

Case Study

Pharma Automated Powder Dosing Solutions



Bottling/Filling of Peptides for Retail – Enhancing Productivity with Quantos

Peptides play a key role in the growing segment of biopharmaceuticals. Peptide-based drug targets are being identified at an increasingly rapid pace and a variety of new peptide drugs are being developed as novel therapies for cancer, pain treatment, viral infections, diabetes and a host of endocrine and neurological disorders.

Controlled Handling of Peptides as Standard Reference Substances

The logistics group within a leading Swiss biochemical company with many years experience in manufacturing and selling peptides and other complex organic molecules to the pharma and biotech industries, has the task of managing the supply of a series of peptides and proteins from the 4400 biochemicals in their catalog.

Many chemical substances, including peptides and proteins, can be expensive as they require multi-step synthesis. The chemical companies producing these substances sell them in small quantities, ranging from 1 mg to several 100 mg.

Biochemical Company

Standard Reference Substances

Peptides

Enhancing Productivity



Custom-designed ergoclips for vials as small as 6mm diameter

METTLER TOLEDO

These samples are usually dosed manually with a spatula from a single source container to a batch at a fixed target weight.

Dosing such small quantities takes a lab technician a lot of time, usually in the range of 2 to 3 minutes per filling. From one production batch, usually 30 to 100, and sometimes up to 1000 units are filled, which again is a very tiring task for the operator.

An operator who has to fill vials for 1 to 5 hours may also suffer from loss of concentration, which leads to errors, e.g. samples that are out of specification.

It is important that a vial is not underfilled, which means that it must not contain less than the specified amount of powder. EU Regulation 76/211/EWG for filling states that "the actual mass of the contents of a flask can vary to maximum 9% compared to the written label."

The Challenge

■ The biggest challenge for this company was to address the tedious manual task of repetitive filling of the same small amount of substance to many target vials. The customer needed to enhance their productivity and speed up this process to meet customer demand. Additionally,

costs from overdosing were a problem for this manufacturer, as they were effectively giving a proportion of their substance away for free.

The METTLER TOLEDO Solution and Return-on-Investment

■ The combination of Quantos with an auto sampler offered an ideal solution to this customer's bottling problem: once the substance is loaded into the Quantos dosing head, 30 target vessels are dosed without user interaction, even with different target weights. The system takes approximately 30 to 60 seconds per vessel, which is four times faster than manual filling. Using the automatically generated labels simplified the logistical track that the vial takes.

In order to fit the target bottle to the autosampler and to reduce electrostatic effects, a range of vial adapters are available.

■ 2 Quantos systems were installed at this site one year ago and since then, productivity has been enhanced more than 4-fold. Additionally, the customer has made savings from dosing to an accuracy of 2%, as opposed to overfilling by 9% of the desired sample weight.

- Annual consumable costs = 2.530,00 €
- Net investment costs = 49.000,00 €
- Total annual gross savings = 62.968,85 €
- Net savings in 5 years = 252.494,26 €

This means the system has paid for itself in <10 months!

■ This customer is delighted with the performance of both the Quantos QB1 and Quantos QS30 with auto sampler for filling/bottling applications, and the impact these automated systems have made on the productivity and savings in their workflow.

Equally, the Quantos technology can be applied to any bottlers and distributors of fine chemicals, reference materials and standards who are involved with repetitive manual dispensing of substances in the range 1mg - 250mg, and who are interested in enhancing their productivity and saving money on costly and unnecessary overfilling of samples.

► www.mt.com/quantos

Dosing Example

The table below shows a summary of dosing data from multiple replicates of four typical peptides, at varying target dose amounts:

Substance	Target Dose (mg)	Mean Actual Dose (mg)	No. of Replicates	Accuracy (%)	RSD (%)	Mean Dosage Time (s)
Boc-Gln-Ala-Arg-AMC	5	5.19	30	3.83%	2.66%	47
Suc-Ala-Ala-Ala-pNA	1000	1005.09	31	0.51%	0.28%	228
H-D-Phe-Pro-Arg-	25	25.39	75	1.58%	1.04%	23
Hippuryl-His-Leu-OH	250	251.78	73	0.71%	0.55%	68

30-75 samples of each peptide were dosed on the Quantos QB1 system in a single batch. The mean dosing time for target amounts between 1 - 250mg was 48 seconds. Accuracy of dosing is typically less than 2%.

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