

The background of the cover is a vibrant golden-yellow color, filled with numerous clear, spherical bubbles of varying sizes. In the lower right quadrant, a portion of a glass dish or petri dish is visible, containing a dense cluster of these bubbles. The overall effect is one of scientific precision and dynamic energy.

**KRATON™**

**PERFORMANCE CHEMICALS**

**EMEA PRODUCT GUIDE**

**KRATON™**

Kraton is the world's largest producer of pinechemicals and specialty resins based on Crude Tall Oil (CTO), a by-product from pine wood pulping. This feedstock and our primary bio-refinery products – SYLFAT™ tall oil fatty acids (TOFA), SYLVAROS™ tall oil rosin (TOR) and SYLVATAL™ distilled tall oil (DTO) – are biobased, natural, non-edible and have overall a lower carbon footprint compared to vegetable alternatives.

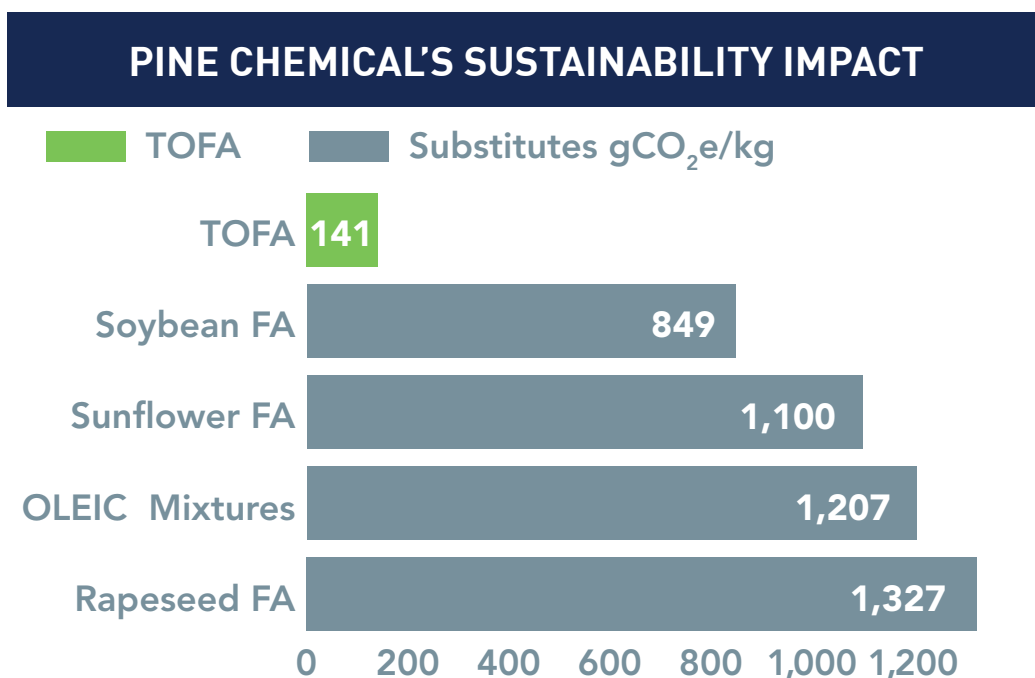
In 2016, Kraton was the first company to receive the European biobased certification for our SYLFAT tall oil fatty acid product range – a key differentiator in the biobased product market. The certification system is based on the European standard EN 16785-1 which enables independent assessment of claims on the biobased content of products.



- \* Sustainable solutions
- \* High quality & excellent composition consistency
- \* High supply security

CTO, being derived from pine trees, in combination with our world-class bio-refineries assists in our commitment to ensuring that our products are characterized by an excellent composition consistency and constant high quality, as trees are not as sensitive to seasonal changes as plant derived alternatives.

Through our global, well established network of bio-refineries, we strive to provide high supply security for our products. Our products with their low carbon footprint and high biobased content are intended to help our customers achieve their sustainability goals.





TOFA's (Tall Oil Fatty Acid) carbon footprint is at least five times lower than the vegetable oil substitutes made from soy beans, sunflowers, rapeseed and oleic mixtures. These substitutes all have nutritional value, whereas our TOFA does not compete with the food supply. (Arthur D. Little for Kraton Corporation Europe)

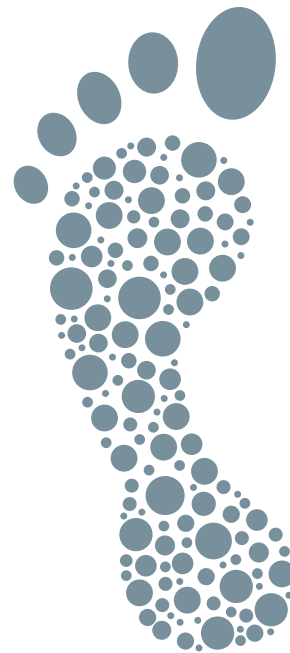
## PINE CHEMICAL'S CARBON FOOTPRINT LOWER THAN SUBSTITUTES

Pine chemicals have been proven to have a lower footprint than their substitutes. On a global scale, pine chemicals cause carbon emissions that are

# 50% less

than when using a substitute.

