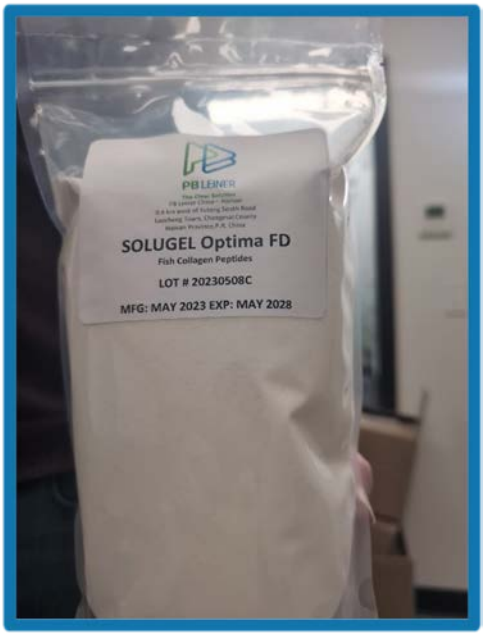
SOLVENT SYSTEMS International, Inc.
Environmental Services

Offer Sheet

Product	Hydrolyzed Fish Collagen
Quantity	33 lb. bags
Net weight	Approximately 91,337 lbs.
Manufacture date	Manuf 2023 – Exp Spring 2028
Availability	One time
Location	Ontario, CA 91761
Date	1/16/26
COA & SDS	Attached below



Brian Svrusis
Solvent Systems International
575 Bennett Road
Elk Grove Village, IL 60007
847-323-6718 call or text
Click here for: Surplus Inventory
Solvent-Systems.com

Dietary supplements (largest commercial use)
Why it's used: high bioavailability, neutral taste (depending on grade), strong consumer awareness for skin/joints.

- Powdered collagen peptide supplements (tubs, sachets, stick packs)
- Capsules / tablets
- "Beauty-from-within" collagen products
- Joint/mobility support blends

Common co-ingredients: hyaluronic acid, vitamin C, biotin, zinc, MSM.

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2) Functional foods & beverages
Why it's used: dissolves well in liquids, adds protein with minimal flavor impact in higher grades.

- Ready-to-drink collagen beverages
- Protein waters / sports hydration blends
- Coffee creamers, drink mixes
- Gummies, chews, bars
- Dairy and nondairy protein fortification (yogurt-style products, smoothies)

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3) Cosmetic & personal care formulations (topical)
Why it's used: film-forming, humectant support, "anti-aging" positioning, marine-origin marketing claims.

- Anti-aging serums / creams
- Moisturizing lotions
- Facial masks (sheet masks, peel-off masks)
- Hair-care products (conditioning/repair claims)
- Nail-care treatments

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4) Medical / wound care / biomedical
Why it's used: collagen is biocompatible; hydrolyzed collagen can be used in gels/films and supports skin-contact products.

- Wound dressings (collagen-based pads/films)
- Tissue engineering research materials
- Biomaterial formulations (as a component in composites)

(Note: uses depend heavily on purity, sterility, and regulatory compliance.)

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5) Pet & animal nutrition
Why it's used: palatability, protein content, joint/skin coat positioning.

- Pet joint supplements (powder chews)
- Skin/coat support formulas
- Functional pet treats

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6) Sports nutrition & recovery
Why it's used: provides peptides and amino acids used in connective tissue support positioning.

- Post-workout recovery powders
- Tendon/ligament support blends
- Protein mixes for endurance athletes

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7) Food processing / ingredient technology (niche but real)
Why it's used: film-forming, binding, texture enhancement.

- Binder in processed foods
- Texture/viscosity enhancer in soups/sauces
- Encapsulation carrier for flavors/nutrients (in some formulations)

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8) Nutraceutical "skin health" and nutricosmetics bulk ingredient
Why it's used: B2B bulk commodity for brands/private label.

- Sold as standardized collagen peptide (MW distribution, protein %, solubility)
- Often positioned as marine collagen premium versus bovine/porcine collagen

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Key commercial advantages (why buyers choose fish collagen specifically)

- **Marine origin** (religious/dietary acceptance vs porcine/bovine)
- **Type I collagen positioning** (skin elasticity, hair/nails)
- **Lower molecular weight peptides** available in premium grades
- Strong consumer perception: "clean," "sustainable," "beauty collagen"

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Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	12-Apr-23
Specifications	Optima FD	Inspection date:	12-Apr-23
Batch	20230412C	Report date:	22-Apr-23
Report No.	202304-8	Expiration date:	11-Apr-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	⩾91	>91
Moisture/%	105°C,17hr	⩽8.0	5.99
Ash/%	550°C,17hr	⩽2.0	0.40
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.76
pH	12.5%, 40°C	4.0~7.0	6.25
*Lead /(mg/kg)	GME	⩽0.1	< 0.1
*Cadmium/(mg/kg)	GME	⩽0.5	< 0.5
*Arsenic /(mg/kg)	GME	⩽0.8	< 0.8
*Chromium/(mg/kg)	GME	⩽ 10	< 10
*Mercury /(mg/kg)	GME	⩽0.1	< 0.1
*Copper/(mg/kg)	GME	⩽30	< 30
*Zinc/(mg/kg)	GME	⩽30	< 30
Peroxide/(mg/kg)	Test strips	⩽10	0
Sulphur dioxide /(mg/kg)	Distillation	⩽10	3.6
Microbiological inspection			
Total plate count/(CFU/g)	USP	⩽1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 周春刚

