

CERTIFICATE of ANALYSIS



Fentanyl Analog Screening Kit - Emergent Panel Version 2 and 3

For R&D purposes only. Not intended for human or animal use.

Item No.:	9003380
Batch No.:	0579747
Size:	200 µg/well
Expiry Date:	27JAN2025 (valid from date of certification)
Storage & Handling:	Store upright and unopened at -20°C. Warm to room temperature prior to opening.
Safety:	Danger. Review the Safety Data Sheets before use.

Description

This product consists of 96-well Matrix plates containing individual fentanyl analog standards. The individual well locations for each unique standard are listed in the table below. The supplemental data package contains the batch-specific certificates of analysis for each compound used in the preparation of this plate.

Traceability Statement

This kit was prepared from individual standards that have been verified through standard quality testing and are traceable via individual item and batch numbers. Individual certificates of analysis are available at www.caymanchem.com/faskitdocuments. All compounds used to make this kit were used within their valid expiry dates. Stability testing of this kit is ongoing to ensure continuous quality and traceability of the materials.

Quality Testing

A single kit was pulled randomly from the batch and high resolution accurate mass analysis was performed to verify the contents of each vial position. A summary of results is reported below as the average ppm mass error \pm standard deviation determined for all analytes.

Test	Result	Specification	Meets Specification
Average mass error	1.82 \pm 0.60 ppm	\pm 10 ppm	Yes

Individual results are reported in the table on pages 2-5.

Approval: 

Title: Director of Analytical Chemistry

Certification Date: 27JAN2020

Cayman Chemical certifies that this product meets the specifications stated in this certificate and warrants this product to meet the stated acceptance criteria through the expiry date when stored unopened as recommended.

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Kit Contents Plate 4

Well	Item Name	Molecular Formula (free analyte)	Calculated [M+H] ⁺ m/z	Measured [M+H] ⁺ m/z	Mass Accuracy (ppm)
A1	Unused	Unused	Unused	Unused	Unused
A2	U-48520	C ₁₆ H ₂₃ ClN ₂ O	295.1572	295.1566	1.97
A3	3'-methyl Acetyl fentanyl (hydrochloride)	C ₂₂ H ₂₈ N ₂ O	337.2274	337.2267	2.25
A4	4-phenyl U-51754 (hydrochloride)	C ₂₃ H ₃₀ N ₂ O	351.2431	351.2423	2.31
A5	2'-methyl Acetyl fentanyl (hydrochloride)	C ₂₂ H ₂₈ N ₂ O	337.2274	337.2267	2.14
A6	(±)- <i>cis</i> -3-methyl Norfentanyl	C ₁₅ H ₂₂ N ₂ O	247.1805	247.1800	1.94
A7	<i>meta</i> -methyl Acetyl fentanyl (hydrochloride)	C ₂₂ H ₂₈ N ₂ O	337.2274	337.2266	2.61
A8	U-51754 (hydrochloride)	C ₁₇ H ₂₄ Cl ₂ N ₂ O	343.1339	343.1330	2.39
A9	(±)- <i>cis</i> -Isorfentanyl (hydrochloride)	C ₂₂ H ₂₈ N ₂ O	337.2274	337.2268	1.96
A10	U-47931E	C ₁₅ H ₂₁ BrN ₂ O	325.0910	325.0903	2.25
A11	U-48753E (maleate)	C ₁₆ H ₂₂ Cl ₂ N ₂ O	329.1182	329.1174	2.34
A12	Unused	Unused	Unused	Unused	Unused
B1	Unused	Unused	Unused	Unused	Unused
B2	<i>meta</i> -fluoro Furanyl fentanyl (hydrochloride)	C ₂₄ H ₂₅ FN ₂ O ₂	393.1973	393.1964	2.21
B3	3,4-Methylenedioxy U-47700 (hydrochloride)	C ₁₇ H ₂₄ N ₂ O ₃	305.1860	305.1852	2.39
B4	3,4-Ethylenedioxy U-51754 (hydrochloride)	C ₁₉ H ₂₈ N ₂ O ₃	333.2173	333.2165	2.34
B5	3,4-Ethylenedioxy U-47700 (hydrochloride)	C ₁₈ H ₂₆ N ₂ O ₃	319.2016	319.2008	2.63
B6	N-methyl U-47931E	C ₁₆ H ₂₃ BrN ₂ O	339.1067	339.1059	2.30
B7	2'-methyl Fentanyl (hydrochloride)	C ₂₃ H ₃₀ N ₂ O	351.2431	351.2422	2.48
B8	Propyl U-47700	C ₁₈ H ₂₆ Cl ₂ N ₂ O	357.1495	357.1489	1.60
B9	N-desmethyl U-47700	C ₁₅ H ₂₀ Cl ₂ N ₂ O	315.1026	315.1018	2.25
B10	3'-methyl Fentanyl (hydrochloride)	C ₂₃ H ₃₀ N ₂ O	351.2431	351.2425	1.62
B11	N,N-didesmethyl U-47700 (trifluoroacetate salt)	C ₁₄ H ₁₈ Cl ₂ N ₂ O	301.0869	301.0862	2.19
B12	Unused	Unused	Unused	Unused	Unused

