compound tires, our test of these featured the latest offering from Hoosier, the A3S05, as well as the newest from Kumho, the ECSTA V710. Hankook, a newcomer to the American market, brought their C70-spec, soft-compound Ventus Z214 to the fight, while Yokohama supplied us with their Advan A032R S (Soft Compound).

While the Hankook, Hoosier and Kumho are molded at a race-ready $\frac{3}{32}$ to $\frac{4}{32}$ of an inch of tread depth, the Yokohama can be used as a wet condition or track day tire and as such is molded to $\frac{9}{32}$ inch. To keep things fair, we shaved the Yokohama's tread down to $\frac{4}{32}$ inch to match the others.

Unfortunately, there were a few omissions in the R-compound test due to circumstances beyond our control. The freshly redesigned Avon Tech R-A didn't land in the U.S. until after our test—we didn't even think it would make the SCCA's April 30 deadline for legality in national Solo competition, but somehow it did—while Nitto's new Nitto NT-01 also missed our deadline. Toyo also has a new race model in the works, and we plan on testing these three new tires as soon as they're available.

Street Touring Tires

Just a few short years ago, only newbies ran real street tires at autocross events. Most anyone who had been competing for even a little while had graduated to either the DOT-approved R-compound race tires or pure racing slicks, all depending on their class rules. In a sport where a win is easily decided by a fraction of second, running second-rate tires wasn't going to cut it.

The arrival of the Street Touring classes changed the tires many competitors now run. For the first time in recent memory, here was a class whose participants could drive to the event on the same tires they'd run on course, all while being competitive. While the SCCA Street Touring rules only require tires that carry a UTQG treadwear rating greater than 140, so far things have worked as intended, keeping the real street tires in and the dedicated race rubber out.

Of course, people are looking for an advantage here, too. Just because the tires offer less stick doesn't mean they don't still need to be capable of fast lap times.

Our street tire testing was done with a NISMO-prepared Nissan Sentra SE-R Spec V. The weather was sunny, and air temperatures hovered between 56 and 59 degrees Fahrenheit.

BFGoodrich g-Force T/A KD

Price Each: \$167 (unshaved)

The fact that the BFGoodrich g-Force T/A KD is an original equipment tire for NISMO and Roush says a lot about its quality. To wear this badge, the tire must meet standards for noise, wear and wet weather traction, all in addition to dry weather performance.

Despite the fact the g-Force T/A KD hasn't forgotten its street manners, the tire has been a stellar competitor in the Street Touring ranks, racking up quite a few National Tour and ProSolo trophies. We use the g-Force T/A KD on our two

BFGoodrich g-Force T/A KD



per schroeder photos

STS Honda Civic Si project cars, the 2002 model we ran several years ago and the EG-chassis car that we are campaigning this year.

In both cases, we use the tires for daily driving and long interstate trips; simply adjust the pressures for competition use, and we're ready to go. They're quiet and wear is very acceptable, especially considering our event schedule and the amount of miles we cover. They also don't overheat as quickly as some other tires out there.

On track, our two drivers credited the g-Force T/A KD with a nice, linear response as it approached its maximum adhesion. It gave good auditory and tactile feedback, but it lacked the overall grip that our front-runners boasted. The feel of the tire led us to theorize that its carcass could be matched to a stickier tread compound to produce some seriously quick lap times.

The g-Force T/A KD initially finished a close sixth out of the six tires tested. Since it was our official "control" tire for the tire test, we reran it at the end of the day. The g-Force T/A KD's second mean was fifth fastest, edging the Kumho ECSTA MX to the back of the pack for both drivers.

Yokohama Advan Neova

Price Each: \$209 (unshaved)

The Yokohama Advan Neova is the long-awaited maximum performance tire from this Japanese company. We've been waiting for something truly awesome from Yokohama since their groundbreaking AVS line and A008s were relegated to the historical dustbin years ago.

In the interim, Yokohama has made a series of very good street tires with compromises for both treadwear and wet weather work, but the "Screw it, we are going racing" section of their catalog has been a little short on options here in the U.S.

The Neova was the second tire that we tested.

Yokohama Advan Neova



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Shaving a tire to $\frac{4}{32}$ inch leaves you with a slightly lighter tire devoid of traction-robbing mold release compound. The end result is a tire that is less prone to overheating due to tread squirm; the process also leaves behind a rubbery mess.

It had the third-fastest mean times for both drivers and was the third-quickest in the “fastest clean run” row of our data sheet.

Our drivers felt that the Neova had one of the higher levels of grip around the skidpad section of the course and on the larger radius corners. It was, however, a little slower to respond in transitions than the Falkens, requiring earlier steering input in order to miss the cones. “The Neova ‘carves’ well but falls behind the best in the fast transitions,” noted Chris Harvey, one of our testers.

