

GLOMIN EZ-IRON

MAGNESIUM BIS GLYCINATE

EZ Zinc

ZINC-GLYCINE COMPLEX

NANOCAL

NANO MAG

LEAN CAL

LACTOBIONIC ACID

DairyCal

EZ-Mn

CALCIUMBISGLYCINATE

Calcium Lactobionate

MagiCal

Tasty Iron

FERROTECH

FERRO SPRAY

GLOCAL

CALCIUM GOLD

EZ - Copper

VegiCal

NANO9

PEPTIDEPLUS

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# Introduction

Global Calcium, a leading manufacturer of superior quality mineral & vitamin compounds catering to Pharmaceutical, Food & Beverage, Cosmeceutical & Nutraceutical sectors, specializing in several product lines including Lactates, Gluconates, Citrates, Pidolates, Orotates, Aspartates, Malates, Glucoheptonates, Glycerophosphates & Lactobionates.

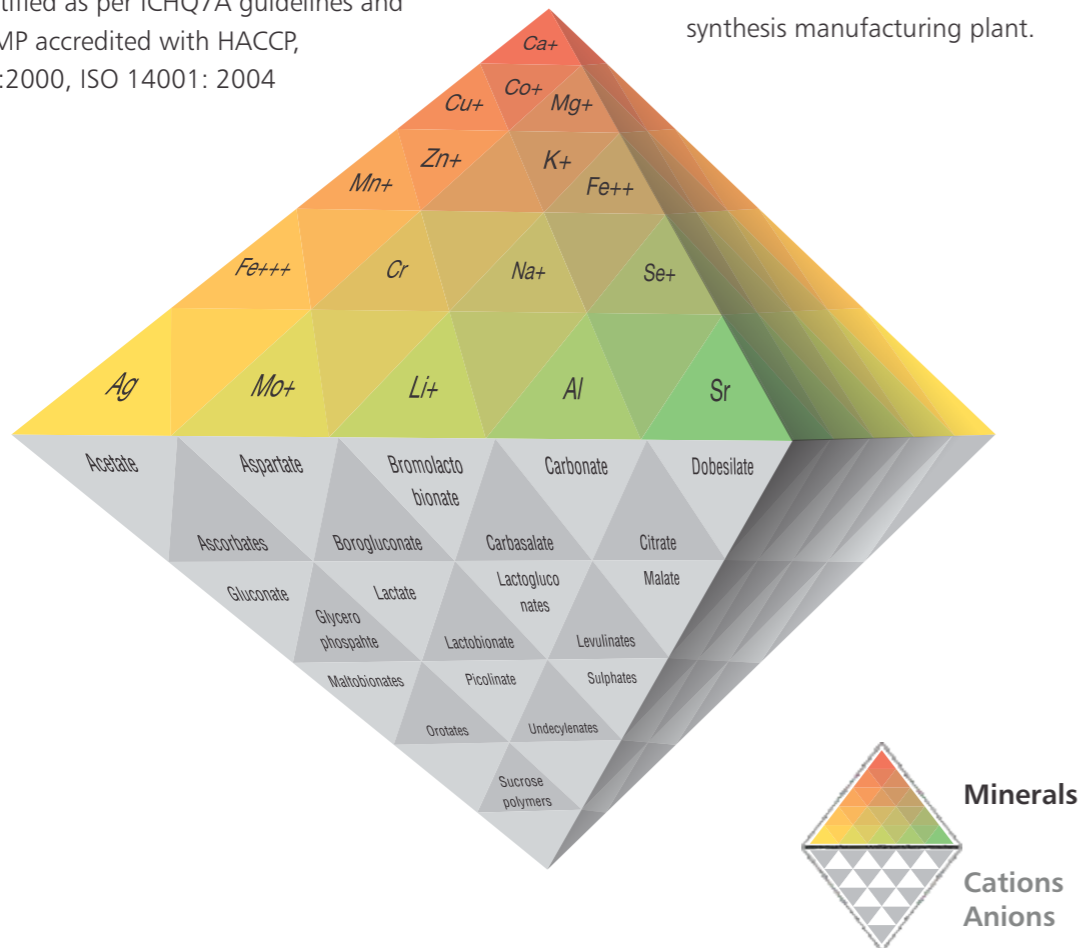
Global Calcium is today the only EU GMP certified manufacturer to comprehensively develop and produce its complete range of products. Its portfolio spans the entire spectra of derivatives of amino acids, carboxylic acids, vitamins and customized pre-mixes. The company has state of the art manufacturing facilities incorporating specialized drying techniques, dedicated micronising and chilsonator sections offering several customized particle size distributions.

