

TMM

VEHICLES | ELECTRONICS | SCIENCE | TECHNOLOGY

DID WE GO BACK TO THE FUTURE?**COMPARISON 600-950 €
SOUNDBAR SPEAKERS**
DENON • LG • PANASONIC
PHILIPS • SAMSUNG
SONOS • SONY • YAMAHA**TEST DRIVE THE SHAPELY
MAZDA CX-3****ROCK MOTORSPORT -
FORMULA 1 AS A HOBBY**

WINTER TYRES

2016

COMPARISON TEST

12 studded tyres

+ 8 non-studded tyres



STUDED TYRES

- **Bridgestone** Blizzak Spike-01
- **Continental** IceContact 2
- **Dunlop** Ice Touch
- **Gislaved** Nord Frost 100
- **Goodyear** Ultragrip Ice Arctic
- **Hankook** Winter I*Pike RS
- **Linglong** Green Max Winter Grip
- **Michelin** X-Ice North 3
- **Nokian** Hakkapeliitta 8
- **Nordman** 5
- **Pirelli** Ice Zero
- **Sava** Eskimo Stud

NON-STUDED TYRES

- **Bridgestone** Blizzak WS80
- **Continental** ContiVikingContact 6
- **Goodyear** Ultra Grip Ice2
- **Michelin** X-Ice XI3
- **Nankang** Ice Activa Ice-1
- **Nokian** Hakkapeliitta R2
- **Nordman** RS
- **Pirelli** Ice Zero R

TYRE SIZE:
205/55 R16

TEST VEHICLE:
FORD FOCUS

The great debate between the proponents of studded and non-studded winter tyres has been going on for decades. It is likely that a final truth will never be found. Or, at the very least, preferences depend on how you look at the matter. The decisions are made harder still by the tyre manufacturers' continuous development which makes both studded and non-studded tyres increasingly safer.

The current legislation does not limit the number of studs on a tyre. To be more exact, there is no limit if the tyre manufacturer has its new product tested by an independent inspection organisation and it can be established that the tyre's road wear effect does not exceed a specific threshold. If the test is successful, the manufacturer can freely choose the stud type to be used and even their number.

Another option is to skip the road wear test for the new product and to adhere to the maximum number of studs,



STUDED OR NON-S



STUDDDED?

JUKKA ANTILA
LASSE ALLARD, PHOTOGRAPHY
TEST WORLD, TESTS AND MEASUREMENTS

A LARGE NUMBER OF STUDS IS NO GUARANTEE FOR OVERALL TEST SUCCESS



i.e. 50 studs per one metre of rolling circumference; in our tested size of 205/55 R16, this means fewer than one hundred studs. Only three out of the twelve manufacturers in our test had chosen this option.

Increasing the number of studs improves grip on ice. This is a logical conclusion that the test results can confirm nearly without exception. However, having a great many studs is not a guarantee for overall test success, even if it does provide some additional grip on ice.

More studs usually means higher rolling noise, which is an especially annoying fea-

