

Test report

From
Entwicklungs- und Redaktionsbüro Werner Koch/MTE

On behalf of:

Mrs. Christelle Dehlinger/head of marketing
motorcycle tires Germany
Michelin Reifenwerke AG & Co. KGaA
Michelinstr. 4
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Test of
Touringsport tire Michelin Road 5 vs. Competitors
October 2017 – Neuhausen Germany

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Shortcut: Motorrad Test Entwicklung = MTE

A Preface

Client

Michelin/Karlsruhe

Service provider

Michelin/Paddock Motorsport

Selection of the test tires

Michelin

Tiresize

Front 120/70 ZR 17, Rear 180/55 ZR 17

Touringsport Tires front/rear

Bridgestone

Battlax Sporttouring T 30 EVO F, DOT 1317

Battlax Sporttouring T 30 EVO R, DOT 0417

Weight front/rear: 4,28 kg/6,87 kg

Construction front: SW 2 Rayon, TR 2 Rayon + 1 Steel

Construction rear: SW 1 Nylon, TR 2 Nylon + 1 Steel

Country of Manufactory: Japan

Continental

Continental Road Attack3, DOT 2817

Continental Road Attack3, DOT 1417

Weight front/rear: 4,62 kg/6,42 kg

Construction front: SW 1 Rayon, TR 2 Rayon + 1 Steel

Construction rear: SW 1 Polyester, TR 2 Polyester + 1 Steel

Country of Manufactory: Germany

Dunlop

Sportmax Roadsmart 3, DOT 2917,

Sportmax Roadsmart 3, Specification SP, DOT 0917

Weight front/rear: 4,50 kg/6,17 kg

Construction front: SW 2 Rayon, TR 2 Rayon + 1 Aramid

Construction rear: SW 1 Rayon, TR 2 Rayon + 1 Steel

Country of Manufactory: France

Metzeler

Roadtec 01, DOT 0617, Roadtec 01, DOT 3516
Weight front/rear: 4,24 kg/6,31 kg
Construction front: SW 2 Polyester, TR 2 Polyester + 1 Steel
Construction rear: SW 1 Rayon, TR 1 Rayonr + 1 Steel
Country of Manufactory: Germany

Michelin

Road 5 2CT, DOT 3617, Road 5 2CT+, DOT 3317
Weight front/rear: 4,20 kg/6,08 kg
Construction front: SW 2 Polyester, TR 2 Polyester + 1 Aramid
Construction rear: SW 2 Polyester, TR 2 Polyester + 1 Aramid
Country of Manufactory: Spain

Michelin

Pilot Road 4 2CT, DOT 1417, Pilot Road 4 2CT, DOT 2317
Weight front/rear: 4,18 kg/6,21 kg
Construction front: SW 2 Polyester, TR 2 Polyester + 1 Aramid
Construction rear: SW 2 Polyester, TR 2 Polyester + 1 Aramid
Country of Manufactory: Spain

Pirelli

Angel GT, DOT 2217, Angel GT, DOT 2617
Weight front/rear: 4,13 kg/6,34 kg
Construction front: SW 2 Rayon, TR 2 Rayon + 1 Steel
Construction rear: SW 1 Rayon, TR 1 Rayon + 1 Steel
Country of Manufactory: Germany

Shortcut in the test reports:

Bridgestone
Conti
Dunlop
Metzeler
Michelin R5
Michelin PR4
Pirelli

Test bike

Kawasaki Z 900

Responsible for Chassis-Settings

MTE

Selection Provingground

MTE

Neuhausen ob Eck/Germany MTE-Handlingcourse #4

Tire Pressure

The air pressure in cold condition:

Front: 2,5 bar

Rear: 2,9 bar

A Preface

The MTE employees were in charge of the following:

- Organizing and renting of the test tracks in Neuhausen (dry handling road simulation)
- 2 MTE-test riders and one Mechanic/2D-Service Stuttgart-Boxberg-Neuhausen-Stuttgart by car to transport tools, spare bike and test equipment to Neuhausen proving ground
- Installation of the 2D-Datarecording units on the test bike
- Recording of all data and measured values
- Testing and evaluation the provided sets of test tires dry handling
- Evaluation the 2D-Datarecording files
- Compose the test report

A.1 Test Impressions and Documentation



The Test bike Kawasaki Z 900 ABS in the Paddock-Motorsport service point



The lefthand handling-track #4 worn the food pegs. The gear lever limited the banking angle in corners and made the testing of maximum sidegrip more difficult.

