


**CERTIFICATE OF ANALYSIS**
**Mix Roquette 12C 11 Toxin 10X in Acetonitrile LCMS Grade**

This document is designed, and the certified values and uncertainty are determined in accordance with ISO Guide 31, ISO Guide 35, ISO Guide 34 and Eurachem/CITAC Guides.

**Description of the Reference Material (RM)**

	<b>Product name:</b>	Mix Roquette 12C 11 Toxin 10X			
	<b>Product number:</b>	FIA000379			
	<b>CAS number:</b>	15-Acetyl-Deoxynivalenol	88337-96-6		
		3-Acetyl-Deoxynivalenol	50722-38-8		
		Aflatoxin B1	1162-65-8		
		Aflatoxin B2	7220-81-7		
		Aflatoxin G1	1165-39-5		
		Aflatoxin G2	7241-98-7		
		Deoxynivalenol	51481-10-8		
		HT2	26934-87-2		
		Ochratoxin A	303-47-9		
		T2	21259-20-1		
	Zearalenone	17924-92-4			
	<b>Lot number:</b>	ROQ1117070102			
	<b>Expiry date:</b>	26-Jul-24			
<b>Certified values by LCMSMS :</b>	15-Acetyl-Deoxynivalenol	34,51	± 2,48	µg/mL	
	3-Acetyl-Deoxynivalenol	33,33	± 2,33	ug/mL	
	Aflatoxin B1	0,44	± 0,03	µg/mL	
	Aflatoxin B2	0,43	± 0,04	µg/mL	
	Aflatoxin G1	0,49	± 0,04	µg/mL	
	Aflatoxin G2	0,54	± 0,05	µg/mL	
	Deoxynivalenol	70,65	± 7,22	µg/mL	
	HT2	3,81	± 0,27	µg/mL	
	Ochratoxin A	1,04	± 0,06	µg/mL	
	T2	2,68	± 0,27	µg/mL	
Zearalenone	14,14	± 1,21	µg/mL		
<b>Physical description:</b>	Clear solution of toxins mixture in Acetonitrile LCMS Grade				
<b>Packing</b>	Amber glass vial filled with 1 mL of solution				
<b>Storage conditions</b>	≤ -10°C				
<b>Matrix and starting material:</b>	This material was prepared with/from:				
	Acetonitrile UPLC/MS	Batch:	10001143		
	Mix Roquette 12C 11 Toxin 100X	Internal ID:	ROQ1117070101		

**Intended use of the RM:**

For laboratory use for R&D purposes only. The main purpose of this material is for analytical instrument calibration (e. g. external calibration, standard addition). Not for drug, household or other uses.

**Instruction for the correct use of the RM:**

The vial should be stored in a dark place at ≤ -10°C . Before usage of the RM, allow the vial to warm to room temperature. The expiry date of this RM is based on the current knowledge and holds only for proper storage conditions in the originally closed vials / packages. Solutions prepared for calibration purpose should be protected from exposure to light. Discard solutions after use in accordance with appropriate safety regulations for chemical substances.

**Hazardous situation:**

H225 : Flammable liquid - Category 2 - Highly flammable liquid and vapour

H302 : Acute toxicity - Oral - Category 4 - Harmful if swallowed

H312 : Acute toxicity - Dermal - Category 4 - Harmful in contact with skin

H319 : Eye irritation - Category 2 - Causes serious eye irritation

H332 : Acute toxicity - Inhalation - Category 4 - Harmful if inhaled

In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid exposure. Wear suitable protective clothing.

### Safety measures:

Special care must be taken when manipulating this standard. Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. Use only in a chemical fume hood. Safety shower and eye bath must be near. In case of spills, cover and absorb with an inert dry material such as dry-lime, sand or soda ash and place in an appropriate waste disposal container.

Keep container tightly closed. Do not store in direct sunlight. Keep away from heat, sparks, flame and incompatible material. Storage area should be cool, dry and away from incompatible materials.

### Further information:

Further information is available in the MSDS provided along with this certificate. Final users should make their own investigations to determine the suitability of the information for their particular research purposes. In no event the supplier of this RM shall be held liable for any damage resulting from handling or from contact with the product.

### Traceability

The certified values are based on the results of analytical techniques previously used for purity assessment of solid mycotoxins. High purity material represents a practical realization of concentration units, through conversion of mass to molar quantity.

### Preparation of the standard and associated uncertainties

Toxin is pipetted and diluted in acetonitrile. Mass concentration calculation is based on certified concentration, purity and dilution step.

