



# German External Quality Assessment Scheme

**Prof. Dr. med. Hans Drexler**

Institute and Out-Patient Clinic for Occupational, Social and Environmental  
Medicine of the Friedrich-Alexander University

---

## REQUEST FORM

**G-EQUAS 66 - 2020**

Please order online until **2<sup>nd</sup> of September 2020**

**Prof. Dr. med. H. Drexler**

Institute and Out-Patient Clinic for Occupational, Social and Environmental Medicine  
of the Friedrich-Alexander University

Henkestr. 9-11

91054 Erlangen

Germany

**Email: [info@g-equas.de](mailto:info@g-equas.de)**

**Lab.-ID:**

**We would appreciate it very much if you could check/update your contact dates online ([www.g-equas.de](http://www.g-equas.de)).**

**Please note that you can only participate in G-EQUAS if we have the name of a contact partner, a valid delivery address, e-mail address and telephone number!**

## ORDER

Please tick the parameters that you would like to order in the current round.

**I / we are going to participate in G-EQUAS 66 and would like to order the following control materials:**

## METALS

### ANALYTICAL PARAMETERS IN **CONTROL BLOOD**

- **3 ml control blood** (for each concentration level) are available for analysis:

#### Occupational medical field

(control material **1** A/B)

- 1 Lead (Pb)
- 2 Cadmium (Cd)
- 3 Chromium (Cr)
- 4 Cobalt (Co)
- 5 Manganese (Mn)
- 6 Nickel (Ni)
- 7 Mercury (Hg)

#### Environmental medical field

(control material **7** A/B)

- 70 Lead (Pb)
- 71 Cadmium (Cd)
- 72 Mercury (Hg)

### ANALYTICAL PARAMETERS IN **CONTROL PLASMA**

- **3 ml control plasma** (for each concentration level) are available for analysis:

(control material **11** A/B)

- 107 Aluminium (Al)
- 108 Chromium (Cr)
- 109 Cobalt (Co)
- 110 Copper (Cu)
- 112 Manganese (Mn)
- 113 Nickel (Ni)

(control material **11** A/B)

- 114 Platinum (Pt)
- 115 Selenium (Se)
- 116 Zinc (Zn)
- 157 Molybdenum (Mo)
- 158 Magnesium (Mg)
- 199 Lead (Pb)

# Inorganic parameters

## ANALYTICAL PARAMETERS IN CONTROL URINE

- **5 ml control urine** (for each concentration level) are available for analysis:

### Occupational medical field

(control material **2** A/B)

8	Aluminium (Al)
9	Antimony (Sb)
10	Arsenic (by hydride technique) (As- Hydride)
11	Arsenic speciation (As <sup>3+</sup> , As <sup>5+</sup> , MMA*, DMA*, AsB)
15	Beryllium (Be)
16	Lead (Pb)
17	Cadmium (Cd)
18	Chromium (Cr)
19	Cobalt (Co)
20	Fluoride (F)
21	Copper (Cu)
22	Manganese (Mn)
23	Nickel (Ni)
24	Mercury (Hg)

\* MMA: Monomethylarsonic acid

\* DMA: Dimethylarsinic acid

### Occupational medical field

(control material **2** A/B)

25	Thallium (Tl)
206	Titanium (Ti)
26	Vanadium (V)
27	Zinc (Zn)
29	Creatinine
126	Total Arsenic (As-tot)
141	Selenium (Se)
142	Tungsten (W)
145	Iodine compounds (as iodine) in urine (I)
159	Barium (Ba)
160	Lithium (Li)
161	Molybdenum (Mo)
176	Gallium (Ga)
194	Indium (In)
198	Tellurium (Te)
201	Germanium (Ge)
202	Tantal (Ta)

# Inorganic parameters

## ANALYTICAL PARAMETERS IN **CONTROL URINE**

- **5 ml control urine** (for each concentration level) are available for analysis:

### Environmental medical field

(control material **8** A/B)

- 73 Arsenic (by hydride technique) (As- Hydride)
- 74 Cadmium (Cd)
- 75 Chromium (Cr)
- 76 Nickel (Ni)
- 77 Mercury (Hg)
- 78 Platinum (Pt)
- 156 Total Arsenic (As-tot)
- 162 Calcium (Ca)
- 163 Copper (Cu)
- 164 Strontium (Sr)
- 165 Zinc (Zn)
- 190 Antimony (Sb)
- 191 Molybdenum (Mo)
- 192 Tin (Sn)
- 195 Arsenic species (As+5, As+3, MMA, DMA, AsB)