Our drivers concurred that the Yokohama has enough grip to run with the Falkens, but it’s not as easy to get 100 percent of its capability. This might be because it does not communicate the limit as well as the Falken, as it ran nearly silent as maximum adhesion was approached.

Like the BFGoodrich g-Force T/A KD, the Neova has what it takes to be an O.E. tire, as it comes on the super-fun Lotus Elise. Echoing this, the Neova had very little wear throughout our test runs and exhibited a stable performance curve as it got hot. It never overheated on the skidpad, which was a rarity in this group of contenders.

One downside of this tire is that it’s priced at \$209 per tire in our tested size. This might put it out of reach for many budget-minded autocrossers.

Hankook Ventus R-S2 Z212

Price Each: \$130 (unshaved)

The Hankook Ventus R-S2 Z212 is the company’s first real stab at the Street Touring market. The earlier Ventus Sport K104 was a decent tire, but it failed to set the world on fire. Hankook didn’t waste much time in producing something new.

Hankook’s engineers and product planners have been listening, and returned with a rock-solid performance tire that blends on-track performance and street usability into an inexpensive package. They freely admit that they compete heavily against fellow Korean tire giant Kumho, and it’s pretty obvious that the Hankook engineers had their sights set on the Kumho ECSTA MX when designing the Ventus R-S2 Z212.

The Ventus R-S2 Z212 was the third tire that we tested and it finished up in a solid mid-pack fourth place, a few tenths behind the Yokohama Advan Neova and slightly ahead of the Kumho ECSTA MX.

The Hankook was designed primarily as a high-performance street tire, not a track tire, and as such the tread design and performance characteristics play that out. The tire has a good initial steering response, but it’s not linear. We felt that the tire was quick to turn in with the first few degrees of steering input, but things quickly became mushy as large steering inputs were needed to get through the tighter transitions. “Even with the non-linearity of steering inputs, the transition grip was very good, making it easy to place the car in slaloms,” said Chris Harvey.

We were surprised to find that the Hankook had the worst grip during acceleration and braking. Like its lateral (or side-to-side) grip, the longitudinal traction was hampered by the large amounts of void area and consequently precious little tread touching the track surface. This led to quite a bit of chatter from the ABS system during braking and even some wheelspin from this LSD-equipped Nissan Sentra SE-R Spec V. Even at the shaved depth of $\frac{4}{32}$ inch, the Hankook still looked like a rain-capable street tire when compared to the other fast players.

The Hankook didn’t give the best feedback

during steady-state cornering, and the tire quickly lost grip as it was pushed over the edge of adhesion. This made cornering on the skidpad a little dicey—and the times suffered.

Accelerating out of the skid pad was where the longitudinal grip, or lack thereof, really hurt the tire, as this pushed the car wide. As a result, speed down the following straight suffered. This was only made worse when the Hankook overheated near the end of each run, requiring considerable cooling between stints.

Both drivers came to the final conclusion that the Hankook Ventus R-S2 Z212 was a great carcass in search of a different tread design, one with less void area for more dry grip. The Hankook exhibited some wear during the testing, and it’s pretty clear that their engineers were certainly going with a softer compound. Our recommendation? Please give us more of that tread compound by reducing the void area. Hankook will be offering contingency money for top finishers at SCCA National Tours, ProSolos and the national championships.

Falken Azenis RT-215

Price Each: \$106 (close-out pricing)

The Falken Azenis is considered by some to be the de facto Street Touring tire and has truly helped define this fledgling Solo category. With numerous national championships under its belt, the RT-215 is considered by some to be the ultimate dual-purpose tire.

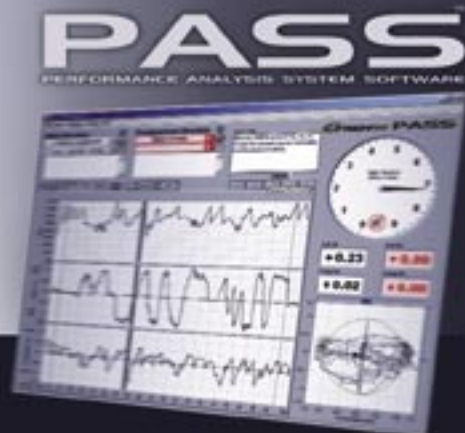
The only caveat is that the Azenis is extremely heat-sensitive; as a result, its popularity has spawned the use of water sprayers and other cooling techniques at grids around the country. It’s been said that the RT-215’s best grip is when it’s nearly brand-new and stone-cold.

