



山东天成万丰化工科技有限公司
Shandong Tiancheng Wanfeng Chemical Technology Co., Ltd.

AKD 蜡粉产品介绍
AKD Wax Introduction





AKD 蜡粉介绍

1. 简介
2. 技术指标
3. 应用

天成 AKD 蜡粉介绍

- 天成 AKD 蜡粉发展历程
- 天成产品优势
- 包装规格

天成化工产品目录

Introduction of AKD Wax

1. Introduction
2. Specifications
3. Application

Introduction of Tiancheng AKD Wax

- Development History
- Product Advantages
- Packaging

Tiancheng Product List

AKD

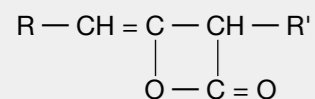
AKD 蜡粉的介绍 Product Introduction

1. 蜡粉简介

化学名称：烷基烯酮二聚体

简称：AKD 蜡粉, AKD

AKD 原粉, 又称 AKD 蜡, 化学名为烷基烯酮二聚体, CAS 登记号为 144245-85-2, 淡黄色固体 (片状或颗粒状), 本产品由脂肪酸 (C≥16) 经酰化、脱氯化氢而制成的烷基烯酮二聚体, AKD 原粉主要用于造纸中性施胶剂。



结构式中的 R 或 R' 为烷基, 变更不同的烷基可以得到一系列的烷基烯酮二聚体, 适于造纸中性施胶的是 18 烷和 16 烷。

烷基烯酮二聚体为白色至黄色固体, 熔点为 47 ~ 51℃ 左右, 溶于乙醇、苯、三氯甲烷等有机溶剂。

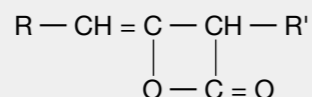
烷基烯酮二聚体反应基酮基具有高活性, 与纤维素中羟基起酯化反应。

1. Introduction of AKD Wax

Chemical name: Alkyl Ketene Dimer

Alias: AKD wax

AKD powder is also called AKD wax. Chemical name is Alkyl ketene dimer. CAS registration number is 144245-85-2. Appearance is pale yellow flake or granular solid. It is produced by fatty acid (C≥16), via acylation and dehydrochlorination to become AKD wax. AKD wax is mainly used for papermaking neutral sizing agent.



R or R' in the above structural formula is the alkyl group, and a series of alkyl ketene dimers can be obtained through modifying different alkyl groups. Octadecane and cetane are applicable to the papermaking neutral sizing agent.

Alkyl ketene dimer is a white-to-yellow solid with the melting point of about 47 ~ 51 °C, which can be soluble in ethyl alcohol, benzene, chloroform and other organic solvents.

The reactive group of alkyl ketene dimer-ketone group has high activity and makes esterification reaction with the hydroxyl in cellulose.



2. 蜡粉技术指标 Specifications of AKD wax

项目 Items	AKD 1840		AKD 1865		AKD 1895	
	一级品 First-rate product	合格品 Qualified product	一级品 First-rate product	合格品 Qualified product	一级品 First-rate product	合格品 Qualified product
外观 Appearance	浅黄色颗粒状固体 Pale yellow granule					
熔点 Melting point/°C	47.0		50.0		60.0	
碘值 Iodine number (I2), w/(g/100g) ≥	45.0	44.0	44.0	43.0	43.0	42.0
酸值 Acid value(KOH), w/(g/100g) ≤	5.0					
纯度 Purity, w/% ≥	88.0	85.0	90.0	86.0	90.0	87.0
甲苯含量 Toluene, w/% ≤	0.001	-	0.001	-	0.001	-



3. 蜡粉的应用

AKD 蜡粉可制成 AKD 乳液，在造纸生产中作为施胶剂应用。

AKD 蜡粉使用阳离子乳化剂进行乳化，融化后的 AKD 蜡粉与乳化剂进行高速剪切，高压均质，冷却后形成液态 AKD 施胶剂。

造纸生产过程中添加 AKD 施胶剂，赋予纸和纸板一定的抗液性，防止或延缓某些液体对纸张纤维的渗透和扩散，以满足人们对纸制品加工和使用的要求。

AKD 有疏水和亲水两种基团，在施胶过程中，均匀分布，转向定位与纤维素成键结合的过程。AKD 乳液粒子由于自身带正电荷，并借助阳离子淀粉和 PAM 等助留剂的作用，留着在带负电荷的纸纤维之间；在纸机的压榨和干燥过程中，这些球状的 AKD 粒子，由于熔点低，易在纤维表面扩展分布，形成均匀的覆盖膜；在纸张干燥和下机贮存一段时间后，AKD 分子上的活性基（内酯环）在一定的条件下和纤维上的羟基发生酯化反应，以牢固的共价键形式结合在纤维上，疏水的长链烷基转向纸面，从而使纸张获得一定的抗液体渗透性能。

3. Product Application

AKD wax can be made into AKD emulsion applied as in sizing agent in the papermaking production.