Global Calcium campuses are spread over 25 acres with fully integrated QA / QC laboratories that are cGMP certified as per ICHQ7A guidelines and WHO cGMP accredited with HACCP, ISO 9001:2000, ISO 14001: 2004

accreditation. The company is also Kosher & Halal approved. Global has also received Certificates of Suitability (COS) from EDQM for different products. The company offers strong regulatory support with more than 50 DMF's for several products in its portfolio.

Global Calcium products are today present in over 55 countries around the world with customers in varied segments.

In 2011, Global Calcium is expected to validate and commercialize a brand new multi-stream, multi-synthesis manufacturing plant.



# Global Innovation Center

(A Subsidiary of Global Calcium Pvt Ltd)

Recognizing the need and importance of new product development and a sound and robust Research & Development Wing integral to our business, we have created a world-class dedicated Global Innovation Centre (GIC), which is housed within our campus at Hosur near Bangalore, a leading global hub for information technology & Biotechnology in India.

A Dynamic team comprising of well qualified and trained scientists (Ph.D / M.Sc / M.Pharm) focuses on development of advanced pharmaceuticals and analytical development



## New products

- ARIPIRAZOLE
- ASPIRIN LYSINE
- CARBASALATE
- CHROMIUM POLY NICOTINATE
- DONEPEZIL HCL
- IMATINIB (ALFA & BETA FORM)
- IRON SUCROSE
- TIEMONIUM METHYL SULPHATE



# Diversified Product Applications

# Product Showcase

## Gluconates

Tablet • Solutions • Injections • Sachets • Cereals • Bakery • Beverages • Dairy

## Pidolates

Creams • Gels • Lotions • Sachets • Vials • Tablets • Sports Nutrition

## Lactates

Tablets • Capsules • Dairy • Beverages • Sachets • Lotions

## Aspartates

Tablets • Capsules • Bakery • Cereals • Dairy

## Citrates

Tablets • Capsules • Bakery • Cereals • Dairy

## Glycinates

Sports Nutrition • Beverages • Sachets

## Glycerophosphates

Tablets • Sports Nutrition • Beverages

## Lactobionates

Syrups • Beverages

## Ascorbates

Tablets • Injectables

## Orotates

Tablets • Capsules

## Zinc



## Calcium



## Potassium



## Trace Minerals



## Magnesium



## Iron





## Innovation in Pre-mixes



Desired healthy feature, solubility, process, temperature, pH, shelf life, packaging, labeling and legislation requirements



## Regulatory forum

Global has a strong R&D facility fully equipped with Pilot Plants and Walk-in Stability Chambers in strict conformance with ICH guidelines. Several new products and molecules are successfully launched each year to meet customers demand.

The strong emphasis on research and development of innovative molecules are patented where applicable offering attractive solutions to customer requirements. Backed with thorough documentation package.

- Global Calcium's dedicated team on Regulatory Affairs has more than 50 active DMF across its portfolio & it is fully equipped to create customized technique data packages.
- Ability to create detailed regulatory documents across various prescribed guidelines ranging from ENEA to US.
- Strong IPR focus in reviewing and filing Patents for innovative ingredients & applications.



## Packaging

Global offers various packing option purely customized, ranging from 1 gm vials to 800 kgs. super sack/big bag. Standard packing ranges from bio-available European approved fibre drums, toughened carton boxes to highly durable plastic drums designed for critical air dispatches.

## EUGMP Certified and EDQM inspected





# Global Quality Certifications

- EUGMP • HACCP • cGMP • ISO 14001 : 2004 • ISO 9001 : 2000 • USFDA • COS (Oral)
- COS (Injection) • FCC • KOSHER • HALAL • ICH-Q7A • USFDA Registered



# Corporate Sustainability

Sustainability is the core in our philosophy at all levels of our operations. Constant investment in renewable energy options, regular up-gradation of zero discharge & effluent treatment facilities, passionate persuance of green technologies, are ingrained in our way of life.

The Global Calcium rigidly follows a policy on sustainability in commercial, environmental, social dimension and also constant training at all levels of management to prepare for the future and to ensure sustained customer satisfaction on an ongoing basis.

# Our Commitment to Environment

Global Calcium's commitment to the environment is manifested by its multi-million dollar investments in green energy wind turbine generators along the Indian Ocean. Not only has this strategy provided an effective hedge against future purchase or carbon credits, it has also allowed the company to gain international reputation as a 'green passionate company' amongst global agencies like the United Nations Framework Convention for Climatic Change (UNFCCC). The company also has invested heavily into state-of-the-art effluent treatment plants allowing it be the first company of its kind to have a zero liquid effluent discharge in 2008. Another driving force behind Global Calcium's environmental strategy is the development of proprietary manufacturing techniques that are significantly green friendly than existing processes.

