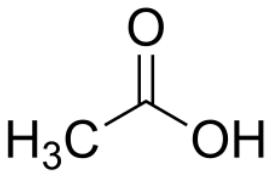
Glacial Acetic Acid
Product Quality, Regulatory & Technical Information Package
June 2025

Product Name: **Glacial Acetic Acid (technical grade)**



Chemical Name:	Acetic Acid
CAS number:	64-19-7
Celanese (bulk) Material number:	50000501 (Glacial Acetic Acid - Global)
	51009356 (Glacial Acetic Acid for Industrial Use - China)

Blends of the Product with water are available from Celanese.

Disclaimer

Celanese is supplying Glacial Acetic Acid as a technical grade product.

This document provides information about technical grade Acetic Acid ("Product") produced by Celanese and its affiliates ("Celanese" or "we"). The information presented in this document is based on our present state of knowledge and is intended to provide general notes on the Product and its intended uses. It does not constitute a guarantee of any specific properties of the Products described herein or its suitability for a particular application. The customer must make the sole determination whether the Product is suitable for the desired use. Celanese undertakes no obligation to update the information in this document.

The practice of providing this information to customers is for their convenience and is not legally binding. It does not alter the terms and conditions of sale, including without limitation, any limits of liability, applicable to the underlying commercial transaction involving the Product(s) to which this information applies. The Information is intended for use by persons having skill with respect to the subject matter involved.

Celanese makes no warranties, express or implied, and assumes no liability for the accuracy or completeness or in connection with any use of this information. Nothing herein is intended as a license to operate under or a recommendation to infringe any patents.

General

Further literature to the Product, such as Safety Data Sheet, Brochures and Specifications can be retrieved from Celanese website www.celanese.com.

Table of Contents

Product Description

Acetic Acid is a clear, colorless liquid with an acrid taste and a pungent, vinegar-like odor. It is miscible in all proportions with water, ethyl alcohol, ether and other organic solvents, but is insoluble in carbon disulfide.

Acetic Acid is very corrosive and may react quickly, under certain conditions, resulting in rapid evolution of heat. Acetic Acid is stable under recommended storage conditions. Acetic Acid will burn when heated or exposed to an ignition source. It is one of the most important large-volume, synthetic organic acids.

The major use for Acetic Acid is as a raw material for vinyl acetate, produced by reaction with ethylene and oxygen. Vinyl acetate is in turn the raw material for polyvinyl acetate, an important polymer used in paints, adhesives, plastics, and textile finishes.

Another important use for Acetic Acid is as a raw material for Acetic Anhydride. This chemical is principally used as an intermediate for cellulose acetate fibers and plastics.

A third significant use for Acetic Acid is as a solvent in the production of Terephthalic Acid from para-Xylene. Terephthalic Acid is one of the major raw materials for polyester fiber and film.

Large quantities of Acetic Acid are used to manufacture esters such as Ethyl Acetate and Butyl Acetate. These solvents find general application in the lacquer, plasticizer and pharmaceutical fields.

Chloroacetic Acid is manufactured from Acetic Acid and Chlorine. The primary end use of Chloroacetic Acid is Sodium Carboxymethylcellulose (CMC). Chloroacetic Acid is the starting point for the production of a series of herbicides, prime examples of which are 2,4-Dichloro-phenoxyacetic Acid and the iso-propyl ester of 2,4,5-Trichlorophenoxyacetic acid.

Textile finishing operations require considerable quantities of Acetic Acid. Acetic Acid is also used in the production of Sorbic Acid, various dyestuffs and pigments.

Other products made from Acetic Acid are salts of Acetic Acid and various rubber and photographic chemicals.

Acetic Acid is a versatile chemical. The following reactions are typical:

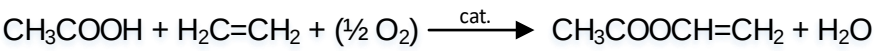
1. Anhydride Formation

$$2\ CH_3COOH \longrightarrow (CH_3CO)_2O + H_2O$$

2. Ketene Formation

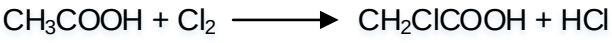
$$CH_3COOH \xrightarrow{600\ °C} CH_2{=}C{=}O + H_2O$$

3. Vinyl Acetate Monomer



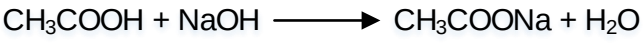
$$CH_3COOH + H_2C{=}CH_2 + (½\ O_2) \xrightarrow{cat.} CH_3COOCH{=}CH_2 + H_2O$$

4. Halogenation



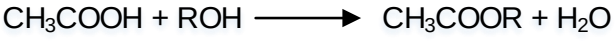
$$CH_3COOH + Cl_2 \longrightarrow CH_2ClCOOH + HCl$$

5. Salt Formation



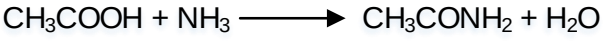
$$CH_3COOH + NaOH \longrightarrow CH_3COONa + H_2O$$

6. Ester Formation



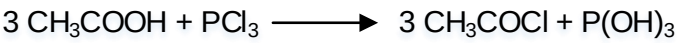
$$CH_3COOH + ROH \longrightarrow CH_3COOR + H_2O$$

7. Amide Formation

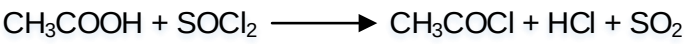


$$CH_3COOH + NH_3 \longrightarrow CH_3CONH_2 + H_2O$$

8. Acid Chloride Formation



$$3\ CH_3COOH + PCl_3 \longrightarrow 3\ CH_3COCl + P(OH)_3$$



$$CH_3COOH + SOCl_2 \longrightarrow CH_3COCl + HCl + SO_2$$

Physical properties

Data are intended for the purpose of product description and are not the subject of continuous monitoring. Further physical properties and characteristic data as well as information on safety and handling are listed in the safety data sheet and the sales specifications. Please consult www.celanese.com.

