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TEST WEIGHTS

Weights yesterday and today
For centuries now, weight pieces have been used in scales for weighing procedures. This original purpose has now almost disappeared. Today, weights are used almost exclusively for adjusting and testing = calibration of electronic balances. They are now named “test weights” as this is their contemporary purpose.

Adjustment or calibration?
▸ ***Adjusting*** a balance means that you are intervening in the weighing system, to make sure that the display is set to show the correct nominal value. With ▸ ***calibration*** on the other hand, there is no intervention, you are testing whether the display is correct and documenting any deviation.

Testing, the right way!
The internationally valid norm OIML R111:2004 classifies test weights hierarchically in accuracy classes, where E1 is the most accurate and M3 is the least accurate weight class. With KERN you get the whole test weight range in all OIML accuracy classes E1, E2, F1, F2, M1, M2, M3.

As the test weight only becomes an ▸ ***ISO 9000ff***-compliant test instrument when its accuracy has been proven, we offer the appropriate ▸ ***Calibration certificate with accreditation symbol*** (in connection with a box) for all KERN test weights. For further details see *Accredited Calibration Service.*

KERN offers you the appropriate test weight package for your balance, consisting of the test weight, box and Calibration certificate with accreditation symbol as proof of its accuracy. The best prerequisite for a correct adjustment or checking of your scales.

▸ ***See the Glossary***

Classes of accuracy of test weights E, F, M and their general relation to the types of balances.

The appropriate OIML tolerance class for the test weight is selected based on the scale’s resolution. The key factor for this is the scale’s increment count:

$$\text{Increment count [n]} = \frac{\text{Maximum capacity [Max]}}{\text{Division value [d]}}$$

E1	Test weights for customers who require a high degree of accuracy for the most demanding applications. For high-resolution balances with d > 1,000,000 Use recommended with Calibration certificate with accreditation symbol only.
E2	Most accurate test weights for high resolution analytical balances of verification class I ≥ 100,000 e
F1	Test weights for analytical balances/precision balances for verification class I/II ≤ 100,000 e
F2	Test weights for precision balances of verification class II ≤ 30,000 e
M1	Test weights for industrial and commercial scales of verification class III ≤ 10,000 e

The appropriate test weight for your new KERN balance can also be found directly in the accessories of the balance in our webshop.

KERN Delivery times & Shipping type	**Total weight ≤ 30 kg (gross weight, incl. packaging)**	**Total weight > 30 kg (gross weight, incl. packaging)**
Standard Service Class E2 – M3	4 DAYS	4 DAYS
Standard Service Class E1, 1 mg – 500 mg and recalibration 1 g – 10 kg with a known volume	10 DAYS	10 DAYS
Class E1, ≥ 1 g, incl. volume determination (new weights)	15 DAYS	15 DAYS
Special weights, Newton weights, heavy duty weights, weight carriers, containers for individual weight sets etc.	on request	

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Just lean back – we have just the right test weight for your measuring device

KERN offers you a large range of OIML test weights, which you can use at any time to quickly and reliably check your measuring instrument. From milligram weights to tonne weights, from the classic OIML design to special weights which are specifically manufactured to your specifications, we can offer you just the right test weight, and naturally the weights have the relevant calibration certificate with accreditation symbol or factory calibration certificate.

On the following pages you will see a selection of standard test weights for OIML error limit classes E1, E2, F1, F2, M1, M2, M3. We will be happy to manufacture special (large) weights, weight containers, Newton weights or weights with special weight values for you on request. Our test weights product specialist will be happy to give you expert, comprehensive advice.

Note: In our webshop you can conveniently select test weights for your scale that have been calculated and matched to your safety requirements and intended use – with or without calibration. We will be happy to determine the minimum sample quantity according to USP Chapter <41> and recommend a KERN Safety Set especially designed for your scale.

PREMIUM^{+} TEST WEIGHTS

Note: Our highly-accurate OIML test weights are also available as **PREMIUM^{+} test weights** for that extra level of safety. Thanks to the most modern manufacturing technology, these test weights can also be adjusted within the specified error limit classes (= tolerances).

I.e. this means that these **PREMIUM^{+} test weights** have a significantly longer service life, thanks this guaranteed positive tolerance. This is of particular benefit with intensive use of the test weights.

For all the details on this **PREMIUM^{+} service** please see **www.kern-lab.com/premium+** or look at the weight you want in our online shop

Marking – never lose track again!