In 2010, Global Calcium invested in a multi-million biodegradable steam plant, thereby actively reducing its dependence on furnace oil by 1 million liters per year.





Products	CAS Number(s)	Compliance	Appearance	Solubility as per pharmacopia	Solubility in water g/l @ **25° *100°C
Acetaminophen Calcium	–	–	White to almost white powder	Freely soluble in water	10% solution is clear / colorless
Arginine Aspartate	7675-83-4	EP	White or almost white granules or powder	Very soluble in water	–
Calcium Ascorbate (DH)	5743-28-2	USP	White to slightly yellow, practically odorless powder	Freely soluble in water	Freely soluble in water
Calcium Boro Gluconate	5743-34-0	In-house specs	White crystalline or granular powder	–	Soluble in boiling water
Calcium Bromolactobionate (HH)	33659-28-8 (AH)	In-house specs	White crystalline or granular Powder	–	Freely soluble in water
Calcium Carbasalate	5749-67-7	EP	White or almost white, crystalline powder.	Freely soluble in water	Freely soluble in water
Calcium Citrate (TH)	5785-44-4	USP	White, odorless, crystalline powder	Slightly soluble in water	Insoluble
Calcium Citrate Malate	–	In-house specs	White powder	Slightly soluble in water	Insoluble
Calcium D Pantothenate BP/EP	137-08-6	USP/BP/EP	White or almost white powder	Freely soluble in water	Freely soluble in water
Calcium D-Saccharate (TH)	5793-89-5	USP	White, odorless, tasteless, crystalline powder.	Very slightly soluble in cold water; slightly soluble in boiling water	Slightly soluble
Calcium Fumarate	19855-56-2	–	White to almost white powder	–	–
Calcium Glubionate (MH)	12569-38-9	In-house specs	White or yellowish white powder	–	Soluble in boiling water
Calcium Glubionate (Inj. Grade) (MH)	12569-38-9	In-house specs	White to off-white, powder	–	Soluble in boiling water
Calcium Glucoheptonate	29039-00-7	BP/EP	White or very slightly yellow, amorphous powder, hygroscopic	Very soluble in water	Freely soluble in water
Calcium Gluconate (AH)	299-28-5	USP FCC	White, crystalline, odorless, tasteless granules or powder	Sparingly soluble in water	Sparingly soluble in water
Calcium Gluconate (MH)	18016-24-5	USP FCC, BP, EP, JP	White crystalline or granular powder	Sparingly soluble in water	Sparingly soluble in water
Calcium Gluconate (Inj Grade) (MH / AH)	18016-24-5	USP/EP	White crystalline or granular powder	Freely soluble in water	Soluble in water
Calcium Gluconoglucoheptonate	299-28-5: 29039-00-7	In-house	White to off-white powder	–	Freely soluble in water
Calcium Glycerophosphate	27214-00-2	BP/EP	White or almost white powder, hygroscopic	Sparingly soluble in water	Sparingly soluble in water
Calcium Glycine Chelate	56960-17-9	In-house	White to off-white crystalline powder.	–	–
Calcium Lactate (PH)	5743-47-5	USP FCC	White granules or powder	Soluble in water	Soluble in water
Calcium Lactate Gluconate -GLOCAL	C:5743-47-5: 18016-24-3	In-house specs	White to off-white free flowing powder,	–	Freely soluble in water
Calcium Lactobionate (DH)	110638-68-1	USP	White-to off-white granular powder	–	Soluble in water
Calcium Lactobionate (Inj. Grade) (DH)	110638-68-1	USP	White-to off-white granular powder	–	Soluble in water
Calcium Levulinate (DH)	5743-49-7	USP	White crystalline or amorphous Powder	Freely soluble in water	Freely soluble in water
Calcium Magnesium Lactate Gluconate-MAGICAL	5743-47-5+ 3632-91-5	In-house specs	White or off-white, free flowing powder	–	200**
Calcium Malate	17482-42-7	In-house	White crystalline powder	–	Slightly soluble in water
Calcium Maleate	5621-36-3	In-house	White to off-white powder.	–	Slightly soluble in water.
Calcium Orotate (DH)	22454-86-0	DAC	White to almost white crystalline powder	Hardly soluble in water	Insoluble
Calcium Phospholactate	–	In-house	White to yellowish crystalline or amorphous powder	–	–
Calcium Pidolate (AH)	31377-05-6	In-house specs	White crystalline or granular powder	Freely soluble in water	Freely soluble in water
Calcium Undecylenate	1322-14-1	USP	Fine White powder.	Insoluble in water	Insoluble in alcohol
Chromium Orotate	94333-35-4	In-house	Grayish to grayish-green	–	Slightly soluble in water
Chromium Picolinate	14639-25-9	USP	Dark purple to purple gray powder	Slightly soluble in water	–
Chromium PolyNicotinate - DCP	NA	In-house	Pale gray to gray powder.	–	Insoluble in water
Cobalt Gluconate (AH)	71957-08-9	In-house specs	Rosy-pink or pinkish red crystalline or granular powder	–	Soluble in water
Copper Boro Gluconate	527-09-3+ 10043-35-3	In-house	Light blue or bluish green or greenish blue crystalline or granular powder	NA	Soluble in water (5%), Freely soluble in boiling water (20%)

