

Bio Plasticizer

Plasticizers are compounds incorporated in a polymer product mainly to increase its flexibility and improve its process-ability. Earlier phthalate-based plasticizers represented 85% of the total plasticizers market. However, ban on usage of phthalate-based plasticizers in consumer goods, food packaging material, toys and medical products have led to the development of eco-friendly bio-based plasticizers.

Further, stringent government regulations and rising health concerns are stimulating demand for non-phthalate and bio-plasticizers in other end applications as well. Flexible PVC product manufacturers are increasingly switching to non-phthalate plasticizers like Epoxy Esters of Soybean Oil & Linseed Oil, Phosphate Esters, Terephthalates, Acid Esters (Sebacates, Adipates) and other bio-based plasticizers.

A renewable, agricultural, non-edible oil based bio plasticizer is well placed to replace phthalate based and other competing plasticizers in soft PVC compounds without sacrificing product performance at a competitive cost. Castor Oil based plasticizer is an ideal choice due to its abundant availability in India, non-edible oil and its chemistry that enables production of plasticizer with superior functionality. Basic process of converting castor oil into plasticizer involves two steps. The first step involves Trans-esterification of hydrogenated castor oil with glycerol and the second step involves Acetylation of the product from the first step with acetic acid to produce plasticizer product. We can provide complete technical know-how of the manufacturing process on industrial scale. Other bio-plasticizers can be based on cottonseed oil, palm oil, rice bran oil, linseed oil etc.

Plasticizers are mainly used in flexible PVC products besides paints, inks, textiles, coatings and cosmetics. Global plasticizer consumption is estimated to be around 5.40 million metric tons per year. Non-phthalate and bio-based plasticizers have a market share of around 25% and are growing rapidly at an annual rate of around 10 to 15%. Plasticizer consumption in India was estimated to be around 400,000 MT during last year. India's per capita PVC consumption at 2.0 kg is very low as compared to that of US at 11.8 kg and China at 10 kg and hence there is huge growth potential for plasticizers in India.

Key target market segments for bio-plasticizers (flexible PVC)

- Medical - e.g. infusion bags, blood bags, tubing etc.
- Pharma - e.g. transparent blister packaging for tablets
- Food packaging – films & sheet
- Toys & consumer goods
- Wire & cable jacketing
- Vinyl flooring, waterproofing sheets, tarpaulins
- Coated fabric & rainwear
- Building construction & irrigation
- Automotive components (specially for export to EU & NA)

Food grade plasticizers can be produced from plant / agricultural based glycerin derivatives. Examples of such food grade plasticizers are Acetylated Monoglycerides (AMG), Acetylated Citric Acid Esters of Monoglyceride (ACMG), Polyglycerol Esters of Fatty Acids (PGE), Calcium Stearoyl Lactylate, Zinc Stearoyl Lactylate etc.

We can provide know-how for the project and assist you in its planning and implementation. As a first step we can prepare a Techno Economic Project Feasibility Report that will provide a realistic picture and help you to take an informed business decision. Typical contents of the project feasibility report are given below.

- 1.0 What are plasticizers, different types and end applications
- 2.0 What is bio-based plasticizers & the different types
 - 2.1 Why a castor oil based bio plasticizer ?
- 3.0 Other non-phthalate plasticizers – advantages & disadvantages
- 4.0 Suggested production volume & project parameters
- 5.0 Production process & technology
 - 5.1 Production flow diagram
 - 5.2 Chemistry behind the chemical reactions and production process
- 6.0 Main plant & machinery with basic specifications and indicative price
- 7.0 Utilities & Support facility with basic specifications and indicative price
- 8.0 Quality Control & Testing Lab with indicative prices
- 9.0 Estimated Project Cost
- 10.0 Manpower requirement & cost
- 11.0 Estimated Product Cost (raw material, additives, production, overheads)

- 12.0 Estimated Turnover, Profitability & Project Payback Period
- 13.0 Working Capital requirement
- 14.0 Factory area & building requirement
- 15.0 Product guiding specifications & test standards
- 15.1 Product pricing vis-à-vis phthalate, non-phthalate & bio-based plasticizers
- 15.2 Pdt. characteristics vis-à-vis phthalate, non-phthalate & bio-based plasticizers
- 15.3 Key market segments and end applications
- 16.0 Market Scenario
- 16.1 Current domestic plasticizer production & consumption, main players
- 16.2 Share of phthalate, non-phthalate & bio-based plasticizers
- 16.3 Market potential and growth prospects of bio-based plasticizers
- 16.4 Key market segments (for bio-plasticizers) – volume and growth prospects
- 17.0 Specific bio-based plasticizer products from Indian and foreign companies being marketed in India

Once you decide to go ahead with the project we can provide complete assistance for the project implementation i.e. selection and sourcing of plant & machinery, plant layout and factory design, selection & sourcing of utilities and support equipment, recruiting technical manpower, commissioning of plant, sourcing of raw material and chemicals, process know-how, quality control and testing systems, product technical qualification, target market segments, end application know-how, market intelligence, REACH compliance for export etc.

Best regards,

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