



# NITRIC ACID

PRODUCT NUMBER: S010101

LOT NUMBER: 1115060

RELEASE DATE: July, 2015

EXPIRY DATE: July, 2017

## CERTIFICATE OF ANALYSIS

| Tests                           | Maximum Specification | Actual Value          | Units             | <u>HNO<sub>3</sub> (67 - 69%): Properties</u> |                       |
|---------------------------------|-----------------------|-----------------------|-------------------|-----------------------------------------------|-----------------------|
| Assay (HNO <sub>3</sub> , w/w): | 67 - 69%              | 69%                   | % by w/w          | Molar Mass:                                   | 63.01g/mol            |
| Colour (APHA):                  | 10                    | < 7                   | APHA              | Density:                                      | 1.41 g/ml             |
|                                 |                       |                       |                   | Molarity:                                     | 16 moles/litre        |
|                                 |                       |                       |                   | Normality:                                    | 16 moles/litre        |
| Analyte                         | Maximum Specification | Actual Value (in ppb) | Analyte           | Maximum Specification                         | Actual Value (in ppb) |
| Aluminum (Al)                   | 1 ppb                 | < 0.5                 | Neodymium (Nd)    | 0.1 ppb                                       | < 0.1                 |
| Antimony (Sb)                   | 0.5 ppb               | < 0.1                 | Nickel (Ni)       | 0.5 ppb                                       | < 0.5                 |
| Arsenic (As)                    | 0.5 ppb               | < 0.1                 | Niobium (Nb)      | 0.1 ppb                                       | < 0.1                 |
| Barium (Ba)                     | 0.1 ppb               | < 0.1                 | Palladium (Pd)    | 0.5 ppb                                       | < 0.1                 |
| Beryllium (Be)                  | 0.1 ppb               | < 0.1                 | Platinum (Pt)     | 0.5 ppb                                       | < 0.1                 |
| Bismuth (Bi)                    | 0.1 ppb               | < 0.1                 | Potassium (K)     | 1 ppb                                         | < 0.2                 |
| Boron (B)                       | 1 ppb                 | < 0.5                 | Praseodymium (Pr) | 0.1 ppb                                       | < 0.1                 |
| Cadmium (Cd)                    | 0.5 ppb               | < 0.1                 | Rhenium (Re)      | 0.1 ppb                                       | < 0.1                 |
| Calcium (Ca)                    | 1 ppb                 | < 0.5                 | Rhodium (Rh)      | 0.5 ppb                                       | < 0.1                 |
| Cerium (Ce)                     | 0.1 ppb               | < 0.1                 | Rubidium (Rb)     | 0.1 ppb                                       | < 0.1                 |
| Cesium (Cs)                     | 0.1 ppb               | < 0.1                 | Ruthenium (Ru)    | 0.5 ppb                                       | < 0.1                 |
| Chromium (Cr)                   | 1 ppb                 | < 0.5                 | Samarium (Sm)     | 0.1 ppb                                       | < 0.1                 |
| Cobalt (Co)                     | 0.5 ppb               | < 0.1                 | Scandium (Sc)     | 0.1 ppb                                       | < 0.1                 |
| Copper (Cu)                     | 0.5 ppb               | < 0.2                 | Selenium (Se)     | 1 ppb                                         | < 0.1                 |
| Dysprosium (Dy)                 | 0.1 ppb               | < 0.1                 | Silver (Ag)       | 0.1 ppb                                       | < 0.1                 |
| Erbium (Er)                     | 0.1 ppb               | < 0.1                 | Sodium (Na)       | 1 ppb                                         | < 0.3                 |
| Europium (Eu)                   | 0.1 ppb               | < 0.1                 | Strontium (Sr)    | 0.1 ppb                                       | < 0.1                 |
| Gadolinium (Gd)                 | 0.1 ppb               | < 0.1                 | Tantalum (Ta)     | Information Only                              | < 0.1                 |
| Gallium (Ga)                    | 0.1 ppb               | < 0.1                 | Tellurium (Te)    | 0.1 ppb                                       | < 0.1                 |
| Germanium (Ge)                  | 0.1 ppb               | < 0.1                 | Terbium (Tb)      | 0.1 ppb                                       | < 0.1                 |
| Gold (Au)                       | 0.1 ppb               | < 0.1                 | Thallium (Tl)     | 0.1 ppb                                       | < 0.1                 |
| Hafnium (Hf)                    | 0.1 ppb               | < 0.1                 | Thorium (Th)      | 0.1 ppb                                       | < 0.1                 |
| Holmium (Ho)                    | 0.1 ppb               | < 0.1                 | Thulium (Tm)      | 0.1 ppb                                       | < 0.1                 |
| Indium (In)                     | 0.1 ppb               | < 0.1                 | Tin (Sn)          | 0.5 ppb                                       | < 0.1                 |
| Iron (Fe)                       | 1 ppb                 | < 0.5                 | Titanium (Ti)     | 0.5 ppb                                       | < 0.1                 |
| Lanthanum (La)                  | 0.1 ppb               | < 0.1                 | Tungsten (W)      | 0.1 ppb                                       | < 0.1                 |
| Lead (Pb)                       | 0.1 ppb               | < 0.1                 | Uranium (U)       | 0.1 ppb                                       | < 0.1                 |
| Lithium (Li)                    | 0.1 ppb               | < 0.1                 | Vanadium (V)      | 0.5 ppb                                       | < 0.1                 |
| Lutetium (Lu)                   | 0.1 ppb               | < 0.1                 | Ytterbium (Yb)    | 0.1 ppb                                       | < 0.1                 |
| Magnesium (Mg)                  | 1 ppb                 | < 0.2                 | Yttrium (Y)       | 0.1 ppb                                       | < 0.1                 |
| Manganese (Mn)                  | 0.1 ppb               | < 0.1                 | Zinc (Zn)         | 0.5 ppb                                       | < 0.2                 |
| Mercury (Hg)                    | 0.1 ppb               | < 0.02                | Zirconium (Zr)    | 0.1 ppb                                       | < 0.1                 |
| Molybdenum (Mo)                 | 0.1 ppb               | < 0.1                 |                   |                                               |                       |
| Analyte                         | Maximum Specification | Actual Value (in ppm) | Analyte           | Maximum Specification                         | Actual Value (in ppm) |
| Chloride (Cl <sup>-</sup> )     | 0.2 ppm               | < 0.2                 | Total Sulphur (S) | 0.3 ppm                                       | < 0.3                 |
| Total Phosphorus (P)            | 0.01 ppm              | < 0.01                |                   |                                               |                       |

  
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