Mineral content in %	Assay in %	Ph in H <sub>2</sub> O ~ 5 - 10% soln	Lead / Arsenic Content	Micro (CFU/g) /BET (IU/g) less than	Bulk Density Kg / m <sup>3</sup>	Particle Size Distribution "Passing Through"
10.40 - 10.90	98 - 102		5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
–	99 - 101	6 - 7	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
9.21 - 9.49	98 - 101	6.8 - 7.4	5ppm / 3ppm	1000 / NA	500 - 900	U.S 16 #:> 80% w/w
7.00 - 8.00	NA	~ 4	3ppm / 3ppm	1000 / NA	250 - 600	U.S 16 #:> 70% w/w
7.40 - 7.76	97 - 102 (as Calcium)	5.3 - 7.3	5ppm / 2ppm	1000 / NA	400 - 800	U.S 16 #:> 70% w/w
8.65 - 8.83	99 - 101	–	5ppm / 2ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
20.53 - 21.17	97.5 - 100.5	NA	10ppm / 3ppm	1000 / NA	400 - 500	U.S 60 #:> 90% w/w
20.00 - 23.00	NA	5 - 8	10ppm / 3ppm	1000 / NA	350 - 500	U.S 40 #:> 90% w/w
8.24 - 8.49	98 - 101	6.8 - 8	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
12.32 - 12.76	98.5 - 102	NA	5ppm / 3ppm	500 / NA	400 - 600	U.S 40 #:> 99% w/w
Min 23.00	–		2ppm / 4ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
6.62 - 6.90	98 - 102 DB	5.3 - 7.3	5ppm / 2ppm	1000 / NA	300 - 600	U.S 60 #:> 90% w/w
6.62 - 6.90	98 - 102 DB	6 - 8.2	5ppm / 2ppm	100/0.0194EU/mg	400 - 800	U.S 60 #:> 90% w/w
–	98 - 102	6 - 8	5ppm / 2ppm	NA / BET<167IU/g	–	U.S 40 #:> 90.0% w/w
–	98 - 102(D.B)	~ 7	0.5ppm / 3ppm	500 / NA	250 - 600	U.S 16 #:> 70% w/w
–	98.5 - 102 (O.B)	~ 7	0.2 ppm / 3ppm	500 / NA	250 - 600	U.S 16 #:> 70% w/w
–	99 - 101	~ 7	0.2 ppm / 3ppm	100/0.075 EU/mg	250 - 600	U.S 16 #:> 70% w/w
8.00 - 9.00	–	6 - 8	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
18.60 - 19.40	–	–	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
18.50 - 22.0 0	–	10.0 – 11.5	3ppm / 1ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
12.74 - 13.13	98 - 101	~ 6.5	2 ppm / 1ppm	1000 / NA	400 - 800	U.S 16 #:> 80% w/w
12.70 - 13.20	98 - 102	6 - 8	1 ppm / 1ppm	500 / NA	300 - 650	U.S 80 #:> 90% w/w
4.87 - 5.17	96 - 102	5.4 - 7.4	NA / 1ppm	1000 / NA	300 - 600	U.S 20 #:> 90% w/w
4.97 - 5.17	98 - 102	5.9 - 7.5	NA / 1ppm	100 / Max 0.03 IU/mg	200 - 500	U.S 20 #:> 90% w/w
12.75 - 13.15	97.5 - 100.50	7 - 8.5	5ppm / 3ppm	1000 / NA	500 - 600	U.S 40 #:> 90% w/w
6.00 - 8.00	NA	~ 7	5ppm /3ppm	500 / NA	250 - 550	U.S 80 #:> 90% w/w
18.20 - 20.50	–		10ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
NLT 23.0 w/w	–	7 - 9	10ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
10.16 - 10.47	98 - 101	5 - 7	5ppm / 3ppm	1000 / NA	400 - 600	U.S 40 #:> 80% w/w
NLT 12.00	Calcium Lactate - 60 - 70	3 - 5	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
13.33 - 13.81	98.5 - 102	6 - 7.5	5ppm / 1ppm	1000 / NA	500 - 600	U.S 40 #:> 95% w/w
9.60 - 10.06	98 - 102	–	5ppm / 3ppm	<1000 / NA	–	U.S 100 #:> 99.0% w/w
8.50 - 9.10	98 - 102		5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
12.20 - 12.70	98 - 102		5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
–	98 - 102	4.5 - 7.5	5 ppm / 5ppm	<1000 / NA	–	U.S 60 #:> 95.0% w/w
12.72 - 13.51	97 - 103	5.0 - 7.5	3 ppm / 1ppm	1000 / NA	300 - 800	U.S 35 #:> 80% w/w
11 - 12 (as is basis)	NA	NA	5ppm / 3ppm	1000 CFU / g	app. 400	U.S 40 #:>n 70%