PB Leiner (Hainan) Biotechnology CO.,LTD.
0.4km West of Yutang South Road, Laocheng Town, Chengmai County, Hainan Province, P.R.China
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Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	10-May-23
Specifications	Optima FD	Inspection date:	10-May-23
Batch	20230510C	Report date:	20-May-23
Report No.	202305-3	Expiration date:	9-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.91
Ash/%	550°C,17hr	≤2.0	0.35
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.75
pH	12.5%, 40°C	4.0~7.0	6.11
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	4.48
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明璞 Reviewer: 周春刚

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Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	13-Apr-23
Specifications	Optima FD	Inspection date:	13-Apr-23
Batch	20230413C	Report date:	23-Apr-23
Report No.	202304-9	Expiration date:	12-Apr-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	⩾91	>91
Moisture/%	105°C,17hr	⩽8.0	5.94
Ash/%	550°C,17hr	⩽2.0	0.27
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.77
pH	12.5%, 40°C	4.0~7.0	6.27
*Lead /(mg/kg)	GME	⩽0.1	< 0.1
*Cadmium/(mg/kg)	GME	⩽0.5	< 0.5
*Arsenic /(mg/kg)	GME	⩽0.8	< 0.8
*Chromium/(mg/kg)	GME	⩽ 10	< 10
*Mercury /(mg/kg)	GME	⩽0.1	< 0.1
*Copper/(mg/kg)	GME	⩽30	< 30
*Zinc/(mg/kg)	GME	⩽30	< 30
Peroxide/(mg/kg)	Test strips	⩽10	0
Sulphur dioxide /(mg/kg)	Distillation	⩽10	3.84
Microbiological inspection			
Total plate count/(CFU/g)	USP	⩽1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈时谟 Reviewer: 周春丽

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Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	14-Mar-23
Specifications	Optima FD	Inspection date:	14-Mar-23
Batch	20230314C	Report date:	24-Mar-23
Report No.	202303-10	Expiration date:	13-Mar-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.77
Ash/%	550°C,17hr	≤2.0	0.43
Viscosity/mpa.s	10%,25°C	1.6~2.0	1.82
pH	12.5%, 40°C	4.0~7.0	6.28
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	6.5
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	140
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

Analyst: 陈明谟　　Reviewer: 周春丽

PB Leiner (Hainan) Biotechnology CO.,LTD.
0.4km West of Yutang South Road, Laocheng Town, Chengmai Country, Hainan Province, P.R.China
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中华人民共和国出入境检验检疫
ENTRY-EXIT INSPECTION AND QUARANTINE
OF THE PEOPLE'S REPUBLIC OF CHINA

正 本
ORIGINAL

兽 医（卫生）证 书
VETERINARY (HEALTH) CERTIFICATE

编号 No.: 共1页，第1页Page 1of 1
223N6411000015600l

发货人名称及地址
Name and Address of Consignor: PB LEINER (HAINAN) BIOTECHNOLOGY CO., LTD.
0.4 KM WEST OF YUTANG SOUTH ROAD,LAOCHENG TOWN,CHENGMAI COUNTY,HAINAN PROVINCE,571924,CHINA

收货人名称及地址
Name and Address of Consignee: PB LEINER USA
7001 N. BRADY STREET, DAVENPORT IA, 52806, USA

品名
Description of Goods: HYDROLYZED FISH COLLAGEN

报检重量
Weight Declared: **12000KGS

产地
Place of Origin: HAINAN, CHINA

标记及号码
Mark & No.: N/M

包装种类及数量
Number and Type of Packages: **800BAGS

集装箱号
Container No.: ***

铅封号
Seal No.: ***

加工厂名称、地址及编号(如果适用)
Name, Address and approval No. of the approved Establishment (if applicable): PB LEINER (HAINAN) BIOTECHNOLOGY CO., LTD.
0.4 KM WEST OF YUTANG SOUTH ROAD,LAOCHENG TOWN,CHENGMAI COUNTY,HAINAN PROVINCE,571924,CHINA (4600/20001)