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Kit Contents Plate 4 Continued

Well	Item Name	Molecular Formula (free analyte)	Calculated [M+H] ⁺ m/z	Measured [M+H] ⁺ m/z	Mass Accuracy (ppm)
C1	Unused	Unused	Unused	Unused	Unused
C2	Remifentanil Acid (trifluoroacetate salt)	C ₁₉ H ₂₆ N ₂ O ₅	363.1915	363.1906	2.23
C3	N-Benzyl phenyl norfentanyl (hydrochloride)	C ₂₅ H ₂₆ N ₂ O	371.2118	371.2109	2.37
C4	<i>para</i> -fluoro 4-ANBP	C ₁₈ H ₂₁ FN ₂	285.1762	285.1755	2.24
C5	Despropionyl <i>para</i> -Fluorofentanyl	C ₁₉ H ₂₃ FN ₂	299.1918	299.1911	2.34
C6	Despropionyl <i>meta</i> -Methylfentanyl	C ₂₀ H ₂₆ N ₂	295.2169	295.2162	2.24
C7	N-benzyl <i>para</i> -fluoro Norfentanyl (hydrochloride)	C ₂₁ H ₂₅ FN ₂ O	341.2024	341.2015	2.52
C8	Despropionyl 2'-fluoro <i>ortho</i> -Fluorofentanyl	C ₁₉ H ₂₂ F ₂ N ₂	317.1824	317.1816	2.62
C9	U-50488 (hydrochloride)	C ₁₉ H ₂₆ Cl ₂ N ₂ O	369.1495	369.1486	2.47
C10	N-methyl Norfentanyl (hydrochloride)	C ₁₅ H ₂₂ N ₂ O	247.1805	247.1800	1.82
C11	N-benzyl <i>para</i> -fluoro Cyclopropyl norfentanyl (hydrochloride)	C ₂₂ H ₂₅ FN ₂ O	353.2024	353.2016	2.26
C12	Unused	Unused	Unused	Unused	Unused
D1	Unused	Unused	Unused	Unused	Unused
D2	<i>para</i> -Bromofentanyl	C ₂₂ H ₂₇ BrN ₂ O	415.1380	415.1372	1.78
D3	<i>para</i> -Toluoyl fentanyl (hydrochloride)	C ₂₇ H ₃₀ N ₂ O	399.2431	399.2423	2.10
D4	Unused	Unused	Unused	Unused	Unused
D5	Unused	Unused	Unused	Unused	Unused
D6	Unused	Unused	Unused	Unused	Unused
D7	Unused	Unused	Unused	Unused	Unused
D8	Unused	Unused	Unused	Unused	Unused
D9	Unused	Unused	Unused	Unused	Unused
D10	Unused	Unused	Unused	Unused	Unused
D11	Unused	Unused	Unused	Unused	Unused
D12	Unused	Unused	Unused	Unused	Unused

