

11. PERFORMING THE ANALYSIS –Quick guide-

NB. The method is not suitable when measuring fresh petrol !!!!!

- 1) If needed check/calibrate the scale using the 100 g weight included in the package



Picture 1

100 g weight

Measuring result
100 g

- 2) Name the eluting tube using the identification code of the sample.



Picture 2

- 3) Set the scale display to zero by pressing On/Off /Zero button. The tube must be placed on the scale during the zeroing.



Picture 3

- 4) Once more, mix the sample thoroughly, portion out the sample into the eluting tube placed on the scale. Measure 10 g ($\pm 0,1$ g) doses by using the aluminum, disposable sampler.



Picture 4

- 5) Break the blue capped ampoule by pressing it gently with your thumb (Picture 5) and pour its contents into the eluting tube and close the cap (Picture 6).

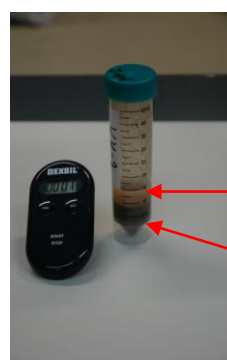


Picture 5



Picture 6

- 6) Set the timer for **5 minutes** (eluting time) and turn the timer on.
- 7) Stir the eluting tube strongly for 15 sec. and place it on the table.
- 8) Stir the eluting tube every now and then for the next 4 minutes.
- 9) Let the eluting tube stand still for the last minute in order to let the sediment settle on the bottom of the tube (Picture 7). (4+1= 5 minutes)



Picture 7

Cleared phase after
5 minutes

Sediment deposited
on the bottom

- 10) Open the small, black capped reagent bottle (placed in the packing case). Leave the bottle on the table. Write the sample id. on white, round shaped adhesive label and stick it onto the black cap of the tube (Picture 8).

sample id data,
on the adhesive label
onto the cap of the tube



Picture 8

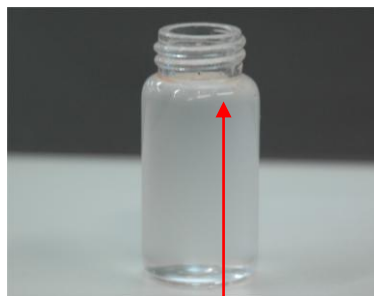
- 11) After eluting the sample successfully, pour the contents of the tube gently into a disposable syringe. **Avoid the sediment settled onto the bottom of the tube from ending up into the plastic syringe.**
- 12) Place the piston into the syringe. First filter a few drops into a waste container after which fill up the reagent bottle (Picture 9) **to the bottom of the screw part** (Picture 10) and close the cap. Stir the reagent bottle strongly for **15 seconds**.



Picture 9

Piston of the syringe,
you can find it inside
the green capped eluting tube.

Reagent bottle,
fill up to the bottom of the
screw part.



Picture 10

NB! Fill up the reagent bottle exactly to the bottom of the screw part

- 13) **Set the timer for 10 minutes** and turn the timer on. Let the reagent bottle stand still for the next 10 minutes (absolute max. time is 20 minutes).
- 14) After 10 minutes clean up the reagent bottle carefully using paper etc. Measuring is based on the measurement of the light that has been transmitted through the bottle. Notice when handling the bottle that dirt/finger prints on the surface of the bottle will contort the measuring result.
- 15) Open the cap of the analyzer's measuring chamber (by unscrewing it counterclockwise). Place the reagent bottle into the measurement chamber. Gently close the measuring chamber's cap by screwing it clockwise.
- 16) Turn on the analyzer by pressing READ / ON-button (Picture 11), after which the display will show **chosen curve and response factor e.g. 1C 5 (recommendation) or change the response factor to one matching with the substance being examined.** (Changing the response factor is advised on the following page).