启运地
Place of Despatch: YANGPU, CHINA

到达国家及地点
Country and Place of Destination: LONG BEACH, USA

运输工具
Means of Conveyance: BY SEA

发货日期
Date of Despatch: ***

RESULTS OF INSPECTION:
1), CONTAINS HYDROLYZED FISH COLLAGEN AS THE ONLY ANIMAL ORIGIN MATERIAL IN THE PRODUCT.
2), WAS PROCESSED USING AN ENZYME THAT WAS NOT ANIMAL DERIVED;
3), WAS HEATED PRIOR TO EXPORT TO THE UNITED STATES AT A MINIMUM TEMPERATURE OF 118°C FOR AT LEAST 20 SECONDS AND.
4), WAS PRODUCED AND HANDLED IN A MANNER TO ENSURE THAT IT DOES NOT CONTAIN AND IS NOT CONTAMINATED WITH ANY ANIMAL ORIGIN MATERIAL NOT AUTHORIZED BY THIS PERMIT INCLUDING RUMINANT MEAT-AND-BONE MEAL OR GREAVES FROM APHIS-DEFINED BSE CONTROLLED OR UNDETERMINED RISK COUNTRIES [BSE REGIONS DESCRIBED BELOW], SPECIFIED RISK MATERIALS [SRMS DESCRIBED BELOW],OR MECHANICALLY SEPARATED MEAT DERIVED FROM THE SKULL AND VERTEBRAL COLUMN OF BOVINES 30 MONTHS OF AGE OR OLDER FROM CONTROLLED RISK REGIONS OR BOVINES OVER 12 MONTHS OF AGE FROM UNDETERMINED RISK REGIONS.
5), IMPORTED MATERIAL IS FOR NON-ANIMAL USE ONLY.

****

HAIKOU CUSTOMS THE PEOPLE'S REPUBLIC OF CHINA INSPECTION AND QUARANTINE 中华人民共和国 海口海关 020 检验检疫专用章

印章 Official Stamp

签证地点 Place of Issue: HAIKOU, CHINA

签证日期 Date of Issue: 22 May,2023

官方兽医 Official Veterinarian: CHEN GUANREN

签 名 Signature: [signature]

[c3-1(2018.4.20) * 1]

BA0048195

PB LEINER
The Clear Solution

SOLUGEL®

Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	14-Apr-23
Specifications	Optima FD	Inspection date:	14-Apr-23
Batch	20230414C	Report date:	24-Apr-23
Report No.	202304-10	Expiration date:	13-Apr-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	6.13
Ash/%	550°C,17hr	≤2.0	0.32
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.87
pH	12.5%, 40°C	4.0~7.0	6.22
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	3.81
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 周春刚

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Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	15-Apr-23
Specifications	Optima FD	Inspection date:	15-Apr-23
Batch	20230415C	Report date:	25-Apr-23
Report No.	202304-11	Expiration date:	14-Apr-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.83
Ash/%	550°C,17hr	≤2.0	0.23
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.87
pH	12.5%, 40°C	4.0~7.0	6.19
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	3.84
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 阎春刚

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The Clear Solution

SOLU GEL®

Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	25-Apr-23
Specifications	Optima FD	Inspection date:	25-Apr-23
Batch	20230425C	Report date:	5-May-23
Report No.	202304-12	Expiration date:	24-Apr-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.62
Ash/%	550°C,17hr	≤2.0	0.42
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.82
pH	12.5%, 40°C	4.0~7.0	6.42
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	5.12
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 周春刚

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SOLU GEL®

Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	13-May-23
Specifications	Optima FD	Inspection date:	13-May-23
Batch	20230513C	Report date:	23-May-23
Report No.	202305-6	Expiration date:	12-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.72
Ash/%	550°C,17hr	≤2.0	0.25
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.71
pH	12.5%, 40°C	4.0~7.0	5.94
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	5.57
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明琪 Reviewer: 周春刚

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The Clear Solution

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Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	9-May-23
Specifications	Optima FD	Inspection date:	9-May-23
Batch	20230509C	Report date:	19-May-23
Report No.	202305-2	Expiration date:	8-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.92
Ash/%	550°C,17hr	≤2.0	0.36
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.75
pH	12.5%, 40°C	4.0~7.0	6.09
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	4.4
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 周春刚

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Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	11-May-23
Specifications	Optima FD	Inspection date:	11-May-23
Batch	20230511C	Report date:	21-May-23
Report No.	202305-4	Expiration date:	10-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.65
Ash/%	550°C,17hr	≤2.0	0.44
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.7
pH	12.5%, 40°C	4.0~7.0	6.02
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	5.77
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 周春刚

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Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	12-May-23
Specifications	Optima FD	Inspection date:	12-May-23
Batch	20230512C	Report date:	22-May-23
Report No.	202305-5	Expiration date:	11-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.75
Ash/%	550°C,17hr	≤2.0	0.43
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.72
pH	12.5%, 40°C	4.0~7.0	5.94
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	4.27
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 周春刚

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Product name	Hydrolyzed fish collagen	Production date:	16-May-23
Specifications	Optima FD	Inspection date:	16-May-23
Batch	20230516C	Report date:	26-May-23
Report No.	202305-8	Expiration date:	15-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.76
Ash/%	550°C,17hr	≤2.0	0.41
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.74
pH	12.5%, 40°C	4.0~7.0	6.20
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	3.2
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(儋南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 周春刚

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Product name	Hydrolyzed fish collagen	Production date:	17-May-23
Specifications	Optima FD	Inspection date:	17-May-23
Batch	20230517C	Report date:	27-May-23
Report No.	202305-9	Expiration date:	16-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.46
Ash/%	550°C,17hr	≤2.0	0.42
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.69
pH	12.5%, 40°C	4.0~7.0	6.31
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	3.84
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

Analyst: 陈明谟

Reviewer: 周春刚

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Product name	Hydrolyzed fish collagen	Production date:	18-May-23
Specifications	Optima FD	Inspection date:	18-May-23
Batch	20230518C	Report date:	28-May-23
Report No.	202305-10	Expiration date:	17-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	6.03
Ash/%	550°C,17hr	≤2.0	0.38
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.7
pH	12.5%, 40°C	4.0~7.0	6.26
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	3.5
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