After three years at the top, the Falken Azenis RT-215 is finally being replaced by the new Azenis RT-615. The discontinued RT-215 has become very hard to find, but we still included the model in our test because it serves as a reference point for the many autocrossers who have run the tire in the past.

We weren’t too surprised when the “old” Azenis was near the top of the charts in our test. The RT-215 had the second-fastest mean and clean fast times for both drivers, barely



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RR model is \$299.⁹⁵ It includes ROAD RACING/AUTOCROSS features along with PASS PC software and downloading cable.
SS model is \$199.⁹⁵ SS units can be upgraded to RR over the internet.

Falken Azenis RT-215



per schroeder photos

lock, the Azenis just kept on gripping.

The Falken also gave auditory feedback in the form of a higher-pitched squeal as the limit was approached. When the pitch dropped, the driver really knew that he had overcooked that portion of the course. This was reminiscent of one of our all-time favorite tires, the BFGoodrich Comp T/A R1 from the mid-'90s.

The downside of this tire was that it had the largest pressure and temperature gains during each run, on the order of 6 to 8 psi as the tire warmed up. This was coupled with a corresponding loss of grip as the tread surface became greasy. Cooling the tire provided immediate and positive results. Bring your water sprayer.

Kumho ECSTA MX



edging out the more expensive Yokohama by a few hundredths of a second. This old dog still has bite, we might say.

The Falken RT-215 has exceptional cornering grip and a linear response curve that inspired driver confidence. With smaller steering inputs at speed, the Falken reacted quickly and competently. At lower speeds, with fistfuls of steering

Kumho ECSTA MX

Price Each: \$135 (unshaved)

The Kumho ECSTA MX holds an interesting position in the current Street Touring tire lineup: It is seen as a fairly quick tire that works well with multiple-driver efforts due to its consistent and non-heat-sensitive tread compounding.

What's probably more interesting is that it is

made by one of the few tire manufacturers to offer contingency money for the Street Touring categories. This came in handy for guys like Kevin McCormick, who captured the 2004 SCCA STS national title in his 1989 Honda Civic Si on Kumhos.

Whether or not some fast drivers are using the tire because of the contingency money offered, the fact of the matter is that you've got to win to collect. The ECSTA MX certainly took care of any speculation

Test Data: Street Touring Tires

Driver: Chris	BFGoodrich g-Force T/A KD	Cones	Yokohama Advan Neova	Cones	Hankook R-S2 Z212	Cones	Falken Azenis RT-215	Cones	Kumho ECSTA MX	Cones	Falken Azenis RT-615	Cones	BFGoodrich g-Force T/A KD (rerun)
Test order	1		2		3		4		5		6		7
Run 1	43.821	2	43.228	2	43.651		43.107	1	43.655		42.565		43.002
Run 2	43.791		43.060		43.285		43.158		43.432	1	42.825	1	43.421
Run 3	43.698	2	43.256	1	43.391		42.935	3	43.697		42.534	3	43.537
Run 4	43.408		43.206		43.625	1	43.297	2	43.543		42.945	2	43.359
Run 5	43.064	2	42.568	2	43.172	2	43.000		43.691	1	42.923		43.351
Mean of middle 3, raw	43.632		43.165		43.434		43.088		43.630		42.771		43.377
Fastest clean	43.408		43.060		43.285		43.000		43.543		42.565		43.351

Driver: Per	BFGoodrich g-Force T/A KD	Cones	Yokohama Advan Neova	Cones	Hankook R-S2 Z212	Cones	Falken Azenis RT-215	Cones	Kumho ECSTA MX	Cones	Falken Azenis RT-615	Cones	BFGoodrich g-Force T/A KD (rerun)
Run 1	44.377		43.188	1	43.641		43.659		43.921		43.384		44.144
Run 2	44.167	1	43.446		43.552		43.546	1	44.028		43.221		43.902
Run 3	44.000		43.962		43.571		43.109		43.723		43.170		43.942
Run 4	43.995	1	43.382		43.455	1	43.36		43.837		43.198		43.468
Run 5	44.067	1	43.399		43.825		43.353		43.925	1	43.053		43.718
Mean of middle 3, raw	44.078		43.409		43.588		43.420		43.894		43.196		43.854
Fastest clean	44.000		43.382		43.552		43.109		43.723		43.053		43.468

2-driver mean, raw	43.855		43.287		43.511		43.254		43.762		42.984		43.612
Rank	6		3		4		2		5		1		

Diameter	24.25		24.25		24.25		24.25		24.125		24.25		
Treadwidth	8.625		8.3		8.25		8.5		8.5		8.5		
Build date (wk/year)	21/04		12/05		11/05		39/04		34/04		02/05		
Weight (pounds)	24		24.5		23		25		21.5		24.5		
Weight (shaved)	22		22.5		21		23		19.5		22.5		
Treadwear	200		180		200		200		220		200		
Initial tread	4/32		4/32		4/32		4/32		4/32		4/32		4/32
Final tread depth	4/32		3.5/32		3/32		4/32		4/32		4/32		3.5/32

regarding its performance with McCormick's recent win.