B.1 Test weighting

The point scoring system used by the MTE allows for a maximum of 20 points for all criteria. This 20 point spread permits the testing of tires of different designs and for different use under uniform conditions.

B.2 Test drivers

The evaluation of the tire pairings was provided by two test riders in Neuhausen/dry handling in road mode, using the methods and unique, specified criteria for testing and evaluation; see Item C.

Personal datas of the MTE-testrider

Thomas Ekhardt, body heigt: 170, weight ready to ride: 76 kg
Werner Koch, body height: 172, weight ready to ride: 96 kg

B.3

The proving ground/handling track for simulation of winding public roads in Neuhausen was clean and with perfect conditions of weather and track.

B.4 Time Schedule

18./19. 10. 2017

Journey Stuttgart-Neuhausen-Stuttgart for test rides dry handling

20. 10. 2017

Composing the point scoring and evaluation of the 2D data.

02. 11. 2017

Sending the test report to Michelin

B.6 Test equipment

All test runs were recorded with the 2D-Datarecording unit.

These data were used to assist with the evaluation.

For the test runs, the following 2-D sensors were used on the Kawasaki Z 900

- Speed through GPS, antenna type: AC-GPS-Mouse-12-Hz-000
- Inclined position through GPS, see above

Other measuring instruments:

- Infrared thermometer Voltcraft 350

B.7 Test Tracks

The wet and dry-handling track of Boxberg in Neuhausen ob Eck was in perfect conditions the test days.

B.8 Explanation 2D-Measuring banking angle

The 2D data recording system calculates the inclined position from the speed and curve radius. At 45 degrees, this value, with the MTE designation "neutral inclined position", equates to a lateral G-force which increases the actual inclined position of the motorcycle by around 5 degrees when taking into account the center of gravity height and tire width. This results in a vehicle lean angle of around 50 degrees.

B.7-1 Vehicle identification / Bike #01

B.7.1. Test vehicle identification

Manufacturer:	Kawasaki
Model designation:	Z 900, year of construction 2017
Weight w. full tank and all fluids in kg:	212 kg, front 51,9/rear 48,1 %

Wheelbase in mm:	1450 mm
Steering head angle in degrees:	65°

B.7-1 Vehicle identification / Bike #01

B.7.2 Chassis components

Wheels and tyres / front wheel

Type:	Aluminium Cast
Rim dimension:	3,5" x 17"
Tyre dimension:	120/70ZR17

Wheels and tyres / Rear wheel

Type:	Aluminium Cast	
Rim dimension:	5,5" x 17"	
Tyre dimension:	180/55 ZR17	

Front forks			Shock absorber		
Manufacturer: std			Manufacturer: std		
Model and type: Std			Model and type: Std		
Spring base std	Negativ 35 mm		Spring base std	Negativ 58 mm	
Return damping	1 1/4 open		Return damping	1 1/2 open	
Compression damping	-		Compression damping	-	

C Details of the MTE testing methods

C.1 Wet-mode

The wet test was not requested by Michelin order.

C.2 Dry-handling sport-mode

The sport mode handlingtest was not requested by Michelin order.

C.3 Dry-handling road-mode

The course #4 in Neuhausen where used to simulate the typical riding situations encountered on country roads. On the Neuhausen handling-course, the rider maintains a touring-posture without hanging off the motorcycle. The weight-transfer by hangig-off ridestyle can influence the criterias like handling, cornering-stability and steering precision by more banking angle of the bike and more pressure/compression to the tires. So the MTE testriders use these touring-posture to simulate the public-road conditions.

During this test, selected test criteria such as steering characteristics in hairpins, steering forces, neutrality in alternating curves and stability in bumpy corners, also with passenger, are evaluated.

