

TECHNICAL DATA SHEET

Sulfuric Acid 50% - Electrolyte Grade

50%

CAS NUMBER

7664-93-9

ALLIANCE CODE

sulfuric-acid-50-electrolyte-grade

GENERATED

2026-08-31

REVISION

1.3

REVIEWED

2026-07-17 · Andre Taki

IDENTITY & COMPOSITION

PRODUCT NAME

Sulfuric Acid 50% – Electrolyte Grade

ALLIANCE CODE

sulfuric-acid-50-electrolyte-grade

GRADE

—

CONCENTRATION

50%

CAS NUMBER

7664-93-9 [PubChem](#)

FORMULA

H2O4S [PubChem](#)

MOLECULAR WEIGHT

98.08 [PubChem](#)

PRODUCT TYPE

solution

SPECIFICATIONS

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
Assay (H2SO4)	49.0 – 51.0 %	50.0 %	—	Commercial practice
Total heavy metals	13 ppm max	1.1 ppm	—	Derived by dilution
Iron (Fe)	50.0 ppm max	5.4 ppm	—	Supplier specification

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
Mercury	1.0 ppm max	0.016 ppm	—	Supplier specification
Nitrates (as NO ₃)	54 ppm max	1.1 ppm	—	Derived by dilution
Residue after ignition	54 ppm max	8.2 ppm	—	Derived by dilution
Sulfur dioxide (SO ₂)	27 ppm max	6.5 ppm	—	Derived by dilution
Chloride (Cl)	5.0 ppm max	1.6 ppm	ASTM E223 (turbidimetric, AgNO ₃)	Interpreted
Manganese (Mn)	0.5 ppm max	0.03 ppm	ICP-OES	Interpreted
Arsenic (As)	1.0 ppm max	0.03 ppm	ICP-MS	Interpreted

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 —	50%	—	current
ACS Grade	96%	—	sulfuric-acid-96-acs-grade
Technical Grade	93%	—	sulfuric-acid-93-technical-grade
Reagent	70%	—	sulfuric-acid-70
—	37%	—	sulfuric-acid-37-battery-acid
Technical	30%	—	sulfuric-acid-30

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

PROPERTY	VALUE	SOURCE
Appearance	Clear to slight amber colored solution	Supplier specification
Form	Liquid solution	Published reference
Color	50 max	Supplier specification
Odor	Odorless	Published reference
pH	1 N solution = 0.3; 0.1 N solution = 1.2; 0.01 N solution = 2.1	Published reference
Specific Gravity (20 °C)	1.408 min	Supplier specification
Density	1.4 (50% w/w aqueous solution, 20 °C)	Published reference
Boiling Point	Not characterized for the 50% solution	Published reference
Melting Point	Not characterized for the 50% solution	Published reference
Flash Point	N/A	Published reference
Vapor Pressure	1 mmHg at 294.8 °F (EPA, 1998)	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 SERVICE ENVELOPE ≈ 50%

MATERIAL	RATING	MAX T (°C)	NOTES	SOURCE
Buna-N (NBR) Elastomer	Poor	—	Swells and degrades	Cole-Parmer Chemical Compatibility
EPDM Elastomer	Good	40	Acceptable but FKM preferred	Cole-Parmer Chemical Compatibility
Viton (FKM) Elastomer	Excellent	80	Preferred elastomer	Cole-Parmer Chemical Compatibility
PTFE Fluoropolymer	Excellent	200	Universal acid compatibility.	Cole-Parmer Chemical Compatibility
Borosilicate Glass Glass Ceramic	Excellent	100	Inert to most strong acids (avoid HF).	Cole-Parmer Chemical Compatibility
Glass (borosilicate) Glass Ceramic	Excellent	100	Inert under all conditions	Cole-Parmer Chemical Compatibility
316 stainless steel Metal	Poor	25	Severe pitting; use only for vapors	Cole-Parmer Chemical Compatibility
Aluminium Metal	Not recommended	—	Reacts to form H ₂ gas	Cole-Parmer Chemical Compatibility
Carbon Steel Metal	Not recommended	—	Catastrophic corrosion; never use.	Cole-Parmer Chemical Compatibility
Hastelloy C-276 Metal	Excellent	90	Premium HCl alloy	Cole-Parmer Chemical Compatibility
Inconel 625 Metal	Good	60	Acceptable for dilute service	Cole-Parmer Chemical Compatibility