Property (Grade: 99/100 %)		Metric Units	English Units
Autoignition Temperature		463 °C	865 °F
Boiling Point @ 101.3 kPa (14.69 psi)		118.1 °C	244.6 °F
Critical Pressure [1]		5.786 MPa	839.2 psia
Critical Temperature [1]		321.45 °C	610.6 °F
Dielectric Constant @20 °C (68 °F) [1]		6.194 F/m	
Dissociation Constant @25 °C (77 °F) [3]		4.76	
Evaporation Rate (n-Butyl Acetate = 1)		0.97	
Flash point [4]	Conc.: 100 vol %	39.5 °C	103.1 °F
(EN ISO 2719 Method A – Pensky Martens in closed cup)	Conc.: 95 vol %	44.5 °C	112.1 °F
	Conc.: 90 vol %	51 °C	123.8 °F
	Conc.: 85 vol %	54 °C	129.2 °F
	Conc.: 80 vol %	59 °C	138.2 °F
	Conc.: 40 vol %	none	none
Heat of Combustion		14.4 MJ/kg	
Heat of Vaporization (@ boiling point, atmospheric) [2]		404.32 kJ/kg	173.9 Btu/lb_m
Liquid Specific Heat @19.4 °C (66.9 °F) [1]		2.044 kJ/(kg·K)	0.4883 Btu/(lb_m·°F)
Liquid Thermal Conductivity @ 20 °C (68 °F) [2]		0.161 W/(m·K)	0.0931 Btu/(hr·ft·°F)
Molar Mass		60.05 g/mole	
Refractive Index n_D^{20} (68 °F)		1.372	
Solubility @20 °C (68 °F) wt%, Acid in Water		Complete	
Solubility @20 °C (68 °F) wt%, Water in Acid		Complete	
Solubility in alcohol, benzene, diethylether, acetone		Complete	
Solubility in carbon disulfide [1]		Insoluble	
Surface Tension @25 °C (77 °F)		27.1 mN/m	
Vapor Pressure @ 20 °C (68 °F) [1]		15.7 mbar	0.31 psia
Vapor Pressure @ 50 °C (122 °F)		77 mbar	1.12 psia

Acetic Acid [% (w/w)]	Acetic Acid [g/l]	Acetic Acid [mole/l]	Density at 20 °C (68 °F) [5] [g/cm³]	Solidification point [°C (°F)] [6]	Viscosity at 25 °C (77 °F) [7] [mPa·s]
100	1050	17.48	1.0491	16.63 (61.93)	1.0560
99	1042	17.35	1.0519	14.80 (58.64)	1.2477
98	1034	17.22	1.0540	13.40 (56.12)	1.3784
97	1025	17.04	1.0559	12.03 (53.65)	1.4976
96	1016	16.92	1.0577	10.69 (51.24)	1.6059
95	1007	16.77	1.0593	9.37 (48.87)	1.7042
90	959.5	15.98	1.0653	3.18 (37.72)	2.0638
85	908.6	15.13	1.0687	-2.46 (27.57)	2.2518
80	856.0	14.25	1.0701	-7.68 (18.18)	2.3211
70	748.0	12.46	1.0691	-17.31 (0.84)	2.2532
60	638.5	10.63	1.0646	-25.34 (-13.61)	2.0653
50	528.8	8.81	1.0575	-20.04 (-4.07)	1.8510
40	419.5	6.99	1.0484	-15.18 (4.68)	1.6408
30	311.5	5.19	1.0377	-10.76 (12.63)	1.4376
20	205.3	3.42	1.0258	-6.77 (19.81)	1.2400
10	101.3	1.69	1.0131	-3.22 (26.20)	1.0539
5	50.28	0.84	1.0061	-1.61 (29.10)	0.9688

Glacial Acetic Acid - Vapor Pressure [1]

T (°C)	T (°F)	P (mbar)		T (°C)	T (°F)	P (mbar)
0	32	4.7		150	302	2461
10	50	8.5		160	320	3160
20	68	15.7		170	338	4041
30	86	26.5		180	356	5091
40	104	45.3		190	374	6333
50	122	74.9		200	392	7813
60	140	117.7		210	410	9612
70	158	182.8		220	428	11733
80	176	269.4		230	446	14249
90	194	390.4		240	464	17057
100	212	555.3		250	482	20210
110	230	776.7		260	500	23854
118.2	245	1013		270	518	28077
130	266	1386.5		280	536	32801
140	284	1841.1				

Glacial Acetic Acid - Liquid Density [1]