Binding Verbalisation

To unify the communication of the test riders and the client of MTC, the binding verbalisation helps to understand and unify the evaluation in words and point scoring.

Points	Binding verbalisation
20	Excellent (currently the best of all results/qualities)
19	Excellent to very good
18	Very good (neck and neck with the current best results/qualities)
17	Very good to good

16	Good
15	Good to satisfactory
14	Satisfactory
13	Satisfactory to enough
12	Enough
11	Enough to fail
10	Fail
9	Fail to very bad
8	Very bad
7	Very bad to not acceptable
6	Not acceptable
5	Not acceptable / Too dangerous
4	Very dangerous
3	Very dangerous / High risk
2	High risk
1	Solid reason to cancel the test

This test report was authored by Werner Koch of MTE.

Stuttgart – 19. 10. 2017

Test report

From
MTE Motorrad Test Entwicklung
Mezgerstraße 47
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On behalf of:

Mrs. Christelle Dehlinger/Head of marketing
motorcycle tires
Michelin Reifenwerke AG & Co. KGaA
Michelinstr. 4, 76 185 Karlsruhe

Test of touring sport tire Michelin Road 5 vs. Competitors
October 2017 – Neuhausen/Germany

Selection of the test tires

Michelin

Selection of the Test bike

Michelin/Kawasaki Z 900

Provingground

Handling-Track #4, Neuhausen ob Eck

Tire Pressure

Air pressure, measures in cold condition:

Front: 2,5 bar

Rear: 2,9 bar

Evaluation of test tires

Bridgestone T30 EVO Sporttouring, Place 5. / 90 %

A little bit sluggish in alternating corners and in sportive ride style, the Bridgestone shows a total uncomplicated and safe riding behavior with a neutral steering, stable cornering and blameless high speed stability or loaded with passenger.

Continental Road Attack 3 Place 3. / 97 %

The most sportive competitor in the touring tire-segment impressed by the very light and agile handling, a fine steering precision and a solid stability in all kind of bends. Only by very sportive riding, the front tire shows a tendency for over steering in strong banking angle.

Dunlop Roadsmart 3 (rear SP-Spec.) Place 4. / 91 %

With the SP-Specification for the rear tire, the agile Dunlop Roadsmart 3 lose some points by a little instable tail under strong acceleration and loaded with passenger. The advantage points: low up righting moment when braking in inclined position and a good steering precision entering the corners.

Metzeler Roadtec 01, Place 6. / 88 %

With the Metzeler Roadtec 01, the test riders miss the solide stability and steering precision in sportive ride style and strong banking angle, like these is demonstrated by the Pirelli tires from the same manufactory. The significant quality: a very comfortable self damping and a perfect high speed stability, neck on neck with Pilot Road 4.

Michelin Pilot Road 4, Place 7. / 83 %

In these strong Competition, the Michelin Pilot Road 4 lose the connection to the best competitors by the soft construction, which generate a more indirect steering behavior, stronger up righting moment when braking and instable rear tire under strong acceleration out of corners in sportive ride style or loaded with passenger. Very impressive: the solide high speed stability on the Kawasaki Z 900.

Michelin Road 5, Place 1. / 100 %

The new Michelin Road 5 impressed in all aspects of dry handling, simulated on the Handling track #4. Very sharp handling, combined with the solid corner stability, also loaded with passenger, brilliant steering precision in all types of bends, the Michelin Road 5 makes the ride on winding roads to very great pleasure. The positive overall profile of the Road 5 is rounded off by a very low up righting moment when braking in inclined position and a solid stability at high speed test, mounted on the Kawasaki Z 900.

Pirelli Angel GT, Place 2. / 98 %

A very solid stability in all corners, fine steering behavior, easy handling and fine sidegrip, the Pirelli tire shoes a very high performance in these handling test. The difference to the Michelin Road 5 is justified in the higher steering-force in alternating corners and sharp U-turns. Problem-free: the high speed test with the Kawasaki Z 900.

This test report was authored by Werner Koch.

