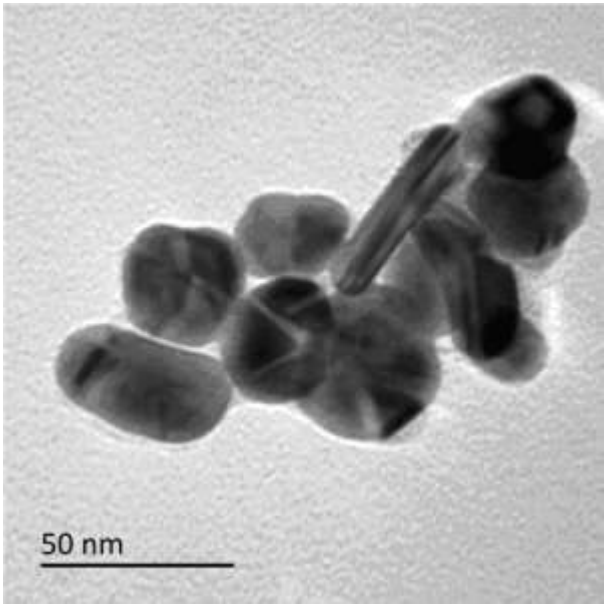
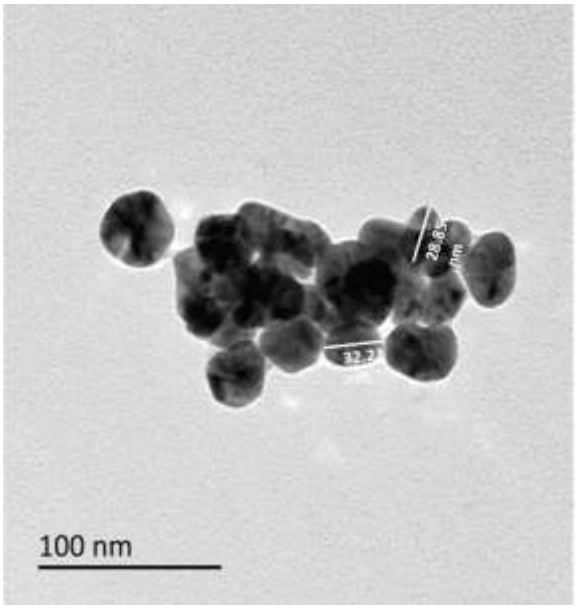
True Amber Colloidal Silver Testing and Analysis

In addition to the testing performed on every batch made, samples are also sent to an independent laboratory to ensure quality. Testing is undertaken at Bristol University research department using an Electron Microscope and other useful test equipment.

TEM Analysis

Transmission electron microscopy (TEM) – a beam of electrons is transmitted through an ultra-thin specimen, interacting as it passes through. An image is formed from the interaction. This image is magnified and focused onto an imaging device. These photos show the particles and we estimate the largest particle is around 40nm.





EU Cosmetic Regulation Testing EC 1223/2009 – Plymouth University

The product has been tested for compliance with the EU Cosmetic Regulations as a cosmetic ingredient. Because of the size of the colloidal particles, they have to be assessed using TEM analysis (see above) at a much higher magnification than previously.