T (°C)	T (°F)	Density (g/cm³)		T (°C)	T (°F)	Density (g/cm³)
20	68	1.0491		130	266	0.9235
26	79	1.0420		139	282	0.9119
34	93	1.0324		140	284	0.9092
52	126	1.0134		145	293	0.9030
60	140	1.0060		156	313	0.8889
63	145	1.0007		180	356	0.8555
75	167	0.9875		220	428	0.7941
85	185	0.9761		260	500	0.7136
97	207	0.9611		300	572	0.5950
100	212	0.9599		320	608	0.4615
107	225	0.9506		321	610	0.3506
117	243	0.9391				

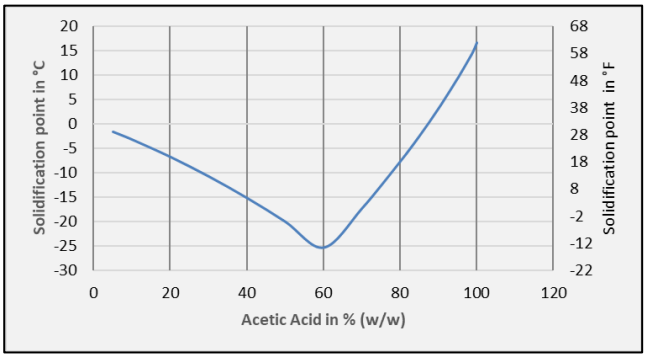


Figure 1: Solidification Point as a function of Acetic Acid concentration (blends with water)

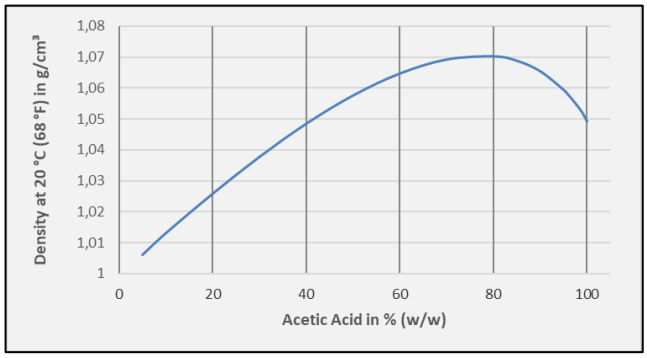


Figure 2: Density as a function of Acetic Acid concentration (blends with water)

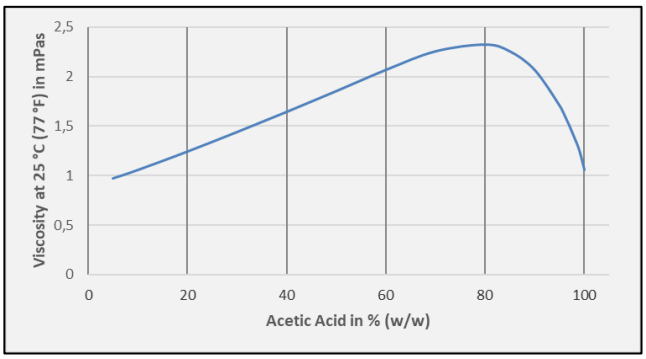


Figure 3: Viscosity as a function of Acetic Acid concentration (blends with water)

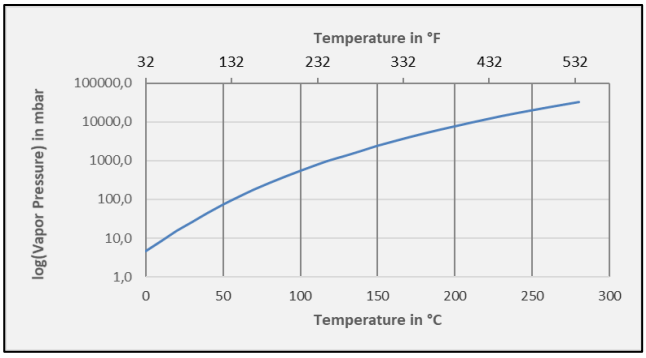


Figure 4: Vapor Pressure (log) as a function of Temperature (Glacial Acetic Acid)

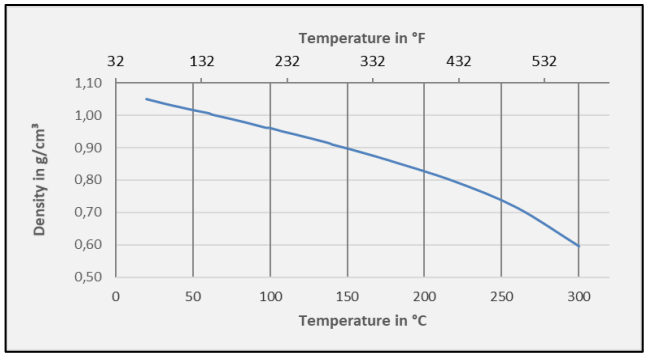


Figure 5: Density as a function of Temperature (Glacial Acetic Acid)

Storage and Handling Recommendations

Storage

Recommended Blanketing	Air[a,b] or Dry Nitrogen[c]	
Recommended Temperature		
Maximum (Glacial)	100° F	(37.8° C)
Minimum (Glacial)	65° F	(18.3° C)
Minimum (56 %)	0° F	(-17.8° C)
Minimum (70%)	10° F	(-12° C)
Minimum (84%)	32° F	(0° C)
Recommended pressure	Atmospheric	
Bulk Quantities	Outside, detached tanks	
Small Containers	Cool, dry, well ventilated area	

a. Refer to National Fire Protection Agency (NFPA) #77 "Static Electricity" or the respective national technical code for proper electrical grounding procedures.
b. See the National Fire Protection Agency (NFPA) #30 "Flammable and Combustible Liquids Code" or the respective national technical code and consult with qualified fire protection specialists to determine specific storage tank design requirements.
c. Blanketing may be used to retain quality in long-term storage conditions.

