Chlorinated Paraffin Wax (CPW) Manufacturing Business

<table>
<thead>
<tr>
<th>Parameter</th>
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<tbody>
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<td>Capacity:</td>
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<td>Plant and machinery cost:</td>
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<td>Working Capital:</td>
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<tr>
<td>Rate of return (ROR):</td>
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<td>Break Even Point (BEP):</td>
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<tr>
<td>TCI:</td>
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<tr>
<td>Cost of Project:</td>
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Chlorinated Paraffin Wax (CPW) Manufacturing Business. Production of Chlorinated Paraffin Plasticizers

Chlorinated paraffin is colorless or yellowish, viscous, dense oils, except for the chlorinated paraffin of long carbon chain length with high chlorine content (about 70%), which are solid. Chlorinated paraffin offers advantages such as flame retardancy and low-temperature strength as well as increases the flexibility of the materials.

Chlorinated paraffin wax is one of the major secondary plasticizers used in flexible PVC manufacturing. Usage of chlorinated paraffin wax increases the flame retardant property in PVC products such as PVC cables and flooring. Additionally, lower cost of chlorinated paraffin wax vis-à-vis other plasticizers lowers the overall cost of manufacturing. Chlorinated paraffin wax is used as plasticizer in paints and coatings, sealants and adhesives, and rubber products such as industrial belts and conveyor belts due to properties such as flame retardancy and inertness.

Chlorinated paraffins are used as extreme pressure additives as metal working lubricants or cutting oils. This is attributed to their compatibility with oils, viscous nature, and property of emancipating hydrochloric acid at high temperatures. They improve the resistance to water and chemicals, which is most suitable when they are used in marine paints, as coatings for industrial flooring, vessels, and swimming pools.

Chlorinated paraffins are chlorinated n-alkanes or paraffins used as metalworking fluids and secondary plasticizers in the manufacture of PVC compounds. These are typically classified based on the grades or carbon chain lengths such as l-grade, m-grade, and h-grade. Each of these grades defines the length of carbon chain such as short chain chlorinated paraffins, medium chain chlorinated paraffins, and long chain chlorinated paraffins. These grades are further sub-divided based on chlorination content within each grade such as less than 40%, 40% to 70%, and above 70% chlorine by weight. The application requirement decides the level of chlorination and grade of chlorinated paraffin used.

**Six reasons why chlorinated paraffin has become the compound of choice for many companies:**

1. **Flame Resistance**
   Chlorinated paraffin offers a low-cost, flame-retardant solution for a wide range of applications. When exposed to high temperatures, CP releases a substantial amount of HCl. In its condensed phase, HCl contributes to the formation of char. In its vapor phase, it can function as a flame poison. Additionally, the decomposed CP forms a char-like residue, which also acts as a flame retardant.
   Because of its flame-retardant properties, chlorinated paraffin is ideal for use in rubber, plastics, sealants, industrial coatings, adhesives, fabric or any application where fire resistance is essential.

2. **Low-temperature Flexibility**
   Chlorinated paraffin ensures greater flexibility at lower temperatures than conventional plasticizers. As a result, it is often added to products that require a high flexibility in colder weather, such as some types of flooring, wire and cable insulation, and garden hose. In the production of plastics, CP is added to increase the elasticity of materials like PVC.

3. **Stain Resistance**
   Another reason why chlorinated paraffin may be selected is its improved stain resistance. This is an important consideration in applications where a certain aesthetic is desired, including flooring, wall coverings and upholstery. In comparison, sulfurized additives can stain metals and cause rancidity.

4. **Resistance to Aqueous Detergent Extraction**
   Many manufacturers use water-based detergents/additives to clean their metal parts. While this cleaning process eliminates contaminants like grease and oil, it can also remove plasticizers that are required for an effective formulation. Chlorinated paraffin, however, releases hydrochloric acid at elevated temperatures, which then bonds with the metal surface and forms a thin yet solid film of lubricant.
5. Chemical Resistance
Chlorinated paraffin offers improved resistance to both water and chemicals. For this reason, it is often added to paints, sealants and coatings. It is especially effective in paints used for traffic markings and marine applications, such as coatings for industrial flooring, vessels, swimming pools, etc.

