

## 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	03/21/2022
Lot Number	22050043	Expiration Date	Jan/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	68.0
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

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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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