With the large variety of test equipment used then it is essential that they are identified accurately. We can help you with this and mark your test weights according to your ideas by etching, with impact numbers or laser engraved. Whether it's letters, numbers, your logo, barcodes or something else – it's your choice.
Our product specialist "Test weights" will gladly help you with any questions about this service, prices, etc.

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SAFELY LOOKED AFTER

KERN weight boxes made of polyoxymethylene (“POM”) – for the most demanding requirements in highly-sensitive environments such as laboratories and clean rooms

You can rely on the highest quality and safety when storing your KERN test weights for clean room areas. KERN weight boxes made of polyoxymethylene (“POM”) are secure and easy to clean and are essential aids in clean rooms, laboratories or production environments because they protect your test weights perfectly and this enables consistently accurate and reliable measurements.

The robust construction means that there are no edges or padding which could collect dirt. This means that the boxes are particularly easy to clean hygienically.

For test weights in weight classes from E1 to M1, KERN clean room boxes offer further advantages in addition to protection, in order to meet the highest requirements in terms of cleanliness and absence of contamination. They do not require maintenance and are resistant to a range of cleaning products, acids, alkalis, disinfectants and solvents. They can also be cleaned in thermo disinfectors without any problems. In addition, repeated disinfection and cleaning ensures that they meet the highest standards of the clean room environment.

Please note: Our clean room boxes are also available in an antistatic version on request – for additional safety in hazardous areas.

All the advantages of KERN clean room boxes at a glance:

→ extremely stable and robust

→ can be fully disinfected

→ easy to clean

→ without padding or edges which could collect dirt

→ maintenance-free and long-lasting

→ for maximum safety and measurement results

Convenient screw thread without edges which could trap dirt – KERN clean room boxes in detail

→ Do you have any special requirements?

High-quality weight boxes e.g. on request we can also manufacture boxes for rectangular weights or complete weight sets to suit your individual requirements.

We will be happy to advise you.

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Our KERN weight cases at a glance:

for individual weights **Plastic box**

for individual weights **Aluminium protected box**

for individual weights **Wooden box, lined / unlined**

for individual weights **Polyoxymethylene boxes POM, unlined**

for weight sets **Plastic case**

for weight sets **Aluminium protected case**

for weight sets **Wooden case, lined / unlined**

It's your choice!

To protect your test weights we can offer you an appropriate weight case. Choose the right box for your needs. You have the choice between plastic, aluminium protected, wood or polyoxymethylene. The available weight cases are shown as a symbol in the test weight tables on the following pages. This way you have all the materials, versions, sizes and prices at a glance, listed in a concise way.

On request only:
for weight sets
Clean room boxes POM (polyoxymethylene), unlined

It's so easy to order your suitable test weight

1 → **2** → **3** → **4**

According to your safety requirements or the specifications of your QM system, you select the test weight with the appropriate weight value and the required tolerance.

We offer many test weights in different designs, giving you complete freedom to decide which test weights you want to use for your application. It goes without saying that all our test weights comply with the OIML R111:2004 directive.

To protect your high-quality test equipment, we offer you cases in various designs.

A calibration certificate with accreditation symbol – the auditor's favourite! With this certificate you provide the standard-compliant proof of all important values of your test equipment and are on the safe side when operating and testing your measuring equipment.

1 **2** **3** **4**

Weight	Tol +/- mg	Individual weights, compact shape		Individual weights, knob shape		Plastic box		Aluminium protected box		Wooden box		DAkkS-accredited certificate	
		KERN	€	KERN	€	KERN	€	KERN	€	KERN	€	KERN	€
1 g	0,03	316-01	41,-	317-01	51,-	317-020-400	5,-	317-010-600	14,-	317-010-100	32,-	962-331	36,-
2 g	0,04	316-02	42,-	317-02	53,-	317-020-400	5,-	317-020-600	14,-	317-020-100	30,-	962-332	36,-
5 g	0,05	316-03	43,-	317-03	55,-	317-030-400	5,-	317-030-600	14,-	317-030-100	32,-	962-333	36,-
10 g	0,06	316-04	47,-	317-04	57,-	317-040-400	5,-	317-040-600	14				36,-
20 g	0,08	316-05	48,-	317-05	64,-	317-050-400	5						
		316-06	53,-	317-06	71,-								

