

TECHNICAL DATA SHEET

Pomegranate Peel Extract Series
Punica granatum L. | Peel | Food Grade

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1. TECHNICAL DATA SHEET

Series Description

The Pomegranate Peel Extract Series is a range of standardized extracts derived from the peel of Punica granatum L. (pomegranate). Pomegranate peel is a by-product of the pomegranate juice industry and is naturally rich in polyphenols, in particular ellagitannins, their representative marker punicalagin, and ellagic acid (the basic hydrolytic unit of the ellagitannins). Depending on the target marker, the series covers ellagitannin-rich, punicalagin-rich and ellagic-acid-rich extracts in different grades, and includes a water-soluble ellagic acid grade. All products are of pomegranate peel origin (not gallnut origin), food grade, and suitable for food, beverage, dietary supplement and cosmetic applications.

Product Information

Item	Information
Product series	Pomegranate Peel Extract (Punica granatum L.)
Plant part	Peel
Key active components	Ellagitannins, Punicalagin, Ellagic acid, Water-soluble ellagic acid
Available grades	Ellagitannins 70%; Punicalagin 40%; Ellagic acid 40% (water-soluble); Ellagic acid 90% (HPLC); Ellagic acid 98% (HPLC)
Grade	Food grade
Extraction	Water extraction (for ellagic acid grades)
Main applications	Food, beverages, dietary supplements and cosmetics
Shelf life	24 months when properly stored
Storage	Stored in tightly sealed and preferably full containers, in a cool, dry and ventilated area, away from strong light



2. KEY ACTIVE COMPONENTS

Pomegranate peel contains a group of related polyphenols that are widely studied for their antioxidant and anti-inflammatory properties. The main active components of the series are summarized below.

Component	CAS No.	Molecular formula	MW	Specific ation	Key properties
Ellagic acid	476-66-4	C14H6O8	302.19	98% and below	The basic hydrolytic unit of the ellagitannins; a natural polyphenol dilactone. A well-known antioxidant polyphenol used as a quality marker for pomegranate peel and approved for use as a food antioxidant.
Punicalagin	65995-63-3	C48H28O30	1084.72	40% and below	The most representative core member of the ellagitannin family; the component present at the highest content in pomegranate peel (up to 50%-85% of the total ellagitannins) and a major carrier of the biological activity of pomegranate peel.
Ellagitannins (ETs)	—	Variable	>500 (typical)	80% and below	A large and complex family of polyphenols formed by ester linkages between gallic-acid derivatives and polyols; the most abundant polyphenols in pomegranate peel and the structural basis of its antioxidant and anti-inflammatory activity.
Water-soluble ellagic acid	476-66-4	C14H6O8	302.19	40% and below	A form of ellagic acid with greatly improved water solubility while retaining the biological activity of ellagic acid; suitable for applications requiring ready dissolution in water-based systems.

Note: ellagitannins in the intestine may be converted to ellagic acid and further metabolized by the gut microbiota; the ellagic acid content determined by HPLC reflects the total potential of ellagitannins and ellagic acid present in the product.

3. PRODUCT RANGE & AVAILABLE SPECIFICATIONS

The following pomegranate peel extract grades are currently offered. Each grade is standardized on its target marker and supplied with a Certificate of Analysis.

N o.	Product	Active marker / assay	Appearance	Description
3. 1	Pomegranate Peel Extract - Ellagitannins 70%	Ellagitannins $\geq$ 70% (UV); Punicalagins $\geq$ 30% (HPLC)	Yellowish brown fine powder	Total polyphenol (ellagitannin) grade
3. 2	Pomegranate Peel Extract - Punicalagin 40%	Punicalagins $\geq$ 40% (HPLC)	Yellowish brown fine powder	Punicalagin-standardized grade
3. 3	Pomegranate Peel Extract - Ellagic Acid 40% (Water-Soluble)	Ellagic acid $\geq$ 40% (HPLC); fully water-soluble	Light yellow fine powder	Water-soluble ellagic acid grade
3. 4	Pomegranate Peel Extract - Ellagic Acid 90% (HPLC)	Ellagic acid $\geq$ 90% (HPLC)	Light yellow powder	High-purity ellagic acid grade
3. 5	Pomegranate Peel Extract - Ellagic Acid 98% (HPLC)	Ellagic acid $\geq$ 98% (HPLC)	Light yellow fine powder	High-purity ellagic acid grade

All grades are of pomegranate peel origin and food grade. Full technical specifications and Certificates of Analysis for each grade are provided in Section 4.

4. PRODUCT SPECIFICATIONS & CERTIFICATES OF ANALYSIS

Detailed specifications and analytical results are compiled from the supplied Certificates of Analysis of each grade. Batch numbers follow the format KY + product code + production date + 01.

