

NOSB NATIONAL LIST FILE CHECKLIST

PROCESSING

MATERIAL NAME: # 9 Silicon dioxide



NOSB Database Form



References



MSDS (or equivalent)



FASP (FDA)



TAP Reviews from: Rich Theuer, Joe
Montecalvo, James
Johnson, William Zimmer,
Walter Jeffery

**NOSB/NATIONAL LIST
COMMENT FORM
PROCESSING**

Material Name: #9 Silicon dioxide

Please use this page to write down comments, questions, and your anticipated vote(s).

COMMENTS/QUESTIONS:

1. In my opinion, this material is:
_____ Synthetic _____ Non-synthetic.

2. Should this material be allowed in an “organic food” (95% or higher organic ingredients)? _____ Yes _____ No
(IF NO, PROCEED TO QUESTION 3.)

3. Should this substance be allowed in a “food made with organic ingredients” (50% or higher organic ingredients)? _____ Yes _____ No

TAP REVIEWER COMMENT FORM for USDA/NOSB

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Complete both sides of page. Attach additional sheets if you wish.

This file is due back to us by: Aug. 5, 1996

Name of Material: Silicon Dioxide

Reviewer Name: RC Theuer RECEIVED 08 05 1996

Is this substance Synthetic or non-synthetic? Explain (if appropriate)

SYNTHETIC

If synthetic, how is the material made? (please answer here if our database form is blank)

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, Non-synthetic (Allowed as an ingredient in organic food)

Non-synthetic (Allowed as a processing aid for organic food)

or, this material should not be on the National List

Are there any use restrictions or limitations that should be placed on this material on the National List?

in accordance with GMP's

Please comment on the accuracy of the information in the file:

ADEQUATE

Any additional comments? (attachments welcomed)

Do you have a commercial interest in this material? Yes; No

Signature Richard C Theuer Date 8/5/96

USDA/TAP REVIEWER
COMMENT FORM

Mailing date: 1 Jul 1996.

Due date: 5 Aug 1996

Name of Materials Silicon Dioxide
Reviewer Name: Richard C. Theuer

SYNTHETIC Silicon dioxide is produced synthetically as described in the NOSB Materials Database form.

COMMENTS RE SECTION 2119(m) CRITERIA:

1. The amount of silicon dioxide used in foods is limited by good manufacturing practices. The primary use that I am aware of is as a carrier, anticaking agent and defoaming agent. Small amounts are effective, and prevent waste (from caking) and overusage (by diluting and thus making it easier to add the smallest effective amount of other additives (nutrients, for example)).
2. Silicon dioxide is found in nature as sand, so the impact of silicon dioxide which finds its way into the environment is benign.

The following synthetic substance should be allowed as an ingredient in organic foods. It should be added to the National List of synthetic substances allowed for use as ingredients or processing aids in Organic Food:

silicon dioxide

5 August 1996

TAP REVIEWER COMMENT FORM for USDA/NOSB

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This file is due back to us by: Aug. 5, 1996

Name of Material: Silicon Dioxide

Reviewer Name: JAMES A. JOHNSON RECEIVED JUL 30 1996

Is this substance Synthetic or non-synthetic? Explain (if appropriate)

If synthetic, how is the material made? (please answer here if our database form is blank)

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, Non-synthetic (Allowed as an ingredient in organic food)

Non-synthetic (Allowed as a processing aid for organic food)

or, this material should not be on the National List
base on lack of info

Are there any use restrictions or limitations that should be placed on this material on the National List?

Please comment on the accuracy of the information in the file:

Any additional comments? (attachments welcomed)

Could not find additional info on this material

Do you have a commercial interest in this material? Yes; No

Signature James A. Johnson Date 7/29/96

Please address the 7 criteria in the Organic Foods Production Act:
(comment in those areas you feel are applicable)

- (1) the potential of such substances for detrimental chemical interactions with other materials used in organic farming systems;

N/A

- (2) the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment;

unknown

- (3) the probability of environmental contamination during manufacture, use, misuse or disposal of such substance;

low

- (4) the effect of the substance on human health;

unknown

- (5) the effects of the substance on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock;

unknown

- (6) the alternatives to using the substance in terms of practices or other available materials; and

unknown to reviewer

- (7) its compatibility with a system of sustainable agriculture.

Even though EU and Codex may have found this material safe, perhaps more studies are the answer to such agents.