# Organic Parameters

## ANALYTICAL PARAMETERS IN CONTROL URINE

- **5 ml control urine** (for each concentration level) are available for the analysis in the **occupational medical field**; **2 x 5 ml control urine** (for each concentration level) are available for the **environmental medical field**:

### Occupational medical field

(control material **3** A/B, 5 ml)

- 30 Hippuric acid (HA)
- 32 Mandelic acid (MA)
- 33 Methylhippuric acids (MHA)
- 34 t,t-Muconic acid (t,t-MA)
- 37 Phenylglyoxylic acid (PGA)
- 39 Trichloroacetic acid (TCA)
- 41 2-Thio-thiazolidine-4-carboxylic acid (TTCA)
- 42 Ethoxyacetic acid (EAA)
- 43 Butoxy acetic acid (BAA)
- 44 N-Methylformamide (NMF)
- 45 2,5-Hexandione (2,5-HD)
- 46 Creatinine
- 117 5-Hydroxy-N-methylpyrrolidine (5-HNMP),  
2-Hydroxy-N-methylsuccinimide (2-HMSI)
- 135 Methoxyacetic acid (MAA)
- 28  $\delta$ -Aminolaevulinic acid (ALA)

### Environmental medical field

(control material **9** A/B, 2 x 5 ml)

- 80 Pyrethroide metabolites, acid part (Br<sub>2</sub>-CA, cis-Cl<sub>2</sub>-CA, trans-Cl<sub>2</sub>-CA, **CTFCA(NEW)**)
- 83 Pyrethroide metabolites, alcohol part (3-PBA, FPBA)
- 204 6-CINA
- 87 Alkyl phosphates\* (DMP, DMTP, DMDTP, DEP, DETP, DEDTP)
- 122 Phthalate metabolites "DEHP" (5-OH-MEHP, 5-oxo-MEHP, 5-carboxy-MEPP, MEHP)
- 129 Phthalate metabolites "other" (MnBP, MiBP, MBzP)
- 207 Glyphosate

\* Alkyl phosphates:

DMP: Dimethylphosphate  
DMTP: Dimethylthiophosphate  
DMDTP: Dimethyldithiophosphate

DEP: Diethylphosphate  
DETP: Diethylthiophosphate  
DEDTP: Diethyldithiophosphate

## **Tobacco-specific N-nitrosamines**

### **Environmental medical field**

- **5 ml control urine** (for each concentration level) are available for analysis:

### **Tobacco-specific N-nitrosamines**

(control material **18** A/B, 5 ml)

- 172 4-(Methylnitrosamine)-1-(3-pyridyl)-1-butanol after hydrolysis (NNAL)  
93 Cotinine, Nicotine

## **Mercapturic acids in urine**

### **Occupational medical field**

- **5 ml control urine** (for each concentration level) are available for analysis:

### **Mercapturic acids in urine**

(control material **17** A/B, 5 ml)

- 38 S-PMA (Benzene metabolite)  
147 Butadiene metabolites (DHBMA, MHBMA)  
149 Acrylamide/Acrylonitrile metabolite (AAMA, GAMA, CEMA)  
152 other mercapturic acids (HEMA, 2-HPMA, 3-HPMA)  
155 AMCC (DMF metabolite)

S-PMA: S-Phenylmercapturic acid  
AMCC: Acetyl-S-(N-methylcarbamoyl)cysteine  
DHBMA: 3,4-Dihydroxybutylmercapturic acid  
MHBMA: 2-Hydroxy-3-butenylmercapturic acid  
AAMA: 2-Carbonamideethylmercapturic acid

GAMA: 2-Carbonamide-2-hydroxyethylmercapturic acid  
CEMA: 2-Cyanoethylmercapturic acid  
HEMA: 2-Hydroxyethylmercapturic acid  
2-HPMA: 2-Hydroxypropylmercapturic acid  
3-HPMA: 3-Hydroxypropylmercapturic acid

### **Amines and phenolic parameters (after hydrolysis)**

(The control material is spiked with the native phenolic compounds as well as with their conjugates (glucuronides and acetates)).

- To analyse parameter (-group) 36,40,134,174,175,177,178,179,205 (control material **14**, occupational medical field) **5 ml control urine** are available.
- To analyse parameter (-group) 79,86,127,140,166,167,200, 208,209 (control material **15**, environmental medical field) **2 x 5 ml control urine** are available.