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Kit Contents Plate 4 Continued

Well	Item Name	Molecular Formula (free analyte)	Calculated [M+H] ⁺ m/z	Measured [M+H] ⁺ m/z	Mass Accuracy (ppm)
E1	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E2	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E3	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E4	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E5	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E6	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E7	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E8	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E9	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E10	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E11	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
E12	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
F1	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>
F2	N-(MDA) Fentanyl (hydrochloride)	C ₂₄ H ₃₀ N ₂ O ₃	395.2329	395.2321	2.10
F3	N-(Phentermine) Fentanyl (hydrochloride)	C ₂₄ H ₃₂ N ₂ O	365.2587	365.2579	2.22
F4	N-(6-APB) Fentanyl	C ₂₅ H ₃₀ N ₂ O ₂	391.2380	391.2371	2.25
F5	N-(6-APDB) Fentanyl	C ₂₅ H ₃₂ N ₂ O ₂	393.2537	393.2528	2.21
F6	N-(2-APB) Fentanyl	C ₂₅ H ₃₀ N ₂ O ₂	391.2380	391.2373	1.87
F7	2',5'-dimethoxy Fentanyl (hydrochloride)	C ₂₄ H ₃₂ N ₂ O ₃	397.2486	397.2478	2.01
F8	N-(2C-E) Fentanyl (hydrochloride)	C ₂₆ H ₃₆ N ₂ O ₃	425.2799	425.2791	1.72
F9	N-(2C-B) Fentanyl (hydrochloride)	C ₂₄ H ₃₁ BrN ₂ O ₃	475.1591	475.1584	1.39
F10	N-(2C-C) Fentanyl (hydrochloride)	C ₂₄ H ₃₁ ClN ₂ O ₃	431.2096	431.2088	1.79
F11	N-(2C-P) Fentanyl (hydrochloride)	C ₂₇ H ₃₈ N ₂ O ₃	439.2955	439.2950	1.16
F12	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>	<i>Unused</i>

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Kit Contents Plate 4 Continued