1 **2** **3** **4**

Weight	Knob shape in plastic case		Knob shape in aluminium protected case		Knob shape in wooden case		DAkkS-accredited certificate	
	KERN	€	KERN	€	KERN	€	KERN	€
1 mg - 500 mg	328-22	165,-	328-226	230,-	-	-	962-450	128,-
1 mg - 50 g	333-024	365,-	333-026	410,-	333-02	370,-	962-401	215,-
1 mg - 100 g	333-034	400,-	333-036	450,-	333-03	405,-	962-402	225,-
1 mg - 200 g	333-044	480,-	333-046	520,-	333-04	490,-	962-403	250,-
1 mg - 500 g	333-054	540,-	333-056	600,-	333-05	560,-	962-404	260,-
1 mg - 1 kg	333-064	710,-	333-066	750,-				280,-
1 mg - 2 kg	333-074	950,-	333-076					

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Selection of the appropriate test weight for your balance

A balance can never be more accurate than the test weight that is used to adjust it, it all depends on its tolerance. **The accuracy of the test weight should correspond to the readout [d] of the balance, or rather be more precise.**

Nominal test weight value is shown in adjust mode “CAL” in the balance display. Given a choice, the heaviest weight is the most suitable for accurate measurement.

Once accuracy and nominal test weight value are specified, the suitable test weight is selected according to the tolerances “Tol” of the individual accuracy classes E2 – M3, see column “Tol ± mg” at the respective weight.

Example:
Balance with weighing range [Max] 2000 g = 2 kg and readout [d] = 0,01 g = 10 mg

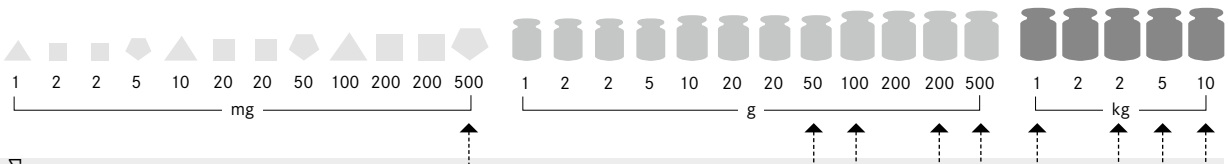
- The accuracy of the required test weight is determined by readout [d]: max. tolerance ± 10 mg.
- Displayed weight size on “CAL” mode: 1000 g or 2000 g. The required test weight has a 2 kg weight size.
- Suitable test weights with ± 10 mg tolerance and 2 kg weight size, can be found in accuracy class F1. KERN-No 326-12 or KERN-No 327-12.

Exception: analytical balances (readout [d] ≤ 0,1 mg):
E1 test weights are recommended. Depending on the safety requirements, E2 test weights with a calibration certificate with accreditation symbol will also be sufficient.

From finely turned to polished stainless steel – the right test weight for every situation

Test weight → / Features ↓	Knob shape with lifting knob, polished stainless steel	Compact shape with carrying grip, polished stainless steel	Knob shape with lifting knob, polished stainless steel	ECO shape, polished stainless steel	Knob shape with lifting knob, finely turned stainless steel
Conforms to OIML:R111	yes	yes	yes	yes	yes
Available classes	E1, E2	E2	F1	F1	F2, M1
Upper surface	polished	polished	polished	polished	finely turned
Material	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Adjusting cavity	no	no	yes	yes, from 50 g, readjustment can only be carried out by KERN	yes, from 20 g
Marking (Milligram weights, generally none)	none	none	Nominal value, etched	Nominal value, etched	F2: Class + nominal value, etched; M1: Class + nominal value, adopted
Checking equipment for verification purposes	approved (E2)	approved	approved	approved	approved (M1)
Ideal as checking equipment in QM systems (e.g. ISO 9000 ff)	yes	yes	yes	yes	yes
Benefits	• High-quality test weight for analytical and precision balances • Highly-refined surface • Ideal shape of the top for good grip	• Affordable test weight for analytical and precision balances • Highly refined surface	• Ideal, high-quality test weight for precision balances • No visible adjustment chamber • High long-term stability • Ideal shape of the top for good grip	• Affordable test weight for analytical and precision balances • Highly refined surface • Optimum shape of the top for good grip	• Ideal test weight for commercial and industrial scales • Ideal shape of the top for good grip

Composition table, valid for all KERN test weight sets from 1 mg



Test weight set	
1 mg–500 mg	∑ = 1,11 g
1 mg–50 g	∑ = 111,11 g
1 mg–100 g	∑ = 211,11 g
1 mg–200 g	∑ = 611,11 g
1 mg–500 g	∑ = 1.111,11 g
1 mg–1 kg	∑ = 2.111,11 g
1 mg–2 kg	∑ = 6.111,11 g
1 mg–5 kg	∑ = 11.111,11 g
1 mg–10 kg	∑ = 21.111,11 g

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The key points from the OIML norm R111:2004
OIML (Organisation Internationale de Métrologie Légale) has established the exact metrological requirements for weights in verified applications in approx. 100 states all over the world.