Analyst: 陈明谟　　Reviewer: 周春刚

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Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	19-May-23
Specifications	Optima FD	Inspection date:	19-May-23
Batch	20230519C	Report date:	29-May-23
Report No.	202305-11	Expiration date:	18-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	6.04
Ash/%	550°C,17hr	≤2.0	0.35
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.75
pH	12.5%, 40°C	4.0~7.0	6.21
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	3.8
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	20
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 周春刚

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Product name	Hydrolyzed fish collagen	Production date:	20-May-23
Specifications	Optima FD	Inspection date:	20-May-23
Batch	20230520C	Report date:	30-May-23
Report No.	202305-12	Expiration date:	19-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.90
Ash/%	550°C,17hr	≤2.0	0.24
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.79
pH	12.5%, 40°C	4.0~7.0	6.30
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	4.48
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

Analyst: 陈明谟

Reviewer: 阎春刚

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Certificate of Analysis

Product name	Hydrolyzed fish collagen	Production date:	11-Apr-23
Specifications	Optima FD	Inspection date:	11-Apr-23
Batch	20230411C	Report date:	21-Apr-23
Report No.	202304-7	Expiration date:	10-Apr-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.34
Ash/%	550°C,17hr	≤2.0	0.36
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.77
pH	12.5%, 40°C	4.0~7.0	6.19
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	3.84
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 周春刚

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Product name	Hydrolyzed fish collagen	Production date:	8-May-23
Specifications	Optima FD	Inspection date:	8-May-23
Batch	20230508C	Report date:	18-May-23
Report No.	202305-1	Expiration date:	7-May-28

Inspection item	Methods	Standard	Results
Physical and chemical inspection			
Protein content/ %	Kjeldahl(N*5.55)	≥91	>91
Moisture/%	105°C,17hr	≤8.0	5.89
Ash/%	550°C,17hr	≤2.0	0.43
Viscosity/mpa.s	10%,25°C	1.6~2.2	1.78
pH	12.5%, 40°C	4.0~7.0	6.12
*Lead /(mg/kg)	GME	≤0.1	< 0.1
*Cadmium/(mg/kg)	GME	≤0.5	< 0.5
*Arsenic /(mg/kg)	GME	≤0.8	< 0.8
*Chromium/(mg/kg)	GME	≤ 10	< 10
*Mercury /(mg/kg)	GME	≤0.1	< 0.1
*Copper/(mg/kg)	GME	≤30	< 30
*Zinc/(mg/kg)	GME	≤30	< 30
Peroxide/(mg/kg)	Test strips	≤10	0
Sulphur dioxide /(mg/kg)	Distillation	≤10	4.48
Microbiological inspection			
Total plate count/(CFU/g)	USP	≤1000	< 10
Salmonella/25g	ISO6579	Negative	Negative
Escherichia coli/10g	USP	Negative	Negative
Sulphite-Reducing Anaerobic Spores/ (CFU/g)	GME	< 10	< 10

Conclusion: Product complies with the prescribed standards.
*The parameter is monitored according to an internal quality programme.

(海南) 生物技术有限公司 实验室

Analyst: 陈明谟 Reviewer: 周春刚

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SAFETY DATA SHEET
FISH HYDROLYZED GELATIN

A safety data sheet under Regulation (EC) No 1907/2006 (REACH) Article 31 is not required for the product mentioned below. This SDS, created on a voluntary basis, meets the UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS) requirements

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY

1.1 Product identifier:

Product name: FISH HYDROLYZED GELATIN Type: All Fish types

Additional identifiers:
Hydrolysed fish gelatin, Hydrolyzed gelatin, Gelatin hydrolysate, Fish gelatin hydrolysate, Marine gelatin hydrolysate, Tilapia gelatin hydrolysate.
Gelatine (non-gelling), Gelatin (non-gelling), gelatin derivatives.
Unique Formula Identifier (UFI): Not Applicable. The product is not a hazardous mixture.

Gelatin hydrolysate which is obtained from a natural occurring biopolymer, do not require a registration according to regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), as amended.

1.2 Relevant identified uses of the substance and uses advised against

Fish hydrolyzed gelatin is used as raw material in food, beverages, food supplements and clinical nutrition, pharmaceutical, cosmetic, feed, petfood and in technical applications.

1.3 Details of the supplier of the safety data sheet

Supplier of the safety data sheet
Tessenderlo Group N.V. Division PB Leiner
Duchéstraat (Marius) 260 B-1800 Vilvoorde - Belgium
Tel number: +32 2 255 62 60
Email address: **sds.responsible@tessenderlo.com**

Supplier of the product

PB Leiner (Hainan) Biotechnology Co., Ltd. 0.4 km west of Yutang South Road, Laocheng Town, Chengmai County, Hainan Province Tel: +86 898 67488618	**PB Gelatins (Heilongjiang) Co., Ltd** Shanghai Branch - Room 4B, No.508 Yishan Road, Xuhui District, Shanghai 200030. P.R. China Tel: +86 2164360106
Tessenderlo Group N.V. Division PB Leiner Address: Duchéstraat (Marius) 260 B-1800 Vilvoorde - Belgium Tel.: +32 2 255 62 60	**PB Gelatins (Heilongjiang) Co.,Ltd.** Xinyi Industry Park, Kongguo Town - Nehe City 161311 - Heilongjiang Province, P. R. China Tel.: + 86 452 380 1188

