KEEP INGREDIENTS CO. LTD

No. 2019, Unit 1, Building 10, Yuexiucheng Phase 1, Guodu Xuefu Street, Chang'an District, Xi'an, Shaanxi, 710119, China

TECHNICAL DATA SHEET

Mixed Tocopherols Concentrate (95%)

1. PRODUCT DESCRIPTION

Mixed tocopherols concentrate contains at least 95% natural mixed tocopherols that are derived from vegetable oil deodorizer distillate. The product is a reddish-brown to light yellow, clear oily liquid; a suspension with smaller crystalline is permitted, with special taste and smell. It is used as an antioxidant and nutrient in foods.

2. PRODUCT INFORMATION

Item	Information
Product name	Mixed Tocopherols Concentrate (95%)
Specification	95%
Composition	Natural mixed tocopherols derived from vegetable oil deodorizer distillate (d-alpha, d-beta, d-gamma and d-delta tocopherols)
CAS No.	See section on molecular structure below (four components)
Appearance	Reddish-brown to light yellow, clear oily liquid; a suspension with smaller crystalline is permitted
Odour & taste	Special taste and smell
Form (per SDS)	Clear oily liquid; may show a slight separation of waxlike constituents in microcrystalline form; brownish red; little odour; melting point 2–3 °C; boiling point 200–220 °C; density (20 °C) 0.92–0.96 g/cm³
Solubility	Insoluble in water; soluble in ethanol; miscible with acetone, chloroform, ether and vegetable oils
Country of origin	China
Supplier	KEEP INGREDIENTS CO. LTD, Xi'an, Shaanxi, China

3. PRODUCT SPECIFICATION (FCC/USP Standard)

Component	Empirical formula	Molecular weight	CAS No.
d-alpha-tocopherol	$C_{29}H_{50}O_2$	430.71	59-02-9
d-beta-tocopherol	$C_{28}H_{48}O_2$	416.68	16698-35-4
d-gamma-tocopherol	$C_{28}H_{48}O_2$	416.68	54-28-4
d-delta-tocopherol	$C_{27}H_{46}O_2$	402.65	119-13-1

Item	Standard requirement	Method
Identification — 1. Color reaction	Positive	FCC

Item	Standard requirement	Method
Identification — 2. Retention time	The principal peak in the chromatogram obtained with the test solution is similar in retention time and size to the principal peak in the chromatogram obtained with the reference solution	FCC
Total tocopherols	≥ 95.0%	FCC
D-(β+γ+δ) tocopherols in total tocopherols	≥ 80.0%	FCC
Specific rotation [α]D²⁵ °C	≥ +20°	FCC
Acidity	≤ 1.0 mL	FCC
Solvent residue — ethanol	≤ 0.5%	USP <467>
* Benzo(a)pyrene	≤ 2 ppb	GC-MS
* Heavy metals — Lead	≤ 1 mg/kg	AAS
* Heavy metals — Arsenic	≤ 1 mg/kg	AFS
* Heavy metals — Cadmium	≤ 1 mg/kg	AAS
* Heavy metals — Mercury	≤ 0.1 mg/kg	AFS
* Microbiology — Aerobic plate count	≤ 1,000 CFU/g	USP <61>
* Microbiology — Yeast and moulds	≤ 100 CFU/g	USP <61>
* Microbiology — E. coli	Negative / g	USP <62>
* Microbiology — Salmonella	Negative / 25 g	USP <62>
* Microbiology — Staphylococcus aureus	Negative / 25 g	USP <62>

** Tested periodically to ensure the requirements are met.*

4. CERTIFICATE OF ANALYSIS - Batch Sample (FCC/USP-NF 2026)

Field	Detail
Product name	Mixed Tocopherols Concentrate
Product code	M95%
Specification	95%
Batch No.	KYMTC2026052702
Manufacture date	May 27, 2026
Report date	May 29, 2026
Expiry date	May 26, 2028
Test standard	FCC, USP-NF 2026



Item	Standard requirement	Method	Result
Appearance	Brown red to light yellow clear oily liquid; may show a slight separation of waxlike constituents in microcrystalline form	Visual	Conform
Identification — 1. Color reaction	Positive	FCC	Positive
Identification — 2. Retention time	Principal peak similar to reference solution	FCC	Conform
Acidity	≤ 1.0 mL	FCC	0.1 mL
Specific rotation [α]D²⁵ °C	≥ +20°	FCC	+22.9°
Assay	≥ 95.0%	FCC	97.8%

Item	Standard requirement	Method	Result
D-(β+γ+δ)-tocopherols in total tocopherols	≥ 80.0%	FCC	86.7%
* Lead	≤ 1 mg/kg	AAS	< 1 mg/kg
* Heavy metals — Arsenic	≤ 1 mg/kg	AFS	< 1 mg/kg
* Heavy metals — Cadmium	≤ 1 mg/kg	AAS	< 1 mg/kg
* Heavy metals — Mercury	≤ 0.1 mg/kg	AFS	< 0.1 mg/kg
Solvent residue — ethanol	≤ 5,000 ppm	USP <467>	1 ppm
* Benzo(a)pyrene	≤ 2 ppb	GC-MS	< 2 ppb
* Microbiology — Aerobic plate count	≤ 1,000 CFU/g	USP <61>	< 10 CFU/g
* Microbiology — Yeast and molds	≤ 100 CFU/g	USP <61>	< 10 CFU/g
* Microbiology — Escherichia coli	Negative / g	USP <62>	Negative
* Microbiology — Salmonella	Negative / 25 g	USP <62>	Negative
* Microbiology — Staphylococcus aureus	Negative / 25 g	USP <62>	Negative

