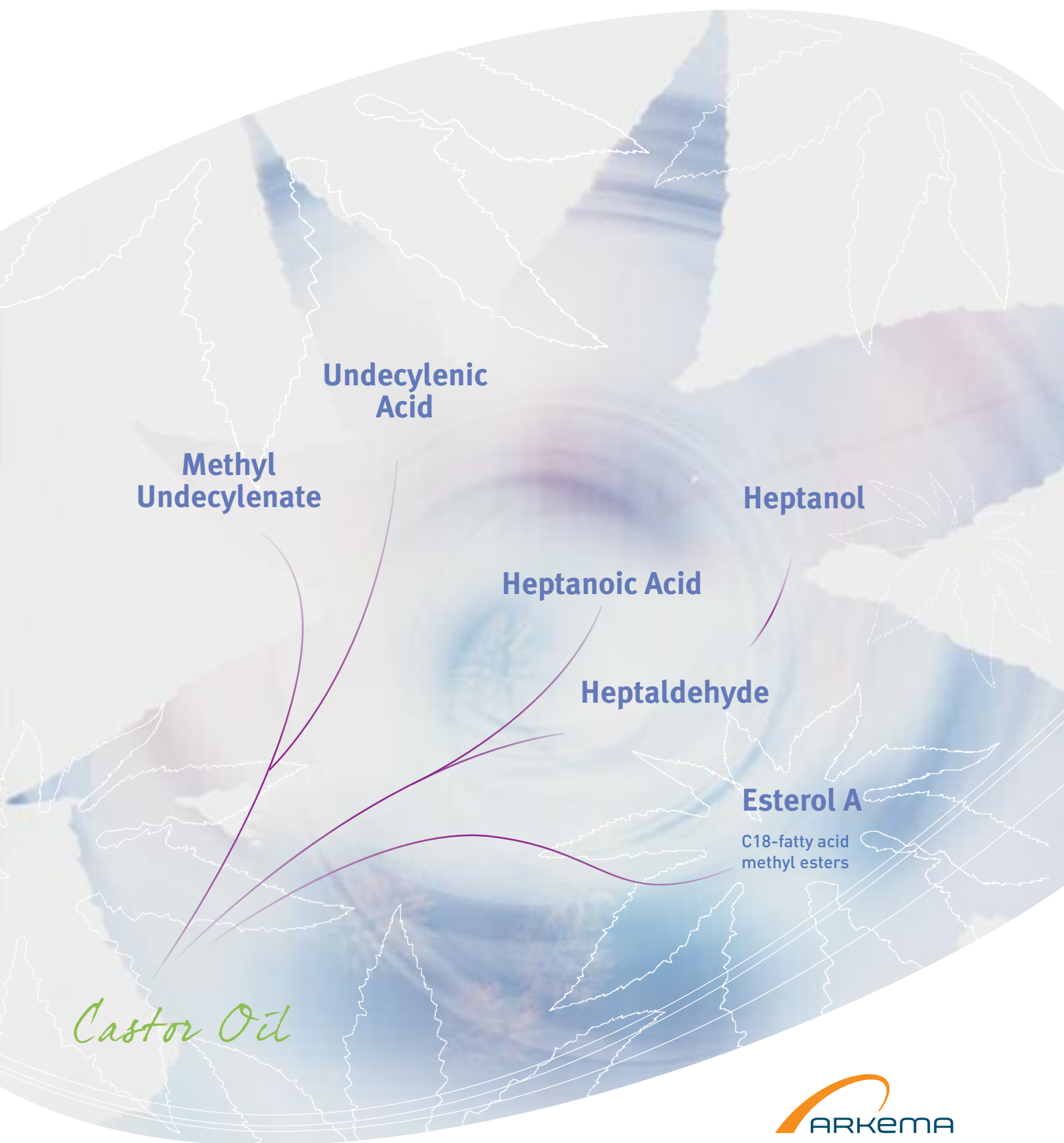




**100% VEGETABLE OIL ORIGIN**

**FROM PERFUMES TO TECHNICAL PRODUCTS**



**Undecylenic  
Acid**

**Methyl  
Undecylenate**

**Heptanol**

**Heptanoic Acid**

**Heptaldehyde**

**Esterol A**

C18-fatty acid  
methyl esters

*Castor Oil*



The peculiar behaviour of castor oil when heated to high temperature has intrigued chemists ever since 1845. It has stimulated the curiosity and research so that the uses of castor oil have dramatically changed over the years. Since then the chemical reactions have been better understood and mastered so that chemical engineers have been able to produce derivatives of the oil that were of even more benefit to man. A real castor oil chemistry has evolved. Today, Marseille in France is the world centre of this chemistry thanks to its process which is unique in the world.