Picture 11

Reagent bottle in the
measuring chamber

READ / ON-button

- 17) **Press READ / ON- button again.** After a while readings 1C and 5 will start blinking simultaneously. After a few seconds of blinking, result of measurement will appear into the display, e.g. 456, which is the sample's oilhydrocarbon concentration ppm.
- 18) Read the result and write it down, e.g. 456 ppm (mg/ L)
- 19) Remove the reagent bottle from the measuring chamber and place it into a hazardous waste container.
If the result is above 2200 ppm, "EEEE" will appear into the display. In these cases the quantifying can be executed as follows:
- 5 g of soil sample, multiply the result by 2, measuring range up to 4 000 ppm
 - 1 g of soil sample, multiply the result by 10, measuring range up to 20 000 ppm
 - or use " High Range Reagents", which are being sold separately. Measuring range 150 – 20 000 ppm.

Enclosed a list of different hydrocarbons and response factors used for them

Name	Response rate number	Detection limit / ppm
- Transformer oil	10	15
- Grease, vaseline	9	15
- Hydraulic oil	8	10
- Transmission oil	8	19
- Motor oil	7	19
- Fuel oil, heavy	7	25
- Fuel oil, light	6	18
- Diesel fuel	5	13
- Transmission oil	5	22
- Low aromatic diesel	4	27
- Pennsylvanian oil	4	20
- Kerosene	4	28
- Jet A, aeroplane	4	27
- Old fuel	2	200

Method is not suitable for fresh petrol !! Response factor 2

**RECOMMENDATION IN CASE THE CONSISTENCY OF THE FUEL IS NOT KNOWN:
CURVE AND RESOPONSE FACTOR : 1C 5 (diesel fuel)**

Changing the response factor for desired hydrocarbon:

- press **READ/ON**-button
- display will show e.g. 1C 5 which means: curve 1C and 5= Diesel or transmission oil. This is a recommended starting curve and response factor when the consistency of the material under examination is not known.
- press **NEXT**-button
- The number of the response factor starts blinking. Press **SCROLL**-button until the desired response factor comes into view
- press **SELECT/OFF**-button
- press **NEXT**, the temperature will be shown in the display.
- press **NEXT**-button, -bl-, will be shown in the display
- press **NEXT**-button, the chosen curve and response factor e.g. 1C 6 will be shown in the display. The response factor has been changed and the analyzer is ready for the measurement.

ERROR MESSAGES , Error XX

Sometimes a notice of an error appears into the display.

Enclosed is a list of possible error messages, where they are originated from and how they can be corrected.

- **Error 0**, calibration error, possibly the blanco and standard have been interchanged, check reagents or reagent bottle may be totally missing.
- **Error 1**, reagent error, check the reagent and try again. If this doesn't help, change the reagent into another one.
- **Error 2**, the blanco used for calibration is not clean. Correct by recalibrating by using an absolutely clean blanco sample.
- **Error 3**, blanco or standard hasn't worked properly during the calibration. Recalibrate by using new blanco and standard reagents.
- **Error 4**, distinct temperature differs $+ / - 10$ degrees from the calibrating temperature. This error can be corrected temporarily and quantifying can be continued by pressing NEXT-button, in which case the device will keep on working, but the result won't be reliable. This insufficiency will improve by recalibrating the device or **by bringing the device to the same temperature it was originally calibrated in.**
- **Error 5**, the temperature of the analyzer or the reagents is out of the device's operation range. Correct the situation by bringing the analyzer and the reagents to the original calibrating temperature. After the equipment has got warmer, run the test again. If this didn't help, calibrate the device accordant with prevailing circumstances.
- **EEEE- as blinking text**, the concentration of the sample exceeds the device's capacity. Correct by running the analysis again with lesser amount of the sample. It is recommended to use 1 g of sample. N.B ! In these cases the accuracy of the result may be unfavourable. **The accurate result is reached by multiplying the result shown in the display by ten.**
- **Blinking concentration result**, concentration of the sample has exceeded the analyzer's inner measuring curve at least by 10 per cent. Correct by running a new test by using a reduced amount of sample. It is recommended to use 1 g of sample. N.B ! In these cases the accuracy of the result may be unfavourable. **The accurate result is reached by multiplying the result shown in the display by ten.**

GWM-Engineering Ltd
Savilahdentie 6, P.O. Box 1750
FI-70211 Kuopio, Finland
Tel. + 358-17 5800 818

www.gwm-engineering.fi