Handling

- Thoroughly review Safety Data Sheet before handling product.
- Protect small containers from physical damage. Keep containers closed when not in use. Open containers slowly to allow any excess pressure to vent.
- Keep away from heat, sparks, flame or other sources of ignition. Use spark-resistant tools.
- See the National Fire Protection Agency (NFPA) #30 "Flammable and Combustible Liquids Code" or the respective national technical code and consult with qualified fire protection specialists to determine specific storage tank design requirements.
- Use proper electrical grounding and bonding procedures when loading, unloading and transferring. Refer to the National Fire Protection Agency (NFPA) #77 "Recommended Practice for Static Electricity" or the respective national technical code for proper electrical grounding procedures.
- Electrical equipment and circuits in all storage and handling areas must conform to requirements of national electrical code (Articles 500 and 501) or the respective national technical code for hazardous location.
- Blanketing may be used to retain quality in long-term storage conditions.
- For further information on safety and handling, please use the following link: https://www.celanese.com/sds-search

Packaging

The following containers are suitable for handling and transportation of the Product:

- DOT 111A60AL1 or 111A100W6 Insulated Tank Cars
- DOT MC 307 or DOT 407 Tank Trucks
- IMO 1 ISO Tank
- Ship Tank and Barge

The Product is available from Celanese as bulk material.
Dilutions of the Product with demineralized water are available from Celanese as bulk material.

Materials of Construction

Unit / element	Acceptable Material	Alternate Material
Tank	Stainless Steel [a]	Stainless Steel [b]
Piping	Stainless Steel [a]	Stainless Steel [b]
Valves	Stainless Steel [a]	Stainless Steel [b]
Pumps	Stainless Steel [a]	Stainless Steel [b]
Relief Valves	Stainless Steel [a]	Alloy 20
Gaskets	Glass filled PTFE [e]	Graphite with Stainless Steel [a] Insert
Pump Seals	Single Mechanical Seal: Stainless Steel / Hastelloy C-276 metallic components [c], Kalrez O-rings	–
Valve Packing	PTFE [e]	Graphite
Pipe End Connections	Butt welded and flanged system	
Heat Exchanger	Product side: Stainless Steel [a, f]	Product side: Stainless Steel [b]
Hoses	Stainless Steel [a]	Stainless Steel [b]
Tank Truck	Stainless Steel [a, b]	Aluminum [d]
Tank Car	Stainless Steel [a, b]	Aluminum [d]
ISO Tank	Stainless Steel [a, b]	–
Barge	Stainless Steel [a, b]	–
Ship Tank	Stainless Steel [a, b]	–

a. Type 316, 316L/316 Dual Grade, or 2205 Stainless Steel
b. Type 304 or 304/304 Dual Grade Stainless Steel when temperature does not exceed 140 °F (60 °C).
c. Use Alloy-C-276 seal components for long service life.
d. Use 3000, 5000, 6000 series Aluminum when temperature does not exceed 120 °F (49 °C).
e. Polytetrafluoroethylene
f. For higher than 150°F (65 °C) metal temperatures consult a metallurgist.

Product Quality Statements

Manufacturing Locations

The Product is produced at manufacturing locations in Clear Lake (USA), Nanjing (China) and Singapore.

- Clear Lake Plant
  9502 Bayport Blvd.
  Pasadena, TX 77507-1498
  USA

- Nanjing Plant
  No. 66, West Fangshui Road,
  Nanjing Jiangbei New Materials High-Tech Park,
  Jiangsu, China, 210047

- Singapore Plant
  21 Sakra Avenue
  Singapore 627883

ISO Certification

The Product is a technical grade material produced under ISO 9001 rules. Certificates are available at Celanese web page (Select Filter "Intermediate Chemistry" and additional filters to retrieve the Certificate from the respective Manufacturing site):
https://www.celanese.com/certificate-search

Specification

The Product is supplied according to Celanese Sales Specification. A copy of the Sales Specification is attached to this dossier.

1. Celanese has a product traceability and withdrawal/recall program in place which we believe is appropriate for technical grade products.
2. The Product is not manufactured under GMP rules.
3. Celanese makes no nutrition statement.
4. There is no food or pharmaceutical grade hazard assessment program available for the Product.

Analytical Methods

Applied analytical methods according to the sales specifications provided as attachment.

Specifications	Analytical Methods [2]
Acetic Acid	ASTM E 302 (Calculated from Freezing Point) / HAC-001-STDEX (Celanese)
Freezing Point	ASTM E 302 / ASTM D 1493 / ASTM E 1064 / ASTM D 6875 / HAC-STD-001-EX (Celanese)
Water	DIN 51777 / ASTM D 1364 (mod. Karl-Fisher Method) / ASTM E1064 / HAC-STD-002EX (Celanese)