Note: Values of particle size and bulk density are indicative only

Products	CAS Number(s)	Compliance	Appearance	Solubility as per pharmacopia	Solubility in water g/l @ **25° *100°C
Copper Citrate	10402-15-0	In-house	Light blue powder	–	Insoluble in water
Copper Gluconate (AH)	527-09-3	USP	Blue or bluish green or greenish blue powder	–	Soluble in water
Copper Glycine Chelate	13479-54-4	In-house	Blue odorless powder	–	Slightly soluble in water
Copper Lactate Gluconate (EZ-Copper)	16039-52-4 527-09-03	In-house	Light blue or bluish green or greenish blue or light green powder	–	Soluble in water
Copper Lactobionate	12069-69-1+ 96-82-2	In-house	Light blue or greenish blue	NA	Soluble in water (10%)
Copper Orotate	61573-60-2	In-house	Greenish-Blue crystalline powder	–	Slightly soluble in water
Ferric Citrate	2338-05-8	In-house	Orange brown powder	–	–
Ferric Pyrophosphate	10058-44-3	FCC	Tan or yellow-white powder	Insoluble in water	–
Ferrous Ascorbate	–	In-house	Dark purplish black powder with typical ferrous salt taste	–	Soluble in water
Ferrous Ascorbate Glycinate	–	In-house	Dark violet to brownish powder	–	Soluble in water
Ferrous Aspartate	75802-64-1	In-house	Light brown to brown powder	–	–
Ferrous Citrate	23383-11-1	In-house	Yellowish white powder	–	Insoluble in water&alcohol
Ferrous Gluconate (DH)	12389-15-0	USP	Yellowish grey or pale greenish yellow, fine powder or granules, odour, slight resembling that of burnt sugar	Soluble in water	Soluble in water
Ferrous Glycine Chelate	–	In-house	Pale brownish gray to greenish gray powder	–	Soluble in water
Ferrous Lactate (DH)	5905-52-2	In-house specs	Greenish white powder or crystals	–	Sparingly soluble in water
Ferrous Lactate Gluconate (EZ-Iron)	5905-52-2 12389-15-0	In-house	Yellowish gray or pale greenish powder	–	Easily soluble
Ferrous Orotate	85187-45-7	In-house	Yellowish brown crystalline powder	–	Slightly soluble in water
Iron Triglycinate	–	In-house	Reddish brown powder	–	Insoluble
Lactobionic Acid	96-82-2 5965-65-1	EP	White or almost white powder	Freely soluble in water	Soluble
Lithium Citrate	6080-58-6	EP/BP	A white or almost white, fine crystalline powder	Freely soluble in water	Freely soluble in water
Lithium orotate	5266-20-6	In-house	Off-white to light yellow crystalline powder	–	Hardly soluble in water
Lithium Sulphate (AH)	10377-48-7	In-house	White crystalline, odorless powder	–	–
Magnesium Amino Acid Chelate-20%	–	In-house	Off-white to light yellow powder	–	–
Magnesium Ascorbate	15431-40-0	In-house	White to off-white powder	–	Insoluble in water
Magnesium Boro Gluconate	59625-89-7+ 10043-35-3	In-house	White to off-yellow white crystalline or granular powder	NA	Soluble in water (5%), Freely soluble in boiling water (20%)
Magnesium Citrate (AH)	3344-18-1	USP	White to off-white crystalline powder	Insoluble	Insoluble
Magnesium Citrate (Hydrous)	3344-18-1	USP	White to off-white crystalline powder	Insoluble	Insoluble
Magnesium Gluconate (AH / DH)	3632-91-5	USP FCC	White to off-white powder	Freely soluble in water	Freely soluble in water
Magnesium Glycine Chelate	14738-68-7	In-house	Off-white to tan powder	–	–
Magnesium Lactate (DH)	18917-93-6	EP	White or almost white, crystalline or granular powder	–	Slightly soluble in water, soluble in boiling water
Magnesium Lactate Gluconate-GLOMIN (TH)	–	In-house specs	White to off-white crystalline, fine powder or granular powder	–	200**
Magnesium Lactobionate	546-93-0+ 96-82-2	In-house	White to off-white or slightly yellow tinged white crystalline or granular powder	NA	Soluble in water (10%), Freely soluble in boiling water (20%)
Magnesium-L-Aspartate	2068-80-6	EP	White crystalline powder	Freely soluble in water	–
Magnesium Malate	869-06-7	In-house	White crystalline powder	–	Soluble in water, soluble in dilute HCl.
Magnesium Orotate (Dihydrate)	34717-03-8	DAC	White to almost white powder	Hardly soluble in water	Insoluble
Magnesium Pidolate	62003-27-4	EP	Amorphous, White or almost white powder	Soluble in water	Freely soluble in water

