Quantos Powder Dosing

Simplified Powder Dosing
for Maximum Accuracy and Safety

METTLER TOLEDO

The Powder Challenge
for Precise Dosing

The first step in sample preparation for analytical methods, such as HPLC, is precise and correct weighing of your substance. It's slow and repetitive, and often causes bottlenecks in the laboratory. Some powders are toxic, others just hard to handle. And you have the worry about accuracy too, since any error in the weighing process can be carried through into the subsequent analysis.

Very small target weights and tight tolerances make the weighing-in of powders even more challenging. Recalculations due to loss on transfer following back-weighing are prone to human error, and handling hazardous or toxic substances may impact user safety.

Handling difficulties	**Safety concerns**	**Risk of human error**

Powders can be hygroscopic, temperature-sensitive, or susceptible to electrostatic charge. External influences make powders tricky to handle, affect the speed of the weighing and the quality and reproducibility of results.

Weighing hazardous substances is challenging. Even small amounts might be enough to pose a health risk. This usually means working in an enclosed environment, but weighing within a glove box can be cumbersome and slow.

In a busy lab with tight deadlines, it's easy for mistakes to occur in manual operations such as weighing and data recording. Undetected transcription and data handling errors may result in costly rework or audit issues.

Powders exhibit a diverse range of characteristics; particles vary in size, shape, surface texture, and density. This can cause powders to behave differently.

Free Webinar: Worry-Free Weighing – Dealing with Static and Drafts

Learn how to improve weighing accuracy and have more confidence in the weighing results generated. Understand the impact of environmental influences on weighing, such as air turbulence or drafts, temperature differences and electrostatic charges, and discover how to minimize or eliminate these effects.

▶ **www.mt.com/lab-elearning-influences**

Unmatched Accuracy
for Dosing Powders

Quantos uses an automated process to dose free-flowing powders directly into your target container. The unique dosing heads achieve a level of accuracy which is impossible to match in a manual process, even by the most skillful hands. Simply enter your target weight and Quantos doses the exact amount.

Capsule filling, HPLC analysis, formulation, standard preparation – whatever your application, the accuracy of your final results depends upon the precise and accurate weighing of your sample. Automated dosing with Quantos eliminates out-of-specification errors and avoids costly reworking.

Beyond manual accuracy

Quantos can dose from 1 milligram to 5 grams of free-flowing powder directly into your target container. The highly accurate dosing process eliminates variability and out-of-specification results.

Save valuable samples

Automated dosing can reduce the minimum net sample weight of your balance by up to 30%. Plus, the risk of over-dosing is reduced to a minimum. You avoid waste and save costs – crucial when working with rare or expensive materials.

Easy balance upgrade

The Quantos powder dosing module is compatible with all XPE analytical balances. The dosing module is easy to attach to your balance, and then you're ready to start powder dosing immediately.

Our range of dosing heads is ideal for dosing fine, fluffy, static, compacted, granular, or heterogeneous substances.

A pin in the head pushes the powder down, and seals the head once dosing is complete.

Hands-free powder dosing, directly into your target container.

We've tested thousands of substances to become experts in accurate weighing and dosing of powders.

Powder Dosing Specifications
with Reference Substance Calcium Carbonate[1]

Target amount (tolerance)	Dosing time*	Average powder dosed*	Dosing accuracy (rsd)*	Dosing time for 30 samples*
1 mg (±20%)	20 s	0.974 mg	4.21 %	21 minutes
10 mg (±5%)	22 s	9.925 mg	1.15 %	22 minutes
50 mg (±1%)	29 s	50.069 mg	0.26 %	23 minutes
250 mg (±1%)	38 s	249.731 mg	0.22 %	27 minutes
1000 mg (±1%)	71 s	999.960 mg	0.03 %	39 minutes

[1] Calcium carbonate: Sigma-Aldrich 21061
* = data measured with an XPE206DR and a powder dosing module Q2

To help select the correct dosing head for your powder type, please download our free guide.

▶ **www.mt.com/dosing-heads**

Assured User Safety
to Handle Powders with Confidence

Hazardous and toxic substances, including active pharmaceutical ingredients, can pose a risk to health, even at the nanogram exposure level. Operators handling light, low density and fluffy compounds know it's all too easy for particles to become airborne and such powders must be handled with extreme care.

With the Quantos powder dosing system, powder remains sealed within the dosing head and hence aerosol formation is kept to a minimum. Hands-free dosing of the powder directly into the target container significantly lowers the risk of exposure.