*Conclusion: conforms to FCC and USP-NF 2026. * Tested periodically to ensure the requirements are met.*

5. COMPOSITION

Ingredient	Percentage
Mixed tocopherols	100%

6. NUTRITIONAL INFORMATION (per 100g)

Item	Value
Energy	7 KJ / 100 g
Protein	Negative
Fat	0.187 g / 100 g
Carbohydrate	0
Sodium	Negative

7. PRODUCTION PROCESS

Molecular distillation (CCP) is the critical control point.

Step	Operation
1	Raw materials: mixed tocopherols (above 50%), ethyl alcohol
2	Adsorption
3	Replacement
4	Elution
5	Removal of solvent
6	Molecular distillation (CCP)
7	Mixed tocopherols (above 95%)
8	Blending
9	Filtration
10	Packing

8. STABILITY DATA

The following stability data are transcribed from the supplied stability test report for mixed tocopherols, batch M20210720-90. Quality standard: brownish red to slight yellow, clear oily liquid; acidity ≤ 1.0 mL; assay ≥ 95.0%; specific rotation [α]D²⁵ ≥ +20.0°.

Long-term stability (25 ± 2 °C, RH 60 ± 10%)

Date	Batch No.	Character	Acidity (mL)	Assay (%)	Specific rotation	Conclusion
12.08.2021	M20210720-90 (0)	Brownish red clear oily liquid	0.2	97.2	24.0	Conform
13.11.2021	M20210720-90 (3)	Brownish red clear oily liquid	0.2	96.9	23.9	Conform
12.02.2022	M20210720-90 (6)	Brownish red clear oily liquid	0.2	96.8	23.8	Conform
12.05.2022	M20210720-90 (9)	Brownish red clear oily liquid	0.2	97.0	23.8	Conform
12.08.2022	M20210720-90 (12)	Brownish red clear oily liquid	0.3	97.0	23.8	Conform
12.02.2023	M20210720-90 (18)	Brownish red clear oily liquid	0.2	96.8	23.9	Conform
12.08.2023	M20210720-90 (24)	Brownish red clear oily liquid	0.2	96.7	23.7	Conform
12.08.2024	M20210720-90 (36)	Brownish red clear oily liquid	0.2	96.6	23.5	Conform

Accelerated stability (40 ± 2 °C, RH 75 ± 5%)

Date	Batch No.	Character	Acidity (mL)	Assay (%)	Specific rotation	Conclusion
12.08.2021	M20210720-90 (0)	Brownish red clear oily liquid	0.2	97.2	24.0	Conform
14.09.2021	M20210720-90 (1)	Brownish red clear oily liquid	0.2	96.8	23.9	Conform
14.10.2021	M20210720-90 (2)	Brownish red clear oily liquid	0.2	96.7	23.8	Conform
13.11.2021	M20210720-90 (3)	Brownish red clear oily liquid	0.2	96.5	23.8	Conform
12.02.2022	M20210720-90 (6)	Brownish red clear oily liquid	0.2	96.7	23.8	Conform

9. STATEMENTS AND COMPLIANCE

Allergen statement (according to (EU) No 1169/2011 and FDA FALCPA)

Allergen	Presence
Wheat	No
Other cereals containing gluten	No
Crustaceans	No
Eggs	No
Fish	No
Peanuts	No
Soybeans	No
Milk (including lactose)	No
Nuts	No
Celery	No
Mustard	No
Sesame seeds	No
Sulphur dioxide and sulphites (> 10 ppm)	No
Lupin	No
Molluscs	No

Safety:

- **Hazards:** no particular hazards known; not listed by ACGIH, IARC, NIOSH, NTP or OSHA.
- **Stability:** chemically stable under normal temperatures and pressures; incompatible with air, oxidizing agents and alkali; avoid light, dust generation, exposure to air, alkali, excess heat and strong oxidants.
- **Transport:** not classified as hazardous under transport regulations; not regulated by IMDG.
- **Usage:** as food additives and antioxidants.

10. STORAGE AND TRANSPORTATION

- Shelf life: at least 24 months after date of manufacture in sealed, original containers under normal storage conditions.
- Storage: store in tightly closed containers, protect from light and oxygen. After opening, use up immediately or seal with nitrogen for further storage. Unstable when exposed to oxygen and light, particularly in the presence of oxidizing agents or in alkaline media. The product darkens slowly upon exposure to air and light.
- Packing: 20 / 25 / 50 / 200 kg steel drum.
- Transport: not classified as hazardous under transport regulations; not regulated by IMDG.