AKD wax is emulsified by the cationic emulsifier, and melted AKD wax and emulsifier undergo high-speed shearing and high pressure homogenization to form the liquid AKD sizing agent after cooled.

In the papermaking process, application of AKD sizing agent gives the fluid resistance to paper and paperboard to prevent or delay the penetration and diffusion of some liquids on paper fibers, thus satisfying people's requirements on the processing and use of paper products.

AKD contains hydrophobic group and hydrophilic group, which are well distributed in the sizing process to transfer to locate the process of bonding with cellulose. AKD emulsion particles stay between negatively charged paper fibers since they carry with positive charge by virtue of cationic starch and PAM and other retention agents; In the pressing and drying process of the paper machine, these globular AKD particles are easily expanded and distributed on the surface of fibers due to the lower melting point to form a homogeneous cover film; When paper is dried and stored for a period, the active group (lactone ring) on AKD molecule makes the esterification reaction with the hydroxyl on fibers under certain conditions to be binding on fibers in the form of fixed covalent bonds. Hydrophobic long-chain alkyls transfer to the paper surface in order to give the penetration resistance to paper.

天成 AKD 蜡粉的介绍 Introduction of Tiancheng AKD wax

天成 AKD 蜡粉发展历程

- 1999 年，天成化工有限公司成立，迄今已有近 20 年的历史。
 - 2002 年，专注于造纸化学品的研制和生产；先后在江苏常州、铜山、新沂和山东泰安、德州建有配套产业基地。
 - 2008 年，AKD 蜡粉产量和质量均居世界前列。
 - 2009 年，与芬兰凯米拉公司合资成立“凯米拉天成化学品(兖州)有限公司”。
 - 2012 年，成立山东天成万丰化工科技有限公司，启动建设占地面积 3000 亩的精细化工园区，并先后取得光气、氯碱、环氧氯丙烷等产品的生产许可。
 - 2016 年 6 月，天成万丰年产 4 万吨 AKD 蜡粉项目正式投产。
- 天成化工专注建设集智能、集约、环保为一体的国际一流精细化工园区。

Development History

Established in 1999, Tiancheng Chemical Co., Ltd. has a history of about twenty years till now.

Since 2002, the company has been devoting itself to the research and production of papermaking chemicals; Further, the company built supporting industrial bases one after another in Jiangsu Province (Changzhou, Tongshan and Xinyi) and Shandong Province (Tai'an and Dezhou).

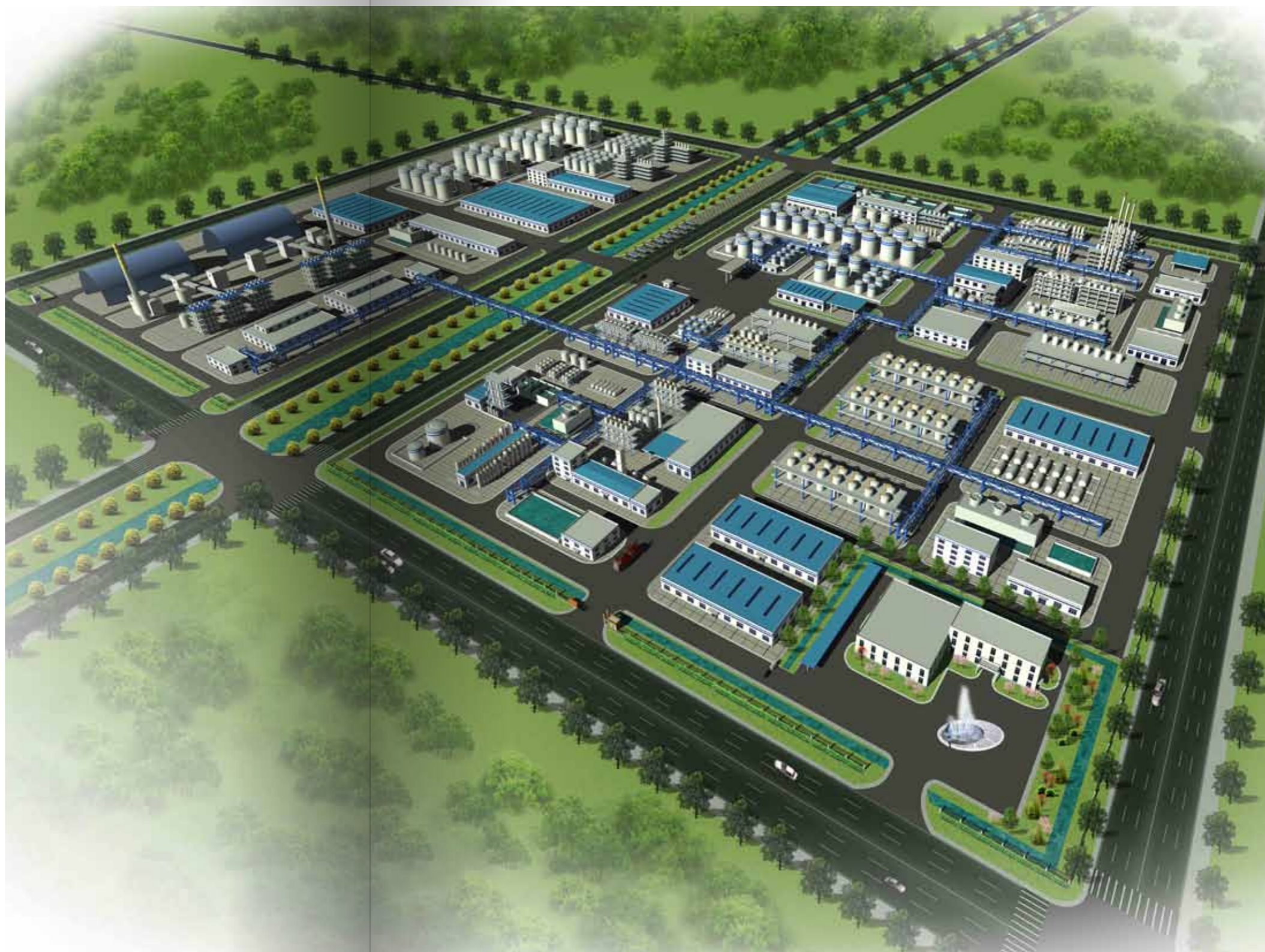
In 2008, the output and quality of Tiancheng's AKD wax ranked the top in the world.

