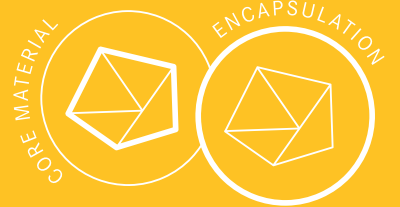


MICROENCAPSULATION

Encapsulated solutions for controlled release, improved shelf life, and enhanced sensory or functional performance.



Microencapsulation – RAPS COATEC technologies

At RAPS, we go beyond traditional blending. With our proprietary **COATEC Technology**, we bring advanced **microencapsulation** solutions that enable food manufacturers to integrate sensitive, functional, or taste-giving ingredients into their processes with precision and consistency.

By coating ingredients with carefully selected raw materials, we protect active components from external influences such as heat, humidity, oxygen, or mechanical stress and enable **targeted release** exactly when and where it's needed in your production process or end product.

Whether in **baked goods, dairy products, convenience and frozen foods, meat and sausage applications and even food supplements**, RAPS provides more than just great taste – we deliver **functional performance and process reliability**.

What is Microencapsulation?

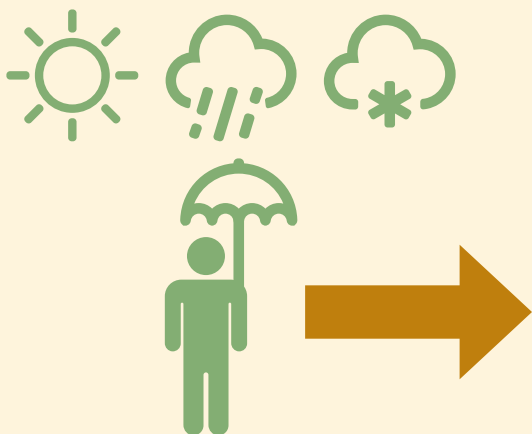
Microencapsulation technology applies protective coatings to functional and taste-giving ingredients using tailored encapsulation materials such as fat-based systems.

This creates a protective barrier around sensitive actives, offering:

- Protection against moisture, oxidation, and temperature
- Controlled or delayed release of actives
- Improved processing stability
- Reduced reactivity or interaction with other ingredients
- Easier processing due to reduced dust formation

Microencapsulation ensures that your ingredients work harder, last longer, and perform more precisely in every stage of production

How it Works:



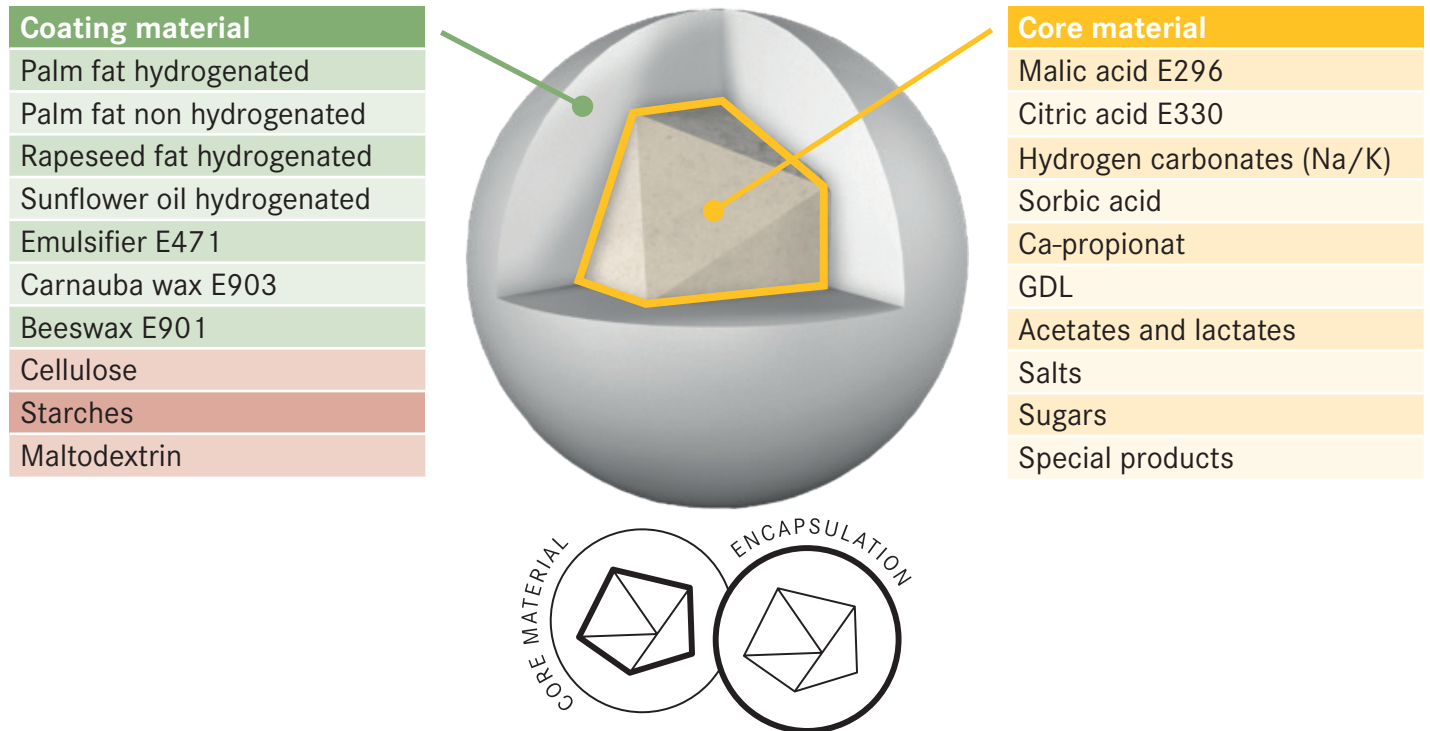
By encapsulating active ingredients, they are protected from external influences, ensuring greater stability and process reliability. At the same time, we allow targeted and controlled release through the precise choice of coating material, for example, using grease-based hydrophobic coating systems.

