

EUDRATEC[®] GRS

Your "floating solution" for an improved absorption in the stomach.



EUDRATEC® GRS – unique gastro-retentive system

EUDRATEC® GRS is a patent-pending technology from Evonik that improves gastro retention for dietary supplements. This is important for health ingredients that are most effective when retained in the stomach for a longer period of time. EUDRATEC® GRS was specifically developed for that reason: to increase the time such ingredients reside in the stomach.

EUDRATEC® GRS technology ensures a slow release of ingredients in the stomach by enabling the floatation of substance-bearing capsules on gastric liquid.

The technology uses ingredients with E-numbers and GRAS status such as EUDRAGUARD® control and has already been proven in vitro in bio relevant media.



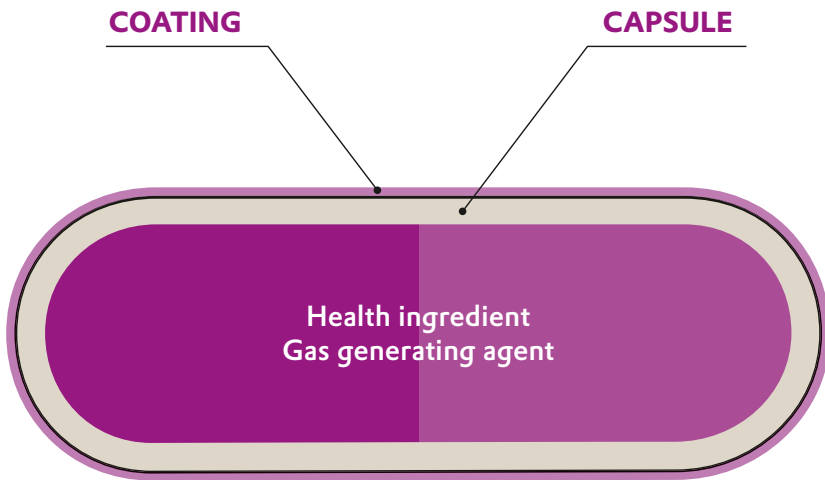
EUDRATEC® GRS is applicable for water-soluble health ingredients that are:

- absorbed in the early parts of the upper GI track (duodenum)
- stable in acid (stomach) but not stable at neutral pH (intestine)
- absorbed in the stomach

Technology behind EUDRATEC® GRS

The EUDRATEC® GRS system works by first filling the health ingredient and the gas generating agent into a capsule. After the first preparation step, the capsule is coated with EUDRAGUARD® control and other excipients.

Once enveloped in gastric acid, the outer layer becomes porous, thus causing small quantities of carbon dioxide gas to escape. This provides buoyancy, so that the capsule float on gastric fluid and remain in the stomach a longer period of time.



Preparation of the floating capsule in 2 steps:

1 Capsules are filled with the health ingredient and a gas generating agent.

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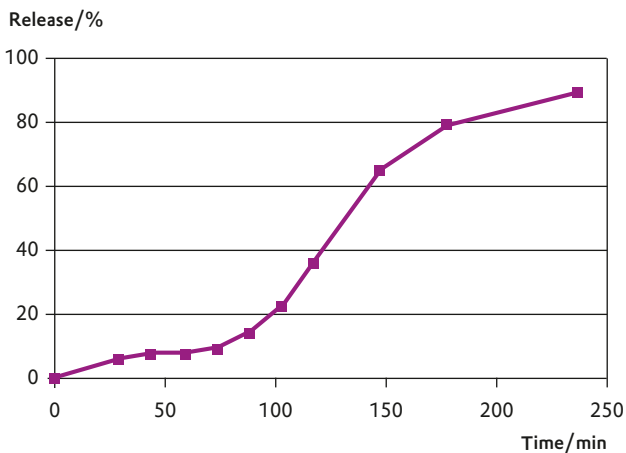
2 Final coating contains EUDRAGUARD® control

Case study with Healthberry® 865

Anthocyanins such as Evonik's Healthberry® 865 are absorbed in the stomach. By gastro retention a constant release of anthocyanins can be achieved which may result in an improved uptake which may result in an improved uptake and better bioavailability.

The graphic shows a dissolution profile of anthocyanins in simulated gastric fluid within a time period of 4 hours. The release profile illustrates that the body has simply more time to absorb the health ingredient suggesting a better uptake.

Release profile of anthocyanins in simulated gastric fluid



Gastro-retentive formulation for health ingredients

EUDRATEC® GRS may improve the stability and bioavailability of health ingredients by increasing the gastric residence time and controlling its release from the dosage form. Examples of health ingredients that may benefit of EUDRATEC® GRS technology:

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Ingredients that are absorbed in the stomach

- Anthocyanins
- Polyphenols
- Chinese medicinal herbs components, e.g. hydroxycinnamic acid
- Caffeine
- Niacin
- Iodide



Ingredients that are absorbed in the early parts of the upper GI track (duodenum)

- Calcium
- Magnesium
- Riboflavin
- Biotin
- Niacin
- Iron
- Thiamin
- Folate



Ingredients that are stable in acid (stomach) but not stable at neutral pH (intestine)

- Green tea extracts, e.g. green tea catechins
- Green coffee bean extracts
- Thiamin
- Riboflavin
- Iron



EUDRATEC® GRS ensures efficacy of health ingredients that were previously difficult to formulate.

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