

HANDHELD DEVICES

Aluminum wheels



MAKRA offers an extensive range of measuring equipment for the quality control in wheel production.



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The automotive industry demands smaller tolerances for the production of vehicle wheels, which requires higher manufacturing accuracy. With the wide range of high-quality handheld measuring equipment, MAKRA offers the right solution for every quality inspection task.

Well-known automobile and wheel manufacturers worldwide test their wheels with MAKRA measuring equipment. As a certified manufacturer of measuring and test equipment with over 20 years of experience, MAKRA offers practical measuring devices for

numerous standardized operations. Individual tools for wheel measurement purpose are available on request. The target-aimed design allows intuitive operation and quick measurement. The possibility of on-site use shortens set-up times and saves walks to the test laboratory. The use of the premium material (e.g. hardened functional parts), the robust construction and the high-precision manufacturing of MAKRA equipment guarantees maximum accuracy and a long operating life.

YOUR ADVANTAGES

» The right solution for every test task

MAKRA offers a variety of measuring and testing equipment for the laboratory and factory use. Individual measurement tools are available on request.

» Certified manufacturer

MAKRA is certified as a manufacturer of measuring and test equipment according to ISO 9001: 2008 and ISO 14001: 2004.

» Long-term experience

Our extensive experience make it possible to develop and manufacture task-oriented and practical solutions for your measuring and testing tasks.

» Consistent quality

We secure the world-famous „MAKRA quality“ for our machines as well as for our measuring and testing equipment. By using high-quality hardened functional parts, we guarantee a long service life of the product.

TIRE SEAT AND HUMP

Tire seat / hump diameter caliper gauge

Additionally to the existing procedures in production, we recommend random cross-checks with our calipers. The digital calipers with preset function are used during setup of wheels in turning operations and to determine the tire seat diameter. They are available in two different versions: with round (tire seat) or flat (hump) special measuring tubes.



Caliper gauge for tire seat diameter

Part no.	Measurement base	Jaw Ø / width (mm)	Measuring range (mm)	Jaw length (mm)	Error limit (mm)	Accuracy (mm)	Weight (g)
113 016 004	Tire seat	8	0-600	310	0,05	0.01	2 400
113 016 005	Hump	8	0-600	310	0,05	0.01	2 000

Accessories: data cable on request



Caliper gauge for hump diameter

Hump circumference measuring tape

This is a flexible stainless steel measuring tape for determining the hump circumference and the hump diameter.

Part no.	Diameter (mm)	Wheel size	Circumference (mm)	Tape width (mm)	Error limit (mm)	Accuracy (mm)	Weight (g)
113 027 001	300-700	13-24"	940-2200	16	0.15	0.1	70



OFFSET

Rim depth caliper gauge

The depth measuring bar is secured against accidental falling out in both directions. The measuring device has a mm/inch switchover and a preset function.



Part no.	Measuring bridge length (mm)	Measuring range (mm)	Error limit (mm)	Accuracy (mm)	Weight (g)
113 016 029	500	300	0.04	0.01	950
113 016 036	610	300	0.04	0.01	1 300
113 016 038	610	450	0.05	0.01	1 350

Accessories: data cable on request

Rim width caliper gauge

The digital caliper with measuring cylinder is used to determine the rim width. The device has a mm/inch switchover, an offset function, which enables immediate reading of the rim width and a preset function for storing two preselection values.



Part no.	Measuring cylinder Ø (mm)	Measuring length (mm)	Jaw length (mm)	Error limit (mm)	Accuracy (mm)	Weight (g)
113 016 027	8	300	75	0.03	0.01	410
113 016 009	16	300	75	0.03	0.01	420
113 016 011	16	450	100	0.03	0.01	1 130

Accessories: data cable on request

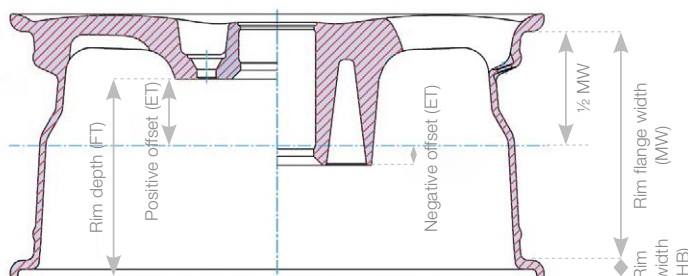
Rim flange width caliper gauge

The digital caliper is used to determine the rim flange width. It contains a height-adjustable measuring ball and has a preset function.