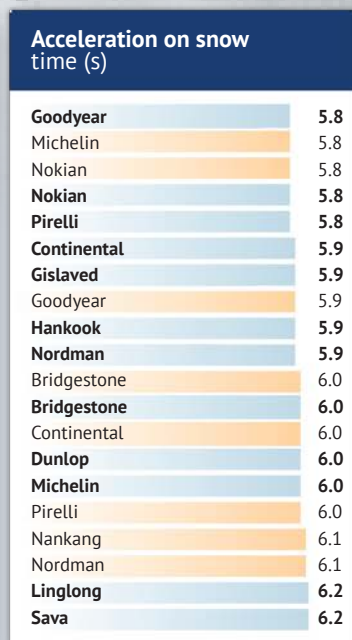
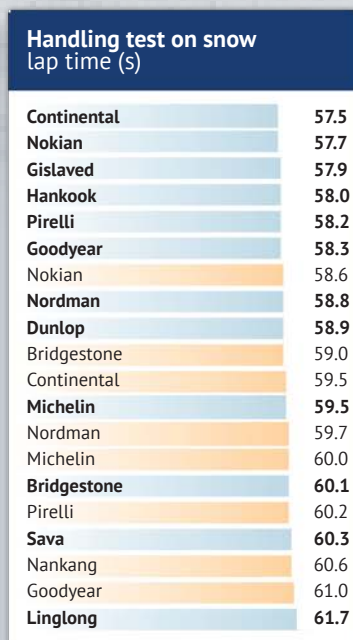
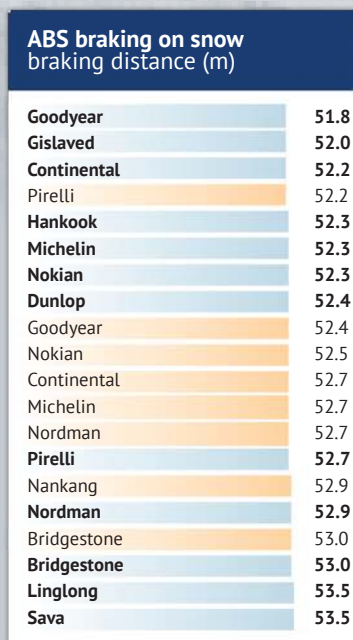
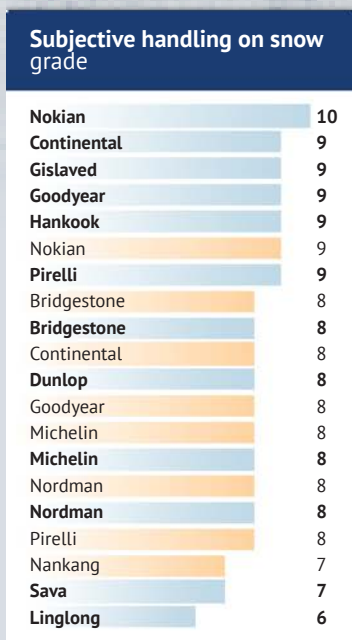
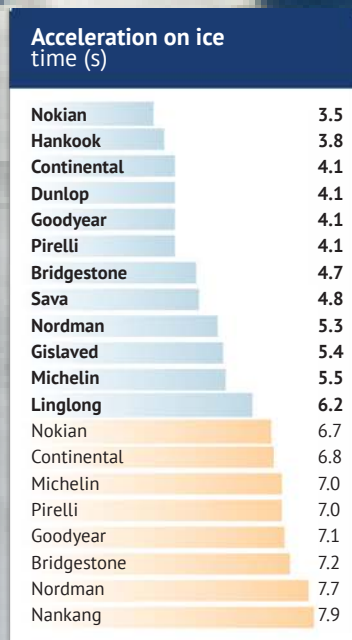
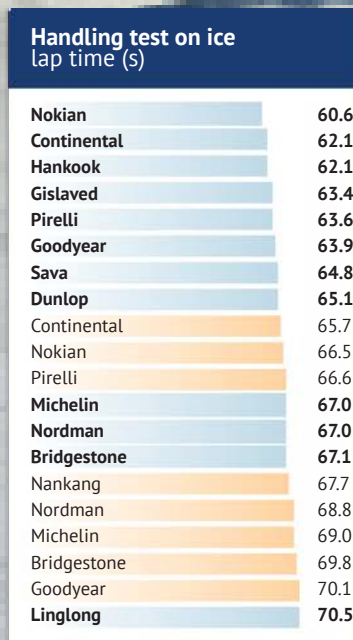
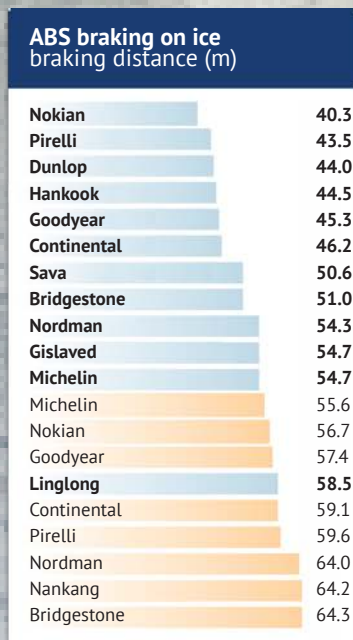
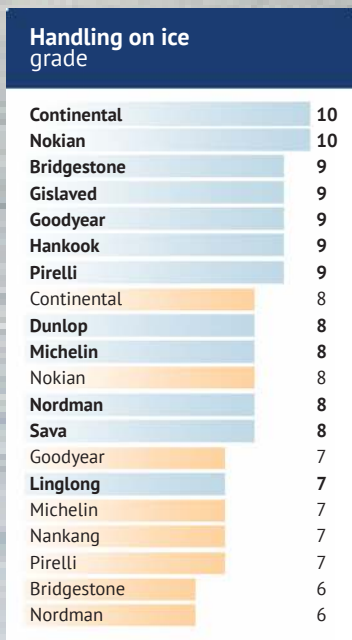
↑ Studs are only useful on icy roads. On snow, non-studded winter tyres are at least as good.

ture in a tyre. When driving on asphalt, the studs can also hurt the car's handling, stability and even braking grip if they support the tyre too much.

The ice grip achieved by studs is based on the stud tip penetrating the surface of the ice. This in turn requires a certain amount of force in order to allow the stud to grip. A higher number of studs means smaller pressure on an individual stud. If the ice is hard in very cold weather, fewer studs may provide better grip than more studs.

Studded tyres in line

Nokian Tyres shook the studded tyre market a couple of years ago by announcing a tyre that had a total of 190 studs; 50–100% more than the market was used to. Since then, Nokian has been nabbing one test win after another due to its good grip on ice; however, their headway is slowly disappearing.



HOW WE TESTED

BRAKING TEST: The braking test was run on ice, snow and wet asphalt. The braking tests were performed at different temperatures, and the result for each tyre is the average from all the tests. The tests were run using the car's ABS system, and the results are presented for braking on ice (50–0 km/h) and on snow and asphalt (80–0 km/h). The braking tests on snow and ice were run normally on outdoor tracks and on natural snow in an indoor hall that provided carefully controlled conditions and the possibility to adjust temperatures, for example.

ACCELERATION TEST: An acceleration test was used to measure the traction of the tyres on ice and snow. The test measured acceleration on ice (5–20 km/h) and

snow (5–35 km/h). Similarly to all the other tests, the acceleration test was also run at different temperatures, and the result is the average from several different tests. Like the braking tests, the acceleration tests were also run normally on outdoor tracks and inside an indoor hall.

HANDLING TEST: The grip of the tyres in different driving scenarios was measured by driving along a handling track and measuring lap times. The result is the average from different drivers. Handling times were measured on ice, snow and wet asphalt. Measuring lap times on dry asphalt is not sensible, and it is not the normal procedure in tyre testing.

SUBJECTIVE HANDLING: The handling of the tyres on ice, snow, and wet and dry asphalt was evaluated

subjectively in addition to the measurements. The final grades are the rounded averages from all drivers. The tyre's safe and predictable handling is the most important evaluation criterion for the subjective handling tests.

