

Certificate of Analysis

Product Number:	S010402	CAS Number:	7647-01-0
Product Description:	Hydrochloric acid, 30%	Molecular Weight:	36.46
Product Grade:	Instrument Quality	Molecular Formula:	HCI
Lot Number:	4120071	Density:	1.15 g/mL
Release Date:	10/23/2020 (mm/dd/yyyy)	Molarity:	9.4 moles/litre
Expiration Date:	10/23/2023 (mm/dd/yyyy)	Normality:	9.4 moles/litre

AnalyeSpecificationActual ValueAnalyteSpecificationActual ValueAsay (I/C)9.3% www30% wwwMagnasium (Mg)0.5 pph<0.5 pphGolau10.4PHA<7 APHAMagnases (Mn)0.1 ppb<0.1 pphBromide (Br)10 ppm<10 ppmMercury (Hg)0.1 ppb<0.1 pphFree Cholino (C)0.5 ppm<0.01 ppmMolydadmun (Mo)0.1 ppb<0.1 pphTotal Sulphur (S)0.3 ppm<0.01 ppmNickel (N)0.1 pph<0.1 pphTotal Sulphur (S)0.5 ppm<0.5 ppmNickel (N)0.1 pph<0.1 pphAumonium (Ms1)1 ppb<0.5 pphNickel (N)0.1 pph<0.5 pphAumonium (Ms1)1 ppb<0.5 pphPelatsium (Pin)1 pph<0.1 pphAuminon (Shi)0.1 pph<0.1 pph<0.1 pph<0.1 pphBarwin (Ba)0.1 pph<0.5 pphRivolum (Rh)0.1 pph<0.1 pphBarwin (Ba)0.1 pph<0.5 pphRivolum (Rh)0.1 pph<0.1 pphBarwin (Ba)0.1 pph<0.1 pph<0.1 pph<0.1 pph<0.1 pphBarwin (Ba)0.1 pph<0.1 pph<0.1 pph<0.1 pph<0.1 pphBarwin (Ba)0.1 pph<0.1 pph<0.1 pph<0.1 pph<0.1 pphBarwin	Analytical Data							
Colour10 APHA< 7 APHA	Analyte	Specification	Actual Value	Analyte	Specification	Actual Value		
Bromide (Br) 10 ppm < 10 ppm Mercury (Hg) 0.1 ppb < 0.2 ppb Free Chorine (Cb) 0.5 ppm < 0.5 ppm	Assay (HCl)	29 - 31% w/w	30% w/w	Magnesium (Mg)	0.5 ppb	< 0.5 ppb		
Free Chlorine (Cl2) $0.5 ppm$ $< 0.5 ppm$ Molydenum (Mo) $0.1 ppb$ $< 0.1 ppb$ Total Phosphorus (P) $0.1 ppm$ $< 0.01 ppm$ Neodymium (Na) $0.1 ppb$ $< 0.1 ppb$ Total Sulphur (S) $0.3 ppm$ $< 0.3 ppm$ Nokel (Ni) $0.5 ppb$ $< 0.1 ppb$ Aumonium (N41) $0.5 ppm$ $< 0.5 ppm$ Nickel (Ni) $0.5 ppb$ $< 0.1 ppb$ Aluminum (A) $1 ppb$ $< 0.5 ppb$ $< 0.1 ppb$ $< 0.5 ppb$ $< 0.1 ppb$ Aluminum (A) $0.5 ppb$ $< 0.1 ppb$ Peladium (Pd)Information Only $< 0.5 ppb$ Arsenic (As) $0.5 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Barium (Ba) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Beryllim (Ba) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Barium (Ba) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Barium (Ba) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadmium (Cd) $0.1 ppb$ $< 0.5 ppb$ Rubidium (Rh) $0.1 ppb$ $< 0.1 ppb$ Cadmium (Cd) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadmium (Ce) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadmium (Ce) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadmium (Ca) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 $	Colour	10 APHA	< 7 APHA	Manganese (Mn)	0.1 ppb	< 0.1 ppb		
Total Phosphorus (P) 0.01 ppm < 0.01 ppm Nedymium (Nd) 0.1 ppb < 0.1 ppb Total Suphur (S) 0.3 ppm < 0.3 ppm	Bromide (Br ⁻)	10 ppm	< 10 ppm	Mercury (Hg)	0.1 ppb	< 0.02 ppb		
Total Sulphur (S)0.3 ppm< 0.3 ppmNickel (N)0.5 ppb< 0.1 ppbAmmonium (NH4")0.5 ppm< 0.5 ppm	Free Chlorine (Cl ₂)	0.5 ppm	< 0.5 ppm	Molybdenum (Mo)	0.1 ppb	< 0.1 ppb		
