

TECHNICAL DATA SHEET

Nitric Acid 40% Technical Grade

Technical · 40%

CAS NUMBER	ALLIANCE CODE	GENERATED
7697-37-2	nitric-acid-40	2026-09-01
REVISION	REVIEWED	
1.4	2026-07-17 · Andre Taki	

IDENTITY & COMPOSITION

PRODUCT NAME	ALLIANCE CODE
Nitric Acid 40% Technical Grade	nitric-acid-40
GRADE	CONCENTRATION
Technical	40%
CAS NUMBER	FORMULA
7697-37-2 PubChem	HNO3 PubChem
MOLECULAR WEIGHT	PRODUCT TYPE
63.013 PubChem	solution

SPECIFICATIONS

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
Nitrite (NO2)	<=15 ppm	1.2 ppm	—	Supplier specification
Oxides of nitrogen	286 ppm max	1.2 ppm	—	Derived by dilution
Residue after evaporation	<= 25 ppm	3 ppm	—	Supplier specification

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
Sulfate (SO ₄)	<=10 ppm	0.000024 %	—	Supplier specification
Chloride (Cl)	<= 3 ppm	0.18 ppm	—	Supplier specification
Iron (Fe)	<= 10 ppm	0.6 ppm	—	Supplier specification
Arsenic (As)	0.0058 ppm max	0.0012 ppm	—	Derived by dilution
Heavy Metals (as Pb)	0.12 ppm max	0.018 ppm	—	Derived by dilution
Lead (Pb)	0.0000035% max	0.0000006 %	—	Derived by dilution
Mercury (Hg)	0.0029 ppm max	0.0002 ppm	—	Derived by dilution
Nickel (Ni)	0.033 ppm max	0.009 ppm	—	Derived by dilution
Residue after Ignition	3.7 ppm max	1.5 ppm	—	Derived by dilution
Phosphate (PO ₄)	0.0001 % max	0.00001 %	Molybdenum blue colorimetric	Derived by dilution
Substances reducing permanganate (as HNO ₂)	0.00031 % max	0.00012 %	Titrimetric, KMnO ₄ decolorization	Derived by dilution
Assay (HNO ₃)	39.0 – 41.0 %	40.0 %	—	Commercial practice
fluoride	3.1 ppm max	0.12 ppm	—	Derived by dilution

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
oxidizable constituents as hno2	9.2 ppm max	2.4 ppm	—	Derived by dilution

Specification values are guaranteed limits. Typical values are representative of production lots and are not guaranteed. Lot-specific certificates of analysis ship with every order.

AVAILABLE GRADES SAME CAS, ALTERNATE GRADES AND CONCENTRATIONS

GRADE	CONCENTRATION	TYPICAL ASSAY	SKU
THIS GRADE Technical	40%	—	current
ACS Grade	70%	—	nitric-acid-70-acs-grade-low-particle
Technical	70%	—	nitric-acid-70-technical-grade
ACS Grade	69%	—	nitric-acid-acs-69-55-gallon-drum
Technical	69%	—	nitric-acid-69-technical-grade
Technical	65%	—	nitric-acid-65-technical-grade
Technical	30%	—	nitric-acid-30
Technical	25%	—	nitric-acid-25
Technical	20%	—	nitric-acid-20
Reagent	5%	—	nitric-acid-5

Typical assay shown is the rolling-window mean from the sibling product's most recent lots. Grade selection drives downstream end-use — verify the sibling grade matches your specification before substitution.

PHYSICAL & CHEMICAL PROPERTIES

One or more physical-property values are temporarily suppressed pending verification against vendor COA data. For complete properties refer to the Safety Data Sheet (SDS) or contact sales@alliancechemical.com.

PROPERTY	VALUE	SOURCE
Form	Liquid	Published reference
Color	<= 50	Supplier specification
Odor	Characteristic choking odor	Published reference
Specific Gravity (20 °C)	1.242 – 1.250	Interpreted
Density	1.249 (40% w/w aqueous solution, 20 °C)	Published reference
Boiling Point	Not characterized for the 40% solution	Published reference
Melting Point	Not characterized for the 40% solution	Published reference
Vapor Pressure	48 mmHg (NIOSH, 2024)	Published reference
Solubility (water)	Miscible (NIOSH, 2024)	Published reference

Strong acid — density and vapor-pressure values shown are at 20 °C; values shift markedly with concentration and temperature. Reference concentration-temperature curves before specifying equipment.

MATERIALS OF CONSTRUCTION

MATERIAL	RATING	CONDITIONS	SOURCE
chromium	Compatible	hot nitric acid; concentration not stated	itwreagents.com

Compatibility is drawn from published manufacturer and supplier documentation for this product; each rating is sourced. Confirm against your specific duty cycle before equipment selection.