TAP REVIEWER COMMENT FORM for USDA/NOSB

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This file is due back to us by: Aug. 5, 1996

Name of Material: Silicon Dioxide

Reviewer Name: JOE Montecalvo RECEIVED AUG 0 5 1996

Is this substance Synthetic or non-synthetic? Explain (if appropriate)

CAN be EITHER Synthetic OR Non Synthetic

If synthetic, how is the material made? (please answer here if our database form is blank) - See DATA BASE

This material should be added to the National List as:

Synthetic Allowed ^{IE ARC SiO₂} Prohibited Natural ^{IE manufactured by other chemical means}
or, Non-synthetic (Allowed as an ingredient in organic food)
 Non-synthetic (Allowed as a processing aid for organic food)

or, this material should not be on the National List

Are there any use restrictions or limitations that should be placed on this material on the National List?

IE SiO₂ IS MANUFACTURED FROM HIGH PURITY SAND THAT IS VAPORIZED AT 3000°C ELECTRIC ARC. THIS IS CALLED ARC SiO₂ AND IS PHYSICALLY SEPARATED FROM OTHER MATERIALS IN THE SAND. THERE IS NO CHEMICAL REACTION, THEREFORE IE SiO₂ MADE THIS WAY, I WOULD SUGGEST IT BE SYNTHETIC ALLOWED.
Please comment on the accuracy of the information in the file: partial info - see pp 842-843 of the Chemical Dictionary, 7th ed pub by VAN Nostrand Reinhold.

Any additional comments? (attachments welcomed)

It seems that fumed SiO₂ can be manufactured in different ways

Do you have a commercial interest in this material? Yes; No

Signature RB Joe Montecalvo Date 7/26/96

Please address the 7 criteria in the Organic Foods Production Act:
(comment in those areas you feel are applicable)

- (1) the potential of such substances for detrimental chemical interactions with other materials used in organic farming systems;

NONE

- (2) the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment;

NONE

- (3) the probability of environmental contamination during manufacture, use, misuse or disposal of such substance;

NONE

- (4) the effect of the substance on human health;

Prolonged inhalation of the dust (SiO_2) can cause fibrosis of the lungs leading to a medical condition known as Silicosis. There are very high levels of this compound for long periods of time, a respiratory system structure will

- (5) the effects of the substance on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock;

NONE

- (6) the alternatives to using the substance in terms of practices or other available materials; and — Magnesium carbonate may serve as an alternative in anti-caking functions.

- (7) its compatibility with a system of sustainable agriculture.

borderline; should have application only as a anti-caking ingredient in food processing and for de-coloring (ie in Jam/Jelly manufacturing)

TAP REVIEWER COMMENT FORM for USDA/NOSB

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This file is due back to us by: Aug. 5, 1996

Name of Material: Silicon Dioxide

Reviewer Name: WALTER JEFFERY RECEIVED JUL 29 1996

Is this substance Synthetic or non-synthetic? Explain (if appropriate)

Synthetic

If synthetic, how is the material made? (please answer here if our database form is blank)

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, Non-synthetic (Allowed as an ingredient in organic food)

Non-synthetic (Allowed as a processing aid for organic food)

or, this material should not be on the National List

Are there any use restrictions or limitations that should be placed on this material on the National List?

Please comment on the accuracy of the information in the file:

Any additional comments? (attachments welcomed)

one of the least offensive anticaking agents

Do you have a commercial interest in this material? Yes; No

Signature Walter Jeffery

Date 7/24/96

Please address the 7 criteria in the Organic Foods Production Act:
(comment in those areas you feel are applicable)

- (1) the potential of such substances for detrimental chemical interactions with other materials used in organic farming systems;

little or no potential for detrimental chemical interactions

- (2) the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment;

non toxic

- (3) the probability of environmental contamination during manufacture, use, misuse or disposal of such substance;

very little to none

- (4) the effect of the substance on human health;

no effect

- (5) the effects of the substance on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock;

no effect

- (6) the alternatives to using the substance in terms of practices or other available materials; and

magnesium carbonate, other silica compounds

- (7) its compatibility with a system of sustainable agriculture.

not really a problem, there is more than enough naturally

TAP REVIEWER COMMENT FORM for USDA/NOSB

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This file is due back to us by: Aug. 5, 1996

Name of Material: Silicon Dioxide

Reviewer Name: William A. Zimmer D.V.M. RECEIVED JUL 30 1996

Is this substance Synthetic or non-synthetic? Explain (if appropriate)

Synthetic

If synthetic, how is the material made? (please answer here if our database form is blank)

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, Non-synthetic (Allowed as an ingredient in organic food)

Non-synthetic (Allowed as a processing aid for organic food)

or, this material should not be on the National List

Are there any use restrictions or limitations that should be placed on this material on the National List?

