

## FILLING OF GINSENG ROOT POWDER BY TAMPING PIN

Our customer, HiQ-Nature GmbH, Germany intends launching ultrapure Red Ginseng root powder obtained from aquaculture filled in Vcaps Plus size 1 capsules as food supplement. Pharma Services organized everything to comply with the requirements of food supplements manufacturing, such as HACCP analysis, microbiological testing, cleaning validation, etc. The target was to fill a minimum of 700,000 capsules on the Modu-C MS, using the tamping pin. The specification was 200 mg fill weight at an RSD of <3%.

The working principal of a tamping pin dosing system is that the powder is filled into a powder bowl. The bowl rotates and the powder is fluidized and homogenized by centrifugal forces. From there it flows by gravity into defined bores of the dosing disc. With additional rotation of the powder bowl, the powder flows into the remaining headspace of the bores and adds more powder, which is compressed. The tamping pin compresses the powder in multiple tamping steps until the bore is completely filled. Five repetitive tamping steps assure the dosing bores being filled reproducibly. At the 6<sup>th</sup> tamping position, the plug is transferred into a capsule.



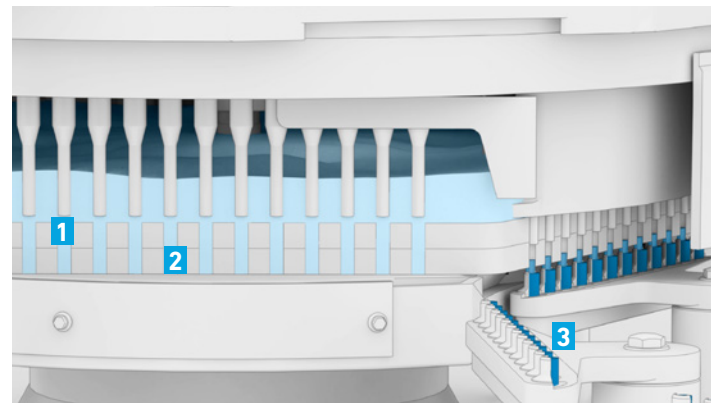
### TAMPING PIN

For abrasive, cohesive, and free-flowing powders

50 mm<sup>3</sup> – 1,000 mm<sup>3</sup>

25 – 1,000 mg

- Automatic tamping force adjustment
- Variable dosing plates
- Trend regulation



- 1. Tamping pin
- 2. Dosing plate
- 3. Transfer in capsules

Figure 1: Description and impression of tamping (right) and Modu-C MS (top) and its tamping pin trolley, bottom (left)

## THE POWDER WAS CHARACTERIZED AS FOLLOWS

### Powder Characterization

Carr's Index	24
Bulk density [g/ml]	0,61
Tapped density [g/ml]	0,80
d <sub>10</sub> [mg]	4,64
d <sub>50</sub> [μm]	71,35
d <sub>90</sub> [μm]	237,98
Compressibility [%]	6,30
Permeability [mbar]	2,53
Flow factor	14,27
Loss on drying [%]	7,0