Castor oil is a 100% vegetable, biodegradable, natural, non-toxic and renewable resource. It is characterized by the high percentage of ricinoleic acid, almost 85%, a unique aliphatic acid that is not found in the oil of other plants.

It is this linear 18 carbon atom chain that is cracked into 2 parts, a C7 and a C11 cut and a mixture of natural fatty acids.

### C7 cut

Heptanol (CAS No. 111-70-6),  
Heptaldehyde (CAS No. 111-71-7)  
Heptanoic acid (CAS No. 111-14-8).

Heptanol and heptaldehyde can be used as synthesis intermediates in flavors and fragrances.

Heptanoic acid, with its good anticorrosion properties and a unique performance level at both high and low temperature, is used primarily in lubricants, refrigerating oils...

### C11 cut

Undecylenic acid (CAS No 112-38-9),  
Methyl Undecylenate (CAS No 111-81-9),

In nature, trace quantities of C11 acid are found in sweat, tears and hair fats. Under salt form (Zn/Ca), it is used for human skincare preparation.

Undecylenic acid is one of the safest, ecological, most economical and highly effective natural antimicrobial and preservative agent.

### A mixture of C18

Saturated and unsaturated fatty acid esters (stearic, oleic and linoleic acids) composes the **Esterol A** (CAS No 67762-38-3).

Easily biodegradable and non-toxic, with low viscosity and good oxidation resistance, Esterol A is an excellent unctuous agent and finds applications as fluxing agent in metalworking fluids, concrete mould release agent, lubricant additive in cutting oils...

fragrances



cosmetics



lubricants



flavors

personal care



mould-release

## Green Chemistry

- Green Chemistry, also called Sustainable Chemistry, is a philosophy of chemical research and engineering that encourages the design of products and processes that minimize the use and generation of hazardous substances.
- Paul Anastas, from the United States Environmental Protection Agency, and John C. Warner developed 12 principles of green chemistry, which help to explain what the definition means in practice (\* Anastas, P. T.; Warner, J. C.; Green Chemistry: Theory and Practice, Oxford University Press: New York, 1998).
- The principles cover such concepts as:
  - The design of processes to maximize the amount of raw material that ends up in the product;
  - The use of safe, environment-benign substances, including solvents, whenever possible;
  - The design of energy efficient processes → catalytic reactions;
  - The best form of waste disposal: not to create it in the first place.
- Indicators of Green Chemistry for Oleris™ products:

 GREEN CHEMISTRY	Real Experimental Atom Economy	E-factor
Undecylenic Acid + Methyl Undecylenate + Heptaldehyde + Esterol A	80%	0.25
Heptanoic Acid	82.5%	0.21
Heptanol	99%	0.01

- Real Experimental Atom Economy = Percentage yield x (theoretical yield/mass of all reactants)x100
- E-Factor = mass of waste / mass of finished products

## A high quality range of products



- 100 % biobased: vegetable oil origin

*Products of vegetable origin, castor oil, a renewable resource*

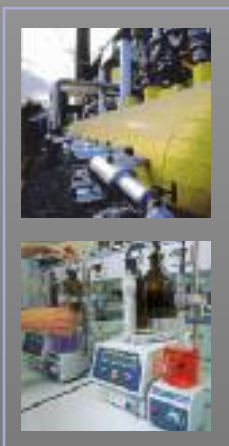
*Environmentally friendly chemicals: good biodegradability, non-hazardous or dangerous for human health.*

- 100% linear molecules
- High purity grades (from 95 to 99%)

*More pure, more linear than with other production process!*

- Registered in Reach, IUCLID toxicologic files available
- "Genetically Modified Origin" free, TSE-BSE,
- Kosher certificated

## A strong and experimented industrial partner



- A production process managed for more than 60 years
- A reliable plant in the south of France
- Able to deliver all over the world
- A continuous production process
- ISO 9001 & 14001
- Our quality management system is in accordance with the requirements of the regulation (EC) n°2032/2006 concerning the good manufacturing practices for materials and articles intended to come into contact with food

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