Well	Item Name	Molecular Formula (free analyte)	Calculated [M+H] ⁺ m/z	Measured [M+H] ⁺ m/z	Mass Accuracy (ppm)
G1	Unused	Unused	Unused	Unused	Unused
G2	N-(2C-T-7) Fentanyl (hydrochloride)	C ₂₇ H ₃₈ N ₂ O ₃ S	471.2676	471.2670	1.19
G3	N-(2C-D) Fentanyl (hydrochloride)	C ₂₅ H ₃₄ N ₂ O ₃	411.2642	411.2635	1.78
G4	N-(2C-G) Fentanyl (hydrochloride)	C ₂₆ H ₃₆ N ₂ O ₃	425.2799	425.2792	1.65
G5	N-(2C-I) Fentanyl (hydrochloride)	C ₂₄ H ₃₁ IN ₂ O ₃	523.1452	523.1450	0.36
G6	N-(2C-iP) Fentanyl (hydrochloride)	C ₂₇ H ₃₈ N ₂ O ₃	439.2955	439.2949	1.43
G7	N-(2C-N) Fentanyl (hydrochloride)	C ₂₄ H ₃₁ N ₃ O ₅	442.2337	442.2330	1.54
G8	N-(2C-T) Fentanyl	C ₂₅ H ₃₄ N ₂ O ₃ S	443.2363	443.2355	1.71
G9	N-(2C-T-2) Fentanyl (hydrochloride)	C ₂₆ H ₃₆ N ₂ O ₃ S	457.2519	457.2514	1.25
G10	N-(2C-T-4) Fentanyl (hydrochloride)	C ₂₇ H ₃₈ N ₂ O ₃ S	471.2676	471.2670	1.32
G11	N-(2C-TFM) Fentanyl (hydrochloride)	C ₂₅ H ₃₁ F ₃ N ₂ O ₃	465.2360	465.2354	1.16
G12	Unused	Unused	Unused	Unused	Unused
H1	Unused	Unused	Unused	Unused	Unused
H2	N-(2C-B-fly) Fentanyl (hydrochloride)	C ₂₆ H ₃₁ BrN ₂ O ₃	499.1591	499.1588	0.48
H3	N-(3C-B-fly) Fentanyl (hydrochloride)	C ₂₇ H ₃₃ BrN ₂ O ₃	513.1747	513.1746	0.33
H4	N-(3,4,5-TMA) Fentanyl (hydrochloride)	C ₂₆ H ₃₆ N ₂ O ₄	441.2748	441.2741	1.45
H5	N-(2,5-DMA) Fentanyl (hydrochloride)	C ₂₅ H ₃₄ N ₂ O ₃	411.2642	411.2636	1.63
H6	N-(DOC) Fentanyl (hydrochloride)	C ₂₅ H ₃₃ ClN ₂ O ₃	445.2253	445.2246	1.44
H7	N-(DOB) Fentanyl (hydrochloride)	C ₂₅ H ₃₃ BrN ₂ O ₃	489.1747	489.1746	0.35
H8	N-(DOI) Fentanyl (hydrochloride)	C ₂₅ H ₃₃ IN ₂ O ₃	537.1609	537.1611	0.50
H9	N-(DOM) Fentanyl (hydrochloride)	C ₂₆ H ₃₆ N ₂ O ₃	425.2799	425.2793	1.27
H10	N-(DOET) Fentanyl (hydrochloride)	C ₂₇ H ₃₈ N ₂ O ₃	439.2955	439.2950	1.16
H11	N-(DOBU) Fentanyl (hydrochloride)	C ₂₉ H ₄₂ N ₂ O ₃	467.3268	467.3264	1.01
H12	Unused	Unused	Unused	Unused	Unused

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Revision History

Revision No.	Date	Reason for Revision
01	27JAN2020	Initial version
02	31AUG2020	Expiry update
03	13OCT2022	Expiry update

Disclaimers

Material Safety Data

This material should be considered hazardous until information to the contrary becomes available. Do not ingest, swallow, or inhale. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. This information contains some but not all of the information required for the safe and proper use of this material. Before use, review the complete Material Safety Data Sheet, which has been sent *via* email to your institution.

Warranty and Limitation of Remedy

Cayman Chemical Company makes no warranty or guarantee of any kind, whether written or oral, expressed or implied, including without limitation, any warranty of fitness for a particular purpose, suitability and merchantability, which extends beyond the description of the chemicals hereof. Cayman warrants only to the original customer that the material will meet our specifications at the time of delivery.

Cayman will carry out its delivery obligations with due care and skill. Thus, in no event will Cayman have any obligation or liability, whether in tort (including negligence) or in contract, for any direct, indirect, incidental or consequential damages, even if Cayman is informed about their possible existence.

This limitation of liability does not apply in the case of intentional acts or negligence of Cayman, its directors or its employees.

Buyer's exclusive remedy and Cayman's sole liability hereunder shall be limited to a refund of the purchase price, or at Cayman's option, the replacement, at no cost to Buyer, of all material that does not meet our specification.

Said refund or replacement is conditioned on Buyer giving written notice to Cayman within thirty (30) days after arrival of the material at its destination. Failure of Buyer to give said notice within thirty (30) days shall constitute a waiver of Buyer of all claims hereunder with respect to said material.

For further details, please refer to our Warranty and Limitations of Remedy located on our website and in our catalog.

This Certificate shall not be reproduced except in full, without written approval from the Cayman Chemical Company.

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