The result: enhanced ingredient performance, reduced product defects, and consistent quality across applications.

The coating acts as a protective shell. Depending on the application, release can be triggered by:

- Temperature (melting or heat-activated release)
- Mechanical force (during mixing or cutting)
- Moisture or solubility (during cooking or hydration)

Typical microencapsulation materials

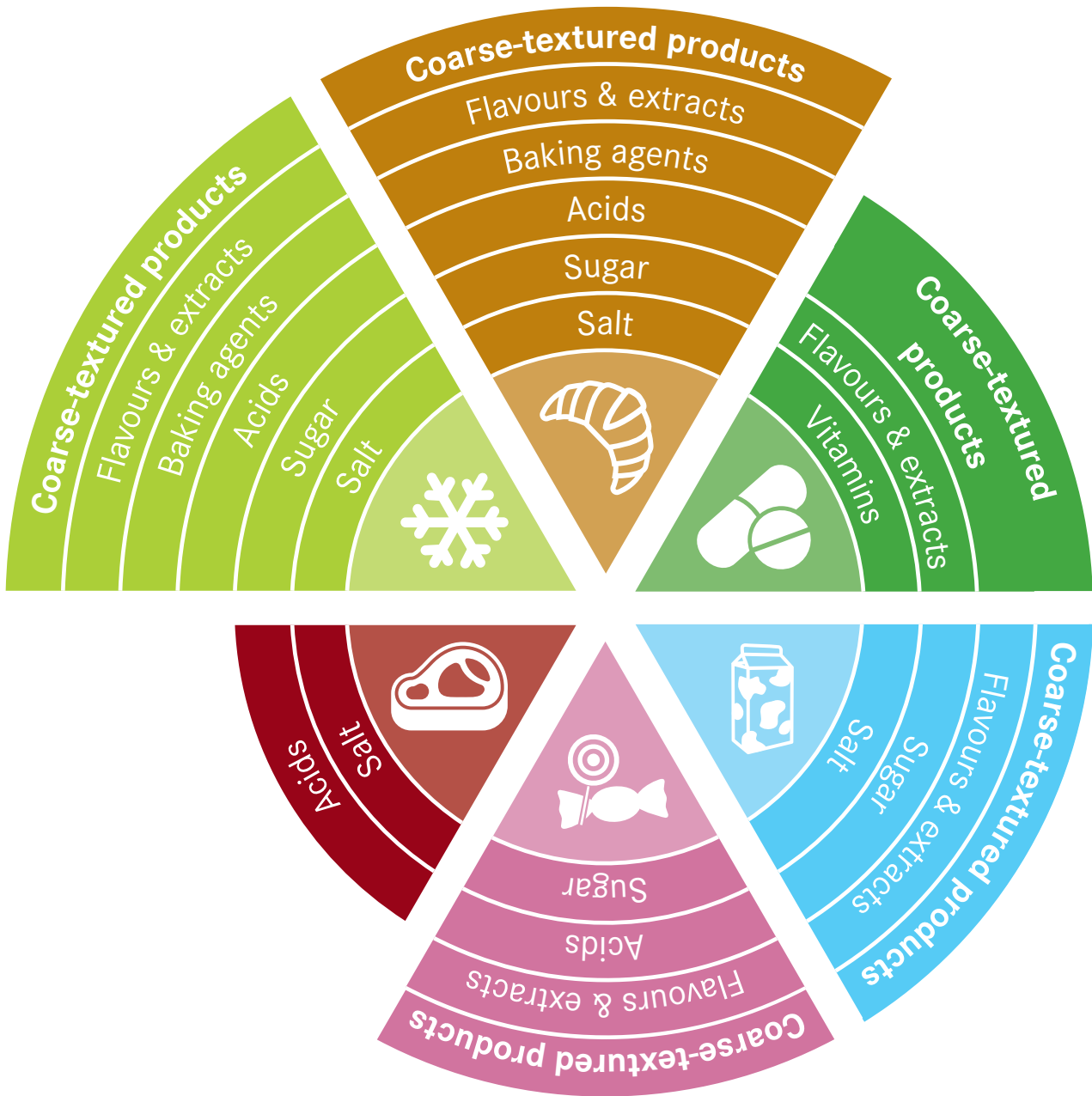


Smart protection. Targeted performance.