4.1 Pomegranate Peel Extract - Ellagitannins 70% (Punicalagin ≥ 30%)

Item	Data
Product	Pomegranate Extract
Raw material	Dried Pomegranate
Batch No.	KYPE2026062101
Batch quantity	1050 kg
Production date	2026-06-21
Retest date	2028-06-20



Maker Compounds

Item	Specification	Result	Method
Punicalagins	≥ 30%	30.76%	HPLC

Organoleptic

Item	Specification	Result	Method
Appearance	Fine powder	Conforms	Visual
Color	Yellowish brown	Conforms	Visual
Odor	Characteristic without off-flavor	Conforms	Visual

Physical Characteristics

Item	Specification	Result	Method
Particle size	95% through 80 mesh	98%	CP2020
Loss on drying	≤ 5.00%	4.47%	CP2020
Ash	≤ 5.00%	2.34%	CP2020

Heavy Metals

Item	Specification	Result	Method
Total heavy metals	≤ 10 ppm	1 ppm	FCC
Arsenic (As)	≤ 3 ppm	1 ppm	FCC
Lead (Pb)	≤ 2 ppm	0.013 ppm	FCC
Cadmium (Cd)	≤ 1 ppm	ND	FCC
Mercury (Hg)	≤ 0.1 ppm	ND	FCC

Solvent / Pesticide Residue

Item	Specification	Result	Method
Solvent residue	500 ppm max	Complies	GC
Pesticide residue	Meet USP <561>	Conforms	GC/LC

Microbiological Tests

Item	Specification	Result	Method
Total plate count	≤ 1000 cfu/g	180 cfu/g	FCC
E. coli	Negative	Negative	FCC
Yeast	100 cfu/g max	< 10 cfu/g	FCC
Mold	100 cfu/g max	< 10 cfu/g	FCC

Ellagitannins ≥ 70% (UV): 71.89%.

4.2 Pomegranate Peel Extract - Punicalagin 40%

Item	Data
Product	Pomegranate Extract
Raw material	Dried Pomegranate
Batch No.	KYPE2026082601
Batch quantity	120 kg
Production date	2026-08-26
Retest date	2028-08-25



Maker Compounds

Item	Specification	Result	Method
Punicalagins	≥ 40%	41.1%	HPLC

Organoleptic

Item	Specification	Result	Method
Appearance	Fine powder	Conforms	Visual
Color	Yellowish brown	Conforms	Visual
Odor	Characteristic without off-flavor	Conforms	Visual

Physical Characteristics

Item	Specification	Result	Method
Particle size	95% through 80 mesh	98%	CP2020
Loss on drying	≤ 7.00%	4.2%	CP2020
Ash	≤ 5.00%	2.0%	CP2020

Heavy Metals

Item	Specification	Result	Method
Total heavy metals	≤ 10 ppm	Conforms	CP2020
Arsenic (As)	≤ 5 ppm	Conforms	CP2020
Lead (Pb)	≤ 5 ppm	Conforms	CP2020
Cadmium (Cd)	≤ 2 ppm	Conforms	CP2020
Mercury (Hg)	≤ 2 ppm	Conforms	CP2020

Solvent / Pesticide Residue

Item	Specification	Result	Method
Solvent residue	500 ppm max	Complies	GC
Pesticide residue	Meet USP <561>	Conforms	GC/LC

Microbiological Tests

Item	Specification	Result	Method
Total plate count	≤ 1000 cfu/g	Conforms	CP2020
E. coli	30 MPN/100 g max	Conforms	CP2020
Yeast	100 cfu/g max	Conforms	CP2020
Mold	100 cfu/g max	Conforms	CP2020

4.3 Pomegranate Peel Extract - Ellagic Acid 40% (Water-Soluble)

Item	Data
Product	Pomegranate Extract
Raw material	Pomegranate Skin
Batch No.	KYPE2026052501
Batch quantity	2 kg
Production date	2026-05-25
Retest date	2028-05-24



Maker Compounds

Item	Specification	Result	Method
Ellagic acid	≥ 40%	40.67%	HPLC

Organoleptic

Item	Specification	Result	Method
Solubility	Fully water-soluble	Fully water-soluble	Visual
Appearance	Fine powder	Conforms	Visual
Color	Light yellow	Conforms	Visual
Odor	Weak odor	Conforms	Visual

Physical Characteristics

Item	Specification	Result	Method
Particle size	100% through 80 mesh	100%	CP2015
Loss on drying	≤ 5.00%	1.75%	CP2015
Ash	≤ 5.00%	2.53%	CP2015