REGULATORY & TRANSPORT

DOT / 49 CFR

UN NUMBER	HAZARD CLASS
UN2031 49 CFR 172.101	8 Adjudicated
PACKING GROUP	PROPER SHIPPING NAME
II Adjudicated	Nitric acid, other than red fuming, with more than 20 percent and less than 65 percent nitric acid
	Adjudicated

GHS / OSHA HAZCOM 2012

SIGNAL WORD	H-CODES (HAZARD STATEMENTS)
Danger Adjudicated	H290, H314, H331 Adjudicated
P-CODES (PRECAUTIONARY STATEMENTS)	
P234, P260, P264, P271, P280, P301+P330+P331, P303+P361+P353, P304+P340, P305+P351+P338, P310, P321, P363, P390, P403+P233, P405, P406, P501	
Adjudicated	

OCCUPATIONAL EXPOSURE LIMITS

OSHA PEL (29 CFR 1910.1000)	ACGIH TLV
2 ppm TWA OSHA 29 CFR 1910.1000	— no canonical
NIOSH REL	NIOSH IDLH
2 ppm TWA / 4 ppm STEL NIOSH Pocket Guide	25 ppm NIOSH Pocket Guide

Transport descriptions reflect 49 CFR 172.101 lookup at time of publication. Sourced data: ECHA CLP Annex VI for harmonised classifications, NIOSH Pocket Guide for REL/IDLH, OSHA Z-Tables for PEL. Always verify against the latest regulatory text before shipment-critical decisions.

CATALOG EQUIVALENTS CROSS-REFERENCE VS MAJOR CHEMICAL SUPPLIERS

SIGMA-ALDRICH

SKU	GRADE	CONC.	MATCH	NOTES
438073	ACS Reagent	70%	Exact	ACS Reagent fuming-free 70%

Cross-references are informational. Confirm against the manufacturer's current specification before substitution. Competitor trademarks are property of their respective owners.

APPLICATIONS

Acid digestion of samples for elemental analysis by ICP or atomic absorption spectroscopy

[laballey.com](https://www.laballey.com)

Etching of metals in laboratory settings [laballey.com](https://www.laballey.com)

Used in nitration reactions of organic compounds [laballey.com](https://www.laballey.com)

Production of fertilizers, dyes, and explosives. [itwreagents.com](https://www.itwreagents.com)

Production of soluble metal nitrates. [itwreagents.com](https://www.itwreagents.com)

Detection of aromatic amino acids and proteins through the xanthoprotein reaction. [itwreagents.com](https://www.itwreagents.com)

Applications are drawn from published manufacturer and supplier documentation; each is sourced. Suitability for a specific use is the buyer's to confirm.

STORAGE & HANDLING

RECOMMENDED STORAGE

Cool, dry, well-ventilated area in compatible containers (lined steel, HDPE, FRP — verify per concentration). Segregate from bases, oxidizers, metals, and cyanides.

Class-level guidance — not product-specific; the SDS controls.

INCOMPATIBILITIES

Bases, active metals (aluminium, zinc), cyanides, sulfides, oxidizing agents. Reacts violently with organic anhydrides.

Class-level guidance — not product-specific; the SDS controls.

HANDLING PRECAUTIONS

Use full PPE including face shield, acid-resistant gloves and apron. Add acid to water slowly with stirring; never reverse. Ventilation required.

Class-level guidance — not product-specific; the SDS controls.

SHELF LIFE

Consult Technical Services for product-specific shelf life

For full hazard, PPE, and emergency response guidance, refer to the Safety Data Sheet (SDS) for this product. The SDS controls in all cases where guidance differs.

PACKAGING & LOGISTICS

SHIPPING DESCRIPTION (US DOT)

UN2031, Nitric acid, other than red fuming, with more than 20 percent and less than 65 percent nitric acid, 8, PG II

Sourced from 49 CFR 172.101. Confirm against shipping documents and carrier requirements before tender.

NMFC CLASS
60

PLACARD
Corrosive

PACKING GROUP
PG II

REVISION HISTORY

Last reviewed 2026-07-17 by Andre Taki, DOT Hazmat Specialist.

VERSION	DATE	CHANGE	TRIGGER
1.4	2026-08-05	Canonical data updated: 1 field changed via the provenance/adjudication pipeline. • <code>unNumber</code> · canonical change (coa.data_provenance / adjudication)	canonical_change
1.3	2026-07-22	Canonical data updated: 1 field changed via the provenance/adjudication pipeline. • <code>dotProperShippingName</code> · canonical change (coa.data_provenance / adjudication)	canonical_change
1.2	2026-07-21	Canonical data updated: 2 fields changed via the provenance/adjudication pipeline. • <code>ghsClassification</code> · canonical change (coa.data_provenance / adjudication) • <code>hazard_p_codes</code> · canonical change (coa.data_provenance / adjudication)	canonical_change
1.1	2026-07-17	Canonical data re-verified: 8 fields updated against independent vendor SDSs, CLP Annex VI, 49 CFR, and OSHA HazCom 2024 (GHS classification, hazard/precautionary codes, signal word, physical properties as applicable). • <code>countryOfOrigin</code> · canonical adjudication / reground (coa.data_provenance) • <code>dotSubsidiaryHazardClass</code> · canonical adjudication / reground (coa.data_provenance) • <code>ghsClassification</code> · canonical adjudication / reground (coa.data_provenance) • <code>hazard_h_codes</code> · canonical adjudication / reground (coa.data_provenance) • <code>hazard_p_codes</code> · canonical adjudication / reground (coa.data_provenance) • <code>hsCode</code> · canonical adjudication / reground (coa.data_provenance) • <code>physicalProperties</code> · canonical adjudication / reground (coa.data_provenance) • <code>specificGravity</code> · canonical adjudication / reground (coa.data_provenance)	canonical_change
1.0	2026-05-20	Initial URL—first TDS published from canonical chemistry registry.	initial

This Technical Data Sheet is provided for technical reference. The Safety Data Sheet (SDS) controls in all cases where guidance differs. Values reflect Alliance Chemical canonical data at time of generation; subsequent revisions are recorded in the Revision History above.