PB Leiner Argentina S.A. Casilla de Correo 108 Parque industrial Sauce Viejo S3016 WAC Santo Tomé- Santa Fe -Argentina Tel: +54 342 4501100	**PB Gelatins GmbH** Groβe Drakenburgerstrasse 43 31582 Nienburg - Germany Tel: +49 5021 60 10 0
PB Leiner USA 7001 Brady Street Davenport, IA, 52806 - United States of America Tel.: +1 516 822 4040	**PB Leiner Brazil Indústria e Comércio de Gelatinas LTDA** Acorizal – Mato Grosso – Brazil - Estrada Vicinal Acorizal-Aldeia, km 03, Acorizal, MT, 78480-000 Tel.: +55 65 99339 9505 or +55 65 99934 6506
PB Gelatins UK Ltd Unit A6, Severn Road Treforest Industrial Estate, Pontypridd, CF37 5SQ - United Kingdom Tel.: +44 144 384 93 06	

1.4 Emergency telephone number / information

PB Leiner (Hainan) Biotechnology Co., Ltd. P.R. China Tel.: +86-898-67488618	**Tessenderlo Group N.V.**, Division PB Leiner Belgium Tel.: +32 2 255 62 11
PB Leiner Argentina S.A. - Argentina Tel.: +54 342 4995622 or + 54 342 4501128	**PB Gelatins GmbH -** Germany Tel.: +49 5021 60 10-0
PB Leiner USA - United States of America Tel.: +1 563-386-8040 Monday to Friday 8.00 to 16.00 Central Time	**PB Leiner Brazil Indústria e Comércio de Gelatinas LTDA -** Brazil Tel.: +55 65 99339 9505 or +55 65 99934 6506
PB Gelatins (Heilongjiang) Co., Ltd - P. R. China Tel.: +86452 3800 577	**PB Gelatins UK Ltd -** United Kingdom Tel.: +44 1443 849 300

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance

Hydrolyzed gelatin is not considered as Hazardous Components as described in Regulation (EC) No 1272/2008 on classification, labeling and packaging of substances and mixtures. Gelatin hydrolysate is exempted from registration according to Regulation (EC) No 1907/2006.
See Section 16 for the hazard and precautionary statements.

Hydrolyzed gelatin is also not listed in the FDA draft list of potentially hazardous contaminants in animal feed and feed ingredients.

Gelatin is listed as UVCB (Unknown or variable compositions, complex reaction products and Biological materials) in the EPA's non-confidential chemical substance listings on the TSCA Inventory 042018 where Gelatin is defined as a complex combination of proteins obtained by hydrolysis of collagen by boiling skin, tendons ligaments, bones, etc. Fish hydrolyzed gelatin is produced by enzymatic hydrolysis of fish collagen present in fish skins and scales.

Gelatin is not considered to be hazardous under US Occupational Safety and Health Administration (OSHA) standard 19CFR 1910-1200. Establishments primarily engaged in manufacturing edible, technical, photographical and pharmaceutical gelatin are classified in OSHA industry group 2899.

2.2 Label elements:
Hydrolyzed gelatin is not classified as dangerous according to the criteria of Regulation (EC) No 1272/2008

2.3 Other hazards
Hydrolyzed gelatin is not persistent, not bioaccumulative and not toxic (PBT) and is also not very persistent and not very bioaccumulative (vPvB) according to Regulation (EC) 1907/2006.

The product was not included in the candidate list for having endocrine disrupting properties.
The product is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 and Commission Regulation (EU) 2018/605.

3. COMPOSITION / INFORMATION ON INGREDIENTS

CAS name	:	Gelatin
Synonyms	:	Fish hydrolyzed gelatin, Fish gelatin hydrolysate, Hydrolysed fish gelatin, Marine gelatin hydrolysate, Tilapia gelatin hydrolysate.Gelatine (non-gelling), Gelatin (non-gelling), gelatin hydrolysate, Hydrolyzed gelatin, Gelatin derivatives.
Composition	:	min. 91% hydrolysed protein, < 8% water, inorganic ash < 2% (Ca, Na, SO_4, etc.)
Molecular Formula	:	$(\text{-CO-CHR-NH-})_n$
Molecular weight	:	Not applicable
Hazard symbol	:	Not applicable
Risks (R phrases)	:	Not applicable
CAS n°	:	9000-70-8
EINECS number	:	232-554-6

Specific concentration limits and M-factors for substances included in the list of harmonised classification and labelling of substances under the CLP Regulation (EC) 2008/1272: Not Applicable for this product.

4. FIRST AID MEASURES

4.1 Description of first aid measures

After inhalation	:	Move from source of gelatin hydrolysate to fresh air. Seek medical assistance if necessary
After skin contact	:	Rinse with water, soap may be used
After eye contact	:	Wash affected eye/s for at least 15 minutes under running water with eyelids held open.
After ingestion	:	Edible product(s). Consult a doctor/medical service in case of discomfort

Self-protection of the first aider: None required. Use normal protective gloves, glasses and clothing.

