

BOS/F2/148/11**Zestaw analizatorów do ciągłej analizy spalin z pojazdu na hamowni podwoziowej****Emissions system for continuous analysis of exhaust gases from vehicles on a chassis dynamometer**

CPV: 38333200-1, 38540000-2, 38545000-7

**SPECIFICATION of ESSENTIAL CONDITIONS
of the SCOPE of ORDER (SEC)****OPEN TENDERING PROCEDURE
REFERRING TO PUBLIC PROCUREMENT LAW**

(ACT of 29 January 2004 with amendments)

Date: 13 July 2011

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Contents: 11 pages and 4 appendices

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§1. INTRODUCTION

1. The item of order is a system designed for research and development activities in the range of emission testing of vehicles fuelled with gasoline, Diesel, LPG, CNG, synthetic fuels and biofuels on a chassis dynamometer in BOSMAL's climatic chamber operating at temperatures ranging from -35°C to +60°C.
2. The system must be designed to be fully integrated into BOSMAL's existing emissions testing system. While the item of order is not destined for use in homologation and certification activities, the system should conform to all relevant requirements of EU, US EPA/CARB and Japanese standards. The ability of BOSMAL's existing emissions testing system to meet EU, US EPA/CARB and Japanese standards must not be compromised in any way by the installation of the item of order.
3. The emission system should facilitate the execution of the following tests of vehicle categories M and N with maximum axle load 3500 kg on a chassis dynamometer in a climatic chamber:
 - a) Continuous analysis of undiluted exhaust before and after the vehicle's aftertreatment device (catalyst) and analysis of CO₂ concentrations downstream of the engine's EGR valve at ambient temperatures ranging from - 15°C to 20°C, during emissions tests according to EU, EPA/CARB and Japanese standards;
 - b) modal analysis and calculation of catalyst efficiency, lambda value and EGR ratio during any type of emissions testing activity or driving cycle;
4. The emission system should be designed, manufactured and installed for continuous operation, not less than 2 shifts a day and 6 days a week, and the system's assumed life time should be at least 10 years.

§2. THE ITEM OF ORDER DESCRIPTION

A. INTRODUCTION

The item of order is an automotive emissions testing system, which should consist of the following elements:

1. Heated sampling lines for sampling exhaust gases both upstream of any type of aftertreatment device ('Pre-cat') and downstream of the aftertreatment device ('Post-cat');
2. Heated hydrocarbon analysers with heated filters, two for each of the two lines ('pre' and 'post'), such that continuous quantification of total hydrocarbons (THC), methane (CH₄) and non-methane hydrocarbons (NMHC) is possible for both lines ('pre' and 'post');

3. For each line ('pre' and 'post'), analyzers for the following compounds:
CO, CO₂, NO and NO_x. O₂ for the 'pre-cat' line only.
4. A sampling line and analyzer for quantification of the exhaust gas recirculation (EGR) ratio via measurement of the CO₂ concentration, for EGR ratios both < 25 % and ≥ 25 %.
5. Full mechanical and electronic integration into BOSMAL's existing HORIBA MEXA7400HRTLE emissions testing system, climatic chamber and all pertinent media supply systems. This integration must include the supply, set-up, installation and start-up of all required computer hardware and software, including total integration into BOSMAL's existing VETS7000NT control software. The volume of sample drawn into the sampling probes of the item of order should be accounted for in all calculations performed by BOSMAL's existing emissions test system which have a sample volume input variable.
6. A warranty agreement covering a period of at least two years, in the range of routine maintenance of the system, all types of troubleshooting and repairs, spare parts, software updates, and all related costs.

B. GENERAL DESCRIPTION

1. A twin-line system dedicated to continuous analysis of undiluted exhaust gases before and after the catalyst.

1.1. The analysis system should consist of following lines of analyzers:

1.1.1. Two measuring lines dedicated to continuous analysis of undiluted exhaust before and after the catalyst, with the measuring ranges given below:

Quantity	Analyser (Operating principle)	Measuring range	
		Low	High
2	CO low (NDIR)	0-50 ppm	0-5000 ppm
2	CO high (NDIR)	0-0.5 %	0-12 %
2	CO ₂ (NDIR)	0-0.5 %	0-20 %
1*	O ₂ (PMD)	0-1 %	0-25 %
2	NO (CLD)	0-10 ppm	0-10000 ppm
2	NO _x (CLD)	0-10 ppm	0-10000 ppm
2	THC (FID)	0-15 ppm C1	0-45000 ppm C1
2	THC / CH4 (FID)	0-50 to 2500 ppm C1	0-25000 ppm C1

* Pre-cat only

1.1.2. A measuring line with CO₂ EGR analyzer, with the measuring range given below:

Quantity	Measured component (Analyzer)	Measuring range	
		Low	High
1	CO ₂ (NDIR)	0-0.5 %	0-20 %

1.2. All implemented analyzers must fulfil the following requirements:

- linearity $< \pm 1 \%$ full scale or $< \pm 2 \%$ of the measuring point, whichever value is lower;
- repeatability $< \pm 0.5 \%$ full scale.