Part no.	Measuring ball Ø (mm)	Measuring length (mm)	Vertical ball adjustment (mm)	Stop plate (mm)	Error limit (mm)	Accuracy (mm)	Weight (g)
180 003 960	8	150	26	40 x 160	0.03	0.01	470
180 003 350	16	150	26	40 x 160	0.03	0.01	470

Accessories: data cable on request



The offset (ET) is the subtraction between the rim depth (FT) and half the rim flange width ($\frac{1}{2}$ MW). Deviations are seen upwards (outside of the wheel) as positive, downwards (inside of the wheel) as negative.

$$ET = (FT) \text{ mm} - \left(\frac{(MW) \text{ mm}}{2} + (HB) \text{ mm} \right)$$



- 1 Hardened measuring body
- 2 Narrow measuring roller distance
 - » For exact testing results
- 3 Laser-cut scale
 - » Readability
 - » Exchangeable
- 4 Comfortable handles
 - » Made of anodized aluminum

BEAD SEAT CIRCUMFERENCE

Ball-tape for car wheels

The measuring device is used to determine the rim circumference of car wheels (rim bead seat taper of 5°). The rim measuring tape with a measuring ball diameter of 16 mm has a fine measuring device with a pitch of 0.1 mm and a scale with a measuring range from -10 mm to +30 mm.



Part no.	Wheel size	Type	Diameter (mm)	Circumference (mm)	Weight (g)
106 000 001	10"	-	251.87	791.3	1 200
106 000 007	12"	A	302.67	950.9	1 300
106 000 008	12"	B	304.26	955.8	1 300
106 000 080	12"	C	307.43	965.8	1 300
106 000 011	13"	-	328.07	1 030.7	1 450
106 000 012	14"	-	353.47	1 110.5	1 540
106 000 013	15"	A	378.87	1 190.2	1 630
106 000 014	15"	B	386.01	1 212.7	1 630
106 000 017	16"	-	404.27	1 270.0	1 730
106 000 021	17"	-	435.22	1 367.3	1 850
106 000 025	18"	-	460.62	1 447.1	1 950
106 000 028	19"	-	486.02	1 526.9	2 040
106 000 032	20"	A	511.42	1 606.7	2 150
106 000 034	20"	C	513.01	1 611.7	2 150
106 000 036	21"	C	536.82	1 686.5	2 250
106 000 045	22"	-	562.22	1 766.3	2 330
106 000 047	23"	-	587.62	1 846.1	2 450
106 000 048	24"	A	613.02	1 925.9	2 550
106 000 050	24"	B	614.61	1 930.9	2 550
106 000 079	25"	-	638.42	2 005.7	2 650
106 000 053	26"	-	663.82	2 085.5	2 750
106 000 055	28"	-	714.62	2 245.1	2 950
106 000 057	30"	-	765.42	2 404.6	3 150

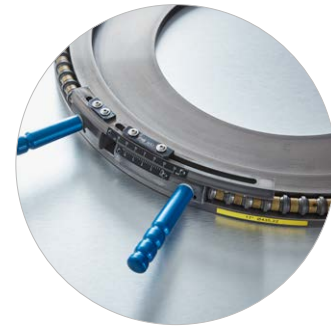
Ball-tape for truck wheels

The measuring device is used to determine the rim circumference of truck wheels (rim bead seat taper of 15°). The rim measuring tape with a measuring ball diameter of 16 mm has a fine measuring device with a pitch of 0.1 mm and a scale with a measuring range from -10 mm to +30 mm.

Part no.	Wheel size	Type	Diameter (mm)	Circumference (mm)	Weight (g)
106 000 024	17.5"	-	441.32	1 386.5	1 850
106 000 031	19.5"	-	492.12	1 546.0	2 040
106 000 046	22.5"	-	568.32	1 785.4	2 330
106 000 052	24.5"	-	619.12	1 945.0	2 550

Ball-tape setting ring gauge for car wheels

The setting ring for the accuracy check of MAKRA car wheel measuring tapes is made of artificially aged steel, hardened and grounded precisely. This ensures a minimal tolerance.



Part no.	Wheel size	Type	Diameter (mm)	Circumference (mm)	Weight (g)
105 005 002	10"	-	251.87	791.3	4 500
105 005 004	12"	A	302.67	950.9	5 000
105 005 007	12"	B	304.26	955.8	5 000
105 005 006	12"	C	307.43	965.8	5 000
105 005 008	13"	-	328.07	1 030.7	7 000
105 005 009	14"	-	353.47	1 110.5	8 100
105 005 010	15"	A	378.87	1 190.2	9 500
105 005 011	15"	B	386.01	1 212.7	9 500
105 005 012	16"	-	404.27	1 270.0	10 900
105 005 017	17"	-	435.22	1 367.3	12 800
105 005 020	18"	-	460.62	1 447.1	14 200
105 005 023	19"	-	486.02	1 526.9	16 800
105 005 026	20"	A	511.42	1 606.7	17 700
105 005 071	20"	C	513.01	1 611.7	17 700
105 005 029	21"	C	536.82	1 686.5	19 900
105 005 032	22"	-	562.22	1 766.3	24 400
105 005 035	23"	-	587.62	1 846.1	26 600
105 005 037	24"	A	613.02	1 925.9	22 400
105 005 038	24"	B	614.61	1 930.9	22 400
105 005 072	25"	-	638.42	2 005.7	24 500
105 005 042	26"	-	663.82	2 085.5	24 500
105 005 043	28"	-	714.62	2 245.1	32 800
105 005 045	30"	-	765.42	2 404.6	34 900

