

Avantor Performance Materials, LLC 3477 Corporate Parkway Center Valley, PA 18034 U.S.A. Tel: 1-610-573-2600 Fax: 1-610-573-2610

www.avantorinc.com

Phosphoric Acid

Product Regulatory Data Sheet

Section 1 – Product Information

Products Covered:

| <u>Brand</u> | Product Code | Product Description | MOC* |
|---------------------------|--------------|--|------|
| J.T.Baker® | 0240 | Phosphoric Acid, N.F., A.C.S. | R |
| J.T.Baker® | 0262 | Phosphoric Acid, N.F F.C.C. | R |
| J.T.Baker® | 0268 | Phosphoric Acid, N.F., Multi-Compendial | R |
| J.T.Baker® | 0334 | Phosphoric Acid Solution, 33% (W/W), Biotech Reagent | R |
| J.T.Baker® | 5683 | Phosphoric Acid, Diluted, N.F., Multi-Compendial | R |
| Macron Fine Chemicals™ | 2788 | Phosphoric Acid, N.F F.C.C. | R |

*MOC = Management of Change

Section 2 – Manufacturing, Packaging and Release Site Information

The products in Section 1 are manufactured according to current Good Manufacturing Practices (cGMPs) as set forth by International Pharmaceutical Excipients Council (IPEC) guidelines.

A number of the cGMP produced products that are sold by Avantor Performance Materials, LLC. may not be originally manufactured at our sites. However, we perform the analytical and stability testing for these products and repackage the products where applicable. With ISO and cGMP procedures in place at our facilities we can ensure, and take complete responsibility for, the traceability and quality of the finished, packaged product that we offer.

The original manufacturer and address will be referenced on the Certificate of Analysis as an alpha or alpha-numeric manufacturer code rather than listing the full name and address. This practice is compliant with both ICH Q7 Good Manufacturing Guidance for Active Pharmaceutical Ingredients (APIs) and IPEC guidelines and it meets cGMP requirements. For instructions to decipher the manufacturer reference code please consult our website. Instructions can be found in the Ask Avantor QA Center of the support section of our web site or by directly linking to Ask Avantor Keyword: Manufacturer Code.



Section 3 – Physical/Chemical Information

CAS #: 7664-38-2

Manufacturing Process:

Distillation; Dedicated closed process.

Raw Material Origin:

Chemical

Section 4 - Regulatory Information

Compendial Compliance: Please see the current product specifications at www.AvantorInc.com.

DMF:

Avantor Performance Materials, LLC does not carry a Drug Master File for these products.

BSE/TSE Status:

The subject materials are manufactured from raw materials that contain NO animal parts, products, and/or by-products nor do they come in contact with animal parts, products, and/or by-products.

Allergen/Hypersensitivities Information:

The products listed do not contain cereals containing gluten (i.e. wheat, rye, oats, barley, spelt, kamut or their hybridized strains), malt, triticale, gluten, other grains, corn, soy, soybeans, eggs, yeast, canola, milk, dairy products, fish, crustacean shellfish, seafood products, tree nuts, peanuts, nut products (i.e. Almond (Amygdalus communis L.), Hazelnut (Corylus avellana), Walnut (Juglans regia), Cashew (Anacardium occidentale), Pecan nut (Carya illiniesis (Wangenh.) K. Koch), Brazil nut (Bertholletia excelsa), Pistachio nut (Pistacia vera), Macadamia nut and Queensland nut (Macadamia ternifolia)), seed products (sesame seeds and products thereof), natural grape products, natural flavors, artificial flavors, celery, mustard, lactose, sulfites, elemental sulfur, preservatives, MSG, disodium guanylate/inosinate, artificial sweeteners, phenylalanine, additives, colorants, dyes, or natural rubber (latex). These products are manufactured using cGMP guidelines which provide controls that allow no potential for cross contamination of any allergens or other products

GMO Information:

The subject materials, including any raw materials and processing aids, are NOT subject to genetic modification

Residual Solvents/Organic Volatile Impurities (OVI) Information:

The above subject materials (all lots) comply with the requirements of the ICH Q3C Residual Solvents Guideline and USP<467>Residual Solvents. No Class 1, 2, 3 or other solvents are used or produced in the manufacturing or purification of the product.

Elemental Impurities:

Please see attached summary for Elemental Impurity information for listed products.

Kosher Status:

Certified Kosher – Pareve for year-round use.

Please refer to the customer support section of our website for our most up to date listing of Kosher products. (Ask Avantor Keyword: Kosher)

Halal Status:

The subject materials are not Halal Certified.



Please refer to the customer support section of our website for our most up to date listing of Halal products. (Ask Avantor Keyword: Halal)

GRAS Status:

The United States Food and Drug Administration (FDA) have acknowledged that Phosphoric Acid is a Substance Generally Recognized as Safe (GRAS) in foods when used in accordance with the requirements and limitations per 21 CFR parts 182.1073.