Please comment on the accuracy of the information in the file:

fairly complete, accurate

Any additional comments? (attachments welcomed)

Uses - moisture scavenger, drying agent

Do you have a commercial interest in this material? Yes; No

Signature William A. Zimmer D.V.M. Date 7-8-96

Please address the 7 criteria in the Organic Foods Production Act:
(comment in those areas you feel are applicable)

- (1) the potential of such substances for detrimental chemical interactions with other materials used in organic farming systems;

none

- (2) the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment;

none

- (3) the probability of environmental contamination during manufacture, use, misuse or disposal of such substance;

none

- (4) the effect of the substance on human health;

Dust laden air should not be breathed in. Breathing apparatus should be used when working with concentrated silicon dioxide. Fineness of dust may cause silicosis of airway passages if excessive amounts are breathed in.

- (5) the effects of the substance on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock;

none

- (6) the alternatives to using the substance in terms of practices or other available materials; and

- (7) its compatibility with a system of sustainable agriculture.

compatible

NOSB Materials Database

1

Identification

Common Name **Silicon Dioxide** Chemical Name
Other Names **Synthetic Amorphous Silica**
Code #: CAS Code #: Other
N. L. Category **Non-agricultural** MSDS yes no

Chemistry

Family
Composition **SiO₂**
Properties **Amorphous substance with noncrystalline pattern. Fumed silica is a white, fluffy, nongritty powder and is hygroscopic. Wet-process silicas occur as white, fluffy powders or as microcellular granules and are hygroscopic or absorb moisture from the air. All are insoluble in water and in organic solvents, but are soluble in hydrofluoric acid and in hot, concentrated solutions of alkalis.**
How Made **Produced synthetically by either a vapor-phase hydrolysis process, yielding fumed (or colloidal) silica, or by a wet process, yielding precipitated silica, silica gel, or hydrous silica. (FCC)**
Type of Use **Processing**

Use/Action

Specific Use(s) **Anticaking agent; defoaming agent; carrier; conditioning agent; chillproofing agent in malt beverages.**
Action
Combinations

Status

OFPA
N. L. Restriction
EPA, FDA, etc **FDA-GRAS**
Directions
Safety Guidelines
Historical status
International status **Allowed by EU and Codex.**

NOSB Materials Database

OFPA Criteria

2

2119(m)1: chemical interactions

2119(m)2: toxicity & persistence

2119(m)3: manufacture & disposal consequences

2119(m)4: effect on human health

2119(m)5: agroecosystem biology

2119(m)6: alternatives to substance
Other anticaking agents.

2119(m)7: Is it compatible?

References

AU: Villota, -R.; Hawkes, -J.G.

TI: Food applications and the toxicological and nutritional implications of amorphous silicon dioxide.

SO: C-R-C-Crit-Rev-Food-Sci-Nutr. Boca Raton, Fla. : CRC Press. 1986. v. 23 (4) p. 289-321. ill., charts.

CN: DNAL TP368.C7

AB: Abstract: A literature review provides current information on the incorporation of amorphous silicon dioxide (silica) as a functional additive in food processing, and discusses some of the toxicological and nutritional aspects of silica usage. Data on the physical properties of commercial conditioning agents (including silicas) and on current commercial applications of amorphous silica are included.(wz).

AU: Peleg, -Micha.; Hollenbach, -Ann-M.

TI: Flow conditioners and anticaking agents.

SO: Food-Technol. Chicago, Ill. : Institute of Food Technologists. March 1984. v. 38 (3) p. 93-102.

CN: DNAL 389.8-F7398

AB: Abstract: Flow conditioners and anticaking agents are finely-divided solids that are added to a host powder to improve its flowability and/or to inhibit its tendency to cake. The principal commercial food-grade conditioners include silicon dioxide, silicates, phosphates, stearic acid salts, talc, starches, and modified carbohydrates. Varying the concentration of these additives can produce certain effects.