Mineral content in %	Assay in %	Ph in H <sub>2</sub> O ~ 5 - 10% soln	Lead / Arsenic Content	Micro (CFU/g) /BET (IU/g) less than	Bulk Density Kg / m <sup>3</sup>	Particle Size Distribution "Passing Through"
34.00 - 38.00	98 - 102	–	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
13.72 - 14.28	98 - 102 (OB)	~ 4	25 ppm / 3 ppm	500 / NA	500 - 900	U.S 35 #:> 90% w/w
28.50 - 31.50	95 - 105	7 - 9	10ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
18.00 - 21.00	98 - 102	–	5ppm / 3ppm	<1000 / NA	400 - 1000	U.S 30 #:> 80.0% w/w
Min. 7.4 (as is basis)	Min. 95 (as is basis)	2 - 6 (5%)	5ppm / 3ppm	1000 CFU / g	app. 500	U.S 40 #> 70%
15.19 - 15.81	98 - 102	–	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
18.00 - 21.00	–	–	2ppm / 4ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
24.00 - 26.00	Not less than 22.0% of ferrous	–	4 ppm / 3ppm	<1000 / NA	–	U.S 60 #:> 90.0% w/w
NLT 16.00	Ascorbic acid - NLT 70	4 - 7.5	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
10.00 - 14.00	Gly - Min.20.0, Asc. acid - Min.40.0	6 - 8	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
12.20 - 13.40	–	2 - 5	10ppm / 3 ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
22.25 - 23.16	98 - 102	–	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
11.23 - 11.81	97 - 102	4 - 5.5	3ppm / 1 ppm	500 / NA	550 - 700	U.S 40 #:> 90% w/w
Not Less than 20.0	–	–	5ppm / 1ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
23.15 - 23.99	97 - 100.50 (AH)	5 - 6	3ppm / 1ppm	1000 / NA	500 - 700	U.S 40 #:> 99% w/w
13.00 - 16.00	–	–	5ppm / 3ppm	<1000 / NA	400 - 1000	U.S 30 #:> 80.0% w/w
12.84 - 13.37	98 - 102	–	5ppm / 2 ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
NLT 19.00	–	6 - 8	2ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
NA	98 - 102 (A.H)	1 - 3	NA / 2ppm	100/100 EU/g	300 - 800	U.S 35 #:> 70% w/w
7.23 - 7.53	98 - 102	Alkaline	5ppm / 2ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
3.74 - 4.01	97 - 104	3.5 - 6.5	5ppm / 2ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
NLT 12.37	NLT 98	–	20 ppm / 3ppm	<1000 / NA	–	100% <50 Microns
20.00 - 25.00	–	–	5ppm / 3ppm	<3000 / NA	–	U.S 40 #:> 85.0% w/w
10.20 - 12.50	Ascorbic acid - NLT 77	5 - 10	10ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
4 - 50 (as is basis)	NA	NA	5 ppm / 3ppm	1000 CFU / g	app. 400	U.S 40 #>70%
14.50 - 16.40	NA	5 - 9	10 ppm / 3ppm	1000 / NA	500 - 700	U.S 90 #:> 75% w/w
Min. 10.50	NA	5 - 9	10 ppm / 3ppm	1000 / NA	500 - 700	U.S 90 #:> 75% w/w
5.74 - 5.86	98 - 102 (AH)	6 - 7.8	2ppm / 2ppm	500 / NA	250 - 650	U.S 80 #:> 90% w/w
11.00 - 12.00	–	10 - 11.5	3ppm / 1ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
10.00 - 10.40	98 - 102	6.5 - 8.5	5 ppm / 3ppm	1000 / NA	500 - 700	U.S 40 #:> 99% w/w
6.23 - 7.39	96 - 102	5.8 - 7.8	2 ppm / 2ppm	500 / NA	250 - 550	U.S 80 #:> 90% w/w
Min. 2.98 (as is basis)	Min. 95 (as is basis)	4 - 8 (5%)	5 ppm / 3ppm	1000 CFU / g	app. 500	U.S 16 #> 70%
7.30 - 7.60	98 - 102	6 - 8	5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
12.00 - 13.30	–	8 - 10	5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
6.42 - 6.63	98 - 101	5 - 7	5 ppm / 3ppm	1000 / NA	400 - 500	U.S 40 #:> 80% w/w
8.53 - 8.83	98.5 - 102	5.5 - 7	3 ppm / 2ppm	1000 / NA	400 - 600	U.S 30 #:> 95.0% w/w

