

## CAPSUL™

**Description:** Chemically modified food starch derived from waxy maize

**Appearance:** Fine white/creamy powder

Features	Benefits
Both hydrophilic and hydrophobic surface properties	Emulsion stabilising starch with excellent oil retention capabilities during spray drying.
Unique branched polymer structure	Excellent emulsification properties allowing minimum oil droplet sizes during spray drying.
Waxy maize base starch	Clean flavour release.
Warm water soluble	Easily prepared solution for subsequent emulsification.
Easily dispersible after spray drying	Excellent flavour release.

## APPLICATION AND USAGE INFORMATION

### Application Summary:

CAPSUL is a food starch specifically designed for the encapsulation of volatile flavour oils. It is a very low viscosity starch with both hydrophilic and hydrophobic properties. CAPSUL's low viscosity at high solids, strong oil retention properties and above all consistency allow for very significant improvements in process efficiency and product quality over traditional encapsulation systems.

### Typical applications include:

**Flavour encapsulation:** By using CAPSUL flavour encapsulation to around 20 to 25% flavour oil in the final product, or where oxidation resistance is not important up to 50% oil load; e.g. Vitamin E encapsulation can be achieved. Viscosity produced is lower than in similar solids content gum arabic systems so that the solids of the pre-emulsion may be increased by approximately 10%. CAPSUL is also capable of much higher volatile oil retention rates than gum arabic or simple maltodextrin systems. This can allow the production of more highly concentrated dried flavours or improved drier efficiency. CAPSUL has a pH in the region of 3 to 4 and as such is an acid tolerant encapsulant. Significant cost savings compared to traditional gum & maltodextrin systems can be achieved because of the very low viscosity of CAPSUL at high solids. Spray drying solids in the region of 40 to 45% are typical.

### Usage Information:

CAPSUL is over 90% soluble in cold water and will solubilise completely and very rapidly at over 70°C. Emulsions particle sizes in the range 1 to 2 µm can be readily achieved using a high shear mixer.

**Label declaration recommendation:** Modified Starch

**EU Classification:** Food Additive E1450 (Complies with Regulation (EC) 1333/2008)

Effective Date: 01.10.2012 [1]

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## ADDITIONAL TECHNICAL INFORMATION

### Typical Emulsion Formulation:

Water	55%
CAPSUL	10% (22.2% of solids)
Orange Oil	10% (22.2% of solids)
Maltodextrin	25% (55.6% of solids)

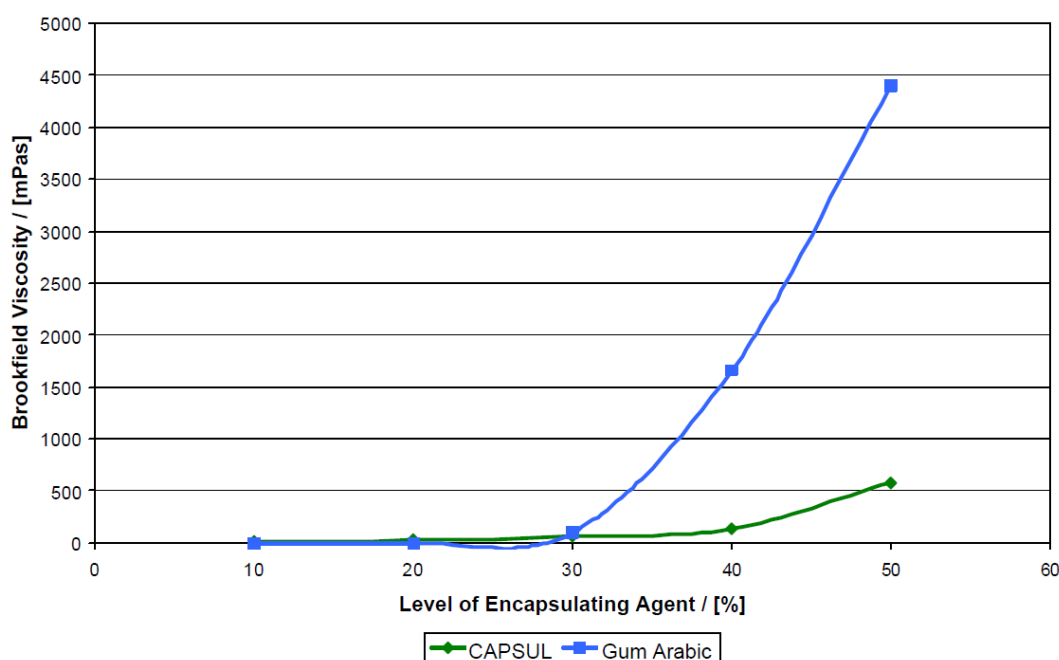
Note: For a non-GM recipe we would recommend the use of CAPSUL TA (or CAPSUL) in combination with a product from the pyrodextrin CRYSTAL TEX range. For a non-GM and MSF (maize and soya free) recipe we would recommend the use of the tapioca based product CAPSUL TA in combination with a tapioca product from the CRYSTAL TEX range such as CRYSTAL TEX 627 or CRYSTAL TEX 626.

### Procedure:

1. Combine CAPSUL with warm water and fully dissolve at 70°C\*.
2. Mix under gentle agitation to fully dissolve.
3. Add the orange oil and homogenise to approximately 1 micron.
4. Spray dry at 200°C inlet/ 95°C outlet.

Typical retention data for this system is around 92 to 95% of the flavour oil spray dried.

Comparative viscosity / concentration diagram of CAPSUL and Gum Arabic (Brookfield viscosity @ 25°C after 5 min. @ 90°C [mPas]):



Please note: This graph shows a typical viscosity / concentration diagram of CAPSUL and Gum Arabic and can be used for comparative purposes. However, it is not part of the specification.

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