

## Certificate of Analysis

<b>Product</b>	Hydrochloric Acid 37%	<b>Batch No.</b>	: 21 06 0174
<b>Grade</b>	VLSI	<b>Manufacturing date</b>	: 21/06/2021
<b>Code No.</b>	VL1107C	<b>Best before</b>	: 06/2025

Items	Descriptions	Specifications	Test Results
1	Assay (by acidimetry)	36.5 - 38.0%	37.7% (w/w)
2	Appearance	Passes test	Passes test
3	Color (APHA)	10 max.	< 10
4	Residue after Ignition	2 ppm max.	< 2 ppm
5	Ammonium (NH <sub>4</sub> )	1 ppm max.	< 1 ppm
6	Free Chlorine (Cl)	0.5 ppm max.	< 0.5 ppm
7	Bromide (Br)	10 ppm max.	< 10 ppm
8	Phosphate (PO <sub>4</sub> )	0.05 ppm max.	< 0.05 ppm
9	Sulfate (SO <sub>4</sub> )	0.5 ppm max.	< 0.5 ppm
10	Sulfite (SO <sub>3</sub> )	0.5 ppm max.	< 0.5 ppm
11	Aluminium (Al)	20 ppb max.	< 20 ppb
12	Antimony (Sb)	1 ppb max.	< 1 ppb
13	Arsenic (As)	1 ppb max.	< 1 ppb
14	Barium (Ba)	5 ppb max.	< 5 ppb
15	Beryllium (Be)	1 ppb max.	< 1 ppb
16	Bismuth (Bi)	5 ppb max.	< 5 ppb
17	Boron (B)	10 ppb max.	< 10 ppb
18	Cadmium (Cd)	1 ppb max.	< 1 ppb
19	Calcium (Ca)	50 ppb max.	< 50 ppb
20	Chromium (Cr)	1 ppb max.	< 1 ppb
21	Cobalt (Co)	1 ppb max.	< 1 ppb
22	Copper (Cu)	1 ppb max.	< 1 ppb
23	Gallium (Ga)	1 ppb max.	< 1 ppb
24	Gold (Au)	1 ppb max.	< 1 ppb
25	Indium (In)	1 ppb max.	< 1 ppb
26	Iron (Fe)	50 ppb max.	< 50 ppb
27	Lead (Pb)	5 ppb max.	< 5 ppb
28	Lithium (Li)	1 ppb max.	< 1 ppb
29	Magnesium (Mg)	20 ppb max.	< 20 ppb
30	Manganese (Mn)	5 ppb max.	< 5 ppb
31	Molybdenum (Mo)	1 ppb max.	< 1 ppb
32	Nickel (Ni)	1 ppb max.	< 1 ppb
33	Platinum (Pt)	1 ppb max.	< 1 ppb
34	Potassium (K)	20 ppb max.	< 20 ppb
35	Silver (Ag)	5 ppb max.	< 5 ppb
36	Sodium (Na)	50 ppb max.	< 50 ppb

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Items	Descriptions	Specifications	Test Results	Test Results
37	Strontium (Sr)	1 ppb max.	< 1	ppb
38	Thallium (Tl)	1 ppb max.	< 1	ppb
39	Tin (Sn)	5 ppb max.	< 5	ppb
40	Titanium (Ti)	10 ppb max.	< 10	ppb
41	Vanadium (V)	10 ppb max.	< 10	ppb
42	Zinc (Zn)	20 ppb max.	< 20	ppb
43	Zirconium (Zr)	1 ppb max.	< 1	ppb
44	Particle/ml :			
	0.5 µm and greater	250 max.	60	
	1.0 µm and greater	10 max.	4	

This is to certify the above batch has been tested and complies with this specification.

Ladaphan  
Chemist

Achan  
Technical Manager