Specifications	Analytical Methods [2]
Color	DIN EN 1557 / DIN ISO 6271 / ASTM D 1209 / ASTM 5386 / HAC-STD-003EX (Celanese)
Distillation Range (incl. 118.1 °C)	ASTM D 1078 / HAC-STD-004EX (Celanese)
Formic Acid	ASTM D 3546
Aldehydes as Acetaldehyde	ASTM D 2191 / DIN 51 405 (GC) / HAC-STD-006EX (Celanese)
Propionic Acid [1]	DIN 51 405 (GC) / HAC-STD-006EX (Celanese)
Iron	ASTM E 394 / Photometric / ICP / HAC-STD-007EX (Celanese)
Heavy Metals as Lead	Sulfide Method / HAC-STD-008EX (Celanese)
Chlorides	HAC-STD-009X (Celanese)
Total Chlorine	ASTM D 5808-23 / DIN 51 408
Sulfates	HAC-STD-010EX (internal)
Sulfurous Acid	HAC-STD-011EX (internal)
Permanganate Time / Oxidizable Impurities	ASTM D 4052 / HAC-STD-12EX (Celanese) / GB/T 1628 2020 [1]
Density at 20 °C [3]	DIN 51 757, Method D
Evaporation Residue [1]	DIN 53172 / ASTM D 1353
Appearance	Visual Examination / ASTM E 2680

(1) Only applicable in China.
(2) Alternative equivalent methods can be used at Celanese Terminals.
(3) Applicable for water dilutions in EAME (Europe, Africa, and Middle East) region.

Manufacturing Process & Raw Materials

Acetic acid is produced by rhodium–catalyzed methanol carbonylation. In this process, methanol and carbon monoxide react to produce acetic acid according to the chemical equation:

$CH_3OH + CO \rightarrow CH_3COOH$

The acetic acid is purified by distillation.

Celanese supplies basic chemicals. Our production technology relies on a continuous production process, and the raw materials are mainly from fossil origin from national wide pipeline networks that might contain trace amounts of bio-content, independent of any Celanese activity. Because of the multiple reaction and purification steps along the value chain to produce Acetic Acid, we believe that the quality properties of our products are not influenced by the bio-content feedstock. All catalysts and processing aids are of synthetic origin. During the manufacturing process, the material does not come into contact with materials of animal origin.

Shelf Life

The shelf life of the Product and its water blends is one year.

The shelf life dates from the date of packaging, and for bulk deliveries this is the date of loading. This period is in general applicable to material

- packaged in discrete containers such as drums or bulk containers and
- stored under conditions recommended by Celanese.

For the Product this entails storage at ambient temperatures in tightly sealed, undamaged containers in a cool and well-ventilated place under dry air or dry nitrogen blanket. Blanketing may be used to retain quality in long term storage conditions, especially to prevent access of humidity.

Most products will have a longer useful life, but should be examined by the owner at its sole responsibility at the end of the recommended storage life to determine purity and condition of product. Bulk storage life, under recommended storage conditions, may be longer if the Product is routinely monitored for specific indications of the condition of the material, or if the Product in the tank is removed and replenished with fresh material on a routine basis. Any use of the Product after expiration of the shelf life is the sole responsibility of the buyer.

Kosher

A Kosher grade is available in some countries. Special shipping arrangements must be made in advance. Contact your Sales Representative for more information.

Celanese supplies basic chemicals. Our production technology relies on a continuous production process, and the raw materials are mainly from fossil origin from national wide pipeline networks that might contain trace amounts of bio-content, independent of any Celanese activity. Because of the multiple reaction and purification steps along the value chain to produce Acetic Acid, we believe that the quality properties of our products are not influenced by the bio-content feedstock. All catalysts and processing aids are of synthetic origin; we do not use any raw materials having an animal (diary) origin, nor is our process likely to be contaminated by such.

Halal

A Halal grade is available in some countries. Special shipping arrangements must be made in advance. Contact your Sales Representative for more information.

Celanese supplies basic chemicals. Our production technology relies on a continuous production process, and the raw materials are mainly from fossil origin from national wide pipeline networks that might contain trace amounts of bio-content, independent of any Celanese activity. Because of the multiple reaction and purification steps along the value chain to produce Acetic Acid, we believe that the quality properties of our products are not influenced by the bio-content feedstock. All catalysts and processing aids are of synthetic origin; we do not use any raw materials having an animal (diary) origin, nor is our process likely to be contaminated by such. Ethanol is not used as raw material or processing aid.

ICH Guidelines

The Product does not, based on Celanese's knowledge, contain solvents in the concentration limits specified by the ICH Guideline Q3C(R9) for residual solvents.
The Product itself is defined as a class 3 solvent by the ICH Guideline for residual solvents.

The Product does not contain intentionally added sources of biological substances as described in ICH: Q5A (R2): Viral safety evaluation of biotechnology products derived from cell lines of human or animal origin.

Radiation

The Product is not subjected to any artificial radiation.

Thawing of Frozen Acetic Acid

Acetic acid freezes at 16.35 °C. The use of steam is a common practice to slowly thaw frozen Acetic Acid (HAC) in pipelines or other containers. Perform this process carefully to avoid damage to the container and any flammability risk. Keep the product away from ignition sources; the flash point of acetic acid is 39 °C (104 °F). Avoid overheating specific zones of the container above the boiling point (118 °C). Take provisions to prevent overpressure of the container since the vapor pressure increases during the heating process. Do not expose the product to direct contact with steam to avoid affecting the product quality (water content). Thawing of frozen HAC under the described recommendations will not affect the quality of the product since it entails only a physical change from solid to liquid phase.