Persons present during testing:

Michelin Service

→ Mr. Thomas Ochsenreither, Technician/Mechanic

Motorrad Test Entwicklung

- Mr. Werner Koch, Head of Testing/Testrider/Mechanic
- Mr. Thomas Ekhardt, Testrider/Mechanic
- Mr. Christoph Koch, 2D Service/Mechanic

Stuttgart – 02. 10. 2017

Werner Koch, Technical Manager/Testrider

Testreport Kawasaki Z900 Pointscoring

Pointscoreing Dry-Handling/Roadmode									
Pos.	Neuhausen, 18. 10. 2017 Kawasaki Z900	Max. Points	Bridgestone T 30	Conti Road Attack 3	Dunlop Roadsmart3	Metzeler Roadtec 01	Michelin Road 5	Michelin Pilot Road 4	Pirelli Angel GT
A									
A 1	Handling in alternating corners	20	17	19	17	16	19	14	18
A 2	Steering Precision	20	16	18	17	16	19	15	18
A 3	Steeringforce in inclined position	20	16	18	18	16	19	16	18
A 4	Steering precision corner exit/running wide	20	16	18	17	16	19	15	18
A 5	Uprightmoment entering corners with brake	20	17	18	17	15	19	15	17
A 6	Uprightmoment in corners with brake	20	17	18	18	16	18	15	17
	Pointscoreing Handling (A1,A2,A3,A4,A5,A6)	120	99	109	104	95	113	90	106
A 7	Sidegrip in corners	20	16	18	16	17	19	14	19
A 8	Sidegrip under acceleration	20	16	18	16	17	18	14	19
	Pointscoreing Grip (A7,A8)	40	32	36	32	34	37	28	38
A 9	Stability in corners	20	17	18	17	17	19	16	19
A 10	Stability under acceleration	20	16	18	15	16	18	15	19
A 11	Stability and Steeringpr. with Passenger	20	17	19	15	15	19	15	18
A 12	Stability Vmax without Stimulation	20	19	19	19	19	19	19	19
A 13	Stability Vmax with Stimulation	20	18	18	18	19	18	19	19
	Pointscoreing Stability only Vmax (A12,A13)	40	37	37	37	38	37	38	38
	Pointscoreing Stability total (A9,A10,A11,A12,A13)	100	87	92	84	86	93	84	94
	Summery	260	218	237	220	215	243	202	238
B	Ranking and %		5. 90 %	3. 97 %	4. 91 %	6. 88%	1. 100 %	7. 83%	2. 98%
	Best lap Rider1/Rider2		50,9/49,9 s	49,5/49,1 s	50,0/49,2 s	49,8/49,2 s	49,4/48,7 s	51,6/50,4 s	49,8/48,6 s
	Section "180° 100 m		7,1/6,8 s	6,9/7,0 s	7,0/6,8 s	7,0/6,8 s	6,9/6,7 s	7,0/6,9 s	6,8/6,6 s
	Section "Slalom" 250 m		16,6/16,8 s	16,3/16,3 s	16,4/16,2 s	16,4/16,4 s	16,2/16,3 s	16,9/16,9 s	16,4/16,2 s
	Section "S-Curves" 265 m		16,2/15,9s	16,0/15,4 s	16,1/15,5 s	16,0/15,4 s	15,8/15,4 s	16,5/15,7 s	15,9/15,4 s
	Section "U-Turn" 55 m		5,9/5,7 s	5,7/5,6 s	5,8/5,8 s	5,9/5,8 s	5,8/5,6 s	6,2/5,9 s	5,9/5,7 s
	Section "Zielkurve" 100 m		4,4/4,5 s	4,3/4,3 s	4,3/4,4 s	4,4/4,3 s	4,3/4,3 s	4,5/4,4 s	4,3/4,4 s
	km/h "Slalom" 190 m meas. length		53,89 km/h	54,84 km/h	54,26 km/h	54,53 km/h	55,04 km/h	52,78 km/h	54,38 km/h
	Tiretemperataure Front:		35°	35°	34°	33°	37°	38°	41°
	Tiretemperature Rear:		42°	47°	43°	40°	50°	46°	50°
	Air/Groundtemperature:		18°	18°	20°	23°	24°	25°	22°