The OIML guideline R111 (2004 Edition) for weights relates to sizes 1 mg – 5000 kg. Statements are made on the accuracy, materials, geometric shape, marking and storage of the weights.

Error limits for weights of classes E1 to M3
The error limit classes are in fixed hierarchical levels in the proportion of 1:3, where E1 is the most accurate and M3 is the least accurate weight class. When testing weights with other weights, the correct test class is the next highest class.

Error limit classes (= tolerances)
The values given in the table below (tolerances ± ... mg) are the respective permitted fabrication tolerances.

They are to be equal to the
▸ ***measuring uncertainty*** of the weight, if no
▸ ***Calibration certificate with accreditation symbol*** is available.

Conventional mass
The problem is the air buoyancy, which makes the weight appear lighter. In order to avoid this "distortion" in daily use, all weights are adjusted to the unit specifications as given in R111, e.g. it is accepted that: material density of the weights is 8000 kg/m^3, air density is 1.2 kg/m^3 and measuring temperature is 20 °C.

KERN test weights:
Unless otherwise specified, they conform to OIML R111:2004 in every detail.

▸ ***See the Glossary***

Nominal value — **OIML R111:2004 Maximum permissible errors for weights = permissible tolerances "Tol ± mg"**

↓	E1	E2	F1	F2	M1	M2	M3
1 mg	± 0,003 mg	± 0,006 mg	± 0,020 mg	± 0,06 mg	± 0,20 mg	-	-
2 mg	± 0,003 mg	± 0,006 mg	± 0,020 mg	± 0,06 mg	± 0,20 mg	-	-
5 mg	± 0,003 mg	± 0,006 mg	± 0,020 mg	± 0,06 mg	± 0,20 mg	-	-
10 mg	± 0,003 mg	± 0,008 mg	± 0,025 mg	± 0,08 mg	± 0,25 mg	-	-
20 mg	± 0,003 mg	± 0,010 mg	± 0,03 mg	± 0,10 mg	± 0,3 mg	-	-
50 mg	± 0,004 mg	± 0,012 mg	± 0,04 mg	± 0,12 mg	± 0,4 mg	-	-
100 mg	± 0,005 mg	± 0,016 mg	± 0,05 mg	± 0,16 mg	± 0,5 mg	± 1,6 mg	-
200 mg	± 0,006 mg	± 0,020 mg	± 0,06 mg	± 0,20 mg	± 0,6 mg	± 2,0 mg	-
500 mg	± 0,008 mg	± 0,025 mg	± 0,08 mg	± 0,25 mg	± 0,8 mg	± 2,5 mg	-
1 g	± 0,010 mg	± 0,03 mg	± 0,10 mg	± 0,3 mg	± 1,0 mg	± 3,0 mg	± 10 mg
2 g	± 0,012 mg	± 0,04 mg	± 0,12 mg	± 0,4 mg	± 1,2 mg	± 4,0 mg	± 12 mg
5 g	± 0,016 mg	± 0,05 mg	± 0,16 mg	± 0,5 mg	± 1,6 mg	± 5,0 mg	± 16 mg
10 g	± 0,020 mg	± 0,06 mg	± 0,20 mg	± 0,6 mg	± 2,0 mg	± 6,0 mg	± 20 mg
20 g	± 0,025 mg	± 0,08 mg	± 0,25 mg	± 0,8 mg	± 2,5 mg	± 8,0 mg	± 25 mg
50 g	± 0,03 mg	± 0,10 mg	± 0,3 mg	± 1,0 mg	± 3,0 mg	± 10 mg	± 30 mg
100 g	± 0,05 mg	± 0,16 mg	± 0,5 mg	± 1,6 mg	± 5,0 mg	± 16 mg	± 50 mg
200 g	± 0,10 mg	± 0,3 mg	± 1,0 mg	± 3,0 mg	± 10 mg	± 30 mg	± 100 mg
500 g	± 0,25 mg	± 0,8 mg	± 2,5 mg	± 8,0 mg	± 25 mg	± 80 mg	± 250 mg
1 kg	± 0,5 mg	± 1,6 mg	± 5,0 mg	± 16 mg	± 50 mg	± 160 mg	± 500 mg
2 kg	± 1,0 mg	± 3,0 mg	± 10 mg	± 30 mg	± 100 mg	± 300 mg	± 1 000 mg
5 kg	± 2,5 mg	± 8,0 mg	± 25 mg	± 80 mg	± 250 mg	± 800 mg	± 2 500 mg
10 kg	± 5,0 mg	± 16 mg	± 50 mg	± 160 mg	± 500 mg	± 1 600 mg	± 5 000 mg
20 kg	± 10 mg	± 30 mg	± 100 mg	± 300 mg	± 1 000 mg	± 3 000 mg	± 10 g
50 kg	± 25 mg	± 80 mg	± 250 mg	± 800 mg	± 2 500 mg	± 8 000 mg	± 25 g
100 kg	-	± 160 mg	± 500 mg	± 1 600 mg	± 5 000 mg	± 16 g	± 50 g
200 kg	-	± 300 mg	± 1 000 mg	± 3 000 mg	± 10 g	± 30 g	± 100 g
500 kg	-	± 800 mg	± 2 500 mg	± 8 000 mg	± 25 g	± 80 g	± 250 g
1 000 kg	-	± 1 600 mg	± 5 000 mg	± 16 g	± 50 g	± 160 g	± 500 g
2 000 kg	-	-	± 10 g	± 30 g	± 100 g	± 300 g	± 1 000 g
5 000 kg	-	-	± 25 g	± 80 g	± 250 g	± 800 g	± 2 500 g