In 2009, ventured with Finland Kemira Corporation, Kemira Tiancheng Chemical (Yanzhou) Co., Ltd. was established.

In 2012, Shandong Tiancheng Wanfeng Chemical Technology Co., Ltd. was founded, and then the fine chemical industrial park covering an area of 2,000,000 square meters was started, which got the phosgene, chlor-alkali and epoxy chloropropane production permits, etc.

In June 2016, Tiancheng Wangfeng officially put AKD wax project with the annual output of 40,000 ton into production.

Tiancheng Chemical is devoted to building a first-class fine chemical industrial park internationally with the integration of intelligence, economy and environmental protection.



天成产品优势 Product Advantages

1. 技术能力

天成化工是AKD蜡粉国家标准起草单位之一，生产AKD原粉已有近20年的历史，始终致力于产品品质的改进和研发。我们不仅是AKD蜡粉的生产厂家，同时也是使用厂家，可以让我们对AKD蜡粉进行更深入的剖析，使AKD蜡粉生产工艺更加成熟稳定。

天成化工从AKD蜡粉到酰氯，再到光气，不断向AKD蜡粉产业链前端延伸，实现一体化生产模式。

1. Technical Ability

Tiancheng Chemical is one of the drafters for National Standard on AKD wax. With a twenty-year history of production of AKD wax, it has been devoting to the quality improvement and R&D. We are not only the manufacturer of AKD wax, but the user. This helps us to deeply analyze AKD wax, and to mature and stabilize the production technology of AKD wax.

Tiancheng Chemical continuously extends its AKD wax industrial chain to the front end from AKD wax to chloride to phosgene, in order to realize the integrative production mode.



2. 生产工艺

天成化工采用溶剂法工艺生产，产品反应充分，转化率高，产品纯度高于90%，最大程度降低多聚体杂质的产生，生产的AKD施胶剂活性成分高，乳化效果好。

造纸生产过程中，使用天成AKD蜡粉生产的施胶剂有以下优势：

- 1) 吨纸单耗低，产生的水解物少，对于造纸成型网的透气性和纸张湿部脱水影响小；
- 2) 湿部成型纸张抗水性能好，可以减少纸张在纸机压榨和干燥过程中的断纸；
- 3) 可以减少纸张出现蜡点的几率，减少纸张滑缸和粘辊等现象，保证纸机正常运转；
- 4) 可以有效防止施胶逆转和假施胶现象的产生。

2. Production Technology

Tiancheng Chemical adopts the solvent techniques for production, and products react fully with high conversion rate, and the product purity is higher than 90%, so that the multimer impurities can be reduced to the maximum degree. AKD sizing agent has high active contents and good emulsification effect.

