TECHNICAL DATA SHEET

Phosphoric Acid 20% ACS Grade

ACS · 20%

CAS NUMBER	ALLIANCE CODE	GENERATED
7664-38-2	phosphoric-acid-20-acs-grade	2026-08-31

REVISION	REVIEWED
1.4	2026-07-17 · Andre Taki

IDENTITY & COMPOSITION

PRODUCT NAME
Phosphoric Acid 20% ACS Grade

ALLIANCE CODE
phosphoric-acid-20-acs-grade

GRADE
ACS

CONCENTRATION
20%

CAS NUMBER
7664-38-2 PubChem

FORMULA
H3O4P PubChem

MOLECULAR WEIGHT
97.995 PubChem

PRODUCT TYPE
solution

SPECIFICATIONS

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
Assay (H3PO4)	19.5 - 20.5 %	20.0 %	—	Commercial practice
Arsenic (As)	0.24 ppm Max	0.0071 ppm	—	Derived by dilution
Calcium (Ca)	0.00047 % Max	0.000047 %	—	Derived by dilution

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
Chloride (Cl)	0.71 ppm Max	0.094 ppm	—	Derived by dilution
Heavy metals (as Pb)	0.00024 % max	0.000024 %	—	Derived by dilution
Insoluble matter	0.00024 % Max	0.000024 %	—	Derived by dilution
Iron (Fe)	0.00071 % Max	0.000024 %	—	Derived by dilution
Magnesium (Mg)	0.00047 % Max	0.000024 %	—	Derived by dilution
Nitrate (NO3)	1.2 ppm Max	0.12 ppm	—	Derived by dilution
Sodium (Na)	0.0059 % Max	0.00047 %	—	Derived by dilution
Sulfate (SO4)	0.00071 % Max	0.00012 %	—	Derived by dilution
Substances reducing permanganate (as H3PO3)	0.00024 % Max	0.000047 %	ACS permanganate titration	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 ACS	20%	—	current
—	75%	—	phosphoric-acid-75

GRADE	CONCENTRATION	TYPICAL ASSAY	SKU
USP Food Grade	75%	—	phosphoric-acid-75-usp-food-grade
ACS	50%	—	phosphoric-acid-50-acs-grade
Technical	50%	—	phosphoric-acid-50-technical-grade
ACS	30%	—	phosphoric-acid-30-acs-grade
Food	20%	—	phosphoric-acid-20-food-grade
Technical	20%	—	phosphoric-acid-20-technical-grade
Technical	10%	—	phosphoric-acid-10-technical-grade
Food	5%	—	phosphoric-acid-5-food-grade
Technical	5%	—	phosphoric-acid-5-technical-grade
Food	—	—	phosphoric-acid-45-food-grade
Technical	—	—	phosphoric-acid-45-technical-grade

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
Color	10 max	Derived by dilution
Specific Gravity (20 °C)	1.110 – 1.117	Interpreted

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 ≈ 20%

MATERIAL	RATING	MAX T (°C)	NOTES	SOURCE
Buna-N (NBR) Elastomer	Poor	—	Hardens and cracks; do not use.	Parker O-ring Chemical Compatibility
EPDM Elastomer	Good	80	Standard for HCl and H2SO4 gaskets.	Parker O-ring Chemical Compatibility
Viton (FKM) Elastomer	Good	80	Acceptable for HCl gaskets up to 37 %.	Parker O-ring Chemical Compatibility
PTFE Fluoropolymer	Excellent	200	Universal acid compatibility.	Cole-Parmer Chemical Compatibility
PVDF (Kynar) Fluoropolymer	Excellent	120	Excellent for HCl piping at elevated temperature.	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 H2 gas	Cole-Parmer Chemical Compatibility
Carbon Steel Metal	Not recommended	—	Catastrophic corrosion; never use.	Cole-Parmer Chemical Compatibility
Hastelloy C-276 Metal	Excellent	80	Preferred metal for concentrated HCl service.	Haynes International C-276 datasheet

MATERIAL	RATING	MAX T (°C)	NOTES	SOURCE
Inconel 625 Metal	Good	60	Acceptable for dilute service	Cole-Parmer Chemical Compatibility
Tantalum Metal	Excellent	100	Best-in-class but expensive	Cole-Parmer Chemical Compatibility
CPVC Thermoplastic	Excellent	90	Higher-temp variant of PVC.	Cole-Parmer Chemical Compatibility
FRP (vinyl ester) Thermoplastic	Good	60	Common bulk-storage tank material	Cole-Parmer Chemical Compatibility
HDPE Thermoplastic	Excellent	60	Standard tank/drum material for HCl up to 37 %.	Cole-Parmer Chemical Compatibility
PVC Thermoplastic	Excellent	60	Common for piping; verify rating for service > 50 °C.	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
UN1805 Adjudicated

HAZARD CLASS
8 Adjudicated

PACKING GROUP
III Adjudicated

PROPER SHIPPING NAME
Phosphoric acid solution 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 / 3 mg/m³ STEL

NIOSH IDLH
1000 mg/m³ NIOSH Pocket Guide

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
345245	ACS Reagent	85%	Exact	ACS Reagent ≥85%

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

APPLICATIONS

Fertilizer manufacture, and use as a pH modifier, sanitizing agent and rust converter laballey.com

Supplied for laboratory, research or manufacturing use as ACS reagent-grade material

digitalassets.avantorsciences.com

Used in fertilizer, cosmetics, foods and beverages, food-industry sanitation, dental cleaning, and rust conversion.

laballey.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.

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.

INCOMPATIBILITIES

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

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)

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UN1805, Phosphoric acid solution, 8, PG III
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Sourced from 49 CFR 172.101. Confirm against shipping documents and carrier requirements before tender.

NMFC CLASS	PLACARD	PACKING GROUP
65	Corrosive	PG III

REVISION HISTORY

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

VERSION	DATE	CHANGE	TRIGGER
1.4	2026-08-19	Canonical data updated: 1 field changed via the provenance/adjudication pipeline. • `unNumber` · canonical change (coa.data_provenance / adjudication)	canonical_change
1.3	2026-08-05	Canonical data updated: 3 fields changed via the provenance/adjudication pipeline. • `hazardClass` · canonical change (coa.data_provenance / adjudication) • `packingGroup` · canonical change (coa.data_provenance / adjudication) • `unNumber` · 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) • `signalWord` · 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.