DIRECTIONAL STABILITY: The directional stability of the tyres was tested by driving at different speeds along a grooved main road. The test evaluated the way that the grooves could be felt in the car's body, and the need to correct direction by steering. The result is the average of the grades from different test drivers.

NOISE: Tyre noise inside the car was rated subjectively. During the test, the vehicle was allowed to decelerate freely from 100 km/h to 40 km/h, while listening to the noise. The test was performed without instruments, only

Subjective handling on dry asphalt grade

Linglong	9
Dunlop	8
Goodyear	8
Michelin	8
Michelin	8
Pirelli	8
Sava	8
Bridgestone	7
Continental	7
Gislaved	7
Goodyear	7
Nokian	7
Nokian	7
Nordman	7
Nordman	7
Pirelli	7
Bridgestone	6
Continental	6
Hankook	6
Nankang	6

Braking on dry asphalt braking distance (m)

Linglong	31.8
Sava	31.9
Michelin	32.0
Dunlop	32.1
Continental	32.7
Goodyear	32.8
Gislaved	33.6
Bridgestone	33.9
Bridgestone	34.0
Pirelli	34.1
Nordman	34.5
Continental	34.7
Hankook	34.7
Nokian	34.7
Pirelli	34.9
Michelin	35.6
Goodyear	36.1
Nordman	37.6
Nankang	38.1
Nokian	39.6

Subjective handling on wet asphalt grade

Dunlop	8
Goodyear	8
Linglong	8
Pirelli	8
Continental	7
Gislaved	7
Goodyear	7
Michelin	7
Michelin	7
Nokian	7
Nordman	7
Pirelli	7
Sava	7
Bridgestone	6
Bridgestone	6
Continental	6
Hankook	6
Nankang	6
Nokian	6
Nordman	6

ABS braking on wet asphalt braking distance (m)

Gislaved	36.3
Goodyear	37.3
Linglong	37.4
Pirelli	37.8
Sava	38.4
Dunlop	38.5
Continental	39.2
Hankook	39.3
Bridgestone	39.4
Linglong	39.4
Goodyear	40.4
Pirelli	40.4
Nordman	40.5
Michelin	41.9
Nordman	41.9
Continental	42.4
Nokian	42.4
Nokian	43.6
Bridgestone	43.9
Nankang	43.9

Handling test on wet asphalt lap time (s)

Linglong	30.9
Dunlop	31.1
Pirelli	31.3
Goodyear	31.6
Goodyear	31.6
Continental	31.7
Gislaved	31.7
Michelin	31.7
Michelin	31.7
Pirelli	31.8
Continental	32.0
Sava	32.0
Bridgestone	32.1
Nokian	32.4
Hankook	32.5
Nordman	32.5
Nordman	32.8
Nankang	32.9
Nokian	33.0
Bridgestone	33.6

Directional stability grade

Gislaved	9
Goodyear	9
Linglong	9
Pirelli	9
Bridgestone	8
Continental	8
Dunlop	8
Goodyear	8
Hankook	8
Bridgestone	7
Continental	7
Michelin	7
Michelin	7
Nokian	7
Nokian	7
Nordman	7
Nordman	7
Pirelli	7
Sava	7
Nankang	6

Noise grade

Bridgestone	10
Goodyear	10
Michelin	10
Nokian	10
Nordman	10
Pirelli	10
Continental	9
Nankang	9
Dunlop	7
Gislaved	7
Michelin	7
Bridgestone	6
Continental	6
Goodyear	6
Hankook	6
Linglong	6
Nokian	6
Sava	6
Nordman	5
Pirelli	5

Fuel economy Increase in fuel consumption (%)

Nokian	0.0
Nordman	0.5
Continental	0.7
Pirelli	1.0
Michelin	1.0
Goodyear	1.1
Hankook	1.3
Nokian	1.5
Nordman	1.6
Nankang	1.6
Dunlop	2.3
Bridgestone	2.4
Sava	2.5
Continental	2.7
Pirelli	2.7
Goodyear	2.8
Linglong	2.8
Gislaved	3.1
Michelin	3.3
Bridgestone	3.5

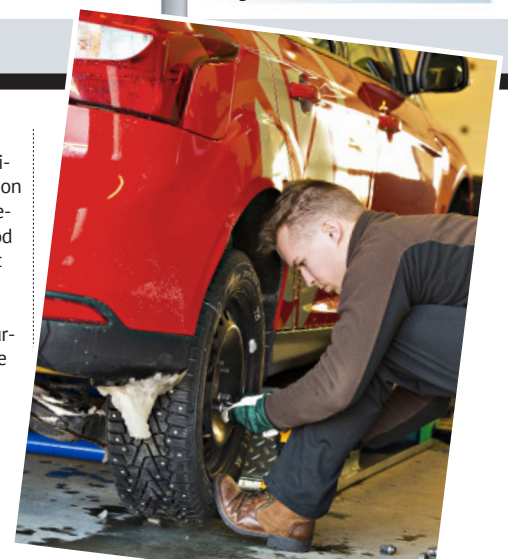
using the human ear. During rolling, we listened to the noise while sitting in the front and rear seats of the test vehicle.

ROLLING RESISTANCE: The rolling resistance of the tyres was measured by performing a rolling test. It measured the car's rolling distance between 80 and 40 km/h. The test was carried out under wind-free conditions at different temperatures. The results have been mathematically converted to differences in fuel economy.