 Pine chemicals footprint  
 Pine chemicals substitutes\*



\* Pine chemicals substitutes = weighted average

**You can find SYLFAT™, SYLVAROS™, SYLVATAL™ and UNIDYME™ pine chemicals in applications such as:**

- Alkyd Resins
- Metalworking Fluids
- Asphalt Emulsions
- Epoxy Ester Resins
- Ester Solvents
- Fuel Additives
- Lubricant Additives
- Rust Inhibitors
- Anti-wear Agents
- Friction Modifiers
- Construction
- Plasticizers for Rubber
- Mineral Processing
- Oilfield Chemicals
- Special Industrial and Household Cleaners
- Textiles

# FATTY ACIDS

Kraton's SYLFAT™ and CENTURY™ fatty acids are useful in a wide range of industrial applications. The utility of these product ranges can be found in the long carbon chain (C<sub>18</sub>), the acid function of the carboxyl group (COOH) and the unsaturation of the double bonds. Each of the SYLFAT and CENTURY fatty acids have a unique degree of unsaturation and fatty acid distribution making one of them suitable for almost any application where C<sub>18</sub> type fatty acids are preferred.

SYLFAT 2 is a standard tall oil fatty acid (TOFA) grade for general use. SYLFAT 2 has a high fatty acid content and a low content of rosin acids and unsaponifiables. SYLFAT 2 provides a combination of light colour, good colour stability and air-drying properties. SYLFAT 2LT is a specialty grade of TOFA with excellent low temperature properties typically used as fuel additive to improve lubricity of low Sulphur diesel. The SYLVATAL™ products are distilled tall oils (DTO) containing 10–30% rosin acids. They combine the advantages of fatty acids and rosin acids and therefore an ideal raw material for functional products like metalworking fluids, oil field chemicals, soaps, cleaners and alkyd resins. SYLVATAL helps provide hardness improvement for indoor varnishes with high gloss and excellent water and alkali resistance. SYLVATAL when used as magnesium soaps can be very efficient dispersants for fuel oils.

The CENTURY fatty acid products each have a unique mixture of branched and straight-chain saturated C<sub>18</sub> fatty acids and differ in unsaturation level and viscosity.

CENTURY M05 is a special fatty acids product that contains both saturated and unsaturated C<sub>18</sub> fatty acids. Branched chain iso-oleic acids constitute the main portion, with virtually no polyunsaturated fatty acids.

CENTURY 1105 and 1107 are isostearic fatty acids (ISA) with a high content of branched acids which makes it a liquid product, while the very low level of unsaturation results in excellent oxidative stability. CENTURY 1224 is a saturated fatty acid product containing approximately 70% C<sub>18</sub> stearic acid (SA), with typically 23% methyl-branched C<sub>18</sub> saturated acids.

		Color Gardner	Acid Value mg KOH/g	Viscosity mPa.s at 20°C	Free Rosin Acids %	Unsaps %	Iodine Value cg I/g	Pour Point °C	Cloud Point °C
<b>SYLFAT 2</b>	TOFA	4	196	25	1.6	2	152	-14	2
<b>SYLFAT 2LT</b>	TOFA	4	197	25	1.7	1	154	-15	-10
<b>CENTURY M05</b>	Mono	3	174	semi-solid	NA	7	80		
<b>CENTURY 1105</b>	ISA	2	181	87	NA	6	8		
<b>CENTURY 1107</b>	ISA	< 1	186	86	NA	3	6		
<b>CENTURY 1224</b>	SA	1	195	solid	NA	1	2		
<b>SYLVATAL 10S</b>	DTO	5	194	40	10	1			
<b>SYLVATAL 20S</b>	DTO	5	192	60	20	2			
<b>SYLVATAL 20/25S</b>	DTO	5	190		22	2			
<b>SYLVATAL 25/30S</b>	DTO	5	189	110	27	2			

\* Typical results- actual product specifications can be obtained from Product Data Sheets

NA = Not Applicable



# DIMER FATTY ACIDS

Kraton's UNIDYME™ products are dimerized fatty acids specially designed for the manufacture of polyamide curing agents, other high molecular weight intermediates and certain specialist additive applications. Being based on same the same feedstocks as our SYLFAT fatty acids, our UNIDYME products are also characterized by a high composition consistency and constant high quality excellent color stability and oxidative stability when formulating hotmelt adhesives.

