KIKO EMMISSIONS TESTING PROCEDURE

1.0 METHODOLOGY

Kiko Technology™ is a nanotechnology product developed by linking infrared energy and the Earth's natural frequency, providing un-parallel Bio & Eco solutions to all water-based applications that we use every day, including fuel.

In fuel, Kiko increases absorption of Near Infrared (NIR), increases the vibration of water from between 120-140 HEU to 60-90 HEU, and accelerates the separation of Oxygen from Hydrogen.

The objective of the study is to confirm Kiko's impact on reducing emissions (HC, CO, O2, NOx, Sox) **and** improving fuel efficiency in motor vehicles by showing before and after emissions and NIR readings. We will run tests on five different vehicle types with a wide range of emission rates and engine sizes, running them at different speeds within a strictly controlled environment.

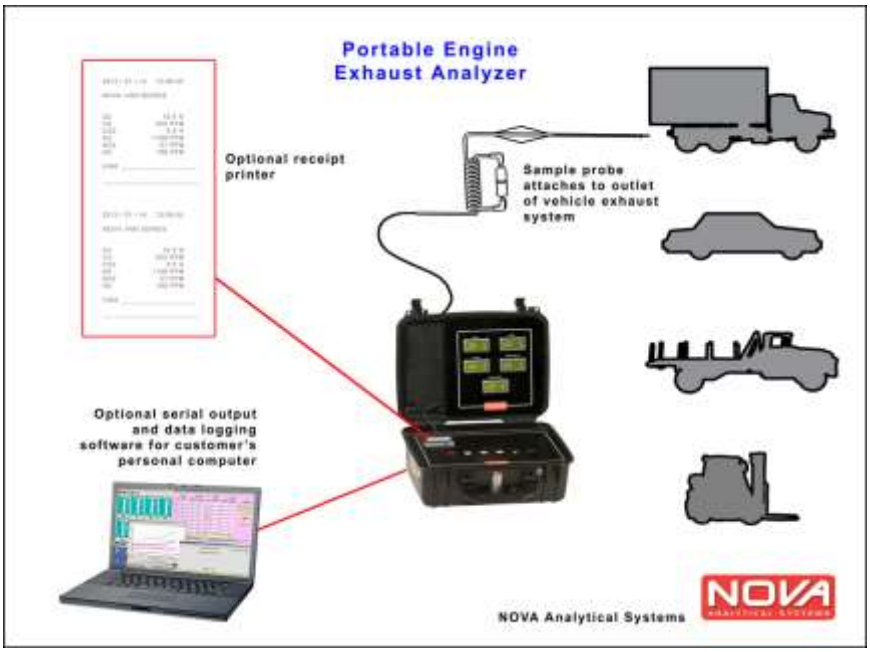
Outlined below are the sampling parameters and conditions, step-by-step testing process for each vehicle type, and the different sampling driving conditions required.

2.0 TESTING PARAMETERS

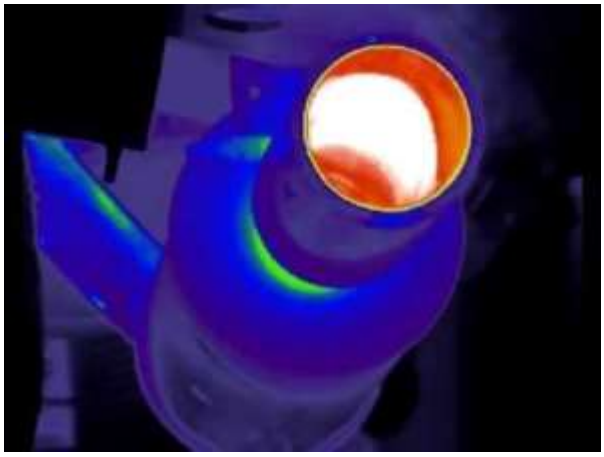
2.1 MEASUREMENT TECHNIQUES

2.1a) EMMISSIONS MEASUREMENTS - Use an Engine Exhaust Analyzer to measure HC, CO, CO2, NOx, and O2 concentration. If available, run a second measurement for each specific gas using the recommended techniques/tools in Table 1.

If using Fourier Transform Infrared (FT-IR) spectroscopy, set resolution to 0.5cm^{-1}, control temperature between 80 – 100^{O}C, set pressure control between 600-650 mmHg, and heat the sampling line between the engine and FT-IR to prevent condensation.