The pipet was calibrated with traceability to national and international standards (Dakks & ilac-MRA). All weights used for metrological control are connected to national and international standards. The weights are calibrated by an accredited laboratory.

$$C (\mu\text{g/mL}) = \frac{C_m \times V_p}{V}$$

Toxin	Source			Standard uncertainty
<b>15-Acetyl-Deoxynivalenol</b>	Purity			100,000
	Liquid solution	concentration	340,49 (μg/mL)	12,233
	Volumetry procedure	Volume	0,50 mL	0,000
	Dilution	Volume	4,93 mL	0,005
$Combined_{u_c} = \sqrt{\left(\frac{u_p}{P}\right)^2 + \left(\frac{u_{Cm}}{V_{Cm}}\right)^2 + \left(\frac{u_{Vp}}{V_p}\right)^2 + \left(\frac{u_{V1}}{V_1}\right)^2}$				0,036
$Concentration_{toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}} \quad \mu\text{g/mL}$				34,51
Total expanded uncertainty (using a coverage factor k=2)				2,48

Toxin	Source			Standard uncertainty
<b>3-Acetyl-Deoxynivalenol</b>	Purity			100,000
	Liquid solution	concentration	328,89 (μg/mL)	11,480
	Volumetry procedure	volume	0,50 mL	0,000
	Dilution	Volume	4,93 mL	0,005
$Combined_{u_c} = \sqrt{\left(\frac{u_p}{P}\right)^2 + \left(\frac{u_{Cm}}{V_{Cm}}\right)^2 + \left(\frac{u_{Vp}}{V_p}\right)^2 + \left(\frac{u_{V1}}{V_1}\right)^2}$				0,035
$Concentration_{toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}} \quad \mu\text{g/mL}$				33,33
Total expanded uncertainty (using a coverage factor k=2)				2,33

Toxin	Source				Standard uncertainty
Aflatoxin B1	Purity				100,000
	Liquid solution	concentration	4,31	(µg/mL)	0,158
	Volumetry procedure	volume	0,50	mL	0,000
	Dilution	Volume	4,93	mL	0,005
$Combined_u = \sqrt{\left(\frac{u_p}{P}\right)^2 + \left(\frac{u_{cm}}{V_{cm}}\right)^2 + \left(\frac{u_{vp}}{V_p}\right)^2 + \left(\frac{u_{v1}}{V_1}\right)^2}$					0,037
$Concentration_{Toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}} \quad \mu\text{g/mL}$					0,44
Total expanded uncertainty (using a coverage factor k=2)					0,03

Toxin	Source				Standard uncertainty
Aflatoxin B2	Purity				100,000
	Liquid solution	concentration	4,26	(µg/mL)	0,173
	Volumetry procedure	volume	0,50	mL	0,000
	Dilution	Volume	4,93	mL	0,005
$Combined_u = \sqrt{\left(\frac{u_p}{P}\right)^2 + \left(\frac{u_{cm}}{V_{cm}}\right)^2 + \left(\frac{u_{vp}}{V_p}\right)^2 + \left(\frac{u_{v1}}{V_1}\right)^2}$					0,041
$Concentration_{Toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}} \quad \mu\text{g/mL}$					0,43
Total expanded uncertainty (using a coverage factor k=2)					0,04

Toxin	Source				Standard uncertainty
Aflatoxin G1	Purity				100,000
	Liquid solution	concentration	4,84	(µg/mL)	0,211
	Volumetry procedure	volume	0,50	mL	0,000
	Dilution	Volume	4,93	mL	0,005
$Combined_u = \sqrt{\left(\frac{u_p}{P}\right)^2 + \left(\frac{u_{cm}}{V_{cm}}\right)^2 + \left(\frac{u_{vp}}{V_p}\right)^2 + \left(\frac{u_{v1}}{V_1}\right)^2}$					0,044
$Concentration_{Toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}} \quad \mu\text{g/mL}$					0,49
Total expanded uncertainty (using a coverage factor k=2)					0,04

Toxin	Source				Standard uncertainty
Aflatoxin G2	Purity				100,000
	Liquid solution	concentration	5,34	(µg/mL)	0,243
	Volumetry procedure	volume	0,50	mL	0,000
	Dilution	Volume	4,93	mL	0,005
$Combined_u = \sqrt{\left(\frac{u_p}{P}\right)^2 + \left(\frac{u_{cm}}{V_{cm}}\right)^2 + \left(\frac{u_{vp}}{V_p}\right)^2 + \left(\frac{u_{v1}}{V_1}\right)^2}$					0,046
$Concentration_{Toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}} \quad \mu\text{g/mL}$					0,54
Total expanded uncertainty (using a coverage factor k=2)					0,05

Toxin	Source				Standard uncertainty
Deoxynivalenol	Purity				100,000
	Liquid solution	concentration	697,09	(µg/mL)	35,598
	Volumetry procedure	volume	0,50	mL	0,000
	Dilution	Volume	4,93	mL	0,005
$Combined_u = \sqrt{\left(\frac{u_p}{P}\right)^2 + \left(\frac{u_{cm}}{V_{cm}}\right)^2 + \left(\frac{u_{vp}}{V_p}\right)^2 + \left(\frac{u_{v1}}{V_1}\right)^2}$					0,051
$Concentration_{Toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}} \quad \mu\text{g/mL}$					70,65
Total expanded uncertainty (using a coverage factor k=2)					7,22

