

Weights Competence



Our Expertise

Your Cornerstone for Reliable Results

METTLER TOLEDO

Our Unique Know-how Ensures the Highest Accuracy

For our weights, we source only the finest quality austenitic steel which offers the highest resistance to corrosion over the course of a weight's lifetime. Our unique manufacturing process involves melting the steel under vacuum, traditional mechanical polishing, final stage electrolytic polishing, fully automated cleaning processes and final calibration using state-of-the-art mass comparators. The process has been perfected over years of experience to bring you accurate weights of the highest quality, with a stability that remains unmatched in the market.



Custom Materials

Our specially produced super-austenitic stainless steel is cast under vacuum to reduce undesired trace elements, remove dissolved gases and improve oxide cleanliness. This optimizes the physical properties of the steel; e.g. density is highly reproducible.



Expert Polishing

In a two-stage process, our highly experienced polishers first mechanically polish each weight by hand. Their special skills and expertise ensure a consistent, high quality finish as the perfect preparation for the second stage electrolytic polishing.



Robot Calibration

Substantial investment in cutting-edge robot technology, combined with decades of experience, guarantees the highest standard of weight calibration. Computer-controlled processes eliminate human error, producing consistent and reproducible results with low uncertainty values.



Electrolytic Polishing

Provides Stability and Longevity

METTLER TOLEDO's proprietary electrolytic polishing process eliminates microscopic protrusions in the weight's surface which is far smoother compared to mechanical polishing. Thanks to the enhanced properties of the passive oxide film, long-term stability of the weight is improved.

The weight is connected to the anode of a DC circuit and immersed in a temperature-controlled bath of customized electrolyte which acts as the cathode. By applying a controlled current to the system, a microscopic amount of the weight's surface is transferred to the electrolyte to provide the following benefits:

- Stable weight value due to reduction in surface roughness
- Higher accuracy as all trace elements have been removed (e.g. graphite)
- Better corrosion resistance thanks to the dense oxide layer covering the weight¹⁾



Durable Weight Properties

The current density and immersion time are precisely adjusted to produce a weight in the upper tolerance range for accuracy. This minimizes the impact of weight loss incurred through normal use to provide a far longer working life.

¹⁾ Source: ASTM, Designation B912-02



Computer-controlled Calibration

Under full computer control, individual weight measurements are transferred automatically to the electrolytic polishing machine. The software evaluates the required parameters to adjust each weight to the targeted tolerance.

Electrolyte Bath ▶

The electrochemical process removes microscopic protrusions from the weight's surface to produce an extremely smooth finish and accurately adjust the weights to the required values.



Anode +

Cathode -

Weight Verification System

Guarantees Traceable Balance Testing

In our innovative WeightLink™ system, every test weight has a unique identification number (UIN) on its base which 'links' it to its calibration certificate. Calibration data is stored in a second data matrix code (DMC), enabling information from the certificate to be read electronically. The dedicated DMC Scanner reads the two codes and sends the information to the balance. The balance firmware validates the certificate and weight data before allowing the balance test to begin.

With this highly efficient system, it is impossible to test using the wrong weight and the risk of errors from manual data entry is completely eliminated. Full traceability of balance tests is achieved in four easy steps:

1. Scan certificate data
2. Scan weight
3. Perform balance test
4. Print report



Proven Traceability

The built-in balance testing application records the weight-specific data and the test results. A detailed test report can be printed out with an external printer to provide full documentation of the performed balance test.



Enhanced Security

WeightLink™ will only allow the use of a valid test weight. Verification of the test weight prior to use means you can rest assured that your testing procedures are fully compliant.



Improved Productivity

Automatic data transfer of weight parameters into the balance firmware is much faster than manual data entry and removes the need to check and re-check handwritten entries. Printing out results is quick and easy.



Easy Setup

WeightLink™ weights are available from 1 g to 5 kg and the data matrix scanner simply plugs into the back of your balance. Your local METTLER TOLEDO representative can advise you on compatible balance firmware versions and their availability.

► www.mt.com/weightlink

Microgram Weights

Push the Boundaries of Engineering

At the extreme end of weights engineering, the nominal values of the microgram weights range from 0.05 mg to 0.5 mg with an outstanding level of calibration uncertainty of just 0.0002 mg (0.2 micrograms). The microgram weights range was developed largely in response to the needs of the nanotechnology market which typically involves the manufacture of objects with dimensions of less than 100 nanometers (smaller than one ten-millionth of a meter), for example computer chips and microscopic devices.

