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Product Specification

I&G (Disodium 5'-Inosinate (50%) & Disodium 5'-Guanylate (50%))

1. Product and Company Information

I&G is a 50:50 mixture of Disodium 5'-Inosinate and Disodium 5'-Guanylate. Disodium 5'-Inosinate contains approximately 7.5 molecules of water of crystallization. Disodium 5'-Guanylate contains approximately 7 molecules of water of crystallization. It occurs as colorless or white crystal or as a white, crystalline powder, having a characteristic taste. It is freely soluble in water, is sparingly soluble in alcohol and practically insoluble in ether.

Items	IMP	GMP
Chemical Formula	$C_{10}H_{11}N_4Na_2O_8P{\cdot}7.5H_2O$	$C_{10}H_{12}N_5Na_2O_8P{\cdot}7H_2O$
Formula Weight	527.17	533.19
CAS Number	4691-65-0	5550-12-9
EINECS Number	225-146-4	226-914-1
RTECS Number	NM7519500	MF9290000
Chemical Family	Purine Nucleotide	

Functional Use in Foods : Flavor enhancer
Synonym : Disodium 5'-Ribonucleotide; Ribotide; I+G
Manufacturer Name : PT. CJ Indonesia
Manufacturer Address : Jl. Raya Brantas Km 3.5, Jatigedong-Ploso, Jombang 61453 Indonesia

2. Chemical / Analytical Information

Requirements	Specification	Test Method
Assay	97.0% ~ 102.0% IMP: 50.0% ± 2.0%, GMP: 50.0% ± 2.0%	HPLC analysis
Clarity & color of solution	Passes test	FCC Methodology
pH of 1 in 20 solution	7.0 ~ 8.5	
Water (Karl Fischer)	Not more than 26%	
Amino acids	Not detectable	
Ammonium salts	Passes test	
Pb	Not more than 1.0 mg/kg	
As	Not more than 1.0 mg/kg	
Cd	Not more than 1.0 mg/kg	
Hg	Not more than 0.1 mg/kg	
Related foreign substance	Chromatographically not detectable	
Test for sodium	Passes test	JECFA Methodology
Test for ribose	Passes test	
Test for organic phosphate	Passes test	

3. Microbiological Information

Requirements	Limit	Method
Total viable count	Not more than 1,000 cfu/g	Every microorganism is identified by cell morphology in their selective media & tested by biochemical test
Yeast & mould	Negative / g	
Coliform bacteria	Negative / g	
E. coli	Negative / g	
Salmonella sp.	Negative / 25g	
Pathogenic microorganism (S. aureus, C. perfringens, Y. enterocolitica, B. cereus, C. botulinum)	Negative / g	

4. Nutritional Information

Item		Per 100 g
Energy (kJ) [Energy (Cal)]		893 kJ [213.5Cal]
Protein	Crude protein (g)	0*
	Non-proteogenic nucleotides (g)	66.69 (66.69%)
Fat	- Total (g)	0
	- Trans fatty acid(g)	0
	- Saturated (g)	0
Carbohydrates	- Total (g)	0
	- Sugars (g)	0
	- Added sugars (g)	0
Water (g)		24.64 (24.64%)
Dietary Fibre (g)		0
Sodium (mg)		8,670 (8.67%)
Potassium (mg)		0
Cholesterol (mg)		0

Nucleotides is non-proteogenic organic acid and not considered as crude protein. Nucleotide (I&G) has its own calorie level based on the chemical composition. Total energy information is grounded in the actual analysis test, not just energy calculation equation.

5. Allergens Information

No	Item	Present/absent	No	Item	Present/absent
01	Cow's milk protein*	Absent	22	Sesame	Absent
02	Lactose*	Absent	23	Sesame oil	Absent
03	Chicken's egg*	Absent	24	Glutamate (E620 – E625)	Absent
04	Soy protein*	Absent	25	Sulphite (E220 – E228)[2]	Absent
05	Soy oil*	Absent	26	Coriander	Absent
06	Gluten*	Absent	27	Celery	Absent
07	Wheat*	Absent	28	Carrot	Absent
08	Rye	Absent	29	Lupine	Absent
09	Beef	Absent	30	Mustard	Absent
10	Pork	Absent	31	*Milk constituents*	Absent
11	Chicken	Absent	32	Milk powder	Absent
12	Fish	Absent	33	Soy lecithin	Absent
13	Shellfish and Crustaceans	Absent	34	Soy flour	Absent
14	Maize	Absent	35	Soy meal	Absent
15	Cocoa	Absent	36	*Wheat flour*	Absent
16	Legumes / Pulses	Absent	37	Wheat meal	Absent
17	Nuts[1]	Absent	38	Wheat starch	Absent
18	Nut oil	Absent	39	Bread crumb	Absent
19	Peanuts	Absent	40	Egg yolk	Absent
20	Peanut oil	Absent	41	Sulphite[2]	Absent
21	Gluten	Absent			

The products are mentioned in the Dutch Databank ALBA, TNO VOEDING, and revision August 2003.

1. This group comprises: walnuts, pecans, almonds, cashew nuts, ginko, hazel nuts, hickory, macadamia nuts, keloewek, kemiry nuts, kola nut, melinjo nut, Brazil nuts, pingang nut, pistachio nuts, Spanish chest nuts.
2. A product is free from sulphite if the concentration in the product is not higher than 10 mg/kg (ppm).

