

**TANNER INDUSTRIES, INC.**  
**Product Specification - Trace Element Analysis**

**Facility:** Swansea, SC  
**Product:** 29.0% Aqua Ammonia (Ammonium Hydroxide)  
**Grade:** Reagent ( Blended with Deionized water.)  
**Production Assay :** 29.4 % to 30.0 % Ammonia

Description: Aqua Ammonia is a water solution of ammonia with production assay by weight of ammonia in water. The material is made using water from either the public mains or facility wells. The water is then softened if necessary for technical grade or deionized for reagent grade. The water supplies contain trace elements. A typical analysis of the trace elements for this grade of material follows:

			METHOD:
Iron	< 0.000002%	< 0.020 ppm	SW846 6010 B
Heavy Metals (as Pb)	< 0.000001%	< 0.010 ppm	SW846 6010 B
Chloride	0.000027%	0.27 ppm	EPA 300.0
Carbon Dioxide (CO <sub>2</sub> )	< 0.002%	< 20 ppm	ACS
Sulfur	< 0.000030%	< 0.30 ppm	SW846 6010 B
Sulfate	< 0.000090%	< 0.90 ppm	(Calculated)
Arsenic	< 0.000003%	< 0.025 ppm	SW846 6010 B
Zinc	< 0.000001%	< 0.005 ppm	SW846 6010 B
Chromium	< 0.000001%	< 0.010 ppm	SW846 6010 B
Phosphates	< 0.000200%	< 2 ppm	ACS
Nitrate as N	< 0.000011%	< 0.1 ppm	EPA 300.0
Sodium	< 0.000055%	< 0.550 ppm	SW846 6010 B
Non-Volatile Residue	0.001800%	18 ppm	ACS
Residue After Ignition	< 0.000500%	< 5 ppm	ACS
Substances Reducing Permanganate	Passes Codex Test		ACS
Color (APHA)	5		EPA 110.2
Turbidity Units (NTU)	< 0.30		EPA 180.1

Please note that the amount of trace elements listed are typical. The actual values may vary slightly. Purchase specifications should list maximum permitted values. Where special quality specifications are necessary, accommodation may be made by notifying our sales personnel.

The material meets the specifications of the National Formulary (NF) for Strong Ammonia Solutions, Federal Specification A-A-59370 (except for packaging) and the Food Chemical Codex. In addition, Reagent Grade material meets the specifications for USP Reagent Grade and the American Chemical Society (ACS) Reagent chemicals.

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(supercedes March 2008)

Prepared by : QC/QA  
Approved by : QC/QA  
*F.B.C. slog*