Key product benefits:

- ⊕ **Customised composition**
tailored to your specific product and process needs
- ⊕ **Controlled release**
through specific selection of coating materials
- ⊕ **Avoidance of ingredient interactions**
during production
- ⊕ **Reduction of product defects**
and process variability
- ⊕ **Improved handling**
and flowability of powders
- ⊕ **Reduced hygroscopic properties**
for better shelf-life
- ⊕ **Homogeneous distribution**
even with different bulk densities
- ⊕ **Grain size**
100 µm to 12 mm, depending on the raw material and processing methods

Versatile solutions across industries



Baked goods



Dairy products



Confectionery



Convenience & frozen food



Food supplements



Meat and sausage products

Key applications

Baked goods & dough applications



- Encapsulated leavening agents or acids for controlled reaction timing
- Enhanced process stability and dough structure
- Prevention of premature activation during mixing

Acidifiers	
Core Materials	Malic Acid, Citric Acid, Fumaric Acid, Glucono-delta-lacton (GDL), Sodium Acid Pyrophosphate (SAPP), etc.
Key Benefits	• Acidifier • pH regulation for optimum dough properties (improved interaction with preservatives used) • Controlled reaction of chemical loosening agents • Acts as leavening agents in conjunction with carbonate salts • Shelf life extension
Preservatives	
Core Materials	Sorbic Acid, Calcium Propionate, Sodium Diacetate
Key Benefits	• Controlled release during natural loosening of the dough • Constant functionality during baking process • Shelf life extension: helps conserve yeast activity & reduce growth of mould and bacteria • High efficiency at low pH level • Reduced dusting during processing and handling
Carbonates	
Core Materials	Sodium Bicarbonate, Potassium Bicarbonate
Key Benefits	• Controlled release • Improved processability • Avoids reaction with other ingredients • Waste reduction
Other Functionalities	
Core Materials	Salt, Sugar
Key Benefits	• Improved freeze and thaw stability • Improved surface adhesion • Used for salt reduction (up to 20%) and as stable decor solutions

Key applications

Sugar confectionery



- Controlled release for sour notes and other sensory effects
- Protection against external influences and sugar inversion
- Long-lasting taste stability

Sour Sanding	
Core Materials	Malic Acid, Citric Acid, Tartaric Acid
Key Benefits	• Avoids sugar inversion • Protection against external influences such as moisture or heat • Shelf life extension • Controlled release of sour effect and long-lasting taste stability

Multi-sensory Effects	
Core Materials	Effervescent powder
Key Benefits	• Controlled release of sensory and textural effects • Protection against external influences such as moisture or heat • Avoids reaction with other ingredients during processing and shelf life • Multi-sensory appeal

Meat and sausage products



- Controlled release of curing agents and functional ingredients
- Stable colour and flavour formation during processing
- Improved shelf life and product safety

Acidifiers	
Core Materials	Citric Acid, Lactic Acid, Glucono-delta-lacton (GDL)
Key Benefits	• Controlled pH-regulation • Improved processability • Avoids reaction with other ingredients during processing and shelf life • Waste reduction

Other Functionalities	
Core Materials	Salt, Sugar
Key Benefits	• Improved freeze and thaw stability • Avoids reaction with other ingredients during processing and shelf life

Further applications

Convenience & frozen food

- Controlled release of curing agents and functional ingredients
- Stable colour and flavour formation during processing
- Improved shelf life and product safety



Dairy products

- Encapsulated spices, flavours and extracts resistant to heat and moisture
- Consistent taste stability over shelf life
- Reduction of undesired interactions (e.g., colour migration)



Food supplements

- Flavour masking
- Protection of sensitive ingredients
- Controlled release



Specialty products

Encapsulated Flavours	FLAVOCAPS
Core Materials	(Nat.) Flavours & Extracts (Coating: Starch)
Key Benefits	• Protection of volatile and sensitive taste components • Controlled release of taste components • Avoids reaction with other ingredients during processing and shelf life • Improved intensity and taste stability

Let's create smarter ingredients together.

At RAPS, we leverage decades of expertise and an innovative spirit to deliver tailor-made microencapsulation solutions that ensure reliability, efficiency, and outstanding quality for our customers. Our proprietary COATEC Technology empowers you to create products that are more stable, easier to process, and consistent in quality – ready for industrial scaling.

We work closely with our partners to develop functional ingredient concepts that turn challenges into performance advantages. With deep application know-how and technological innovation, RAPS is your trusted partner for controlled functionality and enhanced product value.

Ready to elevate your formulations?

Contact our RAPS experts today to discover how our COATEC Technology can add value to your formulations.

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FRESH IDEAS.
AUTHENTIC TASTE.
FUNCTIONAL SOLUTIONS.