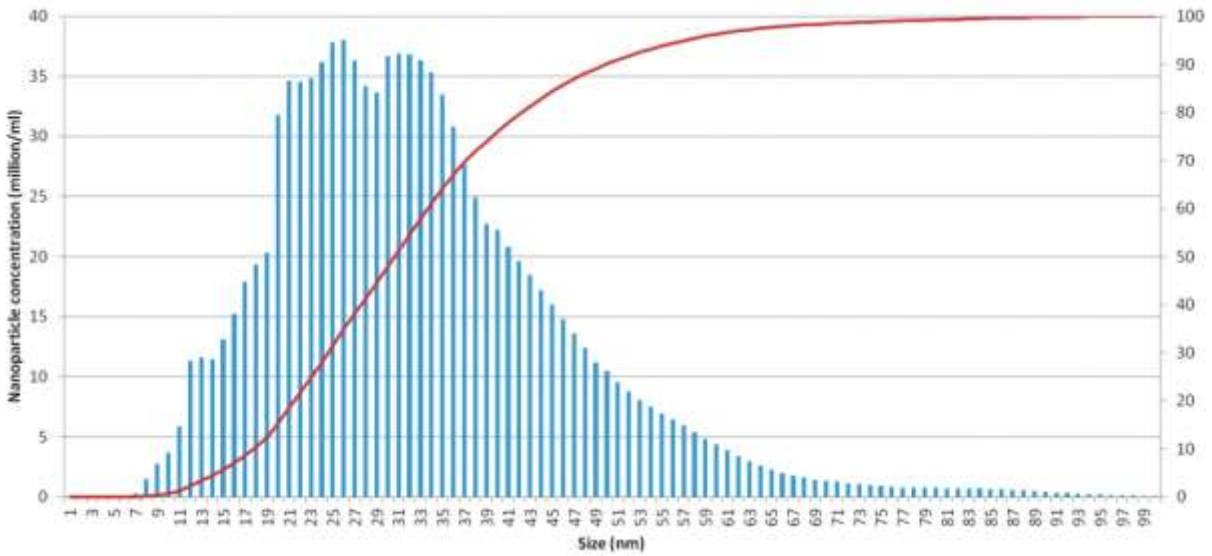
The two slides above show the sizes of the particles at different magnifications.

Because of this testing, this colloidal silver can be used as an ingredient for cosmetic formulations.

Table 3. Mean and median particle sizes (hydrodynamic diameter) determined by NTA.

	Replicate	Mean (nm)	SD	Mode (nm)	Median (nm)	Total particle concentration (particles x10^8/ml)
	1	36	18	32	32	11.60
Batch 1	*2*	34	14	32	32	11.91
	3	34	15	31	32	12.33
	4	34	13	32	32	12.20
	Mean	34.5				12.01
	1	33	13	26	30	10.96
Batch 2	*2*	34	14	30	31	11.53
	3	36	16	32	32	10.88
	4	35	16	30	32	11.34
	Mean	34.5				11.1775

Based on these direct measurements of hydrodynamic diameter, the volume-weighted median for particles of 32 nm diameter would be the particle number concentration (12×108 particles/ml) times the volume of a single particle (i.e., 4/3Pi r3); or approximately (200 nm3/ml). An example plot of the particle size distribution as hydrodynamic diameter is shown (Figure 2). Note the range of sizes with a few percent of particles as small as 10 nm and as large as around 90 nm for the largest aggregates measured in the samples.



Size distribution of colloidal silver determined using nanoparticle tracking analysis (Nanosight NTA 2.2). The concentration at each size category (nm) in shown as 106 particles/ml. Cumulative percentage undersize is shown in red (%).

Particle size distribution in the dispersions

“Nanoparticle tracking analysis was used to determine the size distribution of the particles in the bottle, using the same methodology as the previous batch that was analysed. Particles were detected in the bottle (Table 1), and the median size was around 29 nm (close to the 32 nm measured in the previous batch). The mean diameter (35 nm) was also close to the previous bottles (34.5 nm). The particle number concentration was 10-11 x 108 particles/ml; almost identical to the previous batch at 11-12 x 108 particles/ml. ***There appears to be very good reproducibility of the colloidal silver particle size and number concentrations between the bottles of the materials tested by Plymouth University.”***

World Anti-Doping Agency (WADA) Certification

This product has been screened by a WADA approved laboratory to ensure it is free from prohibited substances.

The Prohibited List (List) was first published in 1963 under the leadership of the International Olympic Committee. Since 2004, as mandated by the World Anti-Doping Code (Code), WADA is responsible for the preparation and publication of the List.