Regulatory Statements

The Product as of this date is not listed in the following regulations:

- Clean Water Act
- Clean Air Act
- CEPA List of Toxic Substances
- EPCRA Section 302
- Department of Homeland Security: Chemicals of Interest
- SARA 313
- California Proposition 65 (January 2025 list)
- Canada ERAP

The Product is not subject to Chemical Weapons Convention or Drug Precursor Substance reporting.

Animal Testing

The Product was not subject of animal testing for cosmetic purposes by or on behalf of Celanese in order to meet the requirements of Regulation (EC) No 1223/2009 on cosmetic products.

As a chemical products manufacturer and importer, Celanese is required to participate in the chemical industry's efforts to ensure the protection of human health and the environment, and also has obligations under the REACH regulation (Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals).

Celanese practice is to extensively search internally and externally for existing toxicological information before initiating testing. Where existing information does not exist for relevant endpoints, a comprehensive effort will be made to avoid the use of animals by employing alternative methods. When

other means have been exhausted and animal testing may be required to develop data to ensure the protection of health and the environment, scientifically sound techniques to reduce the numbers of animals will be used. All applicable animal welfare laws will be followed to ensure care and compassion are exercised.

BSE/TSE

Raw materials are mainly from fossil origin from national wide pipeline networks that might contain trace amounts of bio-content, independent of any Celanese activity. Because of the multiple reaction and purification steps along the value chain to produce Acetic Acid, we believe that the quality properties in terms of BSE/TSE are not influenced by the bio-content feedstock.

Genetically Modified Organisms (GMO)

The chemistry to manufacture the Product does not use genetically modified or engineered organisms or biomaterials. No GMO/GME substances are added to the Product.
The product is not verified through the Non-GMO Project Verification Program.

Acetic acid is produced mainly from fossil origin raw materials from national wide industry pipeline networks that might contain trace amounts of bio-content, independent of any Celanese activity. This bio-content might come from GMO sources. Because of the multiple reaction and purification steps along the value chain to produce Celanese's products, we believe that the quality properties in terms of GMO are not influenced by the bio-content feedstock. However, we do not have a specification for them, and we do not analyze them.

Global Country Inventories

The substance is listed in the following country inventories:

Chemical Inventory Status	listed	comments
Australia (AIIC)	yes	
Canada (DSL)	yes	
China (IECSC)	yes	
Japan (ENCS)	yes	
New Zealand (NZIOC)	yes	
Philippines (PICCS)	yes	
USA (TSCA)*	yes	active
Korea (KECI)	yes	
Taiwan (TCSI)	yes	
Mexico (INSQ)	yes	

* It is not subject to any action under TSCA Section 4, 5, 6, 8a, 8d, or 12b.

Allergens

The Product does not, based on Celanese's knowledge, contain the following substances and products thereof commonly associated with food allergens:

- Peanut
- Soya
- Bean
- Milk
- Egg
- Fish
- Peas
- Barley
- Lupine
- Mollusks
- Sulfur Dioxide
- Sulphites
- Tree nuts
- Wheat
- Crustaceans
- Gluten
- Glycerol
- Mustard

Excluded Substances

These substances are not, based on Celanese's knowledge, present in the Product. They are not known to be generated in the production process, nor are we aware of such substances appearing as impurities in the raw materials. However, we do not have a specification for those substances, nor do we analyze for them.

Normal trace levels of metals may be found in the product.

Substances listed in:

- Prohibition of Certain Toxic Substances Regulations, 2012 (SOR/2012-285), as of December 2020
- California Proposition 65 as of January 2025
- US EPA Priority Pollutants under the Clean Water Act as of Dec. 2019
- US EPA List of Ozone-Depleting Substances as of December 2019
- US Hazardous Air Pollutants (HAPS) as of December 2019
- ZDHC Manufacturing Restricted Substances List, Version 3.1 (July 2023) above applicable thresholds

- Aflatoxins
- Algaecide / biocide
- Alkyl phenol ethoxylates (APEO)
- Aromatic amines
- Aromatic hydrocarbons
- Asbestos
- Azo compounds
- BADGE (2,2-bis(4-hydroxyphenyl)propane bis(2,3-epoxypropyl) ether)
- BFDGE (bis(hydroxyphenyl)methane bis(2,3-epoxypropyl) ethers)
- Bisphenol A
- Bisphenol F
- Brominated flame retardants
- Butylated hydroxytoluene (BHT)
- Carbohydrates
- Coloring Agents / Dyes
- Naphthalene
- Natural Latex
- Nitrates
- Nitrogen oxide
- Nitrosamines
- Nitrosating agents
- NOGE (novolac glycidyl ether)
- Organotin compounds
- Ortho phenyl phenol (OPP)
- Ozone depleting substances
- Palm Oils / Palm Kernel Oils
- Paradichlorobenzene (PDCB)
- Per- and polyfluoroalkyl substances (PFAS)[1]
- Pesticides
- Phosphates
- Phthalates

[1] PFAS as defined by the OECD: PFAS definition published by Organization for Economic Co-operation and Development (OECD) provided at this LINK (last accessed on 25 July 2024) or via DOI 10.1787/e458e796-en

