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Certificate of Analysis: Hops CO₂ Total, *Humulus lupulus*, hops cones grown, dried, and CO₂ extracted in Germany.

Batch No: GE-761305

Lab No: 21449

Type No: 081.013

Raw material: *Humulus lupulus* — dried hop cones from Germany

Country of origin of product: Germany

D/E - ratio: 4,0–5,3 kg raw material which yields 1 kg product

Product contains: about 35% sunflower oil (organic)

Production: September 2016

Retest: September 2021

Storage: Store in a cool, dry place.

Sensory Check

Feature	Reference	Result
Appearance	Green-brown viscous extract at room temperature	meets
Odor	weak typical smell	meets

Analytical Check

Feature	Method	Limits	Value/Unit
Content of essential oil	21.006.01, Distillation, gravimetric	< 2	0,89 % (g/ 100g)
Cohumulone	21.126.01, HPLC	n.s.	8,6 %
n-+ Adhumulone	21.126.01, HPLC	n.s.	26,4 %
Sum of Humulones (alpha acids)	21.126.01, HPLC	30 - 40	35,0 %
Colupulone	21.126.01, HPLC	n.s.	6,5 %
n-+ Adlupulone	21.126.01, HPLC	n.s.	9,1 %
Sum of Lupulones (beta acids)	21.126.01, HPLC	10 - 20	15,6 %
Sum of alpha and beta acids	21.126.01, HPLC	49 - 51	50,6 %
Content of water	Karl Fischer Titr.	n.s.	0,36 %

n.s. = not specified

n.d. = not detected

The data in this report of analysis have been determined carefully and to the best of our knowledge. Depending on transport and storage conditions the indicated data can be subject to certain changes which are outside of our influence. Hence the report has not the meaning of a guaranty in the legal sense and does not dispense the customer from making his own quality control before using the product.

The product meets specifications no. 16.377.02/66.302.02; date of analysis: 2016.09.15

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