2.1b) IMAGERY – Use a calibrated Near Infrared (NIR) camera to photograph the emissions



2.2 PRIMARY EMISSIONS TESTS (Table 1)

Measure the concentration of the gasses listed in Table 1 **and** photograph near infrared levels in the vehicle emissions:

Table 1

	Emission Types	Measurement	Preferred Tool/Technique
E1	Unburned Hydrocarbons (HC)	ppm	Flame Ionization Detector (FID) or Fourier Transform Infrared (FT-IR)
E2	Carbon Monoxide (CO)	%	Non Dispersive Infrared Spectroscopy (NDIR) or FT-IR
E3	Carbon Dioxide (CO2)	%	NDIR or FT-IR
E4	Nitrogen Oxides (NOx)	ppm	Chemiluminescence analyzer (CL) or FT-IR
E5	Sulphur Oxides (SOx)	ppm	FT-IR
E6	Oxygen (O2)	% (Air/Fuel Ratio)	NDIR or FT-IR
E7	NIR	Photograph	Near Infrared Camera (calibrated)

2.3 PHASE II EMISSIONS TESTS (Optional)

1. Volatile Organic Compounds – Chlorofluorocarbons (CFCs), Formaldehyde
2. Evaporative Emissions

3.0 TESTING PROCEDURE & PROTOCOL

3.1 SAMPLE VEHICLES (Table 2)

	Vehicle	Recommended Model	Specifications
V1	Passenger Car (Taxi)	Volkswagon Jetta Konig or Pionier	http://chinaautoweb.com/car-models/vw-jetta/
V2	Passenger Car	Volkswagon Santana	http://chinaautoweb.com/car-models/shanghai-volkswagen-santana/
V3	Passenger Car	Wuling Hongguang	http://chinaautoweb.com/car-models/sgmw-wuling-hongguang/
V4	Farming Vehicle	DongFeng Rich Pickup	http://chinaautoweb.com/car-models/rich-pickup-truck/
V5	Heavy Duty Truck	DongFeng model DFL1311A4-K12-004-010J	

Note: A total of 75 Control tests must be run (5 vehicles x 5 driving conditions **3.2 SAMPLE DRIVING CONDITIONS (Table 3)**

	Condition	Description
C1	Engine Idle	Engine ON only
C2	Engine Speed 2,500rpm	Constant speed
C3	Acceleration	Accelerate car from 0 km/h to 80 km/h
C4	Deceleration	Decelerate car from 80 km/h to 0 km/h
C5	Light Load Cruising	320kgs in the vehicle, constant cruising at 80 km/h

3.2 STEP BY STEP TEST PROCEDURE

3.2a) CONTROL TEST

Step 1 - Inspect vehicle for fuel and exhaust leaks prior to testing
Step 2 – Run vehicle with Engine Idle (C1) for **10 minutes**. Record the following:

- Concentration of each gas at **2 minute intervals** (E1-E6)
- Take a NIR photo (E7)
- Vehicle speed (mph)
- Engine speed (rpm)

Step 3 - Repeat Step 2 TWO more times (**total 3 x 10 minutes**)
Step 4 – Repeat Steps 1 to 3 for each Driving Condition (C1 – C5)

REPEAT the Control test for each of the sample vehicles (V1 – V5).

x 3 samples = 75)

3.2b) KIKO TEST

Step 1 - Inspect vehicle for fuel and exhaust leaks prior to testing
Step 2 - Add 8x KIKO stones to the gas tank of the vehicle.
Step 3 – Run vehicle with Engine Idle (C1) for **10 minutes**. Record the following:

- Concentration of each gas at **2 minute intervals** (E1-E6)
- Take a NIR photo (E7)
- Vehicle speed (mph)
- Engine speed (rpm)

Step 4 - Repeat Step 3 TWO more times (**total 3 x 10 minutes**)
Step 5 – Repeat Steps 1 to 4 for each Driving Condition (C1 – C5)

REPEAT the KIKO test for each of the sample vehicles (V1 – V5).

Note: A total of 75 KIKO tests must be run (5 vehicles x 5 driving conditions x 3 samples = 75)

3.3 ENGINE BREAKDOWN

After all tests are complete, break down the engine of each vehicle to check if the KIKO stones have any physical impact on the engine parts.

4. SUMMARY QUESTIONS

1. What is the percentage reduction in emissions concentration using KIKO for Primary & Secondary test criteria?
2. What does the percentage reduction in the testing centre translate to for a motor vehicle on the road (ie is a 50% lab reduction equivalent to a 40% road reduction)?
3. Percentage reduction in emissions leads to what % in fuel savings?
4. Which organizations can market KIKO based on the results of the test?