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TEST WEIGHTS AND BOXES CLASS M1

Milligram weights,
flat polygonal sheet

Individual weights/weight sets,
knob shape, finely turned
stainless steel

Hook weights, finely turned
stainless steel

Slotted weights, finely turned
stainless steel

Plastic box, for individual
weights ≤ 200 g, for hook
weights and slotted weights
≤ 50 g

Plastic box, lined, for
individual weights ≥ 500 g,
for hook weights and
slotted weights ≥ 100 g

Aluminium protected box,
lined, for individual weights

Wooden box, not lined,
for individual weights
≤ 500 g

Wooden box, not lined,
for individual weights ≥1 kg

Milligram weight
set in plastic case
(348-22)

Milligram weight
set in aluminium
protected case,
lined (348-226)

Plastic case, lined, for weight sets,
knob shape, finely turned
stainless steel

Aluminium protected case, lined,
for weight sets, knob shape,
finely turned stainless steel

Wooden case, for weight sets,
knob shape, finely turned
stainless steel

Test weights (10 – 50 kg), finely turned
stainless steel KERN 347-141 ff,
optional: Wooden box

Beam bars, aluminium or
stainless steel

Block weights, lacquered cast iron/stainless steel glass bead blasted,
optional: Aluminium protected box, lined

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Class M1 · Milligram weights, flat polygonal sheet

Test weight material: stainless steel

Weight	Tol +/- mg	Milligram weight, flat polygonal sheet	Plastic box	Aluminium protected box	Wooden box	DAkkS-accredited certificate
		KERN	KERN	KERN	KERN	KERN
1 mg	0,20	348-01	347-009-400	317-009-600	338-090-200	962-651
2 mg	0,20	348-02	347-009-400	317-009-600	338-090-200	962-652
5 mg	0,20	348-03	347-009-400	317-009-600	338-090-200	962-653
10 mg	0,25	348-04	347-009-400	317-009-600	338-090-200	962-654
20 mg	0,30	348-05	347-009-400	317-009-600	338-090-200	962-655
50 mg	0,40	348-06	347-009-400	317-009-600	338-090-200	962-656
100 mg	0,50	348-07	347-009-400	317-009-600	338-090-200	962-657
200 mg	0,60	348-08	347-009-400	317-009-600	338-090-200	962-658
500 mg	0,80	348-09	347-009-400	317-009-600	338-090-200	962-659