Ammonium (NH4*) $0.5 ppm$ $< 0.5 ppm$ Niobium (Nb) $0.1 ppb$ $< 0.1 ppb$ Aluminum (A)1 ppb $< 0.5 ppb$ $< 0.5 ppb$ $< 0.1 ppb$ Palladium (Pd)Information Only $< 0.5 ppb$ Antimony (Sb) $0.5 ppb$ $< 0.1 ppb$ Barium (Ba) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Beryllium (Be) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Boron (B) $1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadmium (Cd) $0.1 ppb$ $< 0.5 ppb$ Rubidium (Rb) $0.1 ppb$ $< 0.1 ppb$ Cadmium (Cd) $0.1 ppb$ $< 0.5 ppb$ Rubidium (Rb) $0.1 ppb$ $< 0.1 ppb$ Cadmium (Cd) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadmium (Cd) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadmium (Ca) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadmium (Ca) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadium (Ca) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadium (Ca) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadium (Ca) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ Cadium (Ca) $0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$ $< 0.1 ppb$	Total Phosphorus (P)	0.01 ppm	< 0.01 ppm	Neodymium (Nd)	0.1 ppb	< 0.1 ppb		
Aluminum (A)1 ppb< 0.5 ppbPalladium (Pd)Information Only< 0.5 ppbAntimony (Sb)0.5 ppb< 0.1 ppb	Total Sulphur (S)	0.3 ppm	< 0.3 ppm	Nickel (Ni)	0.5 ppb	< 0.1 ppb		
Antimony (b) 0.5 ppb $< 0.1 \text{ ppb}$ Platinum (Pt)Information Only $< 0.5 \text{ ppb}$ Arsenic (As) 0.5 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ Barium (Ba) 0.1 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ Beryllium (Be) 0.1 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ Bismuth (Bi) 0.1 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ Boron (B) 1 ppb $< 0.5 \text{ ppb}$ Rubidium (Rb) 0.1 ppb $< 0.1 \text{ ppb}$ Cadinum (Cd) 0.1 ppb $< 0.5 \text{ ppb}$ Rubinum (Rb) 0.1 ppb $< 0.1 \text{ ppb}$ Cadinum (Cd) 0.1 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ Cadinum (Cd) 0.1 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ Cadinum (Ca) 0.1 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ Cadinum (Ca) 0.1 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ Cadinum (Cr) 0.5 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ Cadinum (Cr) 0.5 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ Cobard (Ca) 0.1 ppb $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.1 \text{ ppb}$ $< 0.$	Ammonium (NH4 ⁺)	0.5 ppm	< 0.5 ppm	Niobium (Nb)	0.1 ppb	< 0.1 ppb		
Arsenic (As)0.5 ppb< 0.1 ppbPotassium (K)1 ppb< 0.1 ppbBarium (Ba)0.1 ppb< 0.1 ppb	Aluminum (Al)	1 ppb	< 0.5 ppb	Palladium (Pd)	Information Only	< 0.5 ppb		
Barium (Ba)0.1 ppb< 0.1 ppb <td>Antimony (Sb)</td> <td>0.5 ppb</td> <td>< 0.1 ppb</td> <td>Platinum (Pt)</td> <td>Information Only</td> <td>< 0.5 ppb</td>	Antimony (Sb)	0.5 ppb	< 0.1 ppb	Platinum (Pt)	Information Only	< 0.5 ppb		
Beryllium (Be) 0.1 ppb < 0.1 ppb Rhenium (Re) 0.1 ppb < 0.1 ppb Bismuth (Bi) 0.1 ppb < 0.1 ppb	Arsenic (As)	0.5 ppb	< 0.1 ppb	Potassium (K)	1 ppb	< 0.1 ppb		
Bismuth (B) 0.1 ppb < 0.1 ppb < 0.1 ppb < 0.1 ppb < 0.1 ppb Boron (B) 1 ppb < 0.5 ppb	Barium (Ba)	0.1 ppb	< 0.1 ppb	Praseodymium (Pr)	0.1 ppb	< 0.1 ppb		
Boron (B)1 pb< 0.5 ppbRubidium (Rb)0.1 ppb< 0.1 ppbCadmium (Cd)0.1 ppb< 0.1 ppb	Beryllium (Be)	0.1 ppb	< 0.1 ppb	Rhenium (Re)	0.1 ppb	< 0.1 ppb		
Cadmium (Cd)0.1 ppb< 0.1 ppbRuthenium (Ru)0.1 ppb< 0.1 ppbCalcium (Ca)1 ppb< 0.5 ppb	Bismuth (Bi)	0.1 ppb	< 0.1 ppb	Rhodium (Rh)	0.1 ppb	< 0.1 ppb		
Calcium (Ca)1 ppb< 0.5 ppbSamarium (Sm)0.1 ppb< 0.1 ppbCerium (Ce)0.1 ppb< 0.1 ppb	Boron (B)	1 ppb	< 0.5 ppb	Rubidium (Rb)	0.1 ppb	< 0.1 ppb		