Date Issued: 27 November, 2015 **CERTIFICATE OF ANALYSIS: 104652**

LGC Supplement Screen

Consignment Number:	post
Delivery Date:	18 November, 2015
Date Analysis Commenced:	18 November, 2015
Purchase Order Number:	C15111214

Product:	Premium Heritage Colloidal Silver	**Pack Size:**	200ml
Flavour:		**Programme:**	Custom
Batch No:	C15111214	**Sample Type:**	Routine
Batch Expiry:		**LGC Reference:**	802777

The sample was analysed using documented LGC screening methods for the compounds specified within the Service Level Agreement: Nutritional Supplements V2.0.

GCMS:
None were found.

LCMS:
None were found.

Signed E Williams

Elizabeth Williams
Scientist

Test results apply to the portion of product taken.
* or isomers of - as specified within the Service Level Agreement.

R-2616

Samplers Comments:

Method Reference	Accreditation	Test	Test Description	Result	Units
M_ICP-OES	I	PHOSPHTO_2		<0.070	mg/l
M_ICPMS	I	ALUMINTO_2	Aluminium	0.021	mg/l
C_COLOUR	I	AMMONIA	Ammonia	<0.03	mg/l as N
M_ICPMS	I	ARSENITO_2	Arsenic	<1.000	ug/l
M_ICPMS	I	CADMIUTO_2	Cadmium	<1.50	ug/l
M_ICPMS	I	CALCIUTO_2	Calcium	0.37	mg/l
B_P-PLATE	I	CC2_37	Total Viable Count (2 Day at 37C)	0	number/ml
B_P-PLATE	I	CC3_22	Total Viable Count (3 Day at 22C)	0	number/ml
C_COLOUR	I	CHLORIDE	Chloride	<0.60	mg/l
C_COND	I	COND_20C	Conductivity	19	usie/cm
M_ICPMS	I	COPPERTO_2	Copper	<5.50	ug/l
B_COLILERT	I	ECOLI_CF	E. coli (Confirmed)	0	number/100ml
C_ISE	I	F	Fluoride	<0.02	mg/l
B_MEM-FILT	I	FSTREP	Enterococci (Species)	0	number/100ml
M_ICPMS	I	IRONDI_2	Iron (Dissolved)	<0.018	mg/l
M_ICPMS	I	IRONTO_2	Iron	<0.018	mg/l
M_ICPMS	I	LEADTO_2	Lead	<5.00	ug/l
M_ICPMS	I	MAGNESTO_2	Magnesium	<0.200	mg/l
M_ICPMS	I	MANGANTO_2	Manganese	<0.004	mg/l
C_COLOUR	I	NITRATE_N	Nitrate	1.220	mg/l as N
C_COLOUR	I	NITRITE_N	Nitrite	0.038	mg/l as N
C_PHY	I	ODOUR_DN	Odour (Quantitative)	0	Diln. No.
C_ISE	I	PH	pH	8.46	pH Units
M_ICPMS	I	POTASSTO_2	Potassium	<0.750	mg/l
M_ICPMS	I	SILVERTO_2	Silver	14000.00	ug/l
M_ICPMS	I	SODIUMTO_2	Sodium	<2.500	mg/l
C_GRAV	I	SS_105	Solids (Suspended at 105C)	1.0	mg/l
C_COLOUR	I	SULPHATE	Sulphate	0.84	mg/l
B_COLILERT	I	TCOLCF	Coliforms (Confirmed Total)	0	number/100ml
C_GRAV	N	TDS_180	Solids (Total Dissolved at 180C)	<0.00	mg/l
M_ICPMS	I	TOT_HARD	Hardness (Total)	0.97	mg/l as CaCO3
C_NEPH	I	TURBIDITY	Turbidity	1.12	FTU
M_ICPMS	I	ZINCTO_2	Zinc	10	ug/l

Independant Analysis – Eurofins Laboritories – 2011