METTLER TOLEDO developed a unique automated manufacturing process to ensure precise and reproducible shapes for each nominal weight; the smallest nominal weight, 0.05 mg, uses wire with a diameter of just 0.05 mm – the width of a human hair. Calibrating the microgram weights with a robotic comparator, such as METTLER TOLEDO's 'a5' system, helps to achieve the lowest possible uncertainty values.

Compact Kit Format

Separate storage box and individual aluminum containers for each weight in a range from 0.05 mg up to 0.5 mg.

Flexibility

Space for customer specific additions, such as 1 mg weights.

Process Efficiency

Removable magazine with integrated wind-shield for required acclimatization and pre-weighing preparations.

Accessories

Tweezers with ceramic tips and special hook for proper handling.





“It’s the biggest thing to hit the smallest weights!”

On 18 September 2012, the United Kingdom’s National Measurement Office became the world’s first mass calibration laboratory to be accredited to ISO 17025 for the calibration of mass standards down to 0.05 mg, with uncertainties as low as 0.0002 mg.

John Pain, Calibration Manager, worked in collaboration with METTLER TOLEDO to achieve this pioneering distinction. He commented: “It’s never been done before, there was no blueprint or procedure to copy. We had to develop an effective method to calibrate weights so small that you can hardly see them, along with new methods of calculating uncertainties that would satisfy UKAS requirements. The relationship with METTLER TOLEDO was excellent: when one of the top calibration labs in the world teams up with a world class manufacturer... the outcome is special.”

The two organizations offer a combined supply and calibration service to customers worldwide.



John Pain with the new microgram weights and METTLER TOLEDO’s ‘a5’ comparator



0205



National
Measurement
Office

Heavy Capacity Weights Ensure Industrial Precision

It is not only balances in laboratories which require regular testing; scales and weighing platforms in industrial environments are also subject to regulations to ensure measurements are reliable and within the law. In accordance with the regulations, the weights used for such tests, which may be up to 2 tons, must be calibrated using a weight from a higher weight class.

METTLER TOLEDO offers a range of high capacity weights in OIML Class F suitable for calibrating weights in Class M and lower. The high-grade stainless steel weights range from 100 kg to 2 t and have a mirror-polished surface which guarantees long term weight stability suitable for repeated calibration procedures. The high capacity weights are available in a range of shapes to suit the different needs of calibration laboratories.



Easy Stacking

Safely stackable reference weights allow straightforward calibration of small and large test weights.

Test Weight Calibration

Test weights, such as this 1000 kg Class M1 cast iron weight, must be calibrated using a reference weight in a higher class.

► www.mt.com/industrial-weights



Cylindrical Weights

The individual weights are available in different nominal values and have an integrated eyebolt for easy lifting by a crane. The high-gloss finish is protected with a sturdy aluminum box.



Rectangular Weights

These weights can be easily combined to achieve different total reference weights and also save on storage space. They are designed to have a low center of gravity to ensure safe stacking.



Disc Weights

The discs are available in standard units of 50 kg and offer maximum flexibility for combining to create a total reference weight. The uniform design ensures convenient handling.

Our Expertise

From Micrograms to Tons

METTLER TOLEDO has an extensive weight portfolio, from low capacity weights for the laboratory to high capacity weights for industrial applications – all available in appropriate weight classes to meet your individual requirements.



Laboratory Weights

- Single weights and weight sets
- 0.05 mg - 50 kg, Class E0* plus OIML Classes E1 - M1
- 1 mg - 20 kg, ANSI/ASTM Classes 1,4
- Positive tolerances with 'Stay-in-Tolerance' lifetime guarantee for Signature Line weights

*Applies to METTLER TOLEDO microgram weights



CarePacs®

- Manufacturer recommended weight sets with two selected weights for testing balance weighing ranges up to 8 kg
- Easy and quick to use testing approach supported by manufacturer SOPs
- Test against process tolerances as low as 0.03 %



Industrial Weights

- 1 kg - 5 tons, OIML Classes F1 - M3
- Stackable heavy capacity cast iron weights for safe stacking and handling
- Stainless steel grip handle weights are available for the highest quality requirements in regulated industries

www.mt.com/weights

For more information



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