Class M1 · Individual weights, knob shape

Test weights material: stainless steel

Weight	Tol +/- mg	Individual weight	Plastic box	Aluminium protected box	Wooden box	DAkkS-accredited certificate
		KERN	KERN	KERN	KERN	KERN
1 g	1,0	347-01	347-030-400	317-010-600	337-010-200	962-631
2 g	1,2	347-02	347-030-400	317-020-600	337-020-200	962-632
5 g	1,6	347-03	347-030-400	317-030-600	337-030-200	962-633
10 g	2,0	347-04	347-050-400	317-040-600	337-040-200	962-634
20 g	2,5	347-05	347-050-400	317-050-600	337-050-200	962-635
50 g	3,0	347-06	347-070-400	317-060-600	337-060-200	962-636
100 g	5,0	347-07	347-070-400	317-070-600	337-070-200	962-637
200 g	10	347-08	347-080-400	317-080-600	337-080-200	962-638
500 g	25	347-09	347-090-400	317-090-600	337-090-200	962-639
1 kg	50	347-11	347-110-400	317-110-600	337-110-200	962-641
2 kg	100	347-12	347-120-400	317-120-600	337-120-200	962-642
5 kg	250	347-13	347-130-400	317-130-600	337-130-200	962-643
10 kg	500	347-14	347-140-400	317-140-600	337-140-200	962-644

Class M1 · Block weights

Block weight material: lacquered cast iron, surface and edges machined or unmachined (ECO)

Weight	Tol +/- g	Block weight	ECO Block weight	Aluminium protected box	DAkkS-accredited certificate
		KERN	KERN	KERN	KERN
5 kg	0,25	346-86	346-76	346-060-600	962-643
10 kg	0,50	346-87	346-77	346-070-600	962-644
20 kg	1,00	346-88	346-78	346-080-600	962-645
50 kg	2,50	346-89	346-79	346-090-600	962-646

Class M1 · Block weights

Block weight material: stainless steel glass bead blasted

Weight	Tol +/- g	Block weight	Aluminium protected box	DAkkS-accredited certificate
		KERN	KERN	KERN
5 kg	0,25	346-06	346-060-600	962-643
10 kg	0,50	346-07	346-070-600	962-644
20 kg	1,00	346-08	346-080-600	962-645
50 kg	2,50	346-09	346-090-600	962-646

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Class M1 · Test weights, stackable

Test weight material: finely turned stainless steel

Weight	Tol +/- g	Test weight	Wooden box	DAkkS-accredited certificate
		KERN	KERN	KERN
5 kg	0,25	347-131	337-131-200	962-643
10 kg	0,5	347-141	337-141-200	962-644
20 kg	1,0	347-151	337-151-200	962-645
50 kg	2,5	347-161	337-161-200	962-646

Class M1 · Heavy duty weights, stackable

Heavy duty weight material: lacquered steel
Designed to be lifted with forklift trucks or cranes, delivery time is approx. 6–8 weeks
Dimensions: see internet

Weight	Tol +/- g	Heavy duty weight	DAkkS-accredited certificate
		KERN	KERN
100 kg	5	346-81	962-691
200 kg	10	346-82	962-692
500 kg	25	346-83	962-693
1000 kg	50	346-84	962-694
2000 kg	100	346-85	962-695

Class M1 · Weight sets, knob shape

Test weight material: Milligram weights stainless steel, individual weights finely turned stainless steel

Weight	Knob shape, in plastic case	Knob shape, in aluminium protected case	Knob shape, in wooden case	DAkkS-accredited certificate
	KERN	KERN	KERN	KERN
1 mg - 500 mg	348-22	348-226	-	962-650
1 mg – 50 g	343-024	343-026	343-02	962-601
1 mg – 100 g	343-034	343-036	343-03	962-602
1 mg – 200 g	343-044	343-046	343-04	962-603
1 mg – 500 g	343-054	343-056	343-05	962-604
1 mg – 1 kg	343-064	343-066	343-06	962-605
1 mg – 2 kg	343-074	343-076	343-07	962-606
1 mg – 5 kg	343-084	343-086	343-08	962-607
1 mg – 10 kg	-	343-096	343-09	962-608
1 g – 50 g	344-024	344-026	344-02	962-615
1 g – 100 g	344-034	344-036	344-03	962-616
1 g – 200 g	344-044	344-046	344-04	962-617
1 g – 500 g	344-054	344-056	344-05	962-618
1 g – 1 kg	344-064	344-066	344-06	962-619
1 g – 2 kg	344-074	344-076	344-07	962-620
1 g – 5 kg	344-084	344-086	344-08	962-621
1 g – 10 kg	-	344-096	344-09	962-622

Tip:
We also offer a large range of heavy-duty weights in other materials, (e.g. stainless steel) and in other forms (e.g. discs) or individual weight containers, please ask for details.