Section 5 - Miscellaneous Product Information

Certificate of Analysis Date Format: The Manufactured Date and Expiration/Retest Date on the C of A are reported as YYYY/MM/DD from our ERP system effective April 30, 2012. For example, the Manufactured Date for October 1, 2012 would be reported as 2012/10/01

Lot Numbering System and Batch Description: Please refer to the customer support section of our website for information concerning our lot/batch numbering system. (Ask Avantor Keyword: Lot Number)

Batch Definition: A "batch" is a homogeneous unit of production; each batch of material is from one single batch of the source supplier.

Shelf Life Information: If a product has an assigned expiration or retest period, the date will appear on the certificate of analysis. For products that do not have assigned dates please contact Technical Support through the customer support section of our website for our product stability profiles. (Ask Avantor Keyword: Expiration)

Nutritional/Supplement Facts Labeling:

are to be processed, labeled, and/or repacked at a site other than where it's originally processed or packed, are exempt from the Nutrient Content Evaluation and Nutrient Labeling Requirements. (21 CFR 101.9(j)(9))

Organic Status:

The products listed in Section 1 are not certified as organic. However, to the best of our knowledge, the product is not produced using Ionizing Radiation as described in 21 CFR 179.26 or Sewage Sludge as described in 7 CFR Section 205.2.

Management of Change: Please refer to the customer support section of our website for information concerning our Management of Change program. (Ask Avantor Keyword: MOC)

Country of Origin Statement: Country of Origin is indicated on the product Certificate of Analysis. Please contact our Trade Compliance Department if you require further documentation. (Trade.Compliance@AvantorInc.com)

Storage Requirements: Please refer to the product Certificate of Analysis/Product Specifications. In the absence of specific storage conditions listed on the Avantor specification sheet or certificate of analysis, our products are to be stored in ambient conditions of temperature and humidity. We do not formally tie any specific temperature or humidity range with the 'ambient' storage designation, but an example of a common temperature interpretation is 15-30°C. Our products are also packaged to protect from the normal variation in humidity during storage and shipment. Further handling and storage information may be found in Section 7 of the product SDS sheet.

Section 6 – Revision History

Rev. 0; Oct. 1, 2007 - IPEC EIP format

Rev. 1; Sept. 16, 2008 – Update Residual Solvents

Rev. 2; Oct. 16, 2008 – Section 4: updated residual solvents information to reference USP<467>.

Rev. 3; Oct. 1, 2009 - Entire document: new letterhead and changed all references of "Solv IT Center" to "AskMBI."; Section 7: Update contact information (JLW)

Rev. 4; August 26, 2011 –Entire document: new letterhead, and changed all references of "AskMBI" to "AskAvantor." Updated website links for new website; Section 1: Mallinckrodt brand name updated to Macron; added MOC codes; Section 2: added GMP statement; Section 4: expanded Allergens list; added Residual Metallic Catalysts and GRAS statements; Section 5: Added Nutritional/Supplemental Facts Labeling and Organic Status statements; Section 7: updated contact information; minor formatting. PH/MCH

Rev.5; Nov 13, 2012 -HDQ address change. Section 4: added add'l allergens as listed in EU Directive 2003/89/EC;



updated Residual Metallic Catalysts statement; separated Kosher/Halal status and added certification statement; Section 5: added Management of Change information; Added COA Date Format statement; Section 7: removed contact list table and added CS/TS contact information. (JDR/JLW)

Rev. 6; Dec. 4, 2014 – Section 1: Added code 0240; Section 4: Updated EMEA Residual Metallic statement to reflect current guideline revision. (MCH)

Rev. 7; July 3, 2017 –Entire document update to new format; Section 4: Added Elemental Impurities information. (MCH)

This electronic document is valid without a signature.

Section 7 - Contact Information

Customer Service

Phone: 1-855-282-6867

1-610-573-2600 (outside U.S.)

Fax: 1-610-573-2650

CS.Specialist@AvantorInc.com

Technical Service

Phone: 1-855-282-6867

1-610-573-2600 (outside U.S.)

Fax: 1-610-573-2650

Technical.Service@AvantorInc.com

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The most current revision of this document is maintained on our website. Reviews and revisions are performed as warranted due to product changes or as part of the supplier audit cycle.