Weigh safely	**Keep substances contained**	**No spills**
It's no longer necessary for operators to weigh-in potent or toxic compounds using a spatula and weighing paper. With an automated dosing process, operators work safely without exposure to substances during weighing.	Powders are sealed within the dosing head. Individual dosing heads for each powder eliminate the risk of cross-contamination. Once the dosing head is filled, work proceeds with no powder contact.	Direct dosing into the target container avoids the spillages which may occur during the manual weighing-in and transfer of the powder. The reduced cleaning effort required further minimizes operator exposure to toxic materials.

The Quantos automated powder dosing system protects users against exposure to potent substances.

Free webinar: Safe Automated Weighing of Potent Compounds in the Pharmaceutical Industry
Learn more about how Merck Research Laboratories evaluated the Quantos powder dosing system in a ventilated balance enclosure for efficient handling and effective containment of potent compounds, and concluded that researchers could safely utilize the system to dispense OEB 5 compounds.

▶ **www.mt.com/labtec-safety-webinar**

Increased Efficiency
via Automated Data Handling

Safe, simple and accurate weighing is only one side of the story. Addressing the challenge of documenting your results and ensuring traceability in line with GLP (Good Laboratory Practice) requirements is key to ensuring efficiency across the whole weighing process.

Up to 35% of laboratory time is spent on documentation, and ensuring data is handled accurately is a common problem in the laboratory. Now you can eliminate tedious and time consuming manual documentation by connecting your Quantos dosing system to LabX software. Calculations and documentation are done automatically. LabX works behind the scenes to take care of all your data, so you can concentrate on your analyses.

Data integrity	Secure processes	Increased productivity

LabX automatically saves all results and process information in a central database. This ensures full traceability, assists in compliance with FDA CFR 21 Part 11, and entirely eliminates transcription errors.

LabX provides step-by-step SOP guidance on the instrument display, so you can be sure all operators follow the same procedures. Calculations are done automatically, and results reports can be printed at any time.

Increase throughput by using a sample changer to fill up to 30 containers at a time. This totally automated process requires minimal user intervention and does away with the hours associated with manual weighing operations.

Connect your Quantos system to LabX software, on a PC inside or outside your laboratory, for a cost-effective and time-saving solution to guarantee the integrity of your data.


The Importance of Data Integrity

Given the increased scrutiny of data integrity, it is critical that managers and scientists in GXP-regulated laboratories understand the current regulatory position. Discover the data integrity criteria and learn how to assess and improve laboratory data management processes to ensure compliance with current regulations.
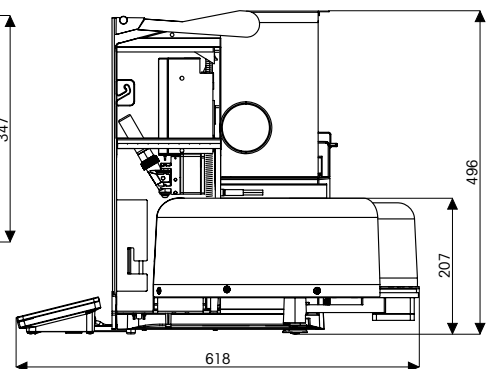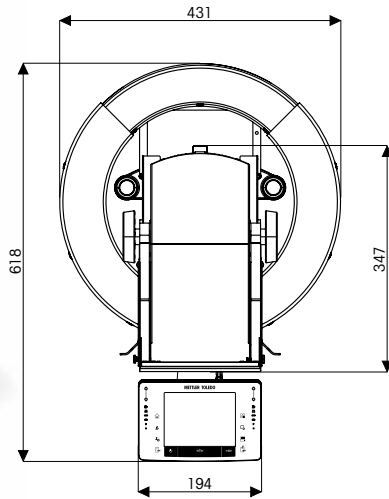
▶ **www.mt.com/wp-data-integrity**

Technical Specifications
Quantos Powder Dosing System

XPE Analytical Balance with Powder Dosing Module
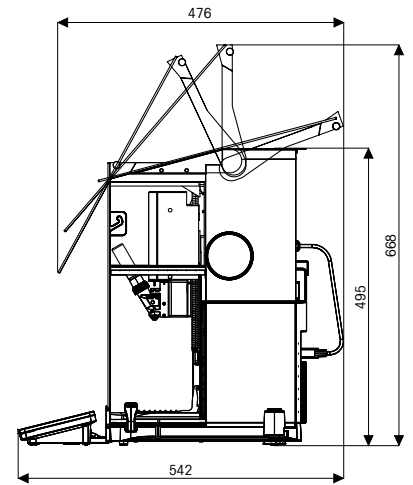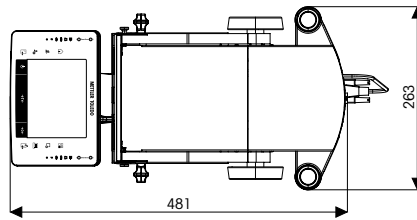
XPE Analytical Balance with Autosampler