Ball-tape setting ring gauge for truck wheels

The setting ring for the accuracy check of MAKRA truck wheel measuring tapes is made of artificially aged steel, hardened and grounded precisely. This ensures a minimal tolerance.

Part no.	Wheel size	Type	Diameter (mm)	Circumference (mm)	Weight (g)
105 005 019	17.5"	-	441.32	1 386.5	13 800
105 005 070	19.5"	-	492.12	1 546.0	16 800
105 005 034	22.5"	-	568.32	1 785.4	21 000
105 005 040	24.5"	-	619.12	1 945.0	23 000

WALL THICKNESS

Rim wall thickness measuring device

This measuring device is used to check the wall thickness on the rim drop center. The device offers a preset function and contains measuring calipers made of hardened steel to increase durability.

Part no.	Measuring range (mm)	Measuring depth (mm)	Accuracy (mm)
113 006 008	0-100	300	0.04



WHEEL MOUNTING SURFACE

Concavity gauge

This device with digital dial gauge and preset function enables convenient measurement of the concavity of the wheel attachment face.

Part no.	Measuring range (mm)	Wheel mounting surface (mm)	Measuring path (mm)	Error limit (mm)	Accuracy (mm)	Weight (g)
113 006 016	10	max. 200	130	0.02	0.01	2 030

Accessories: data cable on request





INCH

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+002,94

»O«

MODE/ON

CENTRE HOLE

Wheel pedestal

The wheel support table is utilized in 3D measuring machines and is used to determine the hub or mounting holes, including the depth measurement. The steel is stress-relieved, artificially aged and precisely ground. For easier handling, the wheel pedestal table is designed weight-optimized.

Basic dimensions:

Support height:	285 mm
Diameter of support:	180 mm
Diameter of base area:	250 mm

Part no.: 101 041 002



Bolt hole depth measuring device

The measuring device, either digital or analog, is used to measure the depth of bolt holes with a spherical or conical shape. The digital version offers a data interface and a preset function. The depth gauge is produced individually on customer request.



Setting master for depth measuring device

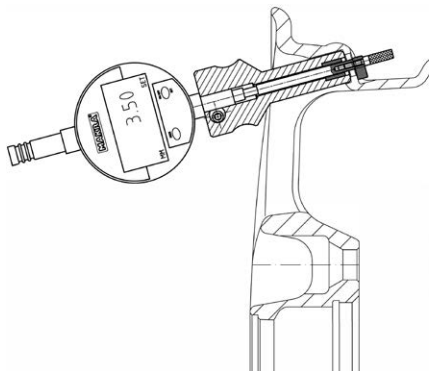
The accuracy of MAKRA bolt hole depth measuring devices can be verified and readjusted with the setting master. The master is produced to match your depth gauge.



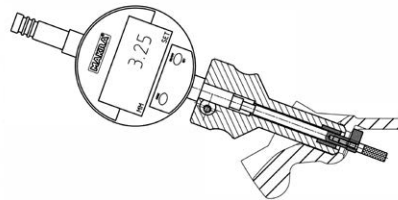
VALVE HOLES

Valve seat wall thickness measuring device

The accuracy of the valve seat is extremely important for the tightness of wheels. The measuring device with digital dial gauge for determining the wall thickness of the valve seat contains an interface for data transmission.



Measurement base inner attachment face



Measurement base 90° ball

Part no.	Measurement base	Measuring range (mm)	Accuracy (mm)	Weight (g)
113 006 012	Inner attachment face	20	0.01	330
113 006 013	90 ball	20	0.01	330

Accessories: data cable on request

LIFE CYCLE BUSINESS

The cross-sectoral division Life Cycle Business guarantees a tailor-made service offering for our customers in every stage of the product life cycle. To ensure correct measurement results, measuring and testing equipment should be regularly serviced and remeasured. We are pleased to check your handheld measuring devices for accuracy and repair any damage or correct deviations. Please contact us for technical clarification of the services.



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