	Color Gardner	Acid Value mg KOH/g	Viscosity cSt at 25°C	Dimer Acid %	Monomer Acids %	Polymer Acids %	Unsaps %
UNIDYME 14	4	194	7250	95	0.2	5	0.2
UNIDYME 18	6	192	8500	82	1.5	17	0.2

\*Typical results- actual product specifications can be obtained from Product Data Sheets



# TALL OIL ROSINS AND SOAPS

Tall oil rosin (TOR) is a primary bio-refinery product based on Crude Tall Oil (CTO) and comparable to the resinous constituent found in pine tree exudates. SYLVAROS™ 85 is an unmodified tall oil rosin (TOR) with a high content of abietic type rosin acids. It is especially suited for the manufacture of fortified rosin, paper size and ink resins.

SYLVAROS Rosin and Disproportionated Rosins (DR) can be used for the manufacture of emulsifiers for the polymerization process and for pigment coating. DR grades are further suitable for the formulation of solvent based adhesives and hot-melts as well as in the manufacture of adhesives tapes and rubber products. Other applications are lacquers, soldering fluxes, sealants, paper sizing agents, marine coatings and the production of rosin derivatives.

SYLVAROS Rosin Soaps and Disproportionated Rosin Soaps are used as emulsifiers in the polymerization process of styrene-butadiene rubber, nitrile rubber, polychloroprene and acrylonitrile-butadiene-styrene plastics. They are also suitable for the preparation of pigments, as anchoring agent and in the adhesive industry to improve properties of adhesives on basis of casein or polymer dispersions.

	Colour US Rosin Grade	Acid Value mg KOH/g	Abietic Acid %	Dehydroabietic Acids %	Unsaps %	Solid Content %
SYLVAROS™ 85	XA	175	33	18	4	NA
SYLVAROS™ R 100A	M	170	53	5	7	NA
SYLVAROS™ DR 731D	WW	153	0	53	11	NA
SYLVAROS™ DRS 214	WW	10.7	0	42	9	80
SYLVAROS™ DRS 215	WW	10	0.1	43	9	84
SYLVAROS™ DRS 731	X	11	0	39	8	70

\*Typical results- actual product specifications can be obtained from Product Data Sheets

NA = Not Applicable



# POTENTIAL APPLICATIONS

Our SYLFAT™, CENTURY™, SYLVATAL™, SYLVAROS™ and UNIDYME™ pine chemicals are used for their functional properties such as chemical reactivity, surface activity, etc. in chemical synthesis or in formulated products. For instance, the functionality of the carboxylic group of the fatty acids can be reacted with amines to form new amines or amides as well as imidazolines. This same functional group is readily reacted with mono-, di-, and poly alcohols to form esters offering unique properties. The sites of unsaturation in the backbone of the carbon chain can be utilized in Diels-Alder reactions to make adducted products. Dimer acids can be produced from tall oil fatty acid either thermally or catalytically.