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Class M1 · Slotted weights

Slotted weight material: finely turned stainless steel

Weight	Tol +/- mg	Slotted weight	Plastic box, lined	DAkkS-accredited certificate
		KERN	KERN	KERN
1 g	1,0	347-015	347-030-400	962-631
2 g	1,2	347-025	347-030-400	962-632
5 g	1,6	347-035	347-030-400	962-633
10 g	2,0	347-045	347-030-400	962-634
20 g	2,5	347-055	347-080-400	962-635
50 g	3,0	347-065	347-080-400	962-636
100 g	5,0	347-075	347-090-400	962-637
200 g	10	347-085	347-090-400	962-638
500 g	25	347-095	347-110-400	962-639
1 kg	50	347-115	347-130-400	962-641
2 kg	100	347-125	347-130-400	962-642
5 kg	250	347-135	347-140-400	962-643
10 kg	500	347-145	347-140-400	962-644

Class M1 · Beam bars, for fixing slotted weights

Beam bars material: 10 g: aluminium, 100 g–1 kg: finely turned stainless steel

Own weight beam bar	Maximum total load [1]	Largest slotted weight possible	Material	Length	Beam bar	DAkkS-accredited certificate
					KERN	KERN
10 g	200 g	100 g	Aluminium	117,5	347-445-100*	962-634
100 g	2 kg	1 kg	Stainless steel	238	347-075-100**	962-637
500 g	20 kg	10 kg	Stainless steel	639	347-095-100***	962-639
1 kg	40 kg	10 kg	Stainless steel	1020	347-115-100***	962-641

[1] is exclusive of the own weight of the beam bar, e.g. the maximum possible total weight is calculated from "Maximum total load" + "own weight beam bar"

Class M1 · Slotted weights

Slotted weight material: finely turned stainless steel (only compatible with the 347-...7-100 series supporting bars)

Weight	Tol +/- mg	Slotted weight	DAkkS-accredited certificate
		KERN	KERN
5 g	1,6	347-037	962-633
10 g	2,0	347-047	962-634
20 g	2,5	347-057	962-635
50 g	3,0	347-067	962-636
100 g	5,0	347-077	962-637
200 g	10	347-087	962-638
500 g	25	347-097	962-639
1 kg	50	347-117	962-641
2 kg	100	347-127	962-642
5 kg	250	347-137	962-643
10 kg	500	347-147	962-644

Class M1 · Beam bars, for fixing slotted weights

Beam bars material: 10 g: aluminium, 100 g–1 kg: finely turned stainless steel (only compatible with the 347-...7 series slotted weights)

Own weight beam bar	Maximum total load [1]	Largest slotted weight possible	Material	Length	Tol +/- mg	Beam bar	DAkkS-accredited certificate
						KERN	KERN
1 kg	46 kg	10 kg	Stainless steel	300 mm	50	347-117-100	962-641
5 kg	95 kg	10 kg	Stainless steel	600 mm	250	347-137-100	962-643
10 kg	126 kg	10 kg	Stainless steel	800 mm	500	347-147-100	962-644

[1] is exclusive of the own weight of the beam bar, e.g. the maximum possible total weight is calculated from "Maximum total load" + "own weight beam bar"

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Class M1 · Hook weights

Hook weight material: finely turned stainless steel

Weight	Tol +/- mg	Hook weight	Plastic box, linned	DAkkS-accredited certificate
		KERN	KERN	KERN
1 g	1,0	347-016	347-030-400	962-631
2 g	1,2	347-026	347-030-400	962-632
5 g	1,6	347-036	347-030-400	962-633
10 g	2,0	347-046	347-050-400	962-634
20 g	2,5	347-056	347-050-400	962-635
50 g	3,0	347-066	347-070-400	962-636
100 g	5,0	347-076	347-090-400	962-637
200 g	10,0	347-086	347-090-400	962-638
500 g	25,0	347-096	347-110-400	962-639
1 kg	50,0	347-116	347-120-400	962-641
2 kg	100,0	347-126	347-130-400	962-642
5 kg	250,0	347-136	347-140-400	962-643
10 kg	500,0	347-146	–	962-644

Newton weights (N):

All hook and slotted weights as well as beam bars are available **with N adjustment according to M1 tolerances**
We need to know the exact location of use of the newton weights (street, postcode, city and country).
Calibration certificates with accreditation symbol for N weights: identical to DAkkS prices for individual weights **M1**

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KERN Pictograms

Internal adjustment
Quick setting up of the balance's accuracy with internal adjusting weight

External adjustment
Quick setting up of the balance's accuracy with external adjusting weight

EasyTouch
Suitable for the connection, data transmission and control through PC or tablet

Memory
Device memory capacity, e.g. for article data, measuring data, tare weights, PLU etc.