The trick with the ECSTA MX is that you've simply got to shave the tire down to $4/32$ or below for maximum grip. Its performance appears to be inversely proportional to the amount of tread that remains. The lower it is, the faster the tire becomes until you're left with just cords hanging out.

The Kumho finished fifth in our test, with consistent grip throughout the test and little in the way of heat sensitivity. In fact, the hotter the tire got, the better it performed.

Like the Hankook, the Kumho has a higher void area; we believe this led to its lower lap times and slower transitional response as the tread squirmed under pressure. The Kumho was nearly untouched by its 10 runs on track and the compound appeared to be quite long-wearing.

Falken Azenis RT-615

Price Each: \$154 (unshaved)

The Falken Azenis RT-615 is the long-awaited replacement for the Azenis RT-215. The marketing buzz indicated that Falken engineers were working on a tire that was as grippy as its older brother, while offering better wet weather traction and less heat sensitivity. We were eager to try a set as soon as they were announced.

On track, the RT-615 did not disappoint: It earned the quickest times for both drivers, both in mean and fastest clean runs. On our test course, the three-tenths spread between the first- and second-place tires was made up in the last little bit of the skidpad sweeper exiting onto the straight. The RT-615's grip allowed the drivers to

Falken Azenis RT-615



per schroeder photo

pull the throttle much sooner than with any other tire, yielding faster times through the next section.

The tire exhibited excellent grip and that same linear response, inspiring driver con-

fidence like the Azenis RT-215. The Azenis RT-615 had the least amount of wheelspin (and throttle-induced push) and understeer in the tighter corners.

The new Falken had about half the pressure and temperature gain exhibited by the older version. This did yield about one more run before the tire needed to be cooled in order to maintain performance. We had hoped that the new compounds and design would eliminate the need for cooling completely, but that is not the case. We started cooling the tire after the second run, not the first run like we are used to doing on the RT-215.

Unfortunately, Falken has raised the prices for its new Azenis. One can theorize that like a good crack dealer, the company gave us a taste of the good stuff and knew that we'd

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R-Compound Tires

For most of recorded history, people raced on "race" tires. Simple.

About 20 years ago, in an effort to tie competition tires to the models sold to the general public, several series started to require true DOT-approved tires. Over time, as with most things, these DOT-approved tires got faster and faster—and started to look more like true racing tires. The treads became shallower, the rubber stickier and the carcasses stiffer.

Today's "R-compound" race tires probably share more DNA with true race models, although the reward has been a more stable product that can deliver faster laps. These tires have become a staple in autocross, as they're now pretty much standard issue for anything not required to run true street tires or allowed to use racing slicks.

While today's max-performance tires keep getting faster, an R-compound model will still set lower lap times. The last time we did a head-to-head comparison, the difference was about 2 seconds on a minute-long course.

Our R-compound tire testing was done with a car that's no stranger to autocross: the Miata. The skies were a little overcast this day, so our air temperatures were between 53 and 55 degrees Fahrenheit.

Yokohama Advan A032R Soft Compound

Price Each: \$135 (unshaved)

The Advan A032R S (Soft Compound) is Yokohama's softer version of their track day favorite, the A032R. The softer compound is said to warm up more quickly and give higher grip levels at the expense of tire wear and possible overheating.

We found that the Yokohama liked as much heat as we could put into it with our test Miata. We never cooled this tire, and it got faster as it got warmer. So much for what the marketing literature says.

Yokohama Advan A032R Soft Compound



per schroeder photos

Unfortunately, the narrow section width and greater void area of the A032R hurt the steady-state grip in comparison to the other tires in this test. Chris called the turn-in response "sharp and linear," while both drivers felt that the tire was the most fun to drive. According to Per it was "tossable and predictable" at the limit.

The Yokohama also showed the least amount of wear, despite being used as our control tire and getting twice the number of runs on it. Once again, so much for being billed as a fast-wearing tire.

The narrow tire and harder compound design predictably yielded the slowest course times. The Yokohama was simply outgunned in this test, but it's not without its charms. We'd recommend this tire to any novice autocrosser as a great first R-compound tire. It doesn't hurt that this was the least expensive tire we tested.