4.2 Most important symptoms and effects, both acute and delayed
No acute or delayed effects known after inhalation, skin contact, eyes contact and/or ingestion. A reaction may be possible for people allergic to fish products.

4.3 Indication of any immediate medical attention and special treatment needed
No information known on clinical testing or medical monitoring of delayed effects or contraindications. A reaction may be possible for people allergic to fish products.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media: water, polyvalent foam, ABC dry chemical powder.

5.2 Special hazards arising from the substance

May form flammable dust in the finely divided and air suspended state.
Under fire conditions, may emit toxic fumes of carbon monoxide, carbon dioxide, nitrogen oxides and lower amounts of sulphur oxides.

5.3 Advice for firefighters

Treat as "class A" fire.
Hydrolyzed gelatin should be removed from the source of heat/ignition to reduce decomposition, if possible.
Wear protecting equipment including overalls, boots, gloves, eye and face protection and compressed air/oxygen apparatus.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Handle as non hazardous material. Wear protective clothing, a dust mask type P1, chemical safety goggles and rubbery boots (type Wellington boots).

6.2 Environmental precautions

Unlikely to present environmental hazard.
Do not flush to drain, surface waters or ground waters. In function of circumstances, inform competent authorities.

6.3 Methods and material for containing and cleaning up

Plug the leak, cut off the supply. Sweep up or vacuum, place in a bag or container and hold for waste disposal. Avoid raising dust. An extreme slip hazard could develop if material spilled on the floor becomes wet. Ventilate area and wash thoroughly spill site with warm water after material pick up is complete. Wash clothing and equipment after handling.
In function of circumstances, inform competent authorities.

6.4 Reference to other sections

See heading 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid dust formation. Do not smoke. Keep away from burning products or heat sources.
Avoid release of the substance to the environment. Avoid spills. Keep away from drains.

Do not eat, drink or smoke in work areas. Remove contaminated clothing and protective equipment and wash hands before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities
Keep in tightly closed containers in a dry area suitable for food products, away from extremes of temperature. Moisture should be excluded from opened bags. Keep a good ventilation of warehouse.

In closed facilities (like silos), avoid accumulation of electrostatic charges and prevent the proximity of any flame or spark created electrically or mechanically.
In case of auto combustion, take appropriate measures in order to avoid contact with air of the burning material.

In order to avoid auto inflammation by chemical reactivity: Do not smoke. Keep away from ignition sources and flame.

Keep a good ventilation of warehouse.
Avoid reactive vapours like formaldehyde, which can compromise the products functionality.
In order to avoid auto inflammation by chemical reactivity: Do not smoke
Keep away from ignition sources and flame.

7.3 Specific end use(s)
Good Manufacturing Practices hygiene measures (or similar measures) should be applied at all times.
Apart from the uses mentioned in section 1.2, no other specific uses of these products are foreseen.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Exposure limit values
Not Applicable. Gelatin and gelatin hydrolysates are Generally Recognised As Safe (GRAS). They are used as ingredients of commonly consumed foods of animal origin.

8.2 Exposure controls
8.2.1 Appropriate engineering controls:
No risk known to the safety and health of workers arising from the presence of the substance. Facilities storing or using this material should be equipped with an eyewash station.

8.2.2. Individual protection measures, such as personal protective equipment
Avoid raising dust : Ventilate area.
Respiratory protection : Wear a dust mask type P1 when handling.
Hand protection : Wear safety gloves when manipulating hot gelatin hydrolysate solutions.
Eye protection : Wear safety glasses approved under appropriate government standards such as NIOSH (US) or EN 166 (EU) when handling.
Skin protection : None. Follow normal safe work practices.
Facilities storing or utilizing this material should be equipped with an eye wash facility and a safety shower.

8.2.3. Environmental exposure controls
Gelatin, is a natural occurring biopolymer and as such does not present a risk for the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance (physical state)	:	White-yellow powder.
Odour	:	No data available
pH	:	4.0 - 7.0 in 12.5% aqueous solution at 40 °C
Melting point/Freezing point	:	No data available
Boiling point/Boiling range	:	No data available
Flash point	:	No data available
Evaporation rate	:	No data available
Flammability	:	No data available
Dust explosion risk	:	very low risk of explosion (Class ST 1)
Combustibility	:	No data available
Vapour pressure	:	No data available
Relative density	:	300 - 500 g/l (as packed).
Solubility	:	Highly soluble in water, insoluble in fat (solvent or oil).

Partition coefficient n octanol / water: Not applicable

Oxidizing properties	:	none.

9.2 Other information:

Moisture	:	< 8%

10. STABILITY AND REACTIVITY

10.1 Reactivity

Avoid reactive like formaldehyde, which can compromise the products functionality.

10.2 Chemical stability

Hydrolyzed gelatin is stable for at least 3 years when suitably stored in sealed containers under typical warehouse conditions, to prevent ingress or loss of moisture.

10.3 Possibility of hazardous reactions/ Hazardous decomposition products

May cause toxic fumes of CO, CO_2 and NO_x in case of burning.

10.4 Conditions to avoid:

Excessive moisture could induce fermentation
Heat that could initiate auto inflammation.