MEASUREMENTS AND RESULT CALCULATIONS: All the tests were run using Racelogic's VBox, which measures the car's movements using GPS and additional sensors, when necessary. The calculation of the final results is based on the reference method. In this method,

a reference tyre is used repeatedly; any changes in its results indicate a change in grip level and conditions. The calculation of the results also used a position adjustment method to manage the effect of grip differences at different points of the test track. The method allows for mathematically eliminating the systematic dispersion caused by track surface variations.

PURCHASING TEST TYRES: The test tyres were purchased at different tyre dealerships in order to ensure that the manufacturers cannot influence the properties of the tested product. All the models were not available in stores when the tests were run; in this case, a product provided by the manufacturer was used in the test. The results for these tyres were verified under indoor conditions in the summer by using a tyre purchased from a dealership.





IT IS GREAT TO SEE GOOD WINTER TYRES COMING FROM ASIA.

This year, the Continental also has 190 studs. It is not difficult to guess where the German manufacturer looked for inspiration when it came up with this number, but the end result is nevertheless excellent.

The Hankook has the third-highest number of studs, a total of 170. This South Korean manufacturer has spent years focusing on research and development, and it is great to see good winter tyres coming from Asia. As a representative from one of the manufacturers put it: 10 years ago, South Korean tyres were the laughing stock for many in the industry, but now the smiles have been wiped off the faces of even the larger Euro-



pean manufacturers.

A large group of manufacturers relies on approximately 130 studs. Goodyear, Bridgestone and Pirelli are well-known manufacturers, which makes them obvious choices for tyres to be tested. The secondary brands Sava and Dunlop, and Nokian's successful old product, now known as Nordman, were included as cheaper and technologically older alternatives to the flagship products.

Michelin, Gislaved and the Chinese Linglong relied on fewer than 100 studs, which means that they had not been required to complete the road wear test. The first two are true premium tyres, but it seems that



the other characteristics cannot compensate for the ice grip handicap caused by the lower number of studs.

Linglong has been included in our tests before, and it is one of the most successful Chinese tyres in our winter tyre tests.

Non-studded tyres rise to the challenge

Non-studded tyres need not worry about the number of studs, but the lack thereof must be compensated in one way or another. This creates a host of other problems. There is a limited tool set for building ice grip into a non-studded tyre. It mostly involves devel-

⬆ The results were confirmed inside an indoor hall but using natural snow and under carefully controlled standard conditions.

⬆ The snow grip label means that the tyre offers at least some sort of winter grip. It does not equal a high-quality tyre, however.

⬆ Tyres that are over two years old are not worth buying, at least not without a sizeable discount. This tyre was manufactured in week 31 of 2014.

Do winter tyres wear down?

■ The tyre business is ripe with all kinds of information concerning the wearing down of different types of winter tyres and its effect on their grip. Some say that non-studded winter tyres wear down twice as fast as studded tyres. Others are convinced that, due to the wearing down of studs, studded tyres will have less grip than non-studded tyres after only a couple of years.

We chose six tyres of different brands from last year's test, 4 of which were studded and 2 non-studded, for a wear test where the tyres were driven in cool weather on an asphalt surface for 15,000 kilometres, which is roughly the equivalent of two winters. The route mainly consisted of main roads, but each shift included one hundred controlled instances of stop and go braking and acceleration at urban speeds in order to simulate urban driving and its wear effects.

The test was run using three cars in a convoy that all took the same route under the same conditions, while rotating the drivers. There were two pieces of each tyre and they were rotated daily between the front and rear axles. Therefore, at the end of the test, each tyre model had been used for an equal distance at the front and rear and driven by each of the drivers. This prevented the differences between cars, driving conditions and driving styles

WEARING DOWN OF WINTER TYRES ¹⁾	Tread depth at different mileages (mm)				Total wear (mm)	Calculated service life to a groove depth of 3 mm (km)
	0 km	5,000 km	10,000 km	15,000 km		
Studded tyres						
Michelin X-Ice North 3	9.29	8.86	8.33	7.82	1.47	64,184
Hankook Winter I*Pike RS	9.56	8.95	8.18	7.56	2.00	49,200
Nokian Hakkapeliitta 8	8.89	8.29	7.38	6.70	2.19	40,342
Pirelli Ice Zero	9.49	8.81	7.96	7.23	2.26	43,075
Non-studded tyres						
Continental ContiVikingContact 6	7.80	7.43	6.84	6.27	1.53	47,059
Goodyear Ultra Grip Ice 2	7.84	7.30	6.29	5.52	2.32	31,293

1) Tyres from the winter tyre test published in the autumn of 2014

from affecting the results.

The tyres also underwent braking tests on ice at the beginning of the test and every 5,000 kilometres thereafter. The tests were run indoors under carefully adjusted standard conditions. The interesting outcome was that, for both studded and non-studded tyres, grip reduced evenly during the test, and after 15,000 kilometres, grip was approx. 80% of that of a new tyre. Grip reduction was very similar between the different brands. The order of the tyres in terms of grip was the same at the beginning, middle and end of the test.

This is a good thing in terms of tyre tests in magazines, and it also demonstrates that the test results for new tyres are very representative of the tyres' characteristics, or rather their ranking order, even when worn.

There were some differences in wear resistance, however. The enclosed table presents the tread depth and calculated service life for the tyres, using

a tread depth of 3 mm.

Michelin has a historical reputation as a tyre with especially good wear resistance, and this seems to be the case at least in this test and for this tyre model. It should be noted that the service life has been calculated; there will always be some dispersion in the measurements caused by the vehicle, route and driving style.

It can be said that, with the exception of the Michelin, the studded tyres and the non-studded Goodyear wore down at the same rate, by approximately 2 mm. The non-studded Continental only wore down by 1.5 millimetres, like the Michelin, but due to the smaller initial tread depth, the calculated 3-mm tyre change will occur faster.

