



## CPF: FROM LIQUID TO POWDER



Mixing small amounts of liquids into solid or viscous products is a technically demanding process. The homogeneous addition of, for instance, highly concentrated aromas or spices into products such as cakes and biscuits, is indispensable to achieve a high quality product. Powdered substances can be blended into such products more easily and homogeneously.

COPRIS™, a cooperation between Yara, Raps, Natex and the researchers of the University of Bochum, is launching a new process on the market, which allows the transformation of liquids, viscous or non-viscous, into powders with a highly concentrated liquid content. This process, which has been patented meanwhile, is called CPF, short for Concentrated Powder Form.



# CONCENTRATED POWDER FORM



In the CPF process liquids or liquid mixtures are processed by the addition of a gas (supercritical CO<sub>2</sub>) in such a way that they are converted gently into powder form without the loss of valuable constituents. The gas-saturated liquids are instantly expanded through a nozzle into a spray tower. The result is a fine spray of tiny droplets at temperatures between -10 °C and 10 °C. At the same time a powder carrier is added, which binds the droplets, so that a free-flowing powder with a liquid content of up to 80 wt.% is created.

With the aid of the CPF process powders can be created from, for instance, lipids and viscous concentrates such as aromas, extracts, pigments, oils, spice extracts, fats, oleoresins and emulsions. These bound liquids or emulsions can then be dosed accurately in powder form. This opens up entirely new opportunities for the food, cosmetics, and pharmaceutical industries as well as many other branches.

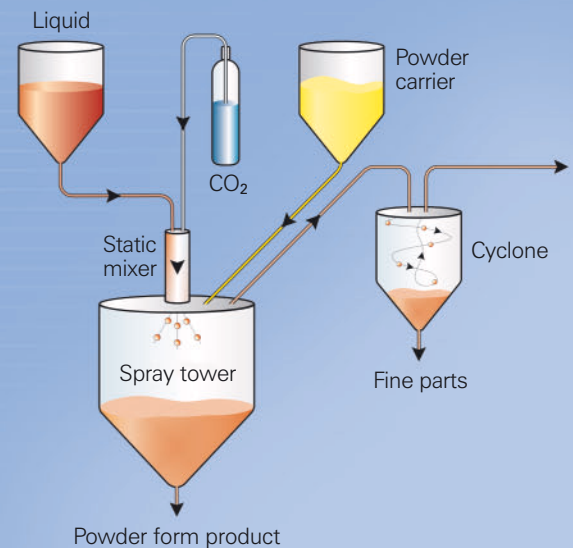
The manufacturing process offers many advantages. The product is drastically cooled down by the expanding gas, so that chemical reactions such as the destruction of active and aromatic substances are slowed down or prevented. At low temperatures volatile aromas remain inside the product, which simultaneously reduces undesirable odour during the manufacturing process.

A further advantage is that only carbon dioxide is used. Carbon dioxide is inert and acts as a so-called protective gas. The active substances of pharmaceuticals for instance are stored in a protective gas environment

to assure their durability. This protective property is already integrated in CPF products.

The release of substances can be controlled by the choice of the carrier. The application of different carrier powders in CPF products provides a simple way to influence the release of fluids in liquid or fatty media.

CPF technology allows the manufacture of fluid powders with exceptionally high liquid content and has generated huge interest in many industrial sectors. It is the aim of the cooperation between Raps, Natex, and Yara to custom design CPF products for food technology, detergents, lacquers and paints, adhesives, pharmaceuticals, cosmetics, coating technology, chemicals, catalyst production and many other products used in daily life.



**YARA INDUSTRIAL BV**  
MAASSLUISSEDIJK 103  
P.O. BOX 58, 3130 AB  
VLAARDINGEN, THE NETHERLANDS  
T +31 10 2322 214  
F +31 10 2322 250  
WWW.YARA.COM

**YARA INDUSTRIAL GMBH**  
SPRUDELSTRASSE 3  
D-53557 BAD HÖNNINGEN  
GERMANY  
T +49 2635 961-0  
F +49 2635 961-140  
WWW.YARA.DE