Kumho ECSTA V710

Price Each: \$143

The Kumho ECSTA V710 is the company's third R-compound tire to be marketed in the U.S. Unlike other manufacturers, Kumho has kept its older tires for sale long after the newer tire hits the market. You can still buy their

stout and dependable Victoracer and competent ECSTA V700 right alongside their latest ECSTA 710.

Kumho's philosophy also departs from that of other tire builders in that they strive to build a tire that works well for both road racing and autocross with no compound changes. This makes them a good choice for the dual-use car that sees both autocross time and track days.

The V710 clearly had the best steady-state grip of our test group. This was most noticeable around the skidpad, where the V710 allowed the Miata to power out with little excess oversteer or understeer. The initial turn-in was good, but Chris found that the transitional response was not as sharp as others in the test.

The drivers both found that the 710 tire will work at, and recover from, large slip angles. "The top of the traction curve is very rounded and forgiving," Chris explained. "This trait also makes it a little more difficult to 'place' the car at the apex or slalom cone."

The Kumho was a challenging tire to drive at 100 percent through the transitions, as using too much slip angle would bind up the car, while the larger useable slip angle tempted the pilots to overdrive.

Kumho ECSTA V710



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Of the four R-compound tires, the ECSTA 710 had the most air pressure gain after each run and was the quickest to see increases in surface temperature. This allowed the ECSTA 710 to work well on the first run, but overheating could occur.

The car's balance changed the most with this tire once the tread became hot to the touch, even though pressures were bled off. Excess understeer was noticeable by the end of the run, but cooling the tire tread with water gave positive results and brought the handling balance back to neutral.

Tire wear appeared significantly better with the Kumho than with the Hankook and Hoosier. The Kumho also did not pick up as much used rubber from the track as those two.

The Kumho ECSTA V710 was the quickest tire at this test, with the lowest two-driver mean and the fastest clean run for Per. It was pretty darn impressive.

Hankook Ventus Z214 (C70 compound)

Price Each: \$149

The Hankook Ventus Z214 is the Korean manufacturer's second R-compound tire to come to the U.S. Its predecessor, the Ventus RSS Z211, has been here only a couple of short years, but already it grabbed the 2004 SCCA Showroom Stock C national title thanks to the efforts of Joel Lipperini and his Honda Civic Si. This year, the Ventus Z214 is poised to make an even bigger mark on the racing community.

With just two circumferential grooves and an improved carcass design, the Z214 was built to go head-to-head with the Kumho and Hoosier offerings.

Hankook Ventus Z214 (C70 compound)



per schroeder photos

Unlike some other race tires, the Ventus Z214 is available in three different compounds: The C30 compound is the hardest and is the spec tire for the SCCA Pro Racing Mazdaspeed Miata Cup Presented by Hankook; the middle, C50 compound is their standard road racing compound; and the softest, C70 compound is clearly meant for the autocross market or road racing qualifying on a damp track.

The Ventus Z214 had the best lateral grip in transition, as the tire provides a "wall of grip" that gives the driver a high amount of confidence in car placement during high-speed transitions. The Hankook also appeared to work well even at higher tread temperatures. The car's balance did not change throughout the runs.

Both of our drivers noticed that the Hankook was the easiest tire to lock up under braking and spin off the line. This lack of longitudinal grip also hurt the car's acceleration off the skidpad: The rear of the car would walk out as the gas

pedal was prodded at the limit. The C70 compound appears to be somewhat softer than the Kumho ECSTA V710, and we noticed a higher rate of tire wear when compared to the Kumho or Yokohama.

The Hankook gave us our third-quickest two-driver mean, though Per had his second-fastest clean run and one of Chris's few clean runs were on the Hankook.

Hoosier A3S05

Price Each: \$182

Right down the road from The Tire Rack's test track lies the world headquarters of Hoosier Racing Tire. Hoosier has long had their finger on the pulse of the amateur racing community, and it's not often that a year will go by without a new tire from their engineers.

This year is no different, with the release of their A3S05. With a very soft compound tread combined with a very stiff carcass, the A3S05 offers excellent lateral and longitudinal grip. This made the Hoosier extremely easy to drive consistently. Its times reflect that, as it placed

Hoosier A3S05



Test Procedure

While all of the tires sampled do carry a DOT number and are thus legal for street use, testing them on public roads at ten-tenths would probably be considered antisocial. And illegal.

So we took all of our gear to The Tire Rack's test facility in South Bend, Ind. This test track is adjacent to their gigantic warehouse and headquarters. Thanks to the nearby garage bays and mounting equipment, testing at The Tire Rack allowed us to mount, shave and swap tires quickly and efficiently.

