

Certificate of Analysis

1 Reagent Lane
 Fair Lawn, NJ 07410
 201.796.7100 tel
 201.796.1329 fax

Thermo Fisher Scientific's Quality System has been found to conform to Quality Management System
 Standard ISO9001:2015 by SAI Global Certificate Number CERT – 0120632

This is to certify that units of the lot number below were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Thermo Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Products are for research use or further manufacturing. Not for direct administration to humans or animals. It is the responsibility of the final formulator and end user to determine suitability based upon the intended use of the end product. Products are tested to meet the analytical requirements of the noted grade. The following information is the actual analytical results obtained.

| | | | |
|-------------------|---|-----------------------------|------------|
| Catalog Number | A509 | Quality Test / Release Date | 03/31/2022 |
| Lot Number | 22090110 | Expiration Date | Mar/2024 |
| Description | NITRIC ACID (TRACE METAL GRADE) | | |
| Country of Origin | United States | | |
| Chemical Origin | Inorganic | | |
| BSE/TSE Comment | No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product. | | |

| N/A | | | |
|-----------------|-------|---------------------------|-------------------------|
| Result Name | Units | Specifications | Test Value |
| APPEARANCE | | REPORT | Clear, colorless liquid |
| ALUMINUM | ppb | <= 1 | <1 |
| ANTIMONY (Sb) | ppb | <= 0.5 | <0.5 |
| ARSENIC (As) | ppb | <= 0.5 | <0.5 |
| ASSAY | % | Inclusive Between 67 - 70 | 69.0 |
| BARIUM (Ba) | ppb | <= 0.1 | <0.1 |
| BERYLLIUM (Be) | ppb | <= 0.1 | <0.1 |
| BISMUTH (Bi) | ppb | <= 0.1 | <0.1 |
| BORON (B) | ppb | <= 1 | <1 |
| CADMIUM (Cd) | ppb | <= 0.5 | <0.5 |
| CALCIUM (Ca) | ppb | <= 1 | <1 |
| CERIUM (Ce) | ppb | <= 0.1 | <0.1 |
| CESIUM (Cs) | ppb | <= 0.1 | <0.1 |
| CHLORIDE | ppm | <= 0.2 | <0.2 |
| CHROMIUM (Cr) | ppb | <= 1 | <1 |
| COBALT (Co) | ppb | <= 0.5 | <0.5 |
| COLOR | APHA | <= 10 | <10 |
| COPPER (Cu) | ppb | <= 0.5 | <0.5 |
| DYSPROSIUM (Dy) | ppb | <= 0.1 | <0.1 |
| ERBIUM (Er) | ppb | <= 0.1 | <0.1 |
| EUROPIUM (Eu) | ppb | <= 0.1 | <0.1 |
| GADOLINIUM (Gd) | ppb | <= 0.1 | <0.1 |
| GALLIUM (Ga) | ppb | <= 0.1 | <0.1 |
| GERMANIUM (Ge) | ppb | <= 0.1 | <0.1 |
| GOLD (Au) | ppb | <= 0.1 | <0.1 |

Note: The data listed is valid for all package sizes of this lot of this product, expressed as an extension of this catalog number listed above.
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| | | | |
|----------------------|-----|---------------------|-------|
| HAFNIUM (Hf) | ppb | <= 0.1 | <0.1 |
| HOLMIUM (Ho) | ppb | <= 0.1 | <0.1 |
| INDIUM (In) | ppb | <= 0.1 | <0.1 |
| IRON (Fe) | ppb | <= 1 | <1 |
| LANTHANUM (La) | ppb | <= 0.1 | <0.1 |
| LEAD (Pb) | ppb | <= 0.1 | <0.1 |
| LITHIUM (Li) | ppb | <= 0.1 | <0.1 |
| LUTETIUM (Lu) | ppb | <= 0.1 | <0.1 |
| MAGNESIUM (Mg) | ppb | <= 1 | <1 |
| MANGANESE (Mn) | ppb | <= 0.1 | <0.1 |
| MERCURY (Hg) | ppb | <= 0.1 | <0.1 |
| MOLYBDENUM (Mo) | ppb | <= 0.1 | <0.1 |
| NEODYMIUM (Nd) | ppb | <= 0.1 | <0.1 |
| NICKEL (Ni) | ppb | <= 0.5 | <0.5 |
| NIOBIUM (Nb) | ppb | <= 0.1 | <0.1 |
| PALLADIUM (Pd) | ppb | <= 0.5 | <0.5 |
| PLATINUM (Pt) | ppb | <= 0.5 | <0.5 |
| POTASSIUM (K) | ppb | <= 1 | <1 |
| PRASEODYMIUM (Pr) | ppb | <= 0.1 | <0.1 |
| RHENIUM (Re) | ppb | <= 0.1 | <0.1 |
| RHODIUM (Rh) | ppb | <= 0.5 | <0.5 |
| RUBIDIUM (Rb) | ppb | <= 0.1 | <0.1 |
| RUTHENIUM (Ru) | ppb | <= 0.5 | <0.5 |
| SAMARIUM (Sm) | ppb | <= 0.1 | <0.1 |
| SCANDIUM (Sc) | ppb | <= 0.1 | <0.1 |
| SELENIUM (Se) | ppb | <= 1 | <1 |
| SILVER (Ag) | ppb | <= 0.1 | <0.1 |
| SODIUM (Na) | ppb | <= 1 | <1 |
| STRONTIUM (Sr) | ppb | <= 0.1 | <0.1 |
| TANTALUM (Ta) | ppb | IN INFORMATION ONLY | <1 |
| TELLURIUM (Te) | ppb | <= 0.1 | <0.1 |
| TERBIUM (Tb) | ppb | <= 0.1 | <0.1 |
| THALLIUM (Tl) | ppb | <= 0.1 | <0.1 |
| THORIUM (Th) | ppb | <= 0.1 | <0.1 |
| THULIUM (Tm) | ppb | <= 0.1 | <0.1 |
| TIN (Sn) | ppb | <= 0.5 | <0.5 |
| TITANIUM (Ti) | ppb | <= 0.5 | <0.5 |
| TOTAL PHOSPHORUS (P) | ppm | <= 0.01 | <0.01 |
| TOTAL SULFUR | ppm | <= 0.3 | <0.3 |
| TUNGSTEN (W) | ppb | <= 0.1 | <0.1 |

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|----------------|-----|--------|------|
| URANIUM (U) | ppb | <= 0.1 | <0.1 |
| VANADIUM (V) | ppb | <= 0.5 | <0.5 |
| YTTERBIUM (Yb) | ppb | <= 0.1 | <0.1 |
| YTTRIUM (Y) | ppb | <= 0.1 | <0.1 |
| ZINC (Zn) | ppb | <= 0.5 | <0.5 |
| ZIRCONIUM (Zr) | ppb | <= 0.1 | <0.1 |



Julian Burton - Quality Control Manager - Bridgewater

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