6. Allergen Control Policy

1) We do not use any materials known as allergens.

Therefore, allergens could not be present as a minor ingredient in raw materials used on site and there is no possibility of cross contamination relating to contact with other materials that contain any of the protein from food allergen materials.

2) **We do not share the equipments in producing different products.**

   Therefore, there is no possibility of cross contamination relating to shared equipments.

3) **In producing I&G, we also apply fermentation & Refinery technology in production IMP and GMP. In fermentation, we sterilize the raw materials. In refinery, we use thermal processes (Concentration, drying, etc.).**

   Therefore, if any, all the active allergens will be inactivated and is eliminated.

In conclusion, we assure that as long as packaging material's entity is effective, there is no possibility of cross contamination.

7. Lot Identification

1) Products are identified by production date. We define production date as lot No. We also keep the Lot identification records according to customer's P.O.
2) Lot identification records should be kept and maintained.
3) All products are printed lot no. according to each lot. With this lot no., we can easily trace all the relevant information.
4) Lot (Batch) No **: BNXZYYMMDD**
   Production date **: YYYY.MM.DD**
   Best before date **: YYYY.MM.DD**

   Explanation for lot number
   B : Indonesia, Jombang Plant
   N : Nucleotides
   X : Nucleotides type (I = IMP)
   (G = GMP)
   (S = I&G)

   Z : Packaging weight code (B = 1 Kg)
   (C = 10 Kg)
   (D = 20 Kg)
   (E = 50 LB)
   (F = 25 Kg)
   (G = 500 Kg)

   YYMMDD: Production date (year / month / date)

   Example: **BNSC200220**

   I&G 10 Kg with production date 20 February 2020, produced by Indonesian Jombang Plant

8. Special consumer requirements

Is the material suitable for?	**Yes / No?**	**Is the material Certified?** (Yes / No)
Kosher	Yes	Yes (Kosher Pareve)
Halal	Yes	Yes
Vegan	Yes	No, but we can provide a signed manufacturer's declaration.
Vegetarian	Yes	No, but we can provide a signed manufacturer's declaration.

9. Storage Conditions & Shelf life

I&G does not require any special storage and handling conditions. But, **we recommend avoiding direct ray of light and store in a cool and dry place.**

Shelf life: Although I&G can be used for more than 3 years, **we recommend the usage within 3 years.**

10. Certification of System

1) Our Quality Management System is certified ISO 9001:2015
2) Our Food Safety Management System is certified ISO 22000:2005 and BRC Food issue 8

11. Regulatory Status & Safety Information

1) **Regulatory status**

a) **In U.S.A., FDA 21 CFR 172.530 for Disodium Guanylate**
Disodium guanylate may be safely used as a flavor enhancer in foods, at a level not in excess of that reasonably required to produce the intended effect.

In U.S.A., FDA 21 CFR 172.535 for Disodium Inosinate
The food additive disodium inosinate may be safely used in food in accordance with the following prescribed conditions:

a. The food additive is the disodium 5'- salt of inosinic acid, manufactured and purified so as to contain no more than 150 parts per million of soluble barium in the compound disodium inosinate with seven and one-half molecules of water of crystallization.

b. The food additive is used as a flavoring adjuvant in food.

c. No substances destroying ozone layer at atmosphere.

b) **In Europe, Commission Directive 2008/84/EC,** revised by 2009/10/EC and 2010/67 laying down specific purity criteria on food additive other than colors and sweeteners and **Regulation (EU) No. 231/2012** laying down specifications for food additives listed in Annexes II and III to Regulation (EC) No. 1333/2008 of the European Parliament and of the Council **(E635)**.

2) **Safety Information**

Disodium 5'-guanylate and disodium 5'-inosinate are widely distributed in all animal and plant tissues. Their role in purine metabolism as well as their breakdown to uric acid and to allantoin (in most mammals, but not humans) is well documented. **Data on the metabolism, reproductive effects, genotoxicity, and short-term and long-term toxicity of guanylate and inosinate were evaluated. No evidence of carcinogenicity, teratogenicity, or adverse effects on reproduction has been observed.**

Changes in dietary purine intake over the past decade resulting from the use of guanylate and inosinate as flavour enhancers are no greater than those due to variability in the consumption of the major dietary contributors of purines. Naturally occurring nucleotides in the diet (calculated to be up to 2 g/person/day) greatly exceeds their intake resulting from use as flavour enhancers (approximately 4 mg/person/day).

JECFA concluded that, on the basis of the available data, the combined total daily intake of disodium 5'-guanylate and disodium 5'-inosinate is not of toxicological significance, and re-confirmed the **ADI "not specified"** (This is JECFA's best classification for food additives) that was previously established. Because exposure to these substances from their use as flavour enhancers is low compared with daily intake of naturally occurring nucleotides in the diet, JECFA found no reason to recommend that foods to which these substances have been added should be labeled on the basis of safety, and withdrew its previous recommendation for labeling.

12. Packaging Information

1 kg X 10 ea	O.P.P./P.E. tube bag packed in carton box
10 kg X 1 ea	P.E. tube bag packed in carton box
25 kg	P.E. tube bag packed in carton box

14 January 2020
Authorized by

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Fabiyan Bani Adam
Quality Control Manager