The tests were performed in the middle of April. While the air temperatures struggled to reach 60 degrees Fahrenheit, the track and tire temperatures got hot enough to give all of the tires a real workout. We actually lucked out, as just one week after the test a large spring snowstorm roared through the Midwest, dumping several inches of snow on The Tire Rack's asphalt. A miss is as good as a mile, and we're looking forward to our next visit to The Tire Rack.

Our testing used about two-thirds of The Tire Rack's mini road course and skidpad, with the straights necked down with slaloms and offsets. The course started off with a tight, left 180 followed by a short straight and the timing lights. A right 90-degree led onto a six-cone slalom with 20-pace spacing, a short straight and a Chicago box with 15-pace spacing.

Out of the box, we had a smallish straight into a lane-change maneuver. This exited onto another short straight and then into a decreasing-radius, right-hand turn that put our drivers onto the left-hand long sweeper. (Think of it as three-quarters of a 200-foot-radius skidpad.) The skidpad emptied onto a longish straight—pop,

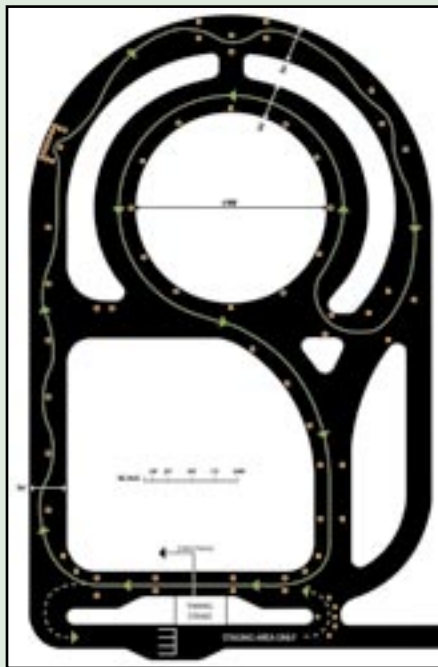
pop, pop goes the rev-limiter!—and into a tight, 90-degree right through the finish lights.

Each tire was tested by both of our test drivers, with Per Schroeder scrubbing in the tires with the first five runs. Chris Harvey then made his five runs. After all of the tires were tested, the first tire of each type was re-tested to see if the weather, surface or driver experience had any effect on the times.

Tire pressure and temperatures were maintained between each run during a five-minute cool down. If the tire was deemed by the driver to need less heat, it was sprayed down with cold water to keep the tire from getting "greasy" from overheating. In between Per and Chris's runs, the tires were cooled completely with a short drive and a thorough soaking from a hose.

The test ranking was determined by averaging the two driver's times. We dropped each driver's fastest and slowest laps, averaged the middle three times for both drivers and then averaged those two driver means for the tire's final score. Cones were not counted in this scoring system, although we did keep track of each driver and tire combination's fastest clean run.

It must be noted that the pylons used for this test are much smaller and more easily moved and knocked over than a standard-issue SCCA marker. While Chris hit more cones, as this is his home track he explained that he was after more consistent laps. For him, the cone count was an indicator of how easily he could drive the tire: More cones meant less control.



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2003	Road America - fastest lap, 2 nd
2003	Roebing Road - F pole, fastest lap, 1 st
2004	Sebring - F pole, Fastest lap
2004	Daytona Rennsport - pole, fastest lap, 1 st
2004	Mid Ohio - 2 nd
2004	Barber MS Park - F pole, fastest lap, 1 st
2004	VIR - F pole, fastest lap, 2 nd

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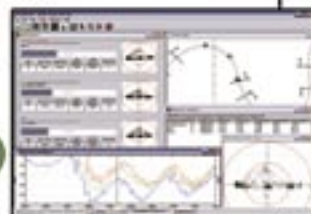
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second in our two-driver means and its spread between times was very small.

The soft-compound Hoosier had the quickest turn-in response and flat-out hauled the car through the slaloms faster than any other tire. The braking grip and acceleration grip meant much less drama on corner entry and exit. Apex cones were easy to nudge as this tire turned in with authority.

That soft compound meant that the Hoosier, like the Hankook, had a high rate of wear, losing about $1/32$ of tread depth in its 10 runs. Oddly enough, the tire did become quite frustrating when pushed for that ultimate fastest run. Since the Hoosier has so much grip, pushing it too hard causes the car to lose momentum as the carcass binds up on corner exit.

This binding meant that we would complete a run at 98 percent of maximum performance, leaving a little on the table. When we'd come back for our next run, pushing the car all the way to 100 percent didn't yield any faster times.

What Should You Buy?

As expected, at the end of our tire test we had a bunch of spent tires, a pile of data and several strong impressions. With a tire's handling so important to on-track performance, selecting the proper compound becomes critical.