10.5 Incompatible materials

Strong oxidising agents

10.6 Hazardous decomposition products

Growth of moulds in the case of storage in high moisture conditions.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
No acute toxicity (ingestion, inhalation, skin and eye contact or other routes): gelatin and its hydrolysates are Generally Recognized As Safe (GRAS).
Not classified as inducing skin corrosion/irritation.
Eye damage/irritation: Dust may cause irritation
Respiratory sensitisation: Dust may cause irritation. At very high concentration for prolonged periods could cause blockages of the respiratory tract due to swelling of the dust as it absorbs body moisture.
No skin sensitisation.
Ingestion: Because gelatin hydrolysate can be used as a food ingredient, no detrimental effect would be expected as a result of moderate ingestion.
Germ cell mutagenicity, carcinogenicity, reproductive toxicity: No (test) data available, Not classified as mutagenic, carcinogenic or teratogenic.
No Single Target Organ Toxicity (STOT) - single exposure and repeated exposure
No aspiration hazard
Potential for accumulation: Not likely to accumulate. Easily metabolised.
Gelatin hydrolysate does not cause occupational disease.
Gelatin hydrolysate is not listed in the National Toxicology Program (NTP) Report on Carcinogens and has not been found as a potential carcinogen in the International Agency for Research on Cancer (IARC) Monograph latest edition, the OSHA or the California Prop 65 list.
Not classified as endocrine disruptor.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
Not hazardous in water (WGK or WHC = 0). Susceptible to microbiological decomposition.
Not toxic to fish, aquatic invertebrates, aquatic plants (e.g. algae) nor microorganisms (e.g. bacteria).

12.2 Persistence and degradability
Susceptible to microbiological decomposition.
In large quantities in watercourse, would raise the B.O.D. level.
Not photodegradable

13. DISPOSAL CONSIDERATIONS

Small quantities: wash to waste with warm water.
Large quantities: as municipal or commercial waste, according to local regulations.
Packaging: recycle, according to local regulations.

14. TRANSPORT INFORMATION

14.1 UN Number and 14.2 UN Shipping name
Not applicable

14.3 Transport Hazard class(es)
Hydrolyzed gelatin is not subject to transport regulations for dangerous substances:
- European REACH regulation: Gelatin and its hydrolysates are exempted from REACH registration.

- Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180): not applicable
- United States Department of Transportation (USDOT or DOT): not applicable
- Canadian Transportation of Dangerous Goods (TDG): not applicable
- International air transport Association (IATA): not applicable

14.4 Packing group: No data available

14.5 Environmental hazard: Not a marine pollutant

14.6 Special precautions for user

Food, Food supplements, products used in clinical nutrition should be transported according to GMP in unopened original containers away from extremes of temperature and in dry condition to avoid moisture pick up.

In the USA, import and transport of products of animal origin are regulated by 9 CFR part 94 and 95.

In Brazil, import and transport of products of animal origin are regulated by RISPOA articles 851 – 869.

15. REGULATORY INFORMATION

In Europe:

- Gelatin and gelatin hydrolysates for human consumption, are regulated by Commission Regulation (EC) No 853/2004 laying down specific hygiene rules for food of animal origin; and by Commission Regulation (EC) No 2073/2005 on microbiological criteria for foodstuffs, as amended.
- Gelatin and its hydrolysate used for technical applications, are regulated by Regulations (EC) No 1069/2009 and (EU) 142/2011.
- Gelatin and its derivatives used in cosmetic products are listed in Commission Decision (EU) 2019/701 establishing a glossary of common ingredient names for use in the labelling of cosmetic products.
- Fish and products derived thereof are covered by Annex II “Substances or products causing allergies or intolerances" of Regulation (EU) No 1169/2011. When fish hydrolyzed gelatin is used as an ingredient, the species origin must be indicated because of the mandatory allergen declaration.
- This SDS is compliant with Commission Regulation (EU) 2020/878 amending Annex II to REACH Regulation.

In the USA, gelatin for human consumption is regulated by:

- FDA 21 CFR 189 and 700 concerning the record keeping requirements for human Food and Cosmetics manufactured from, processed with or otherwise containing Material from Cattle
- FDA 9 CFR parts 309, 310, 311, 318 and 319 concerning the prohibition of the use of specified risk material for human food and by
- FDA Guidance note for industry on bovine gelatin dated September 1997.
- 9 CFR Parts § 94.23, 94.24 and 94.26.

In Argentina, gelatin for human consumption is regulated by SENASA (National Health Service and Food Quality) Decree nº 4238/68 on inspection of animal products and by-products and animal derivatives chapter 18.

In Brazil, gelatin for human consumption is regulated by RISPOA article 433. (RIISPOA = Regulation of industrial and sanitary inspection of products of animal origins)

In China, gelatin for human consumption must comply to the Food Safety Law of the People's Republic of China and the National Standard for gelatin GB 6783- 2013.
Food grade gelatin meets the specifications of most recent edition of Food Chemical Codex,
Pharmaceutical grade gelatin meets the specifications of the harmonised European, US and Japanese Pharmacopeia as well as the Argentina, Brazil and the Chinese Pharmacopoeia.

