

TECHNICAL DATA SHEET

VANILLIN

Synthetic aroma chemical with an intense, warm, sweet and creamy vanilla odour

1. RAW MATERIAL IDENTIFICATION

Product name	Vanillin
Chemical name	4-Hydroxy-3-methoxybenzaldehyde
Synonyms	Vanillin; Vanillic Aldehyde; Methylprotocatechuic Aldehyde
INCI name	VANILLIN
CAS number	121-33-5
EC number	204-465-2
FEMA number	3107
FLAVIS number	05.018
IUPAC name	4-Hydroxy-3-methoxybenzaldehyde
Molecular formula	$C_8H_8O_3$
Molecular weight	152.15 g/mol
Chemical group	Aromatic phenolic aldehyde
Geographical origin	China
Raw material origin	Synthetic
Raw material category	Aroma chemical
Halal status	Halal compliant
Kosher status	Kosher compliant

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2. OLFACTORY CLASSIFICATION AND ODOUR PROFILE

Fragrance note	Base note
Primary olfactory family	Gourmand - Sweet
Additional classification	Balsamic / Powdery / Lactonic - Creamy
Odour profile	Intense, sweet, warm and creamy vanilla odour with balsamic, powdery and slightly milky nuances
Application	Fragrance compositions, cosmetic products and flavours

3. DESCRIPTION AND FUNCTION IN FRAGRANCE COMPOSITION

Vanillin is one of the most important and widely used aroma chemicals in perfumery. It is the principal molecule responsible for the recognisable odour of vanilla, although natural vanilla contains numerous additional aromatic compounds that make its profile more complex.

It has an intense, sweet, warm and creamy odour with nuances of vanilla, cream, milk, powder and soft balsam. Its profile is fuller, denser and less sharp than that of ethyl vanillin, producing a more natural and rounded vanilla effect in compositions.

Vanillin is a fundamental building material in gourmand compositions, but its application is not limited to fragrances in which vanilla is the main theme. At lower concentrations, it softens sharp transitions, rounds floral, ambery, woody and spicy accords and provides warmth, sweetness and fullness.

At higher concentrations, it becomes a dominant base note and creates a pronounced vanilla, creamy, powdery or confectionery character. It has good substantivity and contributes to prolonged fragrance development on skin and blotter.

Solid vanillin may gradually develop a pale yellow shade. This change does not necessarily indicate loss of quality if odour, purity and other parameters remain within specification. In some formulations it may contribute to discolouration of the finished product, particularly at higher concentrations, elevated temperatures or an unsuitable pH.

Functional role in perfumery: Gourmand and balsamic base note, building material for vanilla accords, modifier and mild fixative. It provides sweetness, warmth, creamy fullness and roundness, softens sharp olfactory transitions and links floral, ambery, woody, spicy and musky elements.

4. APPLICATION AND OLFACTORY COMPATIBILITY

Recommended use in fragrances: Vanillin is used to build warm, sweet, creamy and balsamic base notes and to increase the fullness, roundness and longevity of fragrance compositions.

It is used to create and modify:

- vanilla and gourmand accords;
- caramel, chocolate, cocoa and coffee compositions;
- creamy, milky and confectionery odour profiles;
- ambery and balsamic compositions;
- powdery and floral-powdery fragrances;
- tonka, benzoin, Peru balsam and labdanum accords;
- floral compositions with rose, jasmine, heliotrope, iris and ylang-ylang;
- spicy accords with cinnamon, clove, anise and cardamom;
- tobacco, leathery and woody compositions;
- musky and oriental fragrances;
- fragrances for soaps, cosmetics and household-care products.

It combines well with ethyl vanillin, ethyl maltol, coumarin, heliotropin, benzoin, Peru balsam, labdanum, tonka, sandalwood, patchouli, vetiver, floral materials, ionones, musk aroma chemicals and warm spices.



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5. RECOMMENDED USE

Recommended use level	0.10-5.00% in the fragrance concentrate
0.10-1.00%	Modifier and subtle source of sweetness
1.00-5.00%	Pronounced vanilla and gourmand character
Higher levels	Compositions in which vanilla is the main olfactory theme
Laboratory dilution	10% in ethanol, DPG, triethyl citrate or another suitable perfumery solvent

The crystals must be dissolved in a suitable perfumery solvent before use. Dissolution may be accelerated by gentle heating with stirring, without exposure to an open flame or another ignition source. The stated range is a formulation recommendation, not a regulatory maximum concentration.

IFRA certificate: According to the manufacturer's certificate prepared in accordance with the 51st IFRA Amendment, Vanillin is permitted up to 100% in the listed product categories. This is not a recommendation for use at 100%; the final level must be determined according to the desired olfactory effect, safety assessment and intended use of the finished product.

6. PHYSICOCHEMICAL AND TECHNICAL DATA

Appearance	Crystals
Colour	Cream; may gradually become yellow over time
Melting point	81-84 °C
Flash point	Above 100 °C, closed-cup method
Vapour pressure	Approximately 0.010 mmHg at 25 °C
Log Pow	Approximately 1.21
Loss on drying	Maximum 0.50%
Purity	Minimum 99.5%
Water solubility	Limited; approximately 6.875 g/l at 25 °C
Solubility in ethanol	Soluble
Refractive index	Not applicable to the crystalline form
Storage	Up to 20 °C in the original, hermetically sealed container with minimal headspace, protected from air, light and heat sources
Shelf life	24 months

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7. STABILITY AND STORAGE

Stable under normal conditions of use and storage. Avoid strong oxidising agents, elevated temperatures and prolonged exposure to air and light. Carefully reseal the container immediately after use. Confirm stability, odour and possible colour change in the finished formulation and intended packaging.

8. REGULATORY DATA AND STATUS

Halal status: Halal compliant.

Kosher status: Kosher compliant.

Vegan status: Vegan; contains no animal-derived ingredients.

GMO status: Does not contain and is not derived from GMOs.

Nanomaterials: Not stated in the supplied TDS.

9. SAFETY INFORMATION

Vanillin is intended for professional use as an ingredient in fragrance, cosmetic and flavour compositions. Direct application of the undiluted material to the skin is not recommended.

According to the supplied SDS, it is classified as a substance that causes serious eye irritation.

Classification	Eye Irrit. 2
Signal word	Warning
H319	Causes serious eye irritation
P264	Wash hands thoroughly after handling
P280	Wear protective gloves, protective clothing and eye or face protection
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337+P313	If eye irritation persists: Get medical advice or attention
Acute oral toxicity	LD ₅₀ 3,830 mg/kg, rat
Acute dermal toxicity	LD ₅₀ > 2,000 mg/kg, rabbit
Skin irritation	No data available
Serious eye damage / irritation	Classified as Eye Irrit. 2
Respiratory or skin sensitisation	No data available
Phototoxicity	No data available
PBT status	No data available
vPvB status	No data available

During handling, avoid creating or inhaling crystalline dust, direct contact with the eyes and release into the environment. Use suitable protective gloves and safety goggles and ensure adequate ventilation in the working area.

10. DISCLAIMER

The information applies solely to the described raw material and does not replace the specification, COA, IFRA documentation or SDS issued by the specific manufacturer. The user is responsible for verifying suitability, stability, safety and regulatory compliance in the intended application and target market. This document does not constitute regulatory approval or a guarantee of finished-product properties.