Toxin	Source				Standard uncertainty
HT2	Purity				100,000
	Liquid solution	concentration	37,56	(µg/mL)	1,347
	Volumetry procedure	volume	0,50	mL	0,000
	Dilution	Volume	4,93	mL	0,005
$Combined_u = \sqrt{\left(\frac{u_p}{P}\right)^2 + \left(\frac{u_{cm}}{V_{cm}}\right)^2 + \left(\frac{u_{vp}}{V_p}\right)^2 + \left(\frac{u_{v1}}{V_1}\right)^2}$					0,036
$Concentration_{Toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}} \quad \mu\text{g/mL}$					3,81
Total expanded uncertainty (using a coverage factor k=2)					0,27

Toxin	Source				Standard uncertainty
Ochratoxin A	Purity				100,000
	Liquid solution	concentration	10,28	(µg/mL)	0,293
	Volumetry procedure	volume	0,50	mL	0,000
	Dilution	Volume	4,93	mL	0,005
$Combined_u = \sqrt{\left(\frac{u_p}{P}\right)^2 + \left(\frac{u_{cm}}{V_{cm}}\right)^2 + \left(\frac{u_{vp}}{V_p}\right)^2 + \left(\frac{u_{v1}}{V_1}\right)^2}$					0,029
$Concentration_{Toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}} \quad \mu\text{g/mL}$					1,04
Total expanded uncertainty (using a coverage factor k=2)					0,06

Toxin	Source				Standard uncertainty
T2	Purity				100,000
	Liquid solution	concentration	26,44	(µg/mL)	1,326
	Volumetry procedure	volume	0,50	mL	0,000
	Dilution	Volume	4,93	mL	0,005
$Combined_u = \sqrt{\left(\frac{u_p}{P}\right)^2 + \left(\frac{u_{cm}}{V_{cm}}\right)^2 + \left(\frac{u_{vp}}{V_p}\right)^2 + \left(\frac{u_{v1}}{V_1}\right)^2}$					0,050
$Concentration_{Toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}} \quad \mu\text{g/mL}$					2,68
Total expanded uncertainty (using a coverage factor k=2)					0,27

Toxin	Source				Standard uncertainty
Zearalenone	Purity				100,000
	Liquid solution	concentration	139,54	(µg/mL)	5,972
	Volumetry procedure	volume	0,50	mL	0,000
	Dilution	Volume	4,93	mL	0,005
$Combined_u = \sqrt{\left(\frac{u_P}{P}\right)^2 + \left(\frac{u_{cm}}{V_{cm}}\right)^2 + \left(\frac{u_{Vp}}{V_p}\right)^2 + \left(\frac{u_{V1}}{V_1}\right)^2}$					0,054
$Concentration_{toxin} = \frac{Concentration\ mother \times V_p}{V_{D1}}$					µg/mL
Total expanded uncertainty (using a coverage factor k=2)					1,21

Notes: The purity of the mycotoxin used for this RM was determined by liquid chromatography. Following the Guide to the Expression of Uncertainty in measurement (GUM) the expanded uncertainty of toxin level is obtained by multiplication with a coverage factor K for which 2 is usually chosen to obtain a confidence level of 95 %.

## Quality control

Certified concentration by LCMSMS				
The certified concentrations of the prepared solution was confirmed by LCMSMS against a reference batch.				
Chromatographic conditions:				
Column:	Acquity UPLC HSS C18 100 x 2,1 mm 1,8 µm			
Mobile phase:	MeOH / H2O + 0,1% acide formique + 5mM acétate d'ammonium / Gradient			
Flow mL/min:	0,30			
Temperature °C:	35,00			
Detector	MS/MS			
15-Acetyl-Deoxynivalenol	42,51	±	2,46	µg/mL
3-Acetyl-Deoxynivalenol	39,67	±	3,17	ug/mL
Aflatoxin B1	0,57	±	0,04	µg/mL
Aflatoxin B2	0,50	±	0,04	µg/mL
Aflatoxin G1	0,58	±	0,04	µg/mL
Aflatoxin G2	0,66	±	0,05	µg/mL
Deoxynivalenol	76,12	±	3,81	µg/mL
HT2	4,41	±	0,25	µg/mL
Ochratoxin A	1,19	±	0,10	µg/mL
T2	3,24	±	0,17	µg/mL
Zearalenone	16,66	±	1,20	µg/mL
Mean of 6 replicates measurement against reference batch, confidence interval with P = 95%				

**References:**

- a-ISO GUIDE 31:2015, Reference Materials - Contents of certificates, labels and accompanying documentation.
- b-ISO GUIDE 34:2009, General requirements for the competence of reference material producers
- c-ISO GUIDE 35:2006, Reference materials - General and Statistical Principles.
- d-ISO/IEC Guide 98-3:2008 Uncertainty of measurement-Part 3 : Guide to the expression of uncertainty in measurement (GUM:1995)
- e-Eurachem/CITAC guide (2019), Traceability in Chemical Measurement.
- f-Eurachem/CITAC guide (2012), Quantifying Uncertainty in Analytical Measurement.
- g-AOAC Official Method 970.44-1971 - Preparation of Standards for Mycotoxins.

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Quality Control

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