1.3. The analyzer units should be equipped with all necessary valves, pumps and pipes for span and operation gases and the sample gas, to permit the execution of emission tests and the performance of at least following functions: analyzer calibration, performing linearization and linearization checks, efficiency checks of the NO_x converter, checking of the FID analyzer's hydrocarbon response and O₂ interference, interference check of NDIR analyzers, leak check, drift and other checks, as required by emissions legislation. All internal piping and components which come into contact with exhaust gases should be made of stainless steel or PTFE.

1.4. HFID analyzers for continuous THC and CH₄ measurement of undiluted exhaust should be installed separately, together with their own sample conditioning unit and heated sampling lines (190±10°C), and heated wall bushings.

1.5. The analysis system must be equipped with a controlling computer (with monitor), which permits control and operation of all installed analyzers. The installed software (in English) should permit the execution of at least the functions mentioned above in point 1.3. The system may feature, if available, a function permitting remote error diagnosis and troubleshooting via an internet connection.

1.6. Heated wall bushings suitable for conveying all sampling lines from the interior of BOSMAL's climatic chamber (diameters of existing apertures = 50 mm, 100 mm; wall thickness = 120 mm).

1.7. Sampling lines (heated 190±10°C) for continuous undiluted exhaust for measurement before and after the catalyst (lengths of at least 12 m) and for EGR ratio measurement, length of at least 6 m (lengths of heated lines are according to the system lay-out). Sampling line lengths must cover all possibilities for testing M and N category vehicles, both front- and rear-wheel drive. Additionally, heated sampling lines are required to convey the sample from the external side of the chamber wall bushing to the analyzers: two 2-metre lengths to the HFID analyzers, two 12-metre lengths to the main analysis bench, and one 12-metre length for conveying the EGR sample to the EGR CO₂ analyser installed on the main analysis bench.

2. The item of order must be fully integrated into BOSMAL's existing exhaust emissions testing system, in such a way that the functionality of the existing system is not adversely affected in any way by the additional equipment.

The existing system must be able to function both with and without the additional devices, and at all times must continue to meet all demands of all relevant legislation.

3. The emissions test automation software, in its revised form, should permit the execution of emissions tests either with or without the item of order enabled.

The amended software must handle the automated execution of:

- calibration of analyzers before a test commences.
- modal analysis of undiluted exhaust before and after catalyst,
- continuous evaluation of catalyst efficiency for the following compounds: THC, CH₄, NMHC, NO, NO_x, NO₂, CO,
- continuous calculation of the EGR ratio,
- continuous calculation of the A/F ratio and derived λ value,
- archival of all the above-mentioned parameters at a frequency of at least 1 Hz.

C INSTALLATION AND ACCEPTANCE

1. The Supplier will make a design on the system element layout after signing the contract, which will be presented to BOSMAL for acceptance. Deadline: 1 month after signing the contract.
2. After signing the contract, the kick-off meeting will take place at BOSMAL to agree the action schedule.
3. The Supplier shall provide a list of recommended zero, span and operation gases in advance, which BOSMAL will ensure the availability of for commissioning tests.
4. After system production, just before dispatch, the Supplier will inform BOSMAL of their readiness to carry out pre-acceptance at the Supplier's side.
5. In the scope of acceptance at least following tests will be carried out:
 - 5.1. Linearization and linearization check of installed analyzers (11 dividing points).
 - 5.2. CLD analyzer converter efficiency.
 - 5.3. Interference of NDIR analyzers.
 - 5.4. FID analyzers hydrocarbon response.
 - 5.5. Leak check of sampling lines.

5.6. Correlation tests: emission tests to bag together with modal analysis of undiluted exhaust over the NEDC and FTP75 driving cycles. Tests (3 emission tests from cold start, day by day) will be carried out on 2 vehicles powered by SI and CI engines. Correlation results obtained from modal analysis of undiluted exhaust should be as follows:

- CO₂: ≤2%,
- CO, HC, NMHC, NO_x: ≤5%.

6. Media parameters: power supply 400 V ±5%, 230 V ±5%, compressed air: 6 bar.

7. The scope of delivery of the system should include system documentation, in English (2 paper copies and electronic version on CD), consisting of at least:

- System technical drawings;
- Schematics of all gas, pneumatic and hydraulic components;
- Schematics of all electric components and connections with description of usage codes;
- Operation, repair and maintenance manuals including a description of: measurement execution procedures, calibration procedures, functions of system components and software.
- Spare parts list;
- Spare parts list, which the orderer should have in stock to minimize downtime in the case of system breakdown to not longer than 48 hours;
- Reports from analyzers checking after start-up at the Supplier's side;
- The declaration of conformity according to research standards, for the entire system (BOSMAL's existing emissions testing system, with the item of order);
- Declarations of conformity according to at least the following safety standards:
 - 2006/42/EC – safety of machinery;
 - 89/336/EEC and 2004/108/EC – electromagnetic compatibility;
 - 73/23/EEC – low voltage devices;
 - PN-EN ISO 12100-1:2005 and 12100-2:2005 – safety of machinery;
 - PN-EN 61326