Heavy Metals

Item	Specification	Result	Method
Total heavy metals	≤ 10 ppm	Conforms	AAS
Arsenic (As)	≤ 2 ppm	Conforms	ICP-MS
Lead (Pb)	≤ 2 ppm	Conforms	ICP-MS
Cadmium (Cd)	≤ 1 ppm	Conforms	ICP-MS
Mercury (Hg)	≤ 0.5 ppm	Conforms	ICP-MS

Solvent / Pesticide Residue

Item	Specification	Result	Method
Solvent residue	5,000 ppm max	Complies	GB 5009.262-2016
Pesticide residue	Meet USP <561>	Conforms	ASU L 00.00-34:2010-09

Characteristic Constituents of Ellagic Acid from Gallnut (Purity of Pomegranate Origin)

Item	Specification	Result	Method
Anacardic acid	Negative	Negative	Q/DR JS0202-2021
Ginkgoic acid	Negative	Negative	Q/DR JS0202-2021

Microbiological Tests

Item	Specification	Result	Method
Total plate count	≤ 1000 cfu/g	Conforms	GB 4789.2-2016
E. coli	30 MPN/100 g max	Conforms	GB 4789.3-2016

Item	Specification	Result	Method
Yeast	100 cfu/g max	Conforms	GB 4789.15-2016
Mold	100 cfu/g max	Conforms	GB 4789.15-2016

Negative for gallnut-specific toxic markers (anacardic acid and ginkgoic acid), confirming authentic pomegranate peel origin.

4.4 Pomegranate Peel Extract - Ellagic Acid 90% (HPLC)

Item	Data
Product	Pomegranate Peel Extract
Botanical name	Punica granatum L.
Plant part	Peel
Batch No.	KYPE2024111901
Batch quantity	600 kg
Production date	2024-11-19
Retest date	2026-11-18
Issue date	2024-11-22



Chemical Tests

Item	Specification	Result	Method
Ellagic acid	≥ 90.0%	90.29%	HPLC

Physical Description

Item	Specification	Result	Method
Appearance	Light yellow powder	Conforms	Visual
Odor	Unique smell of pomegranate peel	Conforms	Organoleptic
Taste	Unique taste of pomegranate peel	Conforms	Olfactory
Particle size	95% through 80 mesh	Conforms	CP2020

Chemical Tests

Item	Specification	Result	Method
Moisture	≤ 5.0%	2.75%	CP2020 (105 °C, 4 h)
Ash	≤ 5.0%	2.00%	CP2020
Total heavy metals	< 10 ppm	Conforms	CP2020

Microbiology Control

Item	Specification	Result	Method
Aerobic bacterial count	≤ 1,000 CFU/g	Conforms	GB4789.2
Yeast	≤ 100 CFU/g	Conforms	GB4789.15
Mold	≤ 100 CFU/g	Conforms	GB4789.15
Escherichia coli	< 3.0 MPN/g	Conforms	GB4789.38
Salmonella	Not detected	Conforms	GB4789.4
Staphylococcus aureus	Not detected	Conforms	GB4789.10

Status: Natural; Non-irradiation. Store in tightly sealed and preferably full containers in a cool, dry and ventilated area. Shelf life: 24 months when properly stored.

4.5 Pomegranate Peel Extract - Ellagic Acid 98% (HPLC)

Item	Data
Product	Pomegranate Extract
Raw material	Pomegranate Skin
Batch No.	KYPE2026072001
Batch quantity	900 kg
Production date	2026-07-20
Retest date	2028-07-19



Maker Compounds

Item	Specification	Result	Method
Ellagic acid	≥ 98%	98.75%	HPLC / GB 2760-2014

Organoleptic

Item	Specification	Result	Method
Appearance	Fine powder	Conforms	Visual
Color	Light yellow	Conforms	Visual
Odor	Weak odor	Conforms	Visual

Physical Characteristics

Item	Specification	Result	Method
Particle size	100% through 80 mesh	100%	CP2020
Loss on drying	≤ 5.00%	4.7%	CP2020
Ash	≤ 1.00%	1.05%	CP2020

Heavy Metals

Item	Specification	Result	Method
Total heavy metals	≤ 10 ppm	Conforms	AAS
Arsenic (As)	≤ 2 ppm	Conforms	ICP-MS
Lead (Pb)	≤ 2 ppm	Conforms	ICP-MS
Cadmium (Cd)	≤ 1 ppm	Conforms	ICP-MS
Mercury (Hg)	≤ 0.5 ppm	Conforms	ICP-MS

Solvent / Pesticide Residue

Item	Specification	Result	Method
Solvent residue	5,000 ppm max	Complies	GB 5009.262-2016
Pesticide residue	Meet USP <561>	Conforms	ASU L 00.00-34:2010-09

Microbiological Tests

Item	Specification	Result	Method
Total plate count	≤ 1000 cfu/g	Conforms	GB 4789.2-2016
E. coli	30 MPN/100 g max	Conforms	GB 4789.3-2016
Yeast	100 cfu/g max	Conforms	GB 4789.15-2016
Mold	100 cfu/g max	Conforms	GB 4789.15-2016

5. SOURCE AUTHENTICITY & FOOD SAFETY

A key feature of the Pomegranate Peel Extract Series is its authentic pomegranate peel origin. Ellagic acid can be prepared from two different botanical sources, pomegranate peels (*Punica granatum* L.) and gallnuts (*Rhus chinensis* Mill.), and the two are not interchangeable for food use.