The flipside of the wear resistance, or lack thereof, is the tyre's grip. It is up to the customer to choose whether they want to buy less grip more rarely or more grip more often.

LABELS	Size	Number of studs	Load rating	Speed rating	Direction of rotation:	Inner/outer edge	Manufacturing date	DOT	Country of manufacture
STUDED TYRES									
Bridgestone Blizzak Spike-01	205/55R16	130	94	T (190 km/h)	yes	no	2014 week 12	H4 8K	Japan
Continental IceContact 2	205/55R16	190	94	T (190 km/h)	no	yes	2015 week 4	CPOF CUJ6	Germany
Dunlop Ice Touch	205/55R16	130	94	T (190 km/h)	yes	no	2014 week 43	A50F JK8R	Poland
Gislaved Nord Frost 100	205/55R16	96	94	T (190 km/h)	yes	no	2015 week 6	CPOF CNV8	Germany
Goodyear Ultragrip Ice Arctic	205/55R16	130	94	T (190 km/h)	yes	no	2014 week 43	A50F JKAR	Poland
Hankook Winter I*Pike RS	205/55R16	170	94	T (190 km/h)	yes	no	2015 week 2	5MRPVD H	South Korea
Linglong Green Max Winter Grip	205/55R16	98	94	T (190 km/h)	yes	no	2014 week 41	0UAV LPCR	China
Michelin X-Ice North 3	205/55R16	96	94	T (190 km/h)	yes	no	2014 week 37	22WC 04JX	Russia
Nokian Hakkapeliitta 8	205/55R16	190	94	T (190 km/h)	yes	no	2015 week 3	YLVP	Finland
Nordman 5	205/55R16	128	94	T (190 km/h)	yes	no	2014 week 48	60CP	Russia
Pirelli Ice Zero	205/55R16	130	91	T (190 km/h)	yes	no	2014 week 48	XT BK R580	Germany
Sava Eskimo Stud	205/55R16	130	91	T (190 km/h)	yes	no	2015 week 4	A50F PB1R	Poland
NON-STUDED TYRES									
Bridgestone Blizzak WS80	205/55R16	-	94	T (190 km/h)	yes	no	2015 week 45	EN 8K	Japan
Continental ContiVikingContact 6	205/55R16	-	94	T (190 km/h)	no	yes	2015 week 5	CPOF CPVX	Germany
Goodyear Ultra Grip Ice2	205/55R16	-	94	T (190 km/h)	yes	no	2014 week 31	A50F PY1R	Poland
Michelin X-Ice XI3	205/55R16	-	94	T (190 km/h)	yes	no	2014 week 29	H1 WC 033X	Spain
Nankang Ice Activa Ice-1	205/55R16	-	94	Q (160 km/h)	yes	no	2014 week 51	108K	China
Nokian Hakkapeliitta R2	205/55R16	-	94	R (170 km/h)	yes	no	2015 week 8	YLCP	Finland
Nordman RS	205/55R16	-	94	R (170 km/h)	yes	no	2014 week 51	60CP	Russia
Pirelli Ice Zero R	205/55R16	-	94	T (190 km/h)	yes	no	2015 week 2	YB BK U544	Russia

THERE IS A LIMITED TOOL SET FOR BUILDING ICE GRIP INTO A NON-STUDED TYRE.



oping new materials and better tread patterns while making the rubber compound as soft as possible.

If the rubber compound is too soft, this will result in new problems - the worst of them being weak wet grip, unstable handling and poor wear resistance.

In recent years, Nokian and Continental have taken the top spots in non-studded tyre tests. Even without studs, the grip that they can offer on ice is astonishing at its best, but the flipside is that consumers need to accept the sluggish handling on asphalt or go for the somewhat firmer handling but weaker grip of the other products.

Goodyear has focused on the asphalt handling of its non-studded tyre, with only minor compromises in terms of winter grip, and Michelin has always favoured balanced characteristics with no major weak points. Pirelli and Bridgestone are old, familiar brands, but their models differ from those tested previously.

We included two products from the lower price range: Nokian's secondary model Nordman and the Taiwanese Nankang, which is known for producing some decent summer tyres. Now we were able to see whether its winter tyre can compete against European tyres.

■ **THIS YEAR'S TEST** included twenty products of different price ranges, and some of them had significant shortcomings in specific areas. Some of the tyres were clearly developed for harsh winter weather while making compromises concerning handling on asphalt. Others chose to be fairly good at everything but not really excellent in any areas. However, a tyre that does not perform well anywhere is not a good choice, especially when you can find a better option at the same price. **T.M.**