In the maximum-performance street tire category, it's hard to argue against the lap times—and both the new and old Falken Azenis ran strongest in this test. The take-home message is that if you have some useable RT-215s

left over, by all means keep on running them until they're done. The new RT-615 has some additional speed but still does need a cooling spray to extract the best performance.

We'd also like to spend some time with the offerings from Hankook and Yokohama, as we feel that with some tweaks of alignment and driving style, these new tires could also be formidable competitors. The Kumho ECSTA MX and the BFGoodrich g-Force T/A KD are probably both past their prime for national-level Street Touring competition, but we're eagerly awaiting new maximum-performance tires from both companies. That said, a great driver who's familiar with either tire can make them work at a national level.

So, what's the hot tire out there in the real world of top-level STS competition? Hard to say. Kevin McCormick recently racked

Cars and Drivers

Tire testing requires a driver who is both fast and consistent. The goal for the drivers in our test was to perform a series of five runs with very little spread between the times. The points for braking, turn-in and acceleration should only be adjusted if the tire can support the additional inputs without deviating from the fast line.

We had two drivers at this test: Our tech editor, Per Schroeder, and Chris Harvey, a very quick driver who serves The Tire Rack on a regular basis for their own tire testing at this site. Chris has been autocrossing since 1992 and has several national trophies to his credit, including the silver in C Stock at last year's The Tire Rack Solo National Championships. Per has been autocrossing since 1989 and has his share of national hardware as well, with four top-10 finishes at Topeka.

We used two cars for this tire test, one for the street tires and a second for the race rubber. Our street tire test vehicle was a 2004 Nissan Sentra SE-R Spec V fitted with NISMO's S-tune performance parts. The recipe produced a nice car that would fit into the SCCA's Street Touring Xtra class. The SE-R Spec V is one of our favorite new compact performers, and adding a few well-chosen components makes things even better. Tire testing is never easy on equipment, and the Nissan handled everything we could throw at it without a hiccup.

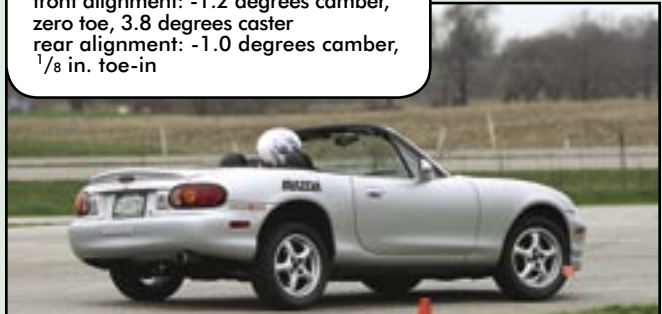
To minimize any variables, all of the street tires were mounted on identical NISMO aluminum wheels manufactured by Rays Engineering, makers of the well-known Volk Racing brand. These very attractive 17x7.5-inch wheels weigh just 17.5 pounds apiece.

The R-compound tires were tested using Chris Harvey's 1999 Mazda Miata. This fully prepped Miata is built for the SCCA's C Stock autocross class, where this year, this make and model has pretty much become the hot car to campaign. All of the R-compound tires were mounted on identical sets of stock 15x6-inch 1999 Miata alloy wheels, each one tipping the scales at a respectable 13.1 pounds.

1999 Mazda Miata Sport

power steering
Koni 80-series, single-adjustable Sport dampers; degassed and revalved by Predator Motorsports
Racing Beat $1\frac{1}{8}$ in. front anti-roll bar with Racing Beat end-links
Borla muffler
Magnecor ignition wires
Mobil 1 fluids
SSR Competition wheels 15x6 in.
Hawk HPS street/sport brake pads
race weight: 2185 lbs.
front alignment: -1.2 degrees camber, zero toe, 3.8 degrees caster
rear alignment: -1.0 degrees camber, $\frac{1}{8}$ in. toe-in

Chris Harvey's trophy-winning C Stock 1999 Mazda Miata served as our R-compound test car.



2004 Nissan Sentra SE-R Spec V

NISMO S-tune shock absorber and spring kit
NISMO front anti-roll bar
NISMO rear anti-roll bar
NISMO brake pads
NISMO S-tune cat-back exhaust system
NISMO forged alloy wheels 17x7.5 in.
front alignment: -1.0 degree of camber, $\frac{1}{8}$ in. toe-in
Rear alignment: -1.0 degree of camber, $\frac{1}{4}$ in. toe-in



The Sentra SE-R Spec V is torquy and benefits from a limited-slip differential, helping to put the power down on acceleration no matter the tire. If run at SCCA events, the Nissan would fit in their Street Touring Xtra class.



