

This certificate is designed in accordance with ISO 17034 and ISO Guide 31. This certified reference material (CRM) was designed, produced and verified in accordance with ISO/IEC 17025, ISO 17034 and a registered quality management system ISO 9001.

**Certified Reference Material**  
**Product Name**

Terpene Mixture 2 2500 µg/mL in Hexane

**Product Code**  
 DRE-S50000474HE

**Lot Number**  
 2-H493587HE

**Format**  
 Multicomponent Solution

**Expiry Date**  
 15 Nov 2025

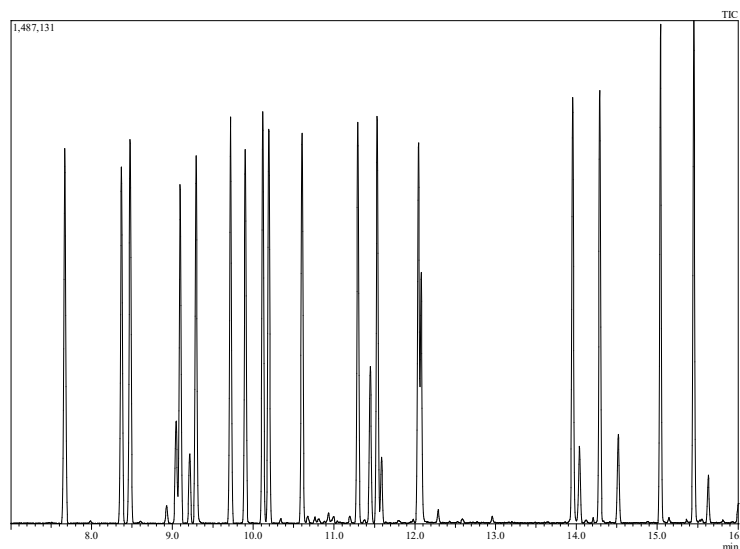
**Storage Temp**  
 -18°C +/- 4°C

Compound Name	CERTIFIED		CAS	Lot Number	Purity (%)	Amount (mg)	RT (min)
	Concentration (µg/mL)	Expanded Uncertainty U (µg/mL)					
A-pinene	2498	130	80-56-8	434.14P	98.8	15.17	7.60
Sabinene	2498	130	3387-41-5	3581.24.1P	86.5	17.33	8.30
B-pinene	2501	150	127-91-3	2024.516.1P	99	12.13	8.41
Alpha-terpinene	2502	130	99-86-5	3550.7.1.1P	90.7	16.55	9.03
(+)-limonene	2513	130	5989-27-5	4375.7.2P	99.3	15.11	9.23
G-terpinene	2501	130	99-85-4	3577.1.1P	99.1	15.14	9.66
Sabinene Hydrate	2500	130	546-79-2	7059.1.3P	98	15.31	9.84
A-terpinolene	2499	130	586-62-9	3556.7.1P	97.2	15.43	10.06
(-)-fenchone	2498	160	7787-20-4	5772.7.2P	99.5	15.07	10.13
(+)-fenchol	2520	130	2217-02-9	7057.450.1.1P	98.5	15.35	10.54
Borneol	2500	130	464-43-7	7039.1.2P	99.9	15.02	11.23
Terpineol, Mixed Isomers	2505	140	8000-41-7	5773.1.1P	84	17.89	11.48
(r)-(+)-pulegone	2505	130	89-82-7	3917.1.2P	98.8	15.21	11.99
Geraniol	2502	130	106-24-1	3933.7.1P	99.2	15.13	12.02
A-cedrene	2505	170	469-61-4	6760.286.2P	95	15.82	13.90
A-humulene	2500	140	6753-98-6	5311.516.1P	95	15.79	14.24
Trans-nerolidol	2497	160	40716-66-3	5309.286.1.2P	96	15.61	14.99
(-)-guaial	2500	130	489-86-1	5822.450.3.1P	98.5	15.23	15.40

The producer certifies that this reference material meets the specification stated in this certificate until the expiry date, provided it is stored unopened at the recommended temperature herein. Product warranties for this reference material are set out in the terms and conditions of purchase.

<b>CERTIFIED BY</b> Susan Mathews	<b>CERTIFIED ON</b> 29 Nov 2022		<b>RM Release</b>

CHROMATOGRAM

Instrument  
GC/MSDetection  
MSColumn/Flow  
Phenomenex ZB-Semivolatile 30m  
x 0.25 mm, ID 0.25 µm / 1 mL/min

Method Details

Rate Temp.(C)	Hold time (min)
40.0	2.0
10.0	100.0
15.0	250.0
20.0	345.0

Inj.-Vol  
1 µL**Method of Preparation**

The certified value is based on gravimetric and volumetric preparation of this CRM. This CRM has been confirmed by the appropriate analytical techniques.

**Batch Information**

Solvent: Hexane, Lot no. 204550, 6 mL

sabinene : \* impurity of 13.5% b-pinene terpeneol, mixed  
isomers : \* a: 84.0% b: 1.1% g: 12.5%

**Intended Use**

This CRM is intended for use in a laboratory as a calibration and quality control standard or in method development for analytical techniques.

**Safety**

Proper precautions should be observed while handling. See Safety Data Sheet.

**Uncertainty**

The certified value(s) and uncertainty(ies) are determined in accordance with ISO 17034 with an 95% confidence level (k=2). Uncertainty is based on the Total Combined Uncertainty, including uncertainties of preparation, purity of neat materials, homogeneity, long-term stability testing, and transportation stability.

**Traceability**

The balances used for gravimetric measurements are calibrated with weights traceable to the national standards (NIST). The calibration of the balances is verified daily internally and annually by an external accredited calibration service. Only Class A glassware is used for volumetric measurements.

**Homogeneity**

Random replicate samples of the final packaged CRM have been analysed to prove homogeneity consistent with ISO 17034.

**Storage**

The CRM should be stored in the original sealed bottle at the indicated temperature.

**Instructions for Use**

The CRM should be used shortly after opening to avoid concentration changes due to evaporation. It is recommended to use 1 µL as the minimum sample size. If storage after opening is necessary, it should be transferred to an amber vial with minimum head space and a Teflon lined silicon septum. If handled as recommended, use period after opening is a maximum of 241 days for an estimated 5% drift in concentration as a result of analyte and/or solvent transpiration. Visit the support section of our website [lgcstandards.com](http://lgcstandards.com) for a series of Dr. Ehrenstorfer Tech Tip videos and frequently asked questions.

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The producer of this reference material is registered to ISO 9001:2015 under 56 100 19560019 by TUV USA and accredited to ISO 17025:2017 and ISO 17034:2016 by A2LA with the accreditation numbers 3031.01 and 3031.02.



ISO 17034 Accredited  
Reference Material Producer  
Cert. No. 3031.02