Alibi memory
Secure, electronic archiving of measuring results, complying with the 2014/31/EU standard

Data interface RS-232
To connect the device to a printer, PC or other peripherals. Suitable for data transfer over large distances. Network in bus topology is possible

Data interface RS-48
To connect the device to a printer, PC or other peripherals. Suitable for data transfer over large distances. Network in bus topology is possible

KERN Universal Port (KUP)
allows the connection of external KUP interface adapters, e.g. RS-232, RS-485, SB, Bluetooth, WiFi, Analogue, Ethernet etc. for the exchange of data and control commands, without installation effort

USB data interface
To connect the device to a printer, PC or other peripherals

Bluetooth* data interface
To transfer data to a printer, PC or other peripherals

WiFi data interface
To transfer data to a printer, PC or other peripherals

Control outputs (optocoupler, digital I/O)
To connect relays, signal lamps, valves, etc.

User Management
The measuring device enables the creation of passwordprotected user profiles with different authorisation levels

Statistics
sing the saved values, the device calculates statistical data, such as average value, standard deviation etc.

Analogue interface
To connect a suitable peripheral device for analogue processing of the measurements

PC Software
to transfer the measurements from the device to a PC

Network interface
For connecting the measuring device to an Ethernet network

KERN Communication Protocol (KCP)
A standardized interface command set for KERN balances and other instruments, which allows retrieving and controlling all relevant parameters and functions of the device. KERN devices featuring KCP are thus easily integrated with computers, industrial controllers and other digital systems

GLP/ISO log internal
The measuring device generates a GLP-compliant printout, independent of a printer connection

Value & Time
The measuring device outputs the value, date and time, regardless of the connected printer

Piece counting
Reference quantities selectable. Display can be switched from piece to weight

Net-Total
The weights of the recipe ingredients can be added together and the total weight of the recipe can be printed out

Formulation
Internal memory for complete recipes with name and target value of the recipe ingredients. User guidance through display

Totalising function
The weights of similar items can be added together and the total can be printed out

Density Determination
The density of liquids and solids with a density of ≤/≥ 1 is determined directly in the measuring device

Percentage determination
Determining the deviation in % from the target value (100 %)

Units
Can be switched to e.g. nonmetric units. For further details see website

Mesuring with tolerance range (Check weighing)
Upper and lower limiting can be programmed individually, e.g. for sorting and dosing. The process is supported by an audible or visual signal, see the relevant model

Hold function
When the weighing conditions are unstable, a stable weight is calculated as an average value

Protection against dust and water splashes IPxx
The type of protection is shown in the pictogram

Suspended weighing
Load support with hook on the underside of the balance

Battery operation
Ready for battery operation. The battery type is specified for each device

Rechargeable battery pack
Rechargeable set

Universal plug-in power supply
with universal input and optional input socket adapters for EU, CH, GB or EU, CH, GB, US or EU, CH, GB, US, AUS

Plug-in power supply
230V/50Hz in standard version for EU. On request GB, AUS or US version available

Integrated power supply unit
Integrated in measuring device. 230V/50Hz standard EU. More standards e.g. GB, AUS or US on request

Weighing principle Strain Gauges
Electrical resistor on an elastic deforming body

Weighing principle Tuning Fork
A resonating body is electromagnetically excited, causing it to oscillate

Weighing principle Electromagnetic Force Compensation
Coil inside a permanent magnet. For the most accurate weighings

Weighing principle Single-Cell Technology
Advanced version of the force compensation principle with the highest level of precision

Conformity assessment
The time required for conformity assessment is 3 working days

Accredited calibration (DKD)
The time required for accredited calibration is 3 working days

Factory calibration (ISO)
The time required for factory calibration is 4 working days

Package shipment
The time required for internal shipping preparations is shown in days in the pictogram

Pallet shipment
The time required for internal shipping preparations is shown in days in the pictogram

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