GRADES	Weight (%)	STUDED TYRES												NON-STUDED TYRES							
		Bridgestone	Continental	Dunlop	Gislaved	Goodyear	Hankook	Linglong	Michelin	Nokian	Nordman	Pirelli	Sava	Bridgestone	Continental	Goodyear	Michelin	Nankang	Nokian	Nordman	Pirelli
Ice	40																				
Braking	15	8	9	9	8	9	9	7	8	10	8	9	8	6	7	7	7	6	7	6	7
Acceleration	10	9	9	9	8	9	10	7	8	10	8	9	9	6	6	6	6	5	6	5	6
Handling track	10	8	10	8	9	9	10	6	8	10	8	9	9	6	8	6	7	7	8	7	8
Subjective handling	5	9	10	8	9	9	9	7	8	10	8	9	8	6	8	7	7	7	8	6	7
Snow	20																				
Braking	5	8	9	9	10	10	9	7	9	9	8	8	7	8	8	9	8	8	9	8	9
Acceleration	5	8	9	8	9	10	9	6	8	10	9	10	6	8	8	9	10	7	10	7	8
Handling track	5	8	10	9	10	9	10	6	8	10	9	9	7	9	8	7	8	7	9	8	7
Subjective handling	5	8	9	8	9	9	9	6	8	10	8	9	7	8	8	8	8	7	9	8	8
Wet asphalt	15																				
Braking	5	8	8	8	9	7	8	8	9	7	7	8	8	6	7	9	7	6	6	7	7
Handling track	5	8	8	9	8	8	7	9	8	7	7	9	8	6	8	8	8	7	7	7	8
Subjective handling	5	6	7	8	7	8	6	8	7	6	6	8	7	6	6	7	7	6	7	7	7
Dry asphalt	10																				
Braking	5	8	8	9	8	8	8	9	9	8	8	8	9	8	8	7	7	7	6	7	8
Subjective handling	5	6	7	8	7	8	6	9	8	7	7	8	8	7	6	7	8	6	7	7	7
Economy and comfort	15																				
Directional stability	5	8	8	8	9	8	8	9	7	7	7	9	7	7	7	9	7	6	7	7	7
Noise	5	6	6	7	7	6	6	6	7	6	5	5	6	10	9	10	10	9	10	10	10
Rolling resistance	5	6	7	7	6	7	9	7	6	8	8	7	7	7	9	9	9	8	10	9	9
Overall grade	100	7.8	8.6	8.4	8.3	8.5	8.6	7.2	7.9	8.8	7.7	8.5	7.8	6.9	7.5	7.6	7.6	6.7	7.7	7.0	7.6



NOKIAN
Hakkapeliitta 8

Further information:
www.nokiantyres.com
Price: €700



CONTINENTAL
IceContact 2

Further information:
www.conti-online.com
Price: €700



HANKOOK
Winter I*Pike RS

Further information:
www.hankooktire-eu.com
Price: €500



GOODYEAR
Ultragrip Ice Arctic

Further information:
www.goodyear.com
Price: €650



PIRELLI
Ice Zero

Further information:
www.pirelli.com
Price: €700

DRIVING ON ICE AND SNOW

The Nokian is the best tyre on the market on ice. Its braking grip and traction are excellent and the tyre is easy to control even under extreme conditions. The Nokian also offers reliable grip and steering on snow.

The Continental has very balanced properties. It has good grip on ice and good lateral grip makes it easy to drive. The snow also works well on ice and reacts quickly during evasions.

The Hankook has good grip on ice and the tyre feels secure to drive even under difficult conditions and in extreme situations. The tyre behaves logically on snow and steers firmly during evasions. The winter properties are balanced even if the tyre was not ranked at the top in any of the tests.

The Goodyear is a quality tyre, even if it did not achieve first place in any of the tests. Braking grip is good on ice, and especially on snow, but lateral grip on ice is less than optimal. Even so, the tyre is easy to control even under extreme conditions. The tyre feels calm on snow.

The Pirelli has excellent grip on ice, and it feels precise and easy to steer during evasion. The rear tyres may sometimes lose grip easily, but the good level of grip makes it easy to regain control. The Pirelli also works well on snow, even though its grip is slightly below the level of the best tyres.

DRIVING ON ASPHALT

On bare roads, you can see that the tyre has been developed for the winter. It lacks grip during braking and lane changes, but fortunately, the tyre's basic nature is calm and it will not surprise you with a sudden loss of grip.

The warmer weather characteristics have not been forgotten, either. The tyre has above average wet grip and it feels firm to drive during evasions. In dry weather, steering is slow like in most winter tyres, but it will not surprise the driver by going into a sharp slide.

Braking grip on wet surfaces is decent, but the tyre feels fairly soft and limp to drive and it steers slowly during evasions. Luckily, the rear tyres maintain grip and the tyre is not too surprising.

On asphalt, the Goodyear is an above-average Nordic studded tyre. Braking grip is reasonably good and steering feels calm during evasion.

On wet asphalt, the Pirelli is one of the best studded tyres on the market. It grips well during evasions that require fast reactions and steers firmly. Evasions are easy even on dry surfaces, but the braking distances are too long.

ECONOMY AND COMFORT

The Nokian is no louder than an average studded tyre, even if you do hear the rattle of the studs. The tyre's rolling resistance is at a good level for a studded tyre.

Noise and rolling resistance are at the average level for studded tyres on the market, and the tyre feels reasonably stable on grooved roads.

Tyre and stud noise are at an average level for studded tyres. Hankook deserves special thanks for the lowest rolling resistance in the tested studded tyres.

Tyre and stud noise, as well as rolling resistance, are at an average level for studded tyres. The stability of the tyre is average on grooved roads.

Rolling resistance is at an average level, but the stud noise is audible. The Pirelli is a stable runner on grooved roads.

FOR

- Grip on ice
- Handling under all winter conditions

AGAINST

- average on asphalt



8,8

FOR

- Grip on ice and snow
- Handling under all winter conditions

AGAINST

- Average in braking on ice



8,6

FOR

- Grip on ice and snow
- Rolling resistance

AGAINST

- Handling on asphalt



8,6

FOR

- Braking and traction on snow
- Balanced properties

AGAINST

- Braking grip on wet asphalt



8,5

FOR

- Grip on ice
- Handling under winter conditions

AGAINST

- Noise



8,5



DUNLOP Ice Touch

Further information:
www.dunlop.eu
Price: €600

Braking distances on ice are short and traction is fairly good. The tyre offers reasonable lateral grip, but handling feels unsure under extreme conditions. Sometimes, the rear tyres also lose grip too easily on snow. However, good grip means that it is easy to recover control.