### **Amines and phenolic parameters (after hydrolysis)**

(control material **14 / 15** A/B, 5 ml in brown glass vials)

- 79 1-Hydroxypyrene (1-HP)
- 86 Pentachlorophenol (PCP)
- 127 1-Naphthol, 2-Naphthol
- 140 Bisphenol A
- 166 Trichloropyridinol (TCPy)
- 167 Isopropoxyphenol (IPP)
- 174 4-Nitrophenol
- 175 Aniline
- 134 Diisocyanate metabolites, aromatic (MDA, 2,4-TDA, 2,6-TDA, 1,5-NDA)
- 180 Diisocyanate metabolites, aliphatic (IPDA, HDA)
- 200 Triclosan (TCS)
- 205 MOCA
- 208 Benzophenone -1
- 209 Benzophenone -3

### **Phenol and o-Cresol (after hydrolysis)**

**NEW**

(Control material **16** A/B, 5 ml in brown glass vials)

- 36 Phenol
- 40 o-Cresol

# HEADSPACE ANALYSIS

## Control blood

### AROMATIC AND HALOGENATED HYDROCARBONS

- To analyze the aromatic- or chlorinated hydrocarbons **2 x 2 ml or 2 x 1 ml control blood** (for each concentration level and each group of hydrocarbons) are available in gas-tight ampoules. The ampoules are offered in two different sizes due to the different headspace analysers.

### Aromatic hydrocarbons

(control material **4** A/B)

47 Benzene, Toluene, Xylenes, Ethylbenzene

For carrying out the determination I require vials with the following volume:

**20 ml (Perkin Elmer HS) (2 ml blood)**

**10 ml (1 ml blood)**

### Halogenated hydrocarbons

(control material **5** A/B)

51 Dichloromethane, 1,2-Dichloroethane, Trichloroethene, Tetrachloroethene, 1,1,1-Trichloroethane, Tetrachloromethane, Trichloromethane

For carrying out the determination I require vials with the following volume:

**20 ml (Perkin Elmer HS) (2 ml blood)**

**10 ml (1 ml blood)**



## Control urine

### ALCOHOLS/ KETONES/ ETHER

- To analyze alcohols/ketones **2 x 2 ml or 2 x 1 ml control urine** are available in gas-tight ampoules. The ampoules are offered in two different sizes due to the different headspace-analysers.

### Alcohols/Ketones/Ether

(control material **12** A/B)

54 Methanol, Methyl-tert-butylether, Tetrahydrofuran, n-Butanol

55 Acetone, Methyl-ethylketone (MEK), Methylisobutylketone (MiBK), Methyl-n-butylketone

For carrying out the determination I require vials with the following volume:

**20 ml (Perkin Elmer HS) (2 ml urine)**

**10 ml (1 ml urine)**

### Aromatic hydrocarbons

(control material **19** A/B)

182 Benzene, Toluene, Xylenes, Ethylbenzene

For carrying out the determination I require vials with the following volume:

**20 ml (Perkin Elmer HS) (2 ml urine)**

**10 ml (1 ml urine)**

## ORGANOHALOGEN COMPOUNDS

### ANALYTICAL PARAMETERS IN CONTROL SERUM

- **5 ml control serum** (for each concentration level) are available for analysis of a parameter/group of parameters:

#### Organohalogen compounds

(control material **10** A/B)

95	p,p`-DDT	p,p`-Dichlorodiphenyltrichloroethane
	p,p`-DDE	p,p`-Dichlorodiphenyldichloroethene
96	HCB	Hexachlorobenzene
97	$\alpha$ -, $\beta$ -, $\gamma$ -HCH	Hexachlorocyclohexane
100	PCB	Polychlorinated biphenyls (Ballschmitter numbers: 28, 52, 101, 138, 153, 180)
106	PCP	Pentachlorophenol
120	PFOA	Perfluorooctanoic acid
	PFOS	Perfluorooctanoic sulfonic acid (n-isomer)

## N-terminal adducts in Hemoglobin

### Human globin - N-terminal adducts in hemoglobin

- To analyse N-terminal adducts 300 mg human globin is available for each concentration level
- The analysis of the five substances counts as one parameter

#### N-terminal adducts in human globin

(control material **13** A/B)

130 Globin adducts:	Methylvaline (MeV)
	2-Hydroxyethylvaline (HEV)
	2-Cyanoethylvaline (CEV)
	2-Carbamoylvaline (AAV)
	2-Hydroxypropylvaline (2-HPV)

Date: \_\_\_\_\_

Lab-ID (please do always quote!): \_\_\_\_\_

Signature and stamp: \_\_\_\_\_

## Order form - additional material

**Please note:** We are not able to provide more than **2 vials of additional samples** for each control material due to reasons of capacity. We have to charge a fee of 15.00 € for each vial you order.

In order to carry out the analysis we require more sample material.

