



STARCH

CAS number: 9005-25-8

Synonyms: Amylum

Chemical formula: $(C_6H_{10}O_5)_n$

Structural formula: —

Workplace exposure standard (retained)

TWA: 10 mg/m³

STEL: —

Peak limitation: —

Notations: —

IDLH: —

Sampling and analysis: The recommended value is quantifiable through available sampling and analysis techniques.

Recommendation and basis for workplace exposure standard

A TWA of 10 mg/m³ is recommended to protect for dermatitis and the aggravation of existing pulmonary (lung) disease in exposed workers.

Discussion and conclusions

Starch is primarily used in in textiles, printing, mining, adhesives, explosives, cosmetics, food products and as lubricant in surgical gloves.

Critical effects of exposure are dermatitis and the aggravation of existing pulmonary disease.

Limited data from human and animal studies indicate that starch has negligible acute, chronic and dermal toxicity (ACGIH 2018, HCOTN 2002).

Given the absence of available exposure data, the TWA of 10 mg/m³ by ACGIH (2018) is recommended to be retained to limit irritant effects.

Recommendation for notations

Not classified as a carcinogen according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Not classified as a skin sensitizer or respiratory sensitizer according to the GHS.

There are insufficient data to recommend a skin notation. A review of additional data sources is recommended at the next scheduled review to address reports of chronic dermatitis.

APPENDIX

Primary sources with reports

Source	Year set	Standard
SWA	1991	TWA: 10 mg/m³
ACGIH	2001	TLV-TWA: 10 mg/m³
<p>TLV-TWA recommended to minimise the risk of dermatitis and the aggravation of existing pulmonary disease in exposed workers</p> <p>Summary of data:</p> <p>Human data:</p> <ul style="list-style-type: none"> Handling of starch products can cause chronic occupational dermatitis Dermal exposure to 300 µg intermittently over 3 d resulted in mild erythema and oedema. <p>Animal data:</p> <ul style="list-style-type: none"> Exposure at 20% body weight (oral) produced few signs of intoxication (no further details provided) LD₅₀: 6,600 mg/kg (mice, intraperitoneal) NOAEL in a 2 yr dietary study rats fed 30% starch and a 3-generation study with rats fed 10% starch resulted in no observed adverse effects. <p>Not Classifiable as a Human Carcinogen (A4).</p> <p>Insufficient data to recommend a skin or sensitiser notation.</p>		
DFG	NA	NA
No report.		
SCOEL	NA	NA
No report.		
OARS/AIHA	NA	NA
No report.		
HCOTN	2002	TWA: 10 mg/m³
<p>The committee considers the toxicological data base on starch too poor to justify recommendation of a health-based occupational exposure limit.</p> <p>Summary of additional data:</p> <p>Millers and bakers occupationally exposed to grain and flour dusts at 1.1–14.3 mg/m³, total dust showed significantly higher incidences of coughing and chronic bronchitis compared to a non-exposed reference group. Flour is a complex product (70% starch), 12% gluten and may also contain mite dust and endotoxins. As such the causative role of starch in the observed respiratory symptoms is therefore not clear.</p>		

Secondary source reports relied upon

NIL.

Carcinogenicity — non-threshold based genotoxic carcinogens

Is the chemical mutagenic? Insufficient data

Is the chemical carcinogenic with a mutagenic mechanism of action? Insufficient data

Insufficient data are available to determine if the chemical is a non-threshold based genotoxic carcinogen.

Notations

Source	Notations
SWA	—
HCIS	NA
NICNAS	NA
EU Annex	NA
ECHA	NA
ACGIH	Carcinogenicity – A4
DFG	NA
SCOEL	NA
HCOTN	—
IARC	NA
US NIOSH	NA
NA = not applicable (a recommendation has not been made by this Agency); — = the Agency has assessed available data for this chemical but has not recommended any notations	

Skin notation assessment

Calculation

Insufficient data to assign a skin notation.

IDLH

Is there a suitable IDLH value available? No

Additional information

Molecular weight:	692.7
Conversion factors at 25°C and 101.3 kPa:	1 ppm = Number mg/m ³ ; 1 mg/m ³ = Number ppm
This chemical is used as a pesticide:	<input type="checkbox"/>
This chemical is a biological product:	<input type="checkbox"/>



This chemical is a by-product of a process:

☐

A biological exposure index has been recommended by these agencies:

☐ ACGIH☐ DFG☐ SCOEL

Workplace exposure standard history

Year	Standard
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[Click here to enter year](#)

References

American Conference of Industrial Hygienists (ACGIH®) (2018) TLVs® and BEIs® with 7th Edition Documentation, CD-ROM, Single User Version. Copyright 2018. Reprinted with permission. See the [TLVs® and BEIs® Guidelines section](#) on the ACGIH website.

Health Council of the Netherlands (HCOTN) (2002) Starch. Health-based calculated occupational cancer risk values. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/038.