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| Material Name: Phosphoric Acid, Dilute | Product codes: : 5 | 5683 <u>Date</u> : October 3, 20 | 016 |
|--|----------------------------------|---|---|
| Source/Type of Excipient: ☐ Mineral; | $\hfill\square$ Mineral derived; | $\ \square$ Plant; $\ \square$ Plant derived; | $oxed{oxed}$ Synthetic; $oxed{\Box}$ Fermentation derived |

Other (explain):

| Elemental Impurity | | Class | Likely to be Present | | | If Known, Please Identify the Expected Concentration /Units (or Range) | Analytical Method Used (and Limit of Detection if Available) | Comments regarding source of information (i.e.; number of lots tested, frequency of testing, process understanding, etc.) |
|------------------------|----|-------|----------------------|------|-----------|--|--|---|
| Arsenic (inorganic) | As | 1 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Cadmium | Cd | 1 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Mercury (inorganic) | Hg | 1 | Yes 🗌 | No 🗵 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Lead | Pb | 1 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Cobalt | Со | 2A | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Nickel | Ni | 2A | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component |

| Elemental Impurity | | Class | Likely to be Present | | | If Known, Please Identify the Expected Concentration /Units (or Range) | Analytical Method Used (and Limit of Detection if Available) | Comments regarding source of information (i.e.; number of lots tested, frequency of testing, process understanding, etc.) |
|-----------------------|----|-------|----------------------|------|-----------|--|--|---|
| | | | | | | | | phosphoric acid and water |
| Vanadium | ٧ | 2A | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Silver | Ag | 2B | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Gold | Au | 2B | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Iridium | lr | 2B | Yes 🗌 | No 🗵 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Osmium | Os | 2B | Yes 🗌 | No 🗵 | Unknown | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Palladium | Pd | 2B | Yes 🗌 | No 🗵 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Platinum | Pt | 2B | Yes 🗌 | No 🗵 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Rhodium | Rh | 2B | Yes 🗌 | No 🗵 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Ruthenium | Ru | 2B | Yes 🗌 | No 🗵 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Selenium | Se | 2B | Yes 🗌 | No 🗵 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Thallium | TI | 2B | Yes 🗌 | No 🗵 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Barium | Ва | 3 | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |

| Elemental Impurity | | Class | Likely to be Present | | | If Known, Please Identify the Expected Concentration /Units (or Range) | Analytical Method Used (and Limit of Detection if Available) | Comments regarding source of information (i.e.; number of lots tested, frequency of testing, process understanding, etc.) |
|-----------------------|----|-------|----------------------|------|-----------|--|--|---|
| Chromium | Cr | 3 | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Copper | Cu | 3 | Yes 🗌 | No 🛚 | Unknown | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Lithium | Li | 3 | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Molybdenum | Мо | 3 | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Antimony | Sb | 3 | Yes 🗌 | No 🗵 | Unknown | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |
| Tin | Sn | 3 | Yes 🗌 | No 🗵 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Calculated from component phosphoric acid and water |

Reference: ICH Q3D Guideline for Elemental Impurities, Step 4 version, September 2014

David L. Cugini, Sr. QA Analyst

Prepared by the Technical Service Department Avantor™ Performance Materials, Inc. 3477 Corporate Parkway Suite #200 Center Valley, PA 18034 1-800-669-8230

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Material Name: Polysorbate 20 Product codes: : 4116 Date: May 3, 2016

Source/Type of Excipient: ☐ Mineral; ☐ Mineral derived; ☐ Plant; ☐ Plant derived; ☐ Synthetic; ☐ Fermentation derived

Other (explain):

| Elemental Impurity | | Class | Likely to be Present | | | If Known, Please Identify the Expected Concentration /Units (or Range) | Analytical Method Used (and Limit of Detection if Available) | Comments regarding source of information (i.e.; number of lots tested, frequency of testing, process understanding, etc.) |
|------------------------|----|-------|----------------------|------|-----------|--|--|---|
| Arsenic (inorganic) | As | 1 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Cadmium | Cd | 1 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Mercury (inorganic) | Hg | 1 | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Lead | Pb | 1 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Cobalt | Со | 2A | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Nickel | Ni | 2A | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Vanadium | V | 2A | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |

| Elemental Impurity | | Class | Likely to be Present | | | If Known, Please Identify the Expected Concentration /Units (or Range) | Analytical Method Used (and Limit of Detection if Available) | Comments regarding source of information (i.e.; number of lots tested, frequency of testing, process understanding, etc.) |
|-----------------------|----|-------|----------------------|------|-----------|--|--|---|
| Silver | Ag | 2B | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Gold | Au | 2B | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Iridium | Ir | 2B | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Osmium | Os | 2B | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Palladium | Pd | 2B | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Platinum | Pt | 2B | Yes 🗌 | No 🛚 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Rhodium | Rh | 2B | Yes 🗌 | No 🗵 | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Ruthenium | Ru | 2B | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Selenium | Se | 2B | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Thallium | TI | 2B | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Barium | Ва | 3 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Chromium | Cr | 3 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Copper | Cu | 3 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Lithium | Li | 3 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Molybdenum | Мо | 3 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Antimony | Sb | 3 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |
| Tin | Sn | 3 | Yes 🗌 | No ⊠ | Unknown 🗌 | <0.05 ppm | ICP-MS (MRL=0.05 ppm) | Avg. of 3 batches |

Reference: ICH Q3D Guideline for Elemental Impurities, Step 4 version, September 2014

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