The Dunlop was one of the best tyres on asphalt. It feels stable and firm to drive and easy to control during evasions. Steering feel is precise, which makes driving easier under rapidly changing conditions.

The Dunlop's rolling resistance is at a good level and it is fairly quiet for a studded tyre.

FOR

- Characteristics on asphalt
- Noise

AGAINST

- Restlessness under specific winter conditions



8,4



GISLAVED Nord Frost 100

Further information:
www.gislaved-tires.com
Price: €700

The tyre has beautiful grip on snow and it offers good steering feel. It behaves calmly and feels firm to drive even under extreme conditions. On ice, the tyre lacks grip, and braking distances are long. The grip runs out easily during evasions, and slides can be long.

Braking grip on wet surfaces is good. The tyre feels soft during evasions, but it nevertheless steers logically due to its high level of grip. On dry surfaces, the Gislaved is a typically slow winter tyre, but its behaviour nevertheless feels calm.

The low number of studs makes the Gislaved a quiet studded tyre. However, its rolling resistance was among the highest in the test.

FOR

- Properties on snow
- Wet grip

AGAINST

- Ice grip is only average for a premium tyre



8,3



MICHELIN X-Ice North 3

Further information:
www.michelin.com
Price: €700

The Michelin feels exceptionally calm under winter conditions. Unfortunately, the front tyres have insufficient grip on ice, which makes braking distances long. The tyre also tends to run out of lateral grip during evasions. The grip is slightly better on snow, but still one step below the best tyres.

Braking distances are short on bare roads. The Michelin maintains its calmness during evasion on asphalt, and the rear tyres do not lose grip even under demanding conditions. Steering is too slow, however.

The rolling resistance was among the highest in the test, but the noise level remains low due to the small number of studs.

FOR

- Calm handling under all conditions
- Noise

AGAINST

- Ice grip is only average for a premium tyre



7,9



BRIDGESTONE Blizzak Spike-01

Further information:
www.bridgestone.com
Price: €550

Ice grip during braking and acceleration is fairly good and the tyre feels calm under extreme conditions, even though it lacks lateral grip. Grip on snow is average, but the calm basic nature makes control easier.

Grip on wet and dry surfaces is average. Braking grip is decent and the tyre starts off with calm behaviour. During harder evasions, however, the Bridgestone is sluggish and responds slowly.

The Bridgestone is an average tyre in terms of noise levels, and the noise is not disturbing. The tyre had the highest rolling resistance in our test.

FOR

- Decent grip on ice

AGAINST

- Handling on wet and dry surfaces
- Rolling resistance



7,8



SAVA Eskimo Stud

Further information:
www.sava-tires.com
Price: €500

Ice grip is at a reasonable level, and the tyre offers competitive braking distances and lap times. Under extreme conditions, the grip limit is too sharp, and the rear tyres may lose grip suddenly. On snow, the tyre feels restless to drive on snow and difficult to control under extreme conditions.

On asphalt, the Sava works well. Braking grip is reasonably good and the tyre responds precisely to steering. Unfortunately, the tyre behaves too sharply during evasion tests.

Rolling resistance and noise level are average. Stud noise is audible but not disturbing.

FOR

- Braking grip on wet surfaces

AGAINST

- Grip on snow
- Handling on snow



7,8

Studded tyres



NORDMAN
5

Further information:
www.nordmantyres.com
Price: €500



LINGLONG
Green Max Winter Grip

Further information:
en.linglong.cn
Price: €350

FINAL EVALUATION | Non-studded tyres



NOKIAN
Hakkapeliitta R2

Further information:
www.nokiantyres.com
Price: €650



GOODYEAR
Ultra Grip Ice2

Further information:
www.goodyear.com
Price: €600



MICHELIN
X-Ice XI3

Further information:
www.michelin.com
Price: €650

DRIVING ON ICE AND SNOW

Nokian's previous successful model is a good demonstration of how technology has advanced. The Nordman is still a fairly functional winter tyre on ice and snow, even if its grip level is no longer up there with the best. The tyre feels calm on slippery surfaces, provided that the grip limits are not exceeded by too much.

Linglong did not succeed in our comparison test. Its grip was the weakest of all the studded tyres on ice and snow, and the tyre feels difficult to drive. Weak grip makes steering slow under extreme conditions and the rear tyres lose grip easily. The behaviour is sharp and surprising under all slippery conditions.

The Nokian is the best non-studded tyre for icy and snowy roads. The grip during braking and acceleration is good, but the best part is that the tyre retains control even under slippery conditions and after the grip limit has been passed. The tyre behaves in a balanced and logical manner in any weather.

Grip during braking and acceleration are at a good level on ice and snow. However, lateral grip is too thin under extreme conditions, and the front tyres may suddenly lose grip, especially on snow. Control is helped by the calm overall behaviour and the fact that the rear tyres maintain their grip.

The Michelin feels calm to drive on ice and snow, and it offers good braking grip. The grip limit for the front tyres is very thin in slippery winter weather, and the tyre can quickly run out of grip when turning too much. The rear tyres maintain grip very well even under suddenly developing situations.

DRIVING ON ASPHALT

Braking grip on asphalt is below average. The tyre also feels fairly soft and steering is sluggish during evasions, but the calm basic behaviour helps in maintaining control.

The Linglong is much more at home on bare roads. It feels stable and braking distances are short. The tyre responds precisely to steering. On dry asphalt, the Linglong was the best tyre in our test.

