



# gako MedCaps

Encapsulation Calculations Made Easy



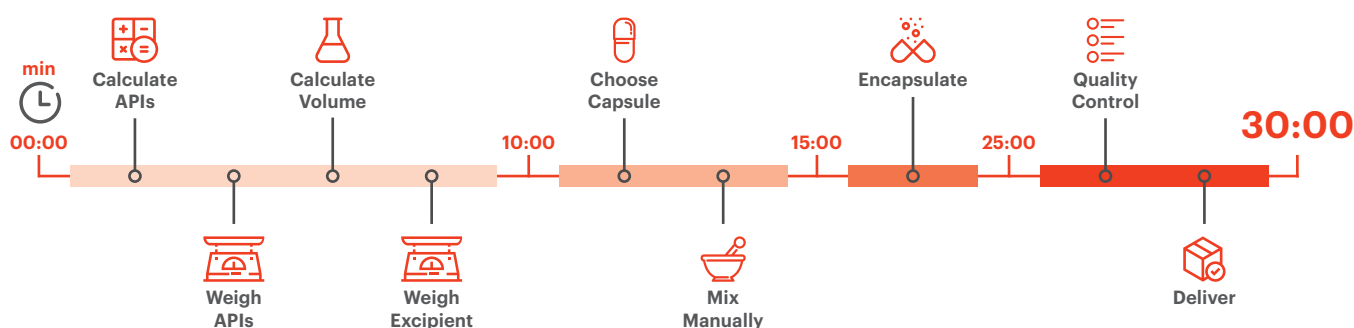
**gako**

Hard capsules are one of the most common dosage forms prepared at compounding pharmacies. The formulation process can be cumbersome and requires many steps such as weighing, calculating weight/volumetric density of powders, mixing, capsule filling, and quality control of the final formulation. Each of these steps is of great importance to ensure the quality and efficacy of treatments, although they can be time-consuming.

With the **gako** solutions, we provide one step further in productivity and continuous quality improvement to the compounding process, providing a way for pharmacists to retain the same level of quality with an expedited process, ensuring that the patient gets their medication quickly and safely.



### Traditional encapsulation process



## gako MedCaps

One of the most important steps during the preparation of hard capsules is the correct choice of the capsule size for the formulation. This step can influence directly the quality of treatment, as it can interfere with patient adherence. Several methods and techniques are used for the calculation of the capsule size, but many of them can be time-consuming and can lead to rework, with low reproducibility on the process, meaning that for every formulation a new calculation should be made.<sup>1,2</sup> These methods can be influenced by the physical particularities of every ingredient, such as apparent and compacted density.

### Encapsulation Calculation Methods<sup>1</sup>

<p><b>1. Trial and Error</b></p> <p>Consists of determining the total mass of the compounded formulation and choosing the capsule size according to the mean capacity of each size. The choice can be confirmed by manually filling one capsule with the formulation and checking the final weight.</p> <p><b>i.e.: Athenolol 100 mg + Chlortalidone 25 mg = 125 mg formulation mass (capsule #3).</b></p>	<p><b>2. Rule of the 6</b></p> <p>In this rule, the mean density of powders is set to 0.62 g/mL. To choose the capsule size, divide the total mass of the compounded formulation by 0.62 to determine the expected volume occupied. Choose the capsule size according to the volume capacity of each capsule.</p> <p><b>i.e.: 0.125 g formulation mass / 0.62 g/mL = 0.20 mL (capsule #4).</b></p>
<p><b>3. Rule of the 7</b></p> <p>This rule converts the weight of the formulation to grains, each grain corresponding to 65 mg. After converting, deduct the number of grains of the formulation from 7, and choose the capsule size from a scale of -3 (#000) to 5 (#5).</p> <p><b>i.e.: 125 mg / 65 mg = 2 grains</b>  <b>7 - 2 = 5 (capsule #5).</b></p>	<p><b>4. Volumetric method</b></p> <p>To find the total volume of the formulation, weigh all ingredients and transfer the amount to a volumetric cylinder. According to the obtained volume, compare to the volumetric capacity of each capsule size and calculate the needed amount of excipient.</p> <p><b>Add excipient, remix, and check the volume again.</b></p>