Note: Values of particle size and bulk density are indicative only

Products	CAS Number(s)	Compliance	Appearance	Solubility as per pharmacopia	Solubility in water g/l @ **25° *100°C
Magnesium-DL-Aspartate	7018-07-7	In-house	White to off-white crystalline powder	–	Freely soluble in water
Maltobionic Acid	534-42-9	In-house	White or almost white crystalline powder, soluble in water	–	Freely soluble
Manganese Ascorbate	16351-10-3	In-house	Light tan to tan powder	–	Insoluble
Manganese Citrate	10024-66-5	FCC	Light pink or pink-white, fine, granular solid	Slightly soluble in water	–
Manganese Gluconate (AH / DH)	6485-39-8	USP FCC	White or slightly pink powder	–	Soluble in water
Manganese Lactate	51877-53-3	In-house	Pink monoclinic crystals	–	Slightly soluble in water
Manganese Lactate Gluconate (EZ-Manganese)	51877-53-3 6485-39-8	In-house	Pinkish white or pink crystals or powder	–	Soluble
Manganese Lactobionate	598-62-9+ 96-82-2	In-house	White to off-white powder	NA	Soluble in water (10%), Freely soluble in boiling water (20%)
Manganese-L-Aspartate	–	In-house	Light brown powder	–	Freely soluble in water
Manganese Orotate	94333-38-7	In-house	Yellowish crystalline Powder.	Slightly soluble in water	Slightly soluble in water.
Mono Sodium Citrate	18996-35-5	DAC	White, odorless crystals powder	Freely soluble in water	–
Potassium Ascorbate	16039-53-5	In-house	Off-white to yellow powder	–	–
Potassium Citrate (MH)	866-84-2	USP	Transparent crystals or White powder	Freely soluble in water	Freely soluble in water
Potassium Gluconate (AH)	299-27-4	USP FCC	White to yellowish-white, crystalline powder or granules	Freely soluble in water	Freely soluble in water
Potassium Magnesium Citrate	137590-34-2	In-house	White crystalline or granular powder.	–	Soluble in water
Potassium-L-Aspartate	14007-45-5	In-house	White crystalline powder	–	Freely soluble in water
Sodium Glucoheptonate	13007-85-7	In-house	Yellowish crystalline powder	–	Freely soluble in water
Sodium Pidolate Liquid	28874-51-3	In-house	Slight yellow clear liquid	–	Freely soluble in water
Strontium Citrate	813-97-8	In-house	White to off-white granular powder	–	–
Zinc Acetate	5970-45-6	USP/EP	White crystals or granules	Freely soluble in water	–
Zinc Acetate Dihydrate	5970-45-6	USP	White crystals or granules	Freely soluble in water	Freely soluble in water
Zinc Amino Acid Chelate-20%	–	In-house	Off white-light yellow powder	–	–
Zinc Citrate (AH)	546-46-3	In-house specs	White crystalline powder	Insoluble	Insoluble
Zinc Gluconate (AH)	4468-02-4	USP FCC	White to practically white powder	Soluble in water	Freely soluble in water
Zinc Glycine Chelate	–	In-house	White to off-white, odorless crystalline powder	–	Soluble in water and insoluble in ethanol (95 %)
Zinc Gold	–	In-house	White to off-white granules.	–	Slightly soluble in water
Zinc L Aspartate	56-41-7	In-house	A white powder, odorless.	–	Freely soluble in water
Zinc Lactate Dihydrate	63179-81-7	In-house	White crystalline powder	–	Freely soluble water
Zinc Lactate Gluconate (EZ-Zinc)	–	In-house	White to off-white crystalline powder	–	Soluble in Water
Zinc Lactobionate	1314-13-2+ 96-82-2	In-house	White to off-white or slightly yellow tinged white crystalline or granular powder	NA	Soluble in water (10%), Freely soluble in boiling water (20%)
Zinc Malate	2847-05-4	In-house	A white powder, odorless.	–	Slightly soluble in water
Zinc Mono Methionine Aspartate	–	In-house	White to off-white crystalline powder	–	Freely soluble in water
Zinc Orotate (DH)	60388-02-5	DAC	White to almost white powder	Hardly soluble in water, practically insoluble in 96% ethanol and ether	Insoluble
Zinc Picolinate	17949-65-4	In-house	White crystalline free flowing powder	–	Partially soluble in water
Zinc Pidolate	15454-75-8	In-house	White crystalline or granular powder	–	Freely Soluble in water
Zinc Undecylenate	557-08-4	USP	Fine white powder	Practically insoluble in water & alcohol	Insoluble in water & alcohol