Cerium (Ce)0.1 ppb< 0.1 ppb	Cadmium (Cd)	0.1 ppb	< 0.1 ppb	Ruthenium (Ru)	0.1 ppb	< 0.1 ppb		
Cesium (Cs)0.1 ppb< 0.1 ppbSelenium (Sc)1 ppb< 0.1 ppbChromium (Cr)0.5 ppb< 0.1 ppb	Calcium (Ca)	1 ppb	< 0.5 ppb	Samarium (Sm)	0.1 ppb	< 0.1 ppb		
Chronium (Cr)0.5 ppb< 0.1 ppbSilver (Ag)1 ppb< 0.1 ppbCobalt (Co)0.1 ppb< 0.1 ppb	Cerium (Ce)	0.1 ppb	< 0.1 ppb	Scandium (Sc)	0.1 ppb	< 0.1 ppb		
Cobalt (Co.)0.1 ppb< 0.1 ppb< 0.1 ppbSodium (Na)1 ppb< 0.5 ppbCopper (Cu)0.5 ppb< 0.1 ppb	Cesium (Cs)	0.1 ppb	< 0.1 ppb	Selenium (Se)	1 ppb	< 0.1 ppb		
Copper (Cu)0.5 ppb< 0.1 ppbStrontium (Sr)0.1 ppb< 0.1 ppbDysprosium (Dy)0.1 ppb< 0.1 ppb	Chromium (Cr)	0.5 ppb	< 0.1 ppb	Silver (Ag)	1 ppb	< 0.1 ppb		
Dysprosium (Dy)0.1 ppb< 0.1 ppbTantalum (Ta)Information Only< 1 ppbErbium (Er)0.1 ppb< 0.1 ppb	Cobalt (Co)	0.1 ppb	< 0.1 ppb	Sodium (Na)	1 ppb	< 0.5 ppb		
Erbium (Er)0.1 ppb< 0.1 ppbTellurium (Te)0.1 ppb< 0.1 ppbEuropium (Eu)0.1 ppb< 0.1 ppb	Copper (Cu)	0.5 ppb	< 0.1 ppb	Strontium (Sr)	0.1 ppb	< 0.1 ppb		
Europium (Eu) 0.1 ppb < 0.1 ppb	Dysprosium (Dy)	0.1 ppb	< 0.1 ppb	Tantalum (Ta)	Information Only	< 1 ppb		
Gadolinium (Gd) 0.1 ppb < 0.1 ppb Thallium (TI) 0.1 ppb < 0.1 ppb Gallium (Ga) 0.1 ppb < 0.1 ppb Thorium (Th) 0.1 ppb < 0.1 ppb Germanium (Ge) 1 ppb < 1 ppb < 1 ppb Thulium (Tm) 0.1 ppb < 0.1 ppb Gold (Au) 0.5 ppb < 0.1 ppb Hafnium (Hf) 0.1 ppb < 0.1 ppb Holmium (Ho) 0.1 ppb < 0.1 ppb Indium (In) 0.1 ppb < 0.1 ppb <td>Erbium (Er)</td> <td>0.1 ppb</td> <td>< 0.1 ppb</td> <td>Tellurium (Te)</td> <td>0.1 ppb</td> <td>< 0.1 ppb</td>	Erbium (Er)	0.1 ppb	< 0.1 ppb	Tellurium (Te)	0.1 ppb	< 0.1 ppb		
Gallium (Ga) 0.1 ppb < 0.1 ppb Thorium (Th) 0.1 ppb < 0.1 ppb Germanium (Ge) 1 ppb < 1 ppb	Europium (Eu)	0.1 ppb	< 0.1 ppb	Terbium (Tb)	0.1 ppb	< 0.1 ppb		
Germanium (Ge) 1 ppb < 1 ppb Thulium (Tm) 0.1 ppb < 0.1 ppb Gold (Au) 0.5 ppb < 0.1 ppb	Gadolinium (Gd)	0.1 ppb	< 0.1 ppb	Thallium (TI)	0.1 ppb	< 0.1 ppb		
Gold (Au) 0.5 ppb < 0.1 ppb Tin (Sn) 0.5 ppb < 0.1 ppb Hafnium (Hf) 0.1 ppb < 0.1 ppb	Gallium (Ga)	0.1 ppb	< 0.1 ppb	Thorium (Th)	0.1 ppb	< 0.1 ppb		
Hafnium (Hf) 0.1 ppb < 0.1 ppb Titanium (Ti) 0.5 ppb < 0.1 ppb Holmium (Ho) 0.1 ppb < 0.1 ppb	Germanium (Ge)	1 ppb	< 1 ppb	Thulium (Tm)	0.1 ppb	< 0.1 ppb		
Holmium (Ho) 0.1 ppb < 0.1 ppb Tungsten (W) 0.1 ppb < 0.1 ppb Indium (In) 0.1 ppb < 0.1 ppb	Gold (Au)	0.5 ppb	< 0.1 ppb	Tin (Sn)	0.5 ppb	< 0.1 ppb		
Indium (In) 0.1 ppb < 0.1 ppb Uranium (U) 0.1 ppb < 0.1 ppb Iron (Fe) 1 ppb < 0.5 ppb	Hafnium (Hf)	0.1 ppb	< 0.1 ppb	Titanium (Ti)	0.5 ppb	< 0.1 ppb		
Iron (Fe) 1 ppb < 0.5 ppb Vanadium (V) 0.5 ppb < 0.1 ppb	Holmium (Ho)	0.1 ppb	< 0.1 ppb	Tungsten (W)	0.1 ppb	< 0.1 ppb		
	Indium (In)	0.1 ppb	< 0.1 ppb	Uranium (U)	0.1 ppb	< 0.1 ppb		
Lanthanum (La) 0.1 ppb < 0.1 ppb Ytterbium (Yb) 0.1 ppb < 0.1 ppb	Iron (Fe)	1 ppb	< 0.5 ppb	Vanadium (V)	0.5 ppb	< 0.1 ppb		
	Lanthanum (La)	0.1 ppb	< 0.1 ppb	Ytterbium (Yb)	0.1 ppb	< 0.1 ppb		
Lead (Pb) 0.1 ppb < 0.1 ppb Yttrium (Y) 0.1 ppb < 0.1 ppb	Lead (Pb)	0.1 ppb	< 0.1 ppb	Yttrium (Y)	0.1 ppb	< 0.1 ppb		
Lithium (Li) 0.1 ppb < 0.1 ppb Zinc (Zn) 1 ppb < 0.5 ppb	Lithium (Li)	0.1 ppb	< 0.1 ppb	Zinc (Zn)	1 ppb	< 0.5 ppb		
Lutetium (Lu) 0.1 ppb < 0.1 ppb Zirconium (Zr) 0.1 ppb < 0.1 ppb	Lutetium (Lu)	0.1 ppb	< 0.1 ppb	Zirconium (Zr)	0.1 ppb	< 0.1 ppb		