MATERIAL	RATING	MAX T (°C)	NOTES	SOURCE
Tantalum Metal	Excellent	100	Best-in-class but expensive	Cole-Parmer Chemical Compatibility
CPVC Thermoplastic	Excellent	90	Preferred for elevated temperature	Cole-Parmer Chemical Compatibility
FRP (vinyl ester) Thermoplastic	Good	60	Common bulk-storage tank material	Cole-Parmer Chemical Compatibility
HDPE Thermoplastic	Excellent	60	Standard drum / IBC material	Cole-Parmer Chemical Compatibility
PVC Thermoplastic	Excellent	60	Standard piping for ambient service	Cole-Parmer Chemical Compatibility

Ratings reflect the service envelope (concentration × temperature) shown. Always confirm against your specific duty cycle and contact-time before equipment selection. The most cautious rating across overlapping references is shown.

REGULATORY & TRANSPORT

DOT / 49 CFR

UN NUMBER

UN2796 Manual review

PACKING GROUP

II Adjudicated

HAZARD CLASS

8 Adjudicated

PROPER SHIPPING NAME

Sulfuric acid with not more than 51% acid

Adjudicated

GHS / OSHA HAZCOM 2012

SIGNAL WORD

Danger Adjudicated

H-CODES (HAZARD STATEMENTS)

H290, H314 ECHA CLP Annex VI

P-CODES (PRECAUTIONARY STATEMENTS)

P234, P260, P264, P280, P301+P330+P331,
P303+P361+P353, P304+P340,
P305+P351+P338, P310, P321, P363, P405,
P501

Adjudicated

OCCUPATIONAL EXPOSURE LIMITS

OSHA PEL (29 CFR 1910.1000)

1 mg/m³ TWA OSHA 29 CFR 1910.1000

ACGIH TLV

— no canonical

NIOSH REL

1 mg/m³ TWA NIOSH Pocket Guide

NIOSH IDLH

15 mg/m³ 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
258105	ACS Reagent	95–98%	Exact	ACS Reagent 95–98%

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

APPLICATIONS

Battery manufacture, chlorine dioxide generation, effluent treatment and inorganic pigment production

nouryon.com

Manufacture of fertilizers (agriculture) lookpolymers.com

Oxidizing and dehydrating agent in chemical processing lookpolymers.com

Treatment of metals (metallurgy) and purification of petroleum lookpolymers.com

pH control in water treatment lookpolymers.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.

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.

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

PACKAGING & LOGISTICS

SHIPPING DESCRIPTION (US DOT)

UN2796, Sulfuric acid with not more than 51% 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
1.3	2026-08-04	Canonical data updated: 3 fields changed via the provenance/adjudication pipeline. • unNumber · canonical change (coa.data_provenance / adjudication) • hazardClass · canonical change (coa.data_provenance / adjudication) • packingGroup · canonical change (coa.data_provenance / adjudication)	canonical_change
1.2	2026-07-22	Canonical data updated: 2 fields changed via the provenance/adjudication pipeline. • dotSubsidiaryHazardClass · canonical change (coa.data_provenance / adjudication) • dotProperShippingName · canonical change (coa.data_provenance / adjudication)	canonical_change
1.1	2026-07-17	Canonical data re-verified: 5 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). • countryOfOrigin · canonical adjudication / reground (coa.data_provenance) • ghsClassification · canonical adjudication / reground (coa.data_provenance) • hazard_p_codes · canonical adjudication / reground (coa.data_provenance) • hsCode · canonical adjudication / reground (coa.data_provenance) • physicalProperties · 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.