Mineral content in %	Assay in %	Ph in H <sub>2</sub> O ~ 5 - 10% soln	Lead / Arsenic Content	Micro (CFU/g) /BET (IU/g) less than	Bulk Density Kg / m <sup>3</sup>	Particle Size Distribution "Passing Through"
–	98 - 102	6 - 8	5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
–	min.95	1 - 3	5 ppm / 2ppm	<100 / NA	300 - 800	U.S 6 #:> 80.0% w/w
12.5 - 14.0	Ascorbic acid - NLT 70	3 - 6	5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
22.00 - 23.90	96.5 - 104.8		2ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
12.08 - 12.57 (AH)11.18 - 11.63 (DH)	98 - 102 (AH)	~ 6.5	2ppm / 3ppm	500 / NA	500 - 900	U.S 16 #:> 80% w/w
min. 23.10	Min.98	5.5 - 7.5	5 ppm / 2ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
–	98 - 102	–	5ppm / 3ppm	<1000 / NA	400 - 1200	U.S 30 #:> 80.0% w/w
Min. 5.8 (as is basis)	Min. 95 (dried basis)	4 - 8 (5%)	5ppm / 3ppm	1000 CFU / g	app. 500	U.S 40 #> 70%
14.00 - 15.40	–	–	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
13.42 - 13.96	98 - 102	–	5ppm / NA	<1000 / NA	–	U.S 40 #:> 90.0% w/w
–	98 - 102	3 - 4	3ppm / 1ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
14.80 - 16.40	95 - 105		10ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
35.79 - 36.33	99 - 100.5	8.5 - 9.5	3 ppm / 1ppm	1000 / NA	700 - 900	U.S 40 #:> 65% w/w
15.87 - 17.19	97 - 103	~ 7	1 ppm / 2 ppm	500 / NA	600 - 950	U.S 16 #:> 80% w/w
–	98 - 102	6 - 8	5ppm / 3ppm	<1000 / NA	Min. 700kg/m <sup>3</sup>	U.S 40 #:> 90.0% w/w
–	97 - 102	5 - 8	10ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
–	Min.96	8.5 - 9.5	5ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
–	Min.75	6.5 - 8.5	5ppm / 3ppm	<1000 / NA	Min. 1.3g/ml	U.S 40 #:> 90.0% w/w
28.00 - 32.00	–	–	5ppm / 3ppm	<1000 / NA	–	U.S 20 #:> 90.0% w/w
USP - 34.9 - 36.4; EP - 34.6 - 35.3	USP - 98 - 102; EP - 99 - 101	USP - 6 to 8; EP - 5.8 - 7	USP - Max. 20ppm / 3 ppm EP - Max. 10 ppm / 2 ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
29.20 - 30.40	98 - 102	6 - 8	20ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
20.00 - 25.00		5 - 8	5ppm / 3ppm	<3000 / NA	–	U.S 40 #:> 85.0% w/w
31.00 - 33.00	NA	5.5 - 7.5	5 ppm / 33ppm	1000 / NA	600 - 1000	U.S 40 #:> 95% w/w
13.92 - 14.64	97 - 102	5.5 - 7.5	10 ppm / 3ppm	500 / NA	350 - 700	U.S 80 #:> 90% w/w
27.00 - 29.50	95 - 105	8 – 9	3 ppm / 1ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
–	98 - 102	6 - 8	10ppm / 5ppm	<3000 / NA	Min 1200kg/m <sup>3</sup>	U.S 40 #:> 90.0% w/w
19.00 - 21.00	98 - 102	3.5 - 6	5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
23.20 - 24.50	NLT 99	5 - 8	5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
20.00 - 23.00		5 - 8	2 ppm / 2ppm	<1000 / NA	500 - 1300	U.S 60 #:> 80.0% w/w
Min. 7.6 (as is basis)	Min. 95 (as is basis)	4 - 8 (5%)	5 ppm / 3ppm	1000 CFU / g	app. 500	U.S 40 #> 70%
32.00 - 34.50			5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
19.50 - 21.50		3 - 5	5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
15.57 - 16.04	98 - 101	3 - 5	5 / 1ppm	1000 / NA	400 - 600	U.S 40 #:> 80% w/w
20.00 - 21.50	98 - 102	5 - 8	5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
19.92 - 20.74	–	5 - 8	5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w
14.83 - 15.44	98 - 102	–	5 ppm / 3ppm	<1000 / NA	–	U.S 40 #:> 90.0% w/w

Note: Values of particle size and bulk density are indicative only