- Corn/Maize
- Cytokines
- Dioxins
- Epoxy compounds
- Ethylene oxide
- Flame retardants
- Fluorochemicals
- Formaldehyde and Formaldehyde releasers
- Glycol ethers
- Gold
- Hybridoma cells
- Jatropha
- Melamine
- Microplastics
- Mineral Oil Aromatic Hydrocarbons (MOAH)
- Mineral Oil Saturated Hydrocarbons (MOSH)
- Monoclonal antibodies
- Nanomaterials
- Nanoparticle-based protein Therapeutics
- Pigments
- Plasticizers
- Polycyclic Aromatic Hydrocarbons (PAH)
- Polybrominated substances
- Polychlorinated substances
- Polyethylene glycol
- Polyvinyl chloride (PVC)
- Protein subunits
- Radioactive substances
- Sewer sludge
- Silicones / Silicone oils
- Subunit vaccines from in-vitro cell culture
- Sulfonamides
- Tantalum
- Tin
- Tribromophenol
- Triclosan
- Tris (nonylphenyl) phosphite
- Tungsten
- Viral vectors and Viral vector derived products

EU REACH

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

Celanese is aware of the obligations imposed by REACH on EU manufacturers and importers as well as on downstream users.
We are obliged to comply with the requirements of the REACH legislation relating to our European manufacturing facilities, our own imports as well as our obligations as a downstream user in the European chemical industry.
Should you require additional information on REACH and SVHC, please contact Celanese at REACH@celanese.com.

Food & Food Contact

Celanese produces and offers the Product exclusively as a technical product. The Product is not of a Food or Food contact grade. Any suitability for use is the sole responsibility of the buyer to verify fitness of the Product for the intended use and fitness of the final good for introduction into the market and to ensure compliance of the final goods with the relevant regulations.

Acetic Acid itself is listed in the following regulations for use in food contact applications:

- US FDA 21CFR 184.1005
- Europe BfR
- China GB 9685-2016

Commission Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food

Status: 21st January 2021

The Product is placed on the market by Celanese exclusively as a technical grade material.
Regulation 10/2011/EU as amended applies to the materials and articles specified in Article 2 of this regulation. The Product does not fall under the scope of this regulation.

The component Acetic Acid is generally listed in ANNEX I, Table 1 in the "Union list of authorized monomers, other starting substances, macromolecules obtained from microbial fermentation, additives and polymer production aids" with the following entry

(1)	FCM substance No	115
(2)	Ref. No	10090 30000
(3)	CAS No	0000064-19-7
(4)	Substance name	acetic acid
(5)	Use as additive or polymer production aid (yes/no)	substance is authorized to be used as additive or polymer production aid
(6)	Use as monomer or other starting substance or macromolecule obtained from microbial fermentation (yes/no)	substance is authorized to be used as monomer or other starting substance or macromolecule obtained from microbial fermentation
(7)	FRF applicable (yes/no)	migration results cannot be corrected by the Fat Consumption Reduction Factor (FRF)
(8)	SML [mg/kg]	no entry

Dual Use Additives (Food)

Status: 21st January 2021

The Product is placed on the market by Celanese exclusively as a technical grade material.
It is ultimately the responsibility of the customer to determine the suitability of the Product for their specific enduse application.
"Certain substances used in food contact plastics are, at the same time, authorized food additives or authorized flavorings respectively by Regulation (EC) No 1333/2008 or Regulation (EC) No1334/2008 or their implementing measures. These substances are called dual-use additives.
To decide if a substance can be considered as a dual-use additive, it is sufficient that the chemical identity of the plastic additive matches that of an authorized food additive or flavoring, regardless of its purity or whether or not the substance is subject to a restriction in food and/or in the plastic." [a]

Food Additives
Regulation (EC) No 1333/2008 on food additives
The Product is not listed.

Regulation 231/2012 on Specifications for Food Additives
It is not applicable for Celanese Acetic Acid, Technical Grade 99/100 % as it applies to Food Grade material only. Despite this, we can confirm that the below mentioned purity requirements, as stated in regulation 231/2012, are fulfilled by our Acetic Acid:

- Boiling point: 118 °C at 760 mmHg

- Test for acetate: positive
- Nonvolatile residue not greater than 100 mg/kg

It should be noted and understood, these substances are not part of Celanese's routine analytical procedures and quality control system, therefore, analytical data on these components cannot be provided.
Any use of this statement by the customer is with the express understanding that this statement does not alter any of the applicable terms and conditions of sale, including but not limited to any limitations on liability, applicable to the underlying commercial transaction involving the products to which this statement applies. In particular, this statement does not constitute any type of warranty or guarantee in respect of Glacial Acetic Acid and Acetic Acid Technical Grade 99/100 %.

Flavorings
Regulation (EC) No 1334/2008 on flavorings and certain food ingredients with flavoring properties for use in and on foods and amending Council Regulation (EEC) No 1601/91, Regulations (EC) No 2232/96 and (EC) No 110/2008 and Directive 2000/13/EC.
The Product is generally listed in Annex I Union List Of Flavorings and Source Materials, PART A Union list of flavoring substances:

(1)	FL No	08.002
(2)	Chemical name	Acetic acid
(3)	CAS No	64-19-7
(4)	JECFA No	81
(5)	CoE No	2
(6)	Purity of the named substance at least 95% unless otherwise specified	
(7)	Restrictions of Use	
(8)	Footnote	
(9)	Reference	JECFA

[a] Quote from "Union Guidelines on Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food"(published by the European Commission Health And Consumers Directorate-General, 21.02.2014)
http://ec.europa.eu/food/food/chemicalsafety/foodcontact/docs/10-2011_plastic_guidance_en.pdf

Packaging Inks in Swiss Ordinance of the FDHA on Materials and Articles (817.023.21)