5.1 Pomegranate Peel vs. Gallnut Ellagic Acid

Pomegranate peel (<i>Punica granatum</i> L.)	Gallnut (<i>Rhus chinensis</i> Mill.)
Safe for oral consumption	Only suitable for external use
Used in food, beverages and dietary supplements	Limited to traditional medicine / industrial / external use
Free of gallnut-specific toxic markers (anacardic acid, ginkgoic acid) - verified by analysis	Contains characteristic toxic markers: anacardic acid, ginkgolic acid (C15:1), ginkgol

5.2 Source Authentication

To guarantee authenticity, the ellagic-acid grades are tested for the gallnut-specific toxic markers anacardic acid and ginkgoic acid; both must be negative (see Section 4.3). This differentiation is also supported by peer-reviewed research establishing a rapid method to distinguish pomegranate-peel-derived from gallnut-derived ellagic acid, and confirming that ellagic acid from gallnuts contains toxic substances (anacardic acid and ginkgolic acid) and is therefore limited to external use, whereas ellagic acid extracted from pomegranate peels can be consumed and is relatively safe and non-toxic to the human body.

Reference: Wei, J.; Xu, R.; Zhang, Y.; Zhao, L.; Li, S.; Zhao, Z. Ultra-High-Performance Liquid Chromatography-Electrospray Ionization-High-Resolution Mass Spectrometry for Distinguishing the Origin of Ellagic Acid Extracts: Pomegranate Peels or Gallnuts. *Molecules* 2024, 29, 666.

6. PRODUCT STATEMENTS

6.1 Non-Irradiation / Non-Ionized Statement

NON-IRRADIATION / NON-IONIZED STATEMENT

We hereby certify that the products have not been sterilized by ionizing radiation at any point during the entire manufacturing process and therefore are in full compliance with the relevant legislated regulations, Directives 1999/2/EC & 1999/3/EC, concerning foods and food ingredients treated with ionizing radiation.

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6.2 BSE/TSE Statement

BSE/TSE STATEMENT

The Pomegranate Peel Extract Series is derived solely from the peel of *Punica granatum* L. (pomegranate), a plant source. The products contain no ingredients of animal or ruminant origin and no materials derived from, or exposed to, ruminants affected by or under quarantine for transmissible spongiform encephalopathy (TSE) / bovine spongiform encephalopathy (BSE). No animal material is used during the whole production process.

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6.3 Vegan / No Animal Origin Statement

VEGAN / NO ANIMAL ORIGIN STATEMENT

The products are plant-derived extracts from pomegranate peel. They do not contain any animal or animal by-products and are vegan products.

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6.4 Heavy Metals Statement

HEAVY METALS STATEMENT

According to the supplied Certificates of Analysis, the products meet the total heavy metals limit of ≤ 10 ppm, with limits for arsenic, lead, cadmium and mercury as stated in the individual specifications (Section 4).

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6.5 Food-Grade / Source Authenticity Statement

FOOD-GRADE / SOURCE AUTHENTICITY STATEMENT

All grades in this series are food-grade extracts of pomegranate peel (*Punica granatum* L.) origin, safe for consumption and suitable for use in food, beverages and dietary supplements. They are free of gallnut-specific toxic markers (anacardic acid and ginkgoic acid), as verified by analysis.

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6.6 Expected Usage**EXPECTED USAGE**

The expected usage of the products is their incorporation as natural polyphenol ingredients in food, beverages, dietary supplements and cosmetics (e.g. antioxidant and anti-inflammatory functional products).

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7. HANDLING, STORAGE & TRANSPORT

Item	Information
Storage	Stored in tightly sealed and preferably full containers, in a cool, dry and ventilated area, away from strong light.
Handling	Follow good industrial hygiene practices; avoid exposure to moisture and strong light.
Transport	Keep dry; avoid direct sunlight and strong light.
Shelf life	24 months when properly stored (in closed containers at ambient temperature).

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Authorized signature & company stamp

This Technical Data Sheet is issued by KEEP INGREDIENTS CO. LTD and is valid together with the supplied Certificate(s) of Analysis. The information given is based on our knowledge of the products at the time of publication and is given in good faith; it does not exempt the user from applying the regulations governing the use, storage and labelling of the products in their own country.