Table 1: Powder characterization

### PSD by laser diffraction analysis by Sympatec HELOS

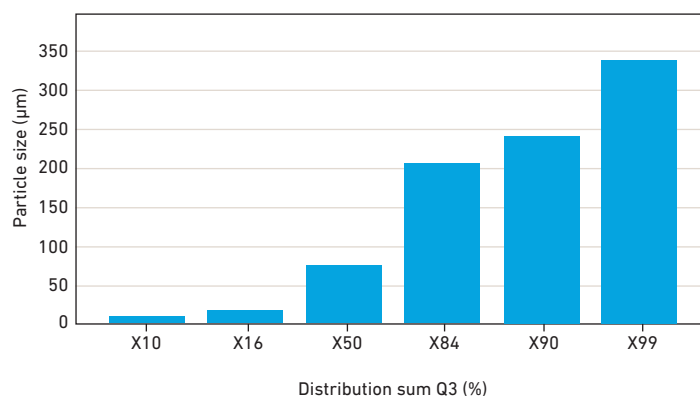


Figure 2: Particle size distribution of Red Ginseng Powder

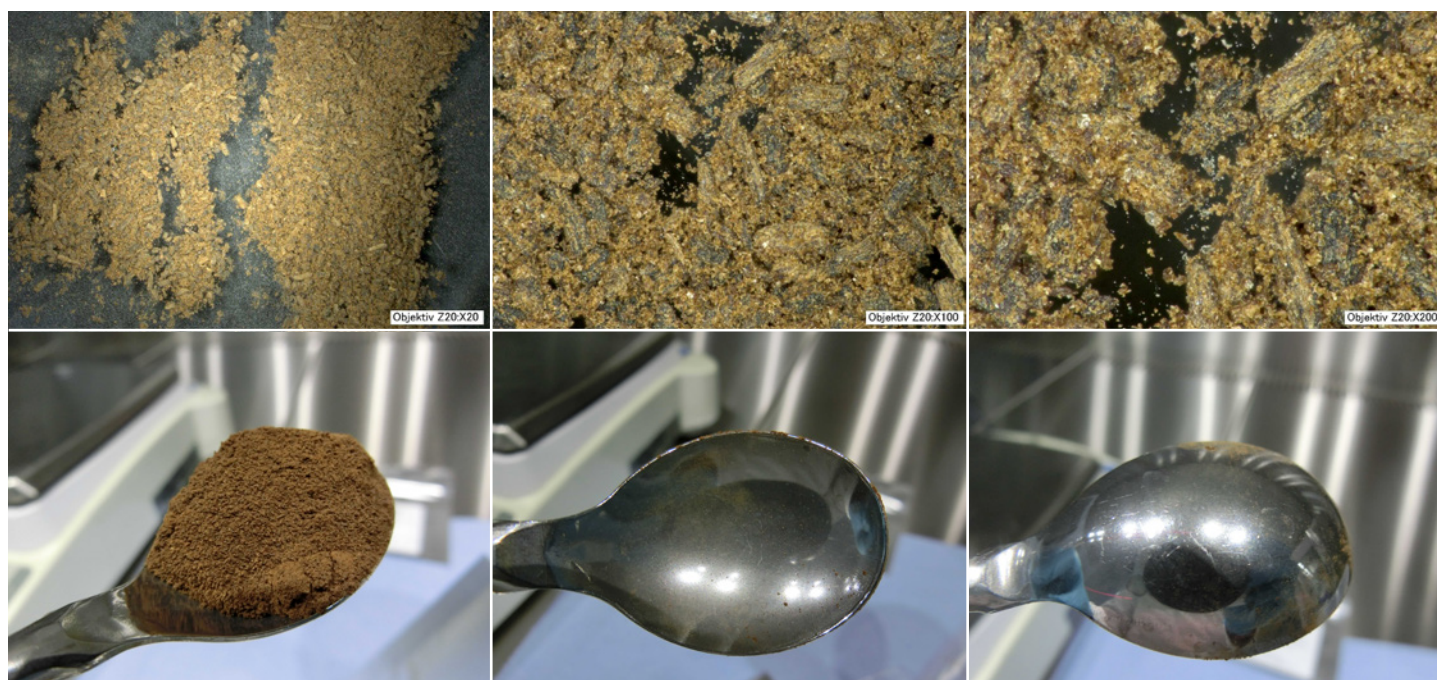


Figure 3: visual impression of Red ginseng powder

## AFTER SET UP, FILLING WAS PERFORMED WITH THE FOLLOWING PARAMETERS:

### Format parts and set up parameter

Format of dosing disc	3
Height of dosing disc	12 mm
Powder bed height	>18 mm
Machine speed	100 cycles/min

Table 2: format parts and set up parameter

The filling was very stable over time. Every 30 min, 24 IPC samples (= 2 machine cycles) were taken and net weighed. As the weight of the empty capsule was 75 mg, the gross target fill weight increased from 200 mg to 275 mg.

### Results over all

Mean weight [mg] over all	272,23
Standard deviation [mg] over all	2,185
Relative Standard Deviation [%] over all	0,803

Table 3: Results over all over time

## NET FILL WEIGHT OVER TIME

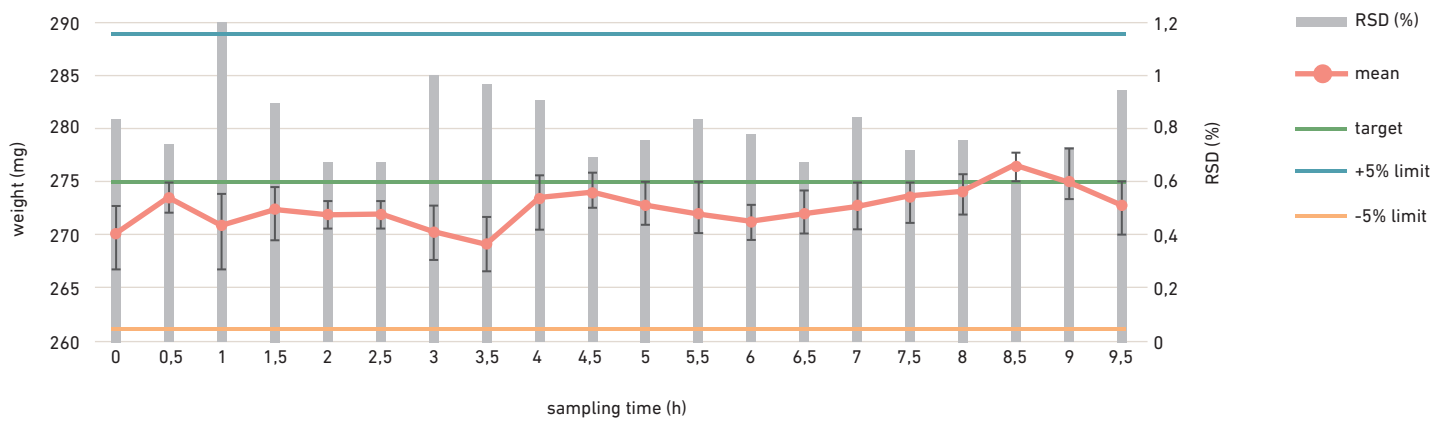


Figure 4: Results of fill weight and RSD over time

Figure 4 shows a stable filling over time including low corresponding SD (as error bars) and RSD within the limits of 5% deviation for single weights. The specification of <3% RSD is easily fulfilled, and the target fill weight is met.

### SUMMARY:

Red Ginseng powder was filled very stably into capsules. The RSD was usually <1% which is a very good result. In total, Red Ginseng powder was filled successfully over a long period of time in high quality, meeting the requirements of the customer in full.