15.1. Safety, health and environmental regulations/ Legislations: not applicable

15.2. Chemical safety assessment: No chemical Assessment known for gelatin hydrolysate.

16. OTHER INFORMATION

Hazard statements: Not applicable
Precautionary statements according to Annex IV of Regulation (EC) No 1272/2008:

- P232: Protect from moisture
- P306+351+338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

Modifications for revision 2:
Replacement of "fish gelatin hydrolysate" by "fish hydrolyzed gelatin" in the name of the SDS and throughout the different sections of this SDS.

The above information is believed to be correct at the date of issue but does not pretend to be exhaustive. It shall only be used as a guideline for correct manipulation, storage, use, transport and disposal of the product, but it is not intended as a guarantee or indication of quality. It is relative to the above-mentioned product and loses its validity when used together with other products, except if otherwise indicated in the text.

TECHNICAL DATASHEET

SOLUGEL® Optima FP

NA/ASIA/LATOC

A. Material description

SOLUGEL® Optima FP is a natural protein product, obtained by enzymatic hydrolysis of collagen-rich material from fish. It does not contain chemical additives or preservatives. SOLUGEL® Optima FP is ideal for collagen and protein fortification in dietetic foods, drinks, and snacks as well as for nutraceutical, cosmeceutical and nutricosmetic applications.

SOLUGEL® Optima FP is a light coloured powder with a neutral taste and smell

B. Product characteristics

1. Physico-chemical properties

Analysis	Specification	Unit	Test method
Protein content[1]	≥ 91	%	Kjeldahl (N x 5.55)
Moisture	≤ 8	%	105 °C, 17 h
Ash	≤ 2	%	550 °C, 17 h
Viscosity	1.6 - 2.0	mPa*s	10%, 25°C
Average molecular weight[1]	approx. 2,000 Da	Dalton	SEC (GME)
pH	4.0 - 7.0		12.5%, 40°C
Peroxide	≤ 10	ppm	Test strips
Sulphur dioxide[1]	≤ 10	ppm	Distillation
Arsenic[1]	≤ 0.8	ppm	GME
Cadmium[1]	≤ 0.5	ppm	GME
Chromium[1]	≤ 10	ppm	GME
Copper[1]	≤ 30	ppm	GME

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Lead[1]	≤ 0.1	ppm	GME
Mercury[1]	≤ 0.1	ppm	GME
Zinc[1]	≤ 30	ppm	GME

[1] The characteristics are performed in reduced testing frequency in accordance with an internal quality program.

2. Microbiological properties

Analysis	Specification	Unit	Test method
Total plate count	≤ 1,000	CFU/ g	USP
Salmonella	Negative	/25 g	ISO 6579
Escherichia coli	Negative	/10 g	USP
Anaerobic sulphite reducing bacteria	< 10	CFU/ g	GME

C. Nutritional information[2] (typical values per 100 g as is)

1. Basic nutrients

	Typical value	Unit
Energy	364 1,523	kcal kJ
Protein	91	g
Fat	0	g
of which saturates	0	g
Carbohydrates	0	g
of which sugars	0	g
Cholesterol	0	mg
Sodium[1]	100	mg
Converted to salt	*250*	mg
Potassium[1]	8	mg
Magnesium[1]	6	mg
Phosphorus[1]	0	mg
Calcium[1]	10	mg
Iron[1]	0	mg
Vitamins	0	mg

[1] The characteristics are performed in reduced testing frequency in accordance with an internal quality program.
[2] For informational purposes only. Not intended for finished product labeling requirements. In Europe gelatin and gelatin hydrolysates are exempted from the mandatory nutrition declaration as specified in annex V point 14 of Regulation 1169/2011.

2. Amino acid spectrum[3]

Amino acid	% on dry solid protein
Alanine	10.2
Arginine	8.1
Aspartic acid	5.4
Cystine/Cysteine	0.0
Glutamic acid	9.7
Glycine	23.1
Histidine[4]	0.9
Hydroxyproline	11.4
Isoleucine[4]	1.2
Leucine[4]	2.8
Lysine[4]	3.4
Methionine[4]	1.1
Phenylalanine[4]	1.9
Proline	12.2
Serine	3.4
Threonine[4]	2.8
Tryptophan[4]	0.0
Tyrosine	0.3
Valine[4]	2.0

[3] Amino acids of the amino acid spectrum were determined in reduced frequency in accordance with an internal quality program, in an accredited laboratory according to ISO 17025 based on representative samples.
[4] Essential amino acid

D. Storage and shelf-life

In unopened original packaging, stored in a dry environment at ambient temperature with no specific odour, SOLUGEL® Optima FP can be stored for 5 years

E. Packaging

Paper bag (with inner PE-protective layer) of 15 kg

F. Disclaimer

1. Ingredient statement

Fish collagen peptides (could also be labeled as fish hydrolyzed gelatins, fish collagen hydrolysates, marine collagen peptides, marine collagen hydrolysates, marine hydrolyzed gelatins, non-gelling gelatin, gelatin derivatives)

2. Regulatory information

SOLUGEL® Optima FP complies with the requirements for finished products as described in Regulations (EC) No 853/2004 and amendments, Commission Regulations (EC) No 1881/2006 and amendments and bacteriological requirements of the GME Collagen Peptides Monograph in the current valid version.

Caixia Xiao
Quality Manager
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