All dimensions are given in mm

Quantos

	XPE56Q	XPE206DR	XPE205	XPE205DR	XPE105
Maximum capacity (fine range/full range)	52 g	81 / 220 g	220 g	81 / 220 g	120 g
Readability full range fine range	0.001 mg	0.01 mg 0.005 mg	0.01 mg	0.1 mg 0.01 mg	0.01 mg
Repeatability* (5% load)	0.0007 mg	0.005 mg	0.007 mg	0.007 mg	0.007 mg
Settling Time*	3.5 s	2.5 / 3.5 s	2.5 s	1.5 / 2.5 s	2.5 s
Minimum weight* (U=1.0%, k=2, 5% load)	-	1.0 mg	1.4 mg	1.4 mg	1.4 mg
USP minimum weight* (U=0.10%, k=2, 5% load)	-	10 mg	14 mg	14 mg	14 mg
Automated minimum weight* (U=1.0%, k=2, 5% load)	0.14 mg	0.7 mg	1 mg	1 mg	1 mg
Automated USP minimum weight* (U=0.10%, k=2, 5% load)	1.4 mg	7 mg	10 mg	10 mg	10 mg
Compatibility					
Q2 Powder Dosing Module	yes	yes	yes	yes	yes
QS30 Autosampler	no	yes	yes	yes	yes

|	XPE105DR	XPE204	XPE304	XPE504	XPE504DR
Maximum capacity (fine range/full range)	41 / 120 g	220 g	320 g	520 g	101 / 520 g
Readability full range fine range	0.1 mg 0.01 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg 1 mg
Repeatability* (5% load)	0.007 mg	0.04 mg	0.04 mg	0.04 mg	0.04 mg
Settling time*	1.5 / 2.5 s	1.5 s	1.5 s	1.5 s	1.5 / 1.5 s
Minimum weight* (U=1.0%, k=2, 5% load)	1.4 mg	8.2 mg	8.2 mg	8.2 mg	8.2 mg
USP Minimum weight* (U=0.10%, k=2, 5% load)	14 mg	82 mg	82 mg	82 mg	82 mg
Automated minimum weight* (U=1.0%, k=2, 5% load)	1 mg	8.2 mg	8.2 mg	8.2 mg	8.2 mg
Automated USP minimum weight* (U=0.10%, k=2, 5% load)	10 mg	82 mg	82 mg	82 mg	82 mg
Compatibility					
Q2 Powder Dosing Module	yes	yes	yes	yes	yes
QS30 Autosampler	yes	yes	no	no	no

* = typical value

Benefit From Our Weighing Expertise

Offering decades of experience in laboratory weighing, METTLER TOLEDO can provide you with a wide range of online learning resources. Take advantage of our expertise to enhance your weighing know-how and make the most of your balance. Check out the documentation on our website for a range of relevant materials.
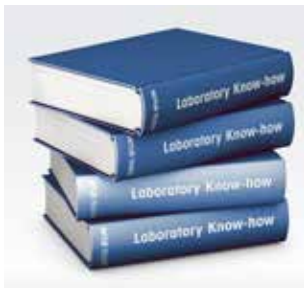
Videos

In an easy learning format, our videos demonstrate the use of our balances and inform you about our weighing solutions.
• Automated Powder Dosing for Precise Batch Preparation
• Lean Lab - Work Smarter, not Harder
• Eliminate "Time-Wasters" with LabX Lab Software

▶ **www.youtube.com/mtlaboratory**

White Papers

Our scientific white papers contain a wealth of information on a range of different topics such as:
• Gravimetric Sample Preparation: Reducing Sample Size and OoS Errors
• GWP® The Standard – Science Based Weighing
• The Unknown Sources of Error in the Weighing Process

▶ **www.mt.com/whitepapers**

On-Demand Webinars

Learn directly from our weighing experts and guest speakers. It's easy to register.
For starters, we recommend:
• Safe Automated Weighing of Potent Compounds
• Safe and Cost-Effective Capsule Filling
• Avoid Out-of-Specification Results

▶ **www.mt.com/webinars**

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