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Greg Henson QA & RA Manager

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Terms and Conditions of Use

Safety Guidelines:

PRIOR to opening or storing this product be sure to consult the Safety Data Sheet (SDS) to ensure safe storage and handling with regards to this hazardous material. This information must be read and understood prior to use or storage.

SAFETY HANDLING NOTES: Consult the SDS PRIOR to handling this product. Use proper safety apparel according to the recommendations of the SDS. Exposure controls and personal protection should include: a properly functioning fume hood, protection for eyes (safety glasses), hands (chemically compatible gloves), feet (chemically compatible boots), and exposed skin (splash protection and a chemically compatible apron). All of these items must conform to local/regional/national regulatory requirements.

SEASTAR[™]'s Product Integrity Guidelines:

We have found our products, unopened and sealed, maintain the certified integrity, or product quality, for their stated certification period under the following conditions:

- Store at room temperature, maximum range 15°C (59°F) to 25°C (77°F).
- Avoid exposure to sunlight or ultraviolet light sources.
- Open in a 'particle free' environment. SEASTAR recommends a HEPA or ULPA particle filtered trace metal clean room. Open product should be handled under Class 100 or ISO 5 clean room or better conditions.

Once opened, product integrity will depend on proper handling and exposure to contaminants. To reduce trace metal contamination, the inner pack of plastic bags and bottle should be opened under Class 100 or ISO 5 clean room or better conditions to maintain the integrity of the product. The use of plastic gloves, hair net and a clean room suit is also advised.

For SEASTAR™'s Product Expiration Policy and Product Permeation FAQ, please see our website.

Notes:

Reported density, molarity and normality values reflect published literature and are characteristic of the product's assay range. If you require an accurate density, molarity, or normality for the product that you have purchased, you will have to perform the measurement. Bottles within a given lot have small assay variations.

Definitions:

- Actual value: the measured value in a particular lot analysis.
- Analyte: the substance being measured.
- Specification: the maximum certified value of an analyte, unless otherwise specified.
 - **Unit(s): ppm** part per million or μg (microgram) of analyte per gram of solution. **ppb** – part per billion or ng (nanogram) of analyte per gram of solution. **ppt** – part per trillion or pg (picogram) of analyte per gram of solution.

Greg Henson QA & RA Manager