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Pine chemicals production and applications in Russia

Market overview

Russian pine chemicals market is based mainly on tall oil, its derivatives and sulphate turpentine as side products of Kraft pulping, where gum rosin and turpentine share is relatively small, due to:

- weather and industrial conditions
- pine tree species

Kraft pulping

Kraft pulping process is the dominant method for producing paper, in Russia too.

In Kraft process wood chips are treated by a hot mixture of:

- water
- sodium hydroxide
- sodium sulfide

that converts the chips into wood pulp.

Tall Oil and Sulphate Turpentine

- There are ten Kraft pulp & paper mills in Russia, producing crude tall oil in the total volume of approx. 165 000 MT/annum.
- Some of them produce crude sulphate turpentine as well in the total volume of approx. 3500 MT/annum.



ILIM Group

- The majority of the Russian pine chemicals production is concentrated by ILIM Group in joint venture with International Paper at:
 - Ust-Ilimsk pulp&paper mill
 - Bratsk pulp&paper mill
 - Koryazhma pulp&paper mill
(pine chemicals unit at Koryazhma is in joint venture with Orgkhim)

The total output of ILIM Group is >3 mln tons of pulp, paper, cardboard, packaging and pine chemicals per year.



- Segezha Group with one Kraft mill in Segezha (Karelia) is No 1 in Europe and No 3 in the world for brown Kraft packaging paper, but represented by only one CTO refinery with current distillation capacity of 30,000 MT/annum, and periodic production of sulphate turpentine 100-150 MT/annum.

CTO (crude tall oil) Refining

Having such good resource of CTO and CST, there are only four CTO refineries:

- 2 in the North West (Koryazhma and Segezha)
- 2 in Siberia (Ust-Ilimsk and Bratsk)

CST (crude sulphate turpentine) refining

CST, which is collected in approx. volume of 3500 MT/annum, is represented by only two refining factories, producing mainly:

- Alpha-pinene
- Pine oil

Pine tree species (*Pinus Sylvestris*)



- The species of pine trees growing in Russia, **Pinus Sylvestris**, allow to manufacture CTO with average 25-30% of resin acids, and CST with 50-60% of A and B pinene.
- In the results substantial volumes of CTO with low resin acids (Hardwood Grade) are exported to Europe, mainly as feedstock for biodiesel production, but some tonnages of Softwood CTO with high resin acids are supplied to Europe for further distillation.
- CST is mostly consumed locally (approx. 80%), some small volume is exported as raw material, mainly to the Asian market.

Crude Gum

While crude gum cropping and distillation is located on only one territory, in the south west of Russia, there used to be other two territories in the north west and central Russia, where now it has almost stopped.

Traditionally, tall oil based rosin and derivatives are much cheaper compared to gum rosin and its derivatives, produced in Russia.

Gum rosin and turpentine applications



Rosin esters for road marking



Disproportioned rosin for synthetic rubber



Alpha pinene for flavor and fragrance

Tall oil rosin applications



Rosin esters for road marking



Emulsifiers for synthetic rubber



Adhesives for rubber and tyre



Paper size for paper industry



Paint and varnish

Crude sulphate turpentine applications



Alpha Pinene for further usage in
flavor and fragrance



Delta-3-carene (Dipentene) used in
terpene resins and pesticides



Pine oils, mainly 60% grade used
for flotation

Other Tall Oil products

- TOFA – Tall Oil Fatty Acids
- DTO – Distilled Tall Oils
- TOP – Tall Oil Pitch

TOFA (tall oil fatty acids)



Main application in Russia is for production of lubricants for vehicle fuel, and is used at two large petrorefineries of Rosneft



As raw material for paints, alternative to refined sunflower oil. This application has been significantly reduced.



Production of flotation fluids.

DTO (distilled tall oils)



Production of flotation fluids



As raw material for varnish,
alternative to raw sunflower oil

TOP (tall oil pitch)



As fuel at pulp and paper mills,
alternative to heavy fuel oil



As biofuel, when exported to
Europe



As raw material for sterols
extraction – developed by Amber
Stream (JV between ILIM and
Orgkhim)

Perspectives and Risks



GROWING
RUSSIAN
ECONOMY
PROVIDES
SUSTAINABLE
GROWTH OF PINE
CHEMICALS
CONSUMPTION



FOCUS MOVE
FROM
TRADITIONAL
PETROCHEMICALS
AND PLASTICS TO
NATURE FRIENDLY
PRODUCTS AND
PAPER
PACKAGING
LEADS TO
INCREASING
USAGE OF SOME
PINE CHEMICALS,
SUCH AS TALL OIL
ROSIN AND GUM
ROSIN
DERIVATIVES,
TOFA AND PITCH



HIGH POLITICAL
RISKS AT THE
SAME TIME DUE
TO GROWING
TENSIONS WITH
THE WESTERN
WORLD, SERIOUS
CHALLENGES AT
DOING BUSINESS
WITH RUSSIAN
COMPANIES



Thank you