

## CERTIFICATE OF ANALYSIS

Thermo Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2015 by Intertek Global  
Certificate Number: CERT-0120633

Catalogue Number	A512
Lot Number	24029616
Description	AMMONIUM HYDROXIDE, TRACE METAL GRADE
CAS Number	1336-21-6,7732-18-5
Quality Test/Release Date	22/May/2026
Suggested retest date	21/May/2031
Country of Origin	United States
Declaration of Origin	Synthetic
BSE/TSE	This material is produced using a synthetic process and the production equipment does not come into contact with anything of animal origin. Therefore, there is no potential for BSE or TSE to be present in the product.

Result Name	Units	Specifications	Test Value
APPEARANCE		REPORT	Clear, colorless liquid
ALUMINUM	ppb	<= 1	<1.00
ANTIMONY (Sb)	ppb	<= 0.5	<0.50
ARSENIC (As)	ppb	<= 1	<0.10
ASSAY	%	Inclusive Between 20 - 22	21
BARIUM (Ba)	ppb	<= 0.1	<0.10
BERYLLIUM (Be)	ppb	<= 0.1	<0.10
BISMUTH (Bi)	ppb	<= 0.1	<0.10
CADMIUM (Cd)	ppb	<= 0.5	<0.50
CALCIUM (Ca)	ppb	<= 1	<1.00
CERIUM (Ce)	ppb	<= 0.1	<0.10
CESIUM (Cs)	ppb	<= 0.1	<0.10
CHLORIDE	ppm	<= 0.5	<0.200
CHROMIUM (Cr)	ppb	<= 0.5	<0.50
COBALT (Co)	ppb	<= 0.5	<0.50
COLOR	APHA	<= 10	<10
COPPER (Cu)	ppb	<= 0.5	<0.50
DYSPROSIUM (Dy)	ppb	<= 0.1	<0.10
ERBIUM (Er)	ppb	<= 0.1	<0.10
EUROPIUM (Eu)	ppb	<= 0.1	<0.10
GADOLINIUM (Gd)	ppb	<= 0.1	<0.10
GALLIUM (Ga)	ppb	<= 0.1	<0.10
GERMANIUM (Ge)	ppb	<= 0.1	<0.10
GOLD (Au)	ppb	<= 0.5	<0.50
HAFNIUM (Hf)	ppb		<0.1
HOLMIUM (Ho)	ppb	<= 0.1	<0.10
INDIUM (In)	ppb	<= 0.1	<0.10
IRON (Fe)	ppb	<= 1	<1.00
LANTHANUM (La)	ppb	<= 0.1	<0.10
LEAD (Pb)	ppb	<= 0.1	<0.10

Note: The data listed is valid for all package sizes of this lot of this product, expressed as an extension of the catalogue number listed above.

LITHIUM (Li)	ppb	<= 0.1	<0.10
LUTETIUM (Lu)	ppb	<= 0.1	<0.10
MAGNESIUM (Mg)	ppb	<= 1	<1.00
MANGANESE (Mn)	ppb	<= 0.5	<0.50
MERCURY (Hg)	ppb	<= 0.2	<0.20
MOLYBDENUM (Mo)	ppb	<= 0.5	<0.50
NEODYMIUM (Nd)	ppb	<= 0.1	<0.10
NICKEL (Ni)	ppb	<= 0.5	<0.50
NIOBIUM (Nb)	ppb	<= 0.1	<0.10
PALLADIUM (Pd)	ppb		<1
PHOSPHOROUS (P)	ppm	<= 0.01	<0.010
PLATINUM (Pt)	ppb		<1
POTASSIUM (K)	ppb	<= 1	<1.00
PRASEODYMIUM (Pr)	ppb	<= 0.1	<0.10
RHENIUM (Re)	ppb	<= 0.1	<1
RHODIUM (Rh)	ppb	<= 0.5	<0.50
RUBIDIUM (Rb)	ppb	<= 0.1	<0.10
RUTHENIUM (Ru)	ppb		<1
SAMARIUM (Sm)	ppb	<= 0.1	<0.10
SCANDIUM (Sc)	ppb	<= 0.1	<0.10
SELENIUM (Se)	ppb	<= 1	<1.00
SILVER (Ag)	ppb	<= 0.5	<0.10
SODIUM (Na)	ppb	<= 1	<1.00
STRONTIUM (Sr)	ppb	<= 0.1	<0.10
TELLURIUM (Te)	ppb	<= 0.1	<0.10
TERBIUM (Tb)	ppb	<= 0.1	<0.10
THALLIUM (Tl)	ppb	<= 0.1	<0.10
THORIUM (Th)		<= 0.1	<0.10
THULIUM (Tm)	ppb	<= 0.1	<0.10
TIN (Sn)	ppb	<= 0.5	<0.50
TITANIUM (Ti)	ppb	<= 0.5	<0.50
TOTAL SULFUR	ppm	<= 1	<1.000
TUNGSTEN (W)	ppb	<= 0.1	<0.10
URANIUM (U)	ppb	<= 0.1	<0.10
VANADIUM (V)	ppb	<= 0.5	<0.50
YTTERBIUM (Yb)	ppb	<= 0.1	<0.10
YTTRIUM (Y)	ppb	<= 0.1	<0.10
ZINC (Zn)	ppb	<= 0.5	<0.50
ZIRCONIUM (Zr)	ppb	<= 0.1	<0.10

Ash Frey  
Supervisor, Quality Control

Products are processed under ISO 9001:2015 quality management systems and samples are tested for conformance to the noted specifications. Certain data may have been supplied by third parties. We disclaim the implied warranties of merchantability and fitness for a particular purpose, and the accuracy of third-party data or information associated with the product. Products are for research use or further manufacturing. Products are not for direct administration to humans or animals. It is the responsibility of the final formulator or end user to determine suitability, and to qualify and/or validate each product for its intended use.

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