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The performance tire market has come a long way in the past five years, and there were no duds in our gathered bunch. They work better on wheels than on people, though.



per schroeder photo

up a National Tour win on his Kumho-shod Civic, beating Hankook driver Andy Hollis and his Civic. Adding more data, both Andy Hollis (STS) and Tom Hoppe (STX) garnered wins at the Atlanta National Tour on the Hankook Ventus R-S2 Z212. There may be no simple answer to the question of which tire is best here.

The choice in R-compounds is even harder because there are no real dogs in this bunch. We would reiterate that the Yokohama A032R Soft Compound is probably the best tire we've ever seen for newcomers to the sport of autocross. Even occasional competitors who have a few years under their belt will appreciate the tire's linear response and fun-to-drive factor. You can also buy the Yokohama at full tread to get countless more runs out of it before it's ready for the junk pile. Thanks to its tread pattern and depth, the Yokohama should also make a good rain tire.

The Yokohama was the only tire that we'd actually recommend if someone wanted an R-compound tire that could be driven on the street. The others simply don't have the tread depth or design for

SOURCES

BFGoodrich
www.bfgoodrichtires.com

Falken Tire
www.falkentire.com

Hankook Tires
www.hankooktireusa.com

Hoosier Racing Tire
www.hoosieracingtire.com

Kumho Tires
www.kumhousa.com

Nissan
www.nissan-usa.com

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any safe street driving, never mind that they carry a DOT-approved stamp.

The hardcore elite will probably gravitate to the Hankook, Kumho or Hoosier, but we're at a loss to pick one over the other. They're all extremely fast and consistent with few vices.

If we had a car with ABS-equipped brakes, the Hankook would be our choice, although the Hoosier seemed the least likely to lock under hard braking on our Miata. Larger cars would benefit from the Kumho's heat resistance that kept the tire gripping even at the end of a grinding skidpad run. The lack of tire wear on the Kumho would also be beneficial for a competitor who needs to make their tires last longer than just a few autocrosses.

There are a lot of choices out there for the grassroots competitor, but it may take individuals a little testing to see which brand and compound works best for their applications.



Test Data: Race Tires

Driver: Chris	Yokohama A032R S	Cones	Kuhmo ECSTA V710	Cones	Hankook Z214 C70	Cones	Hoosier A3S05	Cones	Yokohama A032R S Rerun
Test order	1		2		3		4		5
Run 1	42.057	4	40.321	2	40.929		41.104	1	41.467
Run 2	41.351	2	40.570	1	40.696		40.713	1	41.504
Run 3	41.411	2	40.933	4	40.829	2	40.782	3	41.205
Run 4	41.841	1	40.644	2	40.812	2	40.756	1	41.327
Run 5	41.613	1	40.474	1	40.444		40.981	1	40.931
Mean of middle 3, raw	41.621		40.560		40.779		40.834		41.333
Fastest clean	n/a		n/a		40.444		n/a		41.205

Driver: Per	Yokohama A032R S	Cones	Kuhmo ECSTA V710	Cones	Hankook Z214 C70	Cones	Hoosier A3S05	Cones	Yokohama A032R S Rerun
Run 1	45.753	2	41.578		42.040		41.427		42.404
Run 2	43.206		41.616		41.566		41.434		41.975
Run 3	42.749	1	41.137	2	41.742		41.493		42.45
Run 4	43.268		41.718		41.314		41.384		42.095
Run 5	43.232		41.174		41.653	1	41.768		42.211
Mean of middle 3, raw	43.235		41.456		41.654		41.451		42.237
Fastest clean	43.232		41.174		41.314		41.384		41.975

2-driver mean, raw	42.428		41.008		41.217		41.142		41.785
Rank	4		1		3		2		

Diameter	22.6		22.5		22.6		22.35		
Treadwidth	7.85		8		7.8		8.25		
Build date (wk/year)	14/03		41/04		10/05		13/05		
Weight (pounds)	20.5		20		18.5		18.5		
Weight (shaved)	20		n/a		n/a		n/a		
Initial tread	4/32		4/32		4/32		3/32		4/32
Final tread depth	4/32		3/32		2/32		2.5/32		3.5/32

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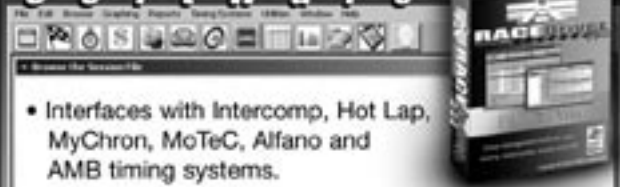
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