In papermaking process, the sizing agent produced by Tiancheng AKD wax has the following advantages:

- 1) Low consumption per ton of paper, few hydrolysates generated, which has a small influence on the permeability of paper-making molding net and dehydration in wet end of paper;
- 2) Wet-end formed paper has good water resistance, which can reduce paper breaking in the pressing and drying process of the paper machine;
- 3) Reduce the possibility of wax points on paper, reduce paper sliding cylinder and roller sticking to guarantee the normal running of the paper machine.
- 4) Effectively prevent sizing reversal and false sizing phenomenon.



3. 生产设备

天成AKD蜡粉生产过程采用DCS自动化控制；采用国外进口设备，如法国德地氏反应釜、德国西赫真空泵、克罗拉喷射器、E+H流量计和控制阀；采用全自动包装线，并由机器人进行码垛。

3. Production Equipment

The production process of Tiancheng AKD wax adopts DCS automatic control; Adopt imported equipment, such as French De Dietrich reaction kettle, German SIHI vacuum pump, Kroll injector, E+H flow meter and control valve; Adopt the fully automatic packaging lines and pile up by the robot.





瑞士万通自动电位滴定仪
Switzerland Metrohm Automatic Potentiometric titrator



安捷伦气相色谱仪
Agilent Gas Chromatograph

4. 质量管理

天成化工建有完善的质量管理体系，由专业人员进行产品分析检测和质量控制；拥有六台美国安捷伦气相色谱仪、两台瑞士万通自动电位滴定仪、日本岛津液相色谱仪、粒径检测仪等先进检测仪器，严格控制原材料和产品品质。

4. Quality Management

Tiancheng Chemical builds the perfect quality management system, based on which product analysis detection and quality control are carried out by professional personnel; Own six sets of U.S. Agilent gas chromatograph, two sets of Swiss Metrohm automatic potentiometric titration, Japanese SHIMADZU liquid chromatograph, particle size detector, etc., strictly control raw materials and product quality.



5. 售后服务

天成售后服务团队，拥有丰富的AKD蜡粉、AKD施胶剂生产及应用经验，并多年服务于造纸行业，为客户解决AKD施胶剂生产问题的同时，也为客户提供应用技术支持，免除客户后顾之忧。

5. After-sales service

After-sales service team of Tiancheng Chemical has rich experience in production and application of AKD wax and AKD sizing agent, and serves to the papermaking industry for many years. The team not only solves production problems of AKD sizing agent for customers, but provides application technical support for customers to eliminate customers' worries.



包装规格

25kg/ 袋
500kg/ 包

Packaging Specification

25kg/bag
500kg/bag

自动化包装线

Automatic Packing Line



天成化工产品目录 Tiancheng Products List

造纸化学品系列

- ① AKD 中性施胶剂
- ② 表面施胶剂
- ③ 表面施胶增强剂
- ④ 湿强剂
- ⑤ 干强剂
- ⑥ 助留剂
- ⑦ 润滑剂
- ⑧ 固着剂
- ⑨ 柔软剂

其它产品

- ① 杀菌剂
- ② 消泡剂
- ③ 抗水剂
- ④ 湿强除湿剂
- ⑤ 流变改质剂

Paper Chemical

- ① AKD Neutral Sizing Agent
- ② Surface Sizing Agent
- ③ Surface Sizing Enhanced Agent
- ④ Wet Strength Agent (PAE)
- ⑤ Dry-Strengthening Agent (PAM)
- ⑥ Retention Aid
- ⑦ Lubricant
- ⑧ Fixing Agent
- ⑨ Softening Agent

Others

- ① Bactericide
- ② Defoamer
- ③ Water Repellent Agent
- ④ Wet Strength Release Agent
- ⑤ Rheology Modifier

AKD 施胶配套产品

- ① AKD 蜡粉
- ② 阳离子醚化剂
- ③ 高分子乳化剂
- ④ AKD 乳化剂
- ⑤ AKD 专用淀粉
- ⑥ 氧氯化锆
- ⑦ 分散剂
- ⑧ 熟化剂

环保增塑剂系列

- ① 增塑剂 TCS-100
- ② 增塑剂 TCS-500

电子化学品系列

- ① 表面活性剂 TC-2000
- ② 表面活性剂 TC-1000

AKD Sizing Agent Series

- ① AKD Wax
- ② Cationic Reagent (PTAC)
- ③ Polymer Emulsifier
- ④ AKD Emulsifier
- ⑤ Special Starch for AKD
- ⑥ Zirconium Oxychloride
- ⑦ Dispersant
- ⑧ Curing Agent (PolyDADMAC)

Environmental Plasticizer Series

- ① Plasticizer TCS-100
- ② Plasticizer TCS-500

Electronic chemicals series

- ① Surface active agent TC-2000
- ② Surface active agent TC-1000

AKD



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