Status: 21st January 2021

Packaging inks are regulated in the section 12 of the Ordinance of the FDHA on Materials and Articles, and the provisions of this Section apply to packaging inks as specific constituent elements of materials and articles.
General listings in Annex 2 and Annex 10 to the Swiss Ordinance of the FDHA on Materials and Articles (817.023.21):
Annex 2

1	Stoff-Nr..	33
2	Bezeichnung des Stoffes	Acetic acid
3	CAS-Nr.	0000064-19-7
4	Verpackungsmaterial-Referenz-Nr. der Europaischen Kommission fur den Stoff	10090 30000
5	Verwendung als Monomer oder als anderer Ausgangsstoff oder als durch mikrobielle Fermentation gewonnenes Makromolekul	M
6	Verwendung als Zusatzstoff oder als Hilfsstoff bei der Herstellung von Kunststoffen	A
7	FRF anwendbar	

8	SML [mg/kg]	
9	SML(T): Gruppenbeschränkungs-Nr	
10	Beschränkungen und Spezifikationen	
11	Hinweise zur Konformitätsprüfung	

Annex 10

1	Nr.	33
2	Bezeichnung des Stoffes	Acetic acid
3	CAS-Nr.	0000064-19-7
4	Ref-Nr.	10090 30000
5	Verwendung	M, AD
6	Teil	A
7	SML [mg/kg]	

Restriction of Hazardous Substances (RoHS)

Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast) (RoHS)

Status: 21st January 2021

The Product as supplied by Celanese does not fall within the scope of directive 2011/65/EU, since it applies to electrical and electronic equipment (EEE) "falling within the categories set out in Annex I." (Art. 2)
Annex II of Directive 2011/65/EU lists "Restricted substances […] and maximum concentration values tolerated by weight in homogeneous materials"

- Lead (0.1 %)
- Mercury (0.1 %)
- Cadmium (0.01 %)
- Hexavalent chromium (0.1 %)
- Polybrominated biphenyls (PBB) (0.1 %)
- Polybrominated diphenyl ethers (PBDE) (0.1 %)
- Bis(2-ethylhexyl) phthalate (DEHP) (0,1 %)
- Butyl benzyl phthalate (BBP) (0,1 %)
- Dibutyl phthalate (DBP) (0,1 %)
- Diisobutyl phthalate (DIBP) (0,1 %)

The Product, based on Celanese's knowledge, does not contain these substances at the required limits. However, these substances are not routinely tested in our analytical procedures and quality control system, therefore, analytical data on the existence/non-existence of these substances cannot be provided.

Volatile Organic Compounds (VOC)

Status: 21st January 2021

The Product fulfills the criteria and is considered a VOC according to

- 2010/75/EU on industrial emissions (integrated pollution prevention and control) (Recast)

- 2004/42/CE on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products (Paints Directive)
- Swiss OVOC, Ordinance on the Incentive Tax on Volatile Organic Compounds 814.018

Attachment I: Sales Specifications

Global

Glacial Acetic Acid

CAS-No. 64-19-7

Sales Specification

Specifications [1]		Limit	Unit
Acetic Acid [2]	min.	99.85	wt. %
Freezing Point	min.	16.35	°C
Water	max.	0.15	wt. %
Color	max.	10	Pt-Co
Distillation Range [3]	max.	1.0	°C
Formic Acid	max.	0.0500	wt. %
Aldehydes as Acetaldehyde	max.	0.0500	wt. %
Iron	max.	0.40	ppm
Heavy Metals, as Pb	max.	0.5	ppm
Chlorides [4]	max.	1.0	ppm
Sulfates	max.	1.0	ppm
Sulfurous Acid	max.	1.0	ppm
Permanganate Time	min.	2	hours
Specific Gravity 20°C/20°C	-	1.0505 – 1.0520	-
Appearance	-	CFSM [5]	-

(1) Analytical methods are available upon request.
(2) Determined by Freezing Point.
(3) Product conforms to limit, but test is not routinely performed.
(4) Total chlorine meets 1 ppm max., but test is not routinely performed.
(5) Clear and Free from Suspended Matter.

Product Numbers: 50000501, 50001486
Spec. HAC-001-Global-Jun25
Supersedes: Global Spec HAC-001, Nov 2016 / EAME Spec 50000501, Version 5, Nov 15, 2016.

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China

Celanese
The chemistry inside innovation™

Glacial Acetic Acid for Industrial Use (China) CAS-No. 64-19-7

Sales Specification

Specifications (1)		Limit	Unit
Acetic Acid (2)	min.	99.85	wt. %
Freezing Point	min.	16.35	°C
Water	max.	0.15	wt. %
Color	max.	10.0	Pt-Co
Distillation Range	max.	1.0	°C
Formic Acid	max.	0.03	wt. %
Aldehydes as Acetaldehyde	max.	0.02	wt. %
Iron	max.	0.40	ppm
Heavy Metals, as Pb	max.	0.5	ppm
Chlorides	max.	1.0	ppm
Sulfates	max.	1	ppm
Sulfurous Acid	max.	1	ppm
Permanganate Time	min.	2	hours
Propionic Acid	max.	500	ppm
Evaporation Residue	max.	0.005	wt. %
Appearance	-	CFSM (3)	-

(1) Analytical methods are available upon request.
(2) Determined by Freezing Point.
(3) Clear and Free from Suspended Matter.

Product Numbers: 51009356
Spec. HAC-001-China-Jun25
Supersedes: Sep-2020

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