On asphalt, the Nokian feels sluggish, and its braking distances are long. Despite the slow steering, the Nokian behaves calmly and does not surprise the driver, but reactions to steering should be more precise when a quick response is required.

The Goodyear was the best non-studded tyre on wet asphalt. Braking grip is excellent for a Nordic non-studded winter tyre and the tyre is easy to drive. Grip remains good on dry surfaces as well, and despite the slow reactions, the tyre feels calm even during the hardest evasions.

The tyre feels reliable on bare roads. During evasion, it steers slowly but surely and does not lose grip easily even under extreme conditions. The Michelin has a clear tendency to understeer even on asphalt, which means that the front tyres run out of grip before the rear tyres.

ECONOMY AND COMFORT

Rolling resistance is fairly low for a studded tyre, but the noise level was one of the highest in the test.

Noise and rolling resistance are average among studded tyres.

The tyre is extremely quiet and it had the lowest rolling resistance in the entire test.

The Goodyear is stable and quiet, and its rolling resistance is average among the non-studded tyres.

The tyre is quiet, and its rolling resistance is average among the non-studded tyres.

FOR

- Reasonably good winter properties

AGAINST

- Wet grip
- Noise

★★

7,7

FOR

- Characteristics on asphalt

AGAINST

- Grip under winter conditions
- Handling under winter conditions

★

7,2

FOR

- Characteristics under all winter conditions
- Rolling resistance

AGAINST

- Grip on asphalt

★★

7,7

FOR

- Braking grip on ice and snow
- Characteristics on asphalt

AGAINST

- Average lateral grip on ice and snow

★★

7,6

FOR

- Braking grip on ice and snow
- Calm behaviour in any weather

AGAINST

- Average grip on wet surfaces

★★

7,6

(Average price across different retailers, includes installation)



PIRELLI Ice Zero R

Further information:
www.pirelli.com
Price: €650

Grip on ice is good, but it is not among the best. The tyre feels easy to drive, but especially the rear tyres can easily run out of grip during the quickest evasions. The tyre has a precise feel on snow, and the tyre steers in a balanced and reliable manner.

Grip on asphalt is fairly good and braking distances are short. During lighter evasions, the Pirelli steers firmly, but it feels slow especially on dry surfaces and more demanding conditions. This is typical of soft non-studded tyres that are designed for use on ice.

The tyre is quiet, and its rolling resistance is at a good level.

FOR

- Grip on ice and snow
- Grip on wet asphalt

AGAINST

- Handling on dry asphalt



7,6



CONTINENTAL ContiVikingContact 6

Further information:
www.conti-online.com
Price: €650

The tyre has good grip on ice, and it can achieve short braking distances and good lap times. On snow, the grip limit is slightly too thin and grip tends to run out under extreme conditions, especially when turning too much or too quickly. Restoring control is easy, however.

Braking grip is reasonably good on asphalt. However, the tyre feels rather soft and sluggish. Due to the slow reactions, passing obstacles with precision is difficult under extreme conditions.

The Continental is a quiet tyre with a low rolling resistance.

FOR

- Grip on ice and snow
- Rolling resistance

AGAINST

- Handling on asphalt



7,5



NORDMAN RS

Further information:
www.nordmantyres.com
Price: €450

Grip on ice is a level or two below the best tyres in the test. The tyre is usable, but the grip limit is sharp under extreme conditions and restoring control is difficult. On snow, the tyre handles calmly and behaves in a balanced manner, but it is lacking grip.

On asphalt, the Nordman is a typical non-studded tyre. It steers slowly under extreme conditions on wet and dry surfaces alike, but the behaviour is logical. When returning to your own lane after an evasion, the rear tyres maintain grip fairly well, and the Nordman will not surprise the driver with sudden losses of grip.

The tyre feels slightly unstable on grooved roads, but it is quiet and has low rolling resistance.

FOR

- Grip on snow
- Rolling resistance

AGAINST

- Grip on ice



7,0



BRIDGESTONE Blizzak WS80

Further information:
www.bridgestone.com
Price: €550

Grip on ice is fairly modest, at least when compared to the top tyres. Control is difficult since the front or rear tyres can easily lose grip. Handling on snow is more peaceful thanks to the good lateral grip. Grip during braking and acceleration on snow is also at a good level.

On wet asphalt, the tyre feels sluggish and unreliable. It steers slowly during evasions and returning to your own lane in a controlled manner may also be difficult due to the weak grip and imprecise steering. The Bridgestone fares well on dry asphalt.

Like most premium non-studded tyres, the tyre has low noise. The tyre had the highest rolling resistance in our test.

FOR

- Grip on snow and dry asphalt

AGAINST

- Grip on ice and wet surfaces
- Rolling resistance



6,9



NANKANG Ice Activa Ice-1

Further information:
www.nankang-tyre.com
Price: €400

Nankang did not fare well in our comparison test. The lack of ice grip during acceleration and braking was the biggest problem. The slightly better lateral grip and calm basic behaviour do help, but driving nevertheless feels insecure. On snow, the tyre goes into a slide too easily.

On wet asphalt, the Nankang feels unreliable and restless. It reacts slowly during evasion and the rear tyres may lose grip especially when returning to your own lane. Braking distances are long. The tyre lacks grip even on dry surfaces and it is difficult to control during quick evasions.

The tyre had one of the highest rolling resistances for non-studded tyres. The noise is audible but not disturbing.

FOR

- Reasonable lateral grip on ice

AGAINST

- Handling on ice and snow
- Handling on asphalt



6,7