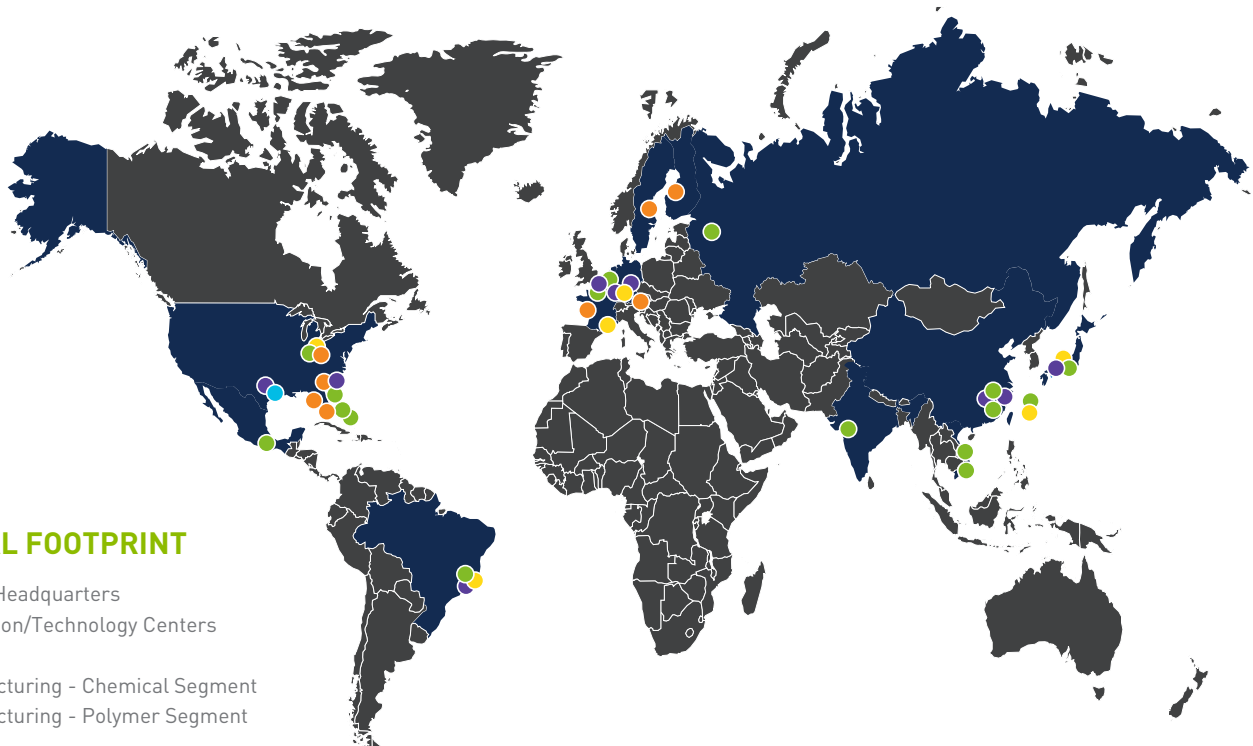
	SYLFAT	SYLVATAL	CENTURY M05	CENTURY 11xx	UNIDYME	SYLVAROS 85, R 100A	SYLVAROS DR 731D	UNI-REZ 25xx
	TOFA	DTO	Monomer	Isostearic Acid	Dimer	Rosin	Dispro.Rosin	Thixo Polyamide
<b>Asphalt Emulsions</b>	■	□						
<b>Construction</b>								
Concrete Release Agents	■	■	□					
Concrete Air Entrainment	■	■						
<b>Ester Solvents</b>	■	□	■					
<b>Fuel Additives</b>	■	□			■			
<b>Lubricants</b>								
Lubricant Esters / Base Oils	■	□	■	■	■			
Lubricants Additives	■			■				
Metalworking Fluids	■	■						
<b>Mineral Processing</b>	■	■	■	■				
<b>Oilfield Chemicals</b>	■	■	■	■	■			
<b>Plasticizers For Rubber</b>	■		□	□				
<b>Resins</b>								
Alkyds, Short Oil		■	■			□		
Alkyds, Medium/ Long Oil	■	■				□		
Antifouling Coatings					■	□	■	
Phenolic / Resinate Ink Resins								
Epoxy Esters	■				■			
Pigment Wetting Agents	■	■					■	
Polyamide Curing Agents	■				■			
UV Curing Resins					■			
<b>Special Industrial and Household Cleaners</b>	■	■						
<b>Textiles</b>	■	■	□	□				

■ Recommended    □ Functional



## ABOUT KRATON CORPORATION

Kraton Corporation (NYSE “KRA”) is a leading global producer of styrenic block copolymers, specialty polymers and high-value performance products derived from pine wood pulping co-products. Kraton’s polymers are used in a wide range of applications, including adhesives, coatings, consumer and personal care products, sealants and lubricants, and medical, packaging, automotive, paving, roofing and footwear products. As the largest global provider in the pine chemicals industry, the company’s pine-based specialty products are sold into adhesive, road and construction and tire markets, and it produces and sells a broad range of chemical intermediates into markets that include fuel additives, oilfield chemicals, coatings, metalworking fluids and lubricants, inks, flavors and fragrances and mining. Kraton offers its products to a diverse customer base in over 70 countries worldwide.



### GLOBAL FOOTPRINT

- Global Headquarters
- Innovation/Technology Centers
- Offices
- Manufacturing - Chemical Segment
- Manufacturing - Polymer Segment

#### Global Headquarters

Houston, TX, USA

#### Regional Offices

Jacksonville, FL, USA  
 Shanghai, China  
 Almere, The Netherlands  
 Tokyo, Japan  
 Paulinia, Brazil  
 Mumbai, India

#### Manufacturing in the Americas

Belpre, OH, USA  
 Dover, OH, USA  
 Panama City, FL, USA  
 Pensacola, FL, USA  
 Savannah, GA, USA  
 Paulínia, Brazil

#### Manufacturing in Asia

Kashima, Japan (JV)  
 Mailiao, Taiwan (JV)

#### Manufacturing in Europe

Berre, France  
 Niort, France  
 Oulu, Finland  
 Gersthofen, Germany  
 Wesseling, Germany  
 Sandarne, Sweden

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