6. Plastisol Viscosity Stability
Chlorinated paraffin serves as a viscosity regulator for plastisols. This is especially critical in the manufacturing of PVC plastisol, which must maintain a stable viscosity for an extended period of time (during dip and rotational molding). For improved stability, we recommend using CPs with a chlorine content of 30%-40%.

Market Outlook
The global chlorinated paraffin wax market was valued at US$ 1,647.0 Mn in 2018 and is anticipated to expand at a CAGR of 3.3% from 2019 to 2027. Rise in usage of chlorinated paraffin wax as flame retardant is expected to drive the market in the near future.

Factors that drive the growth of the global chlorinated paraffin market are rise in PVC and metal working industry coupled with aerospace & industrial sector. In addition, growth in automotive sector is also expected to fuel the demand for chlorinated paraffin in the near future. However, stringent regulations pertaining to use of short-chain chlorinated paraffin in many regions and availability of alternatives is expected to hamper the growth of this market in near future.

Demand for chlorinated paraffins has increased in various applications owing to the low cost and broad range of properties of these paraffins. Growth in plastic and metalworking industries is likely to drive the demand for chlorinated paraffins during the forecast period. Availability of various application-specific substitutes and potential prohibition in developed regions owing to environmental concerns are projected to hamper market growth in the next eight years. However, expansion in the lubricants market in Asia Pacific is anticipated to offer growth opportunities to the chlorinated paraffins market during the forecast period.

Construction sector expansion is likely to augment the market growth in coming years owing to rising population coupled with increasing housing requirements of the people in the developing regions. This is due to extensive product usage in PVC in order to manufacture the sheets, films, cables, wires, pipes and other related products. Increasing demand for the PVC products in construction, insulation, transmission and other industries is fueling the chlorinated paraffin market growth due to outstanding technical features. Based on end-user, the chlorinated paraffin market is fragmented into paints & coatings, rubber, manufacturing, textile, leather and other industries. Among these, rubber and manufacturing industries will register a combined share of over 50% in chlorinated paraffin market in 2024. This is attributed due to the wide acceptance of the product as a softening agent, lubricative additive, fire retardants and water repellant fabric treatment agent.

Based on region, the global chlorinated paraffin wax market has been split into North America, Europe, Asia Pacific, Latin America, and Middle East & Africa. Currently, countries in Asia Pacific such as China, India, Indonesia, Japan, and South Korea are considered to be the center of gravity for the global fabrication and metalworking industry. Increase in trend of domestic manufacturing of chlorinated paraffin wax is fueled by the growth in end-user industries. Chlorinated paraffin wax is primarily used in industrial cutting fluids or metalworking lubricants as high-pressure additives. It possesses the property of providing the necessary lubrication at high temperature and pressure, thus making it suitable for large metal cutting operations.

Increase in demand for metalworking fluids in automotive, aerospace, and other manufacturing sectors is projected to boost the metalworking fluids segment, as these fluids are good flame retardants and coolants. Chlorinated paraffin wax is primarily used as a key ingredient in the formulation of working or metal cutting fluids. This is likely to boost the penetration of chlorinated paraffin wax during the forecast period.
Global Chlorinated Paraffins Market: Market Participants

- INOVYN
- Caffaro Industrie S.p.A.
- Ajinomoto Fine-Techno
- JSC Kaustik
- Altair Chimica SpA
- INEOS Chlor
- Quimica del Cinca, S.A.
- Handy Chemical Corporation Ltd.
- LEUNA-Tenside GmbH
- Dover Chemical Corporation
- Aditya Birla Chemicals.
- Flow Tech Group of Industries
- Makwell Group

Tags

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