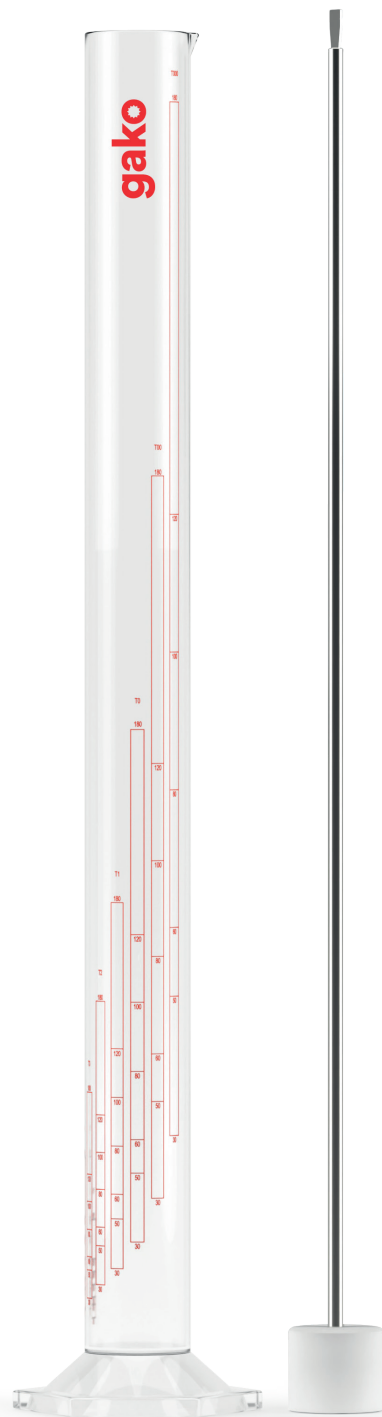
It is important to highlight that, although these methods have been present inside the compounding pharmacy for a long time, they work on estimation, and require lots of calculation and experienced professional handling to obtain successful results. Nevertheless, even with these requirements, these methods can still lead to rework as many ingredients differ in physical-chemical properties as described above.

We present **gako MedCaps**, a new solution to increase productivity during the compounding process of hard capsules.

**gako MedCaps** is a glass cylinder with special and validated graduation designed for the compounding process of hard capsules. It allows the appropriate choice of the capsule size to be used, as well as the exact definition of the amount of excipient required for the complete volumetric filling of the capsule, in a practical and fast way. Graduation present in **gako MedCaps** is suitable for all capsule sizes used in human and veterinary medicine (from #5 to #000 capsules sizes), in accordance to most prescribed quantities (30, 50, 60, 80, 100, 120, and 180 capsules).

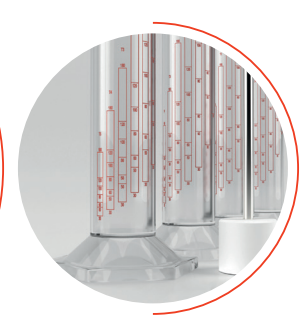
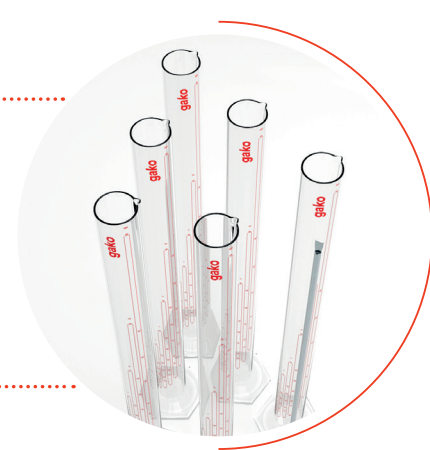
The use of **gako MedCaps** eliminates the need for calculations involving the bulk density of powders that normally vary between different batches of active ingredients and excipients, by showing the actual apparent volume of the formulation being compounded. Another factor that influences the volumetric filling of the capsules, besides the density, is the degree of compaction of powders, and reproducing this factor during calculations is something hard to achieve. For that, we feature the **gako MedCaps Tamper** – a tool specifically designed from pharma grade materials, to compact the powder inside the cylinder, replicating the tamping process applied during the encapsulation process.

With the **gako MedCaps**, both the choice of capsule size and the total amount of excipient required are decided easily, fast, and efficiently.



**gako MedCaps Advantages**

- Reproducibility
- Precision
- Practicality
- Reliability
- Cost-effectiveness



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