I/We would like to order the following additional control materials:

### **Metals – Blood** (3 ml):

(control material **1** A/B)

**ZA1**      A \_\_\_\_\_ x 15.00 €

**ZB1**      B \_\_\_\_\_ x 15.00 €

(control material **7** A/B)

**ZA7**      A \_\_\_\_\_ x 15.00 €

**ZB7**      B \_\_\_\_\_ x 15.00 €

### **Metals - Plasma** (3 ml):

(control material **11** A/B)

**ZA11**      A \_\_\_\_\_ x 15.00 €

**ZB11**      B \_\_\_\_\_ x 15.00 €

### **Headspace Analyses - Blood**

#### **Aromatic hydrocarbons**

(control material **4** A/B)

vial, 20 ml

**ZA41**      A \_\_\_\_\_ x 15.00 €

**ZB41**      B \_\_\_\_\_ x 15.00 €

vial, 10 ml

**ZA42**      A \_\_\_\_\_ x 15.00 €

**ZB42**      B \_\_\_\_\_ x 15.00 €

*Date:* \_\_\_\_\_

*Lab-ID (please do always quote!):* \_\_\_\_\_

*Signature and stamp:* \_\_\_\_\_

## Headspace Analyses - Blood

### Chlorinated hydrocarbons

(control material 5 A/B)

vial, 20 ml

**ZA51** A \_\_\_\_\_ x 15.00 €

**ZB51** B \_\_\_\_\_ x 15.00 €

vial, 10 ml

**ZA52** A \_\_\_\_\_ x 15.00 €

**ZB52** B \_\_\_\_\_ x 15.00 €

## Headspace Analyses – Urine

### Alcohols/Ketones/Ether

(control material 12 A/B)

vial, 20 ml

**ZA01** A \_\_\_\_\_ x 15.00 €

**ZB01** B \_\_\_\_\_ x 15.00 €

vial, 10 ml

**ZA02** A \_\_\_\_\_ x 15.00 €

**ZB02** B \_\_\_\_\_ x 15.00 €

### Aromatic hydrocarbons

(control material 19 A/B)

vial, 20 ml

**ZA182** A \_\_\_\_\_ x 15.00 €

**ZB182** B \_\_\_\_\_ x 15.00 €

vial, 10 ml

**ZA282** A \_\_\_\_\_ x 15.00 €

**ZB282** B \_\_\_\_\_ x 15.00 €

## Organohalogen compounds Serum (5 ml)

(control material 10 A/B)

**ZA10** A \_\_\_\_\_ x 15.00 €

**ZB10** B \_\_\_\_\_ x 15.00 €

Date: \_\_\_\_\_

Lab-ID (please do always quote!): \_\_\_\_\_

Signature and stamp: \_\_\_\_\_

**Inorganic components - Urine** (5 ml)

(control material **2** A/B)

**ZA2** A \_\_\_\_\_ x 15.00 €

**ZB2** B \_\_\_\_\_ x 15.00 €

(control material **8** A/B)

**ZA8** A \_\_\_\_\_ x 15.00 €

**ZB8** B \_\_\_\_\_ x 15.00 €

**Organic Components - Urine** ( 5 ml )

(control material **3** A/B)

**ZA3** A \_\_\_\_\_ x 15.00 €

**ZB3** B \_\_\_\_\_ x 15.00 €

(control material **9** A/B)

**ZA9** A \_\_\_\_\_ x 15.00 €

**ZB9** B \_\_\_\_\_ x 15.00 €

**Tobacco-specific N-nitrosamines – urine**

(control material **18** A/B)

**ZA18** A \_\_\_\_\_ x 15.00 €

**ZB18** B \_\_\_\_\_ x 15.00 €

**Amines and Phenolic Components- Urine** ( 5 ml )

(control material **14** A/B)

**ZA14** A \_\_\_\_\_ x 15.00 €

**ZB14** B \_\_\_\_\_ x 15.00 €

(control material **15** A/B)

**ZA15**

A \_\_\_\_\_ x 15.00 €

**ZB15**

B \_\_\_\_\_ x 15.00 €

**Phenol und o-Cresol –Urine** (5ml) **NEW**

(control material **16** A/B)

**ZA16** A \_\_\_\_\_ x 15.00 €

**ZB16** B \_\_\_\_\_ x 15.00 €

**Mercapturic acids - Urine** ( 5 ml )

(control material **17** A/B)

**ZA17** A \_\_\_\_\_ x 15.00 €

**ZB17** B \_\_\_\_\_ x 15.00 €

Date: \_\_\_\_\_

Lab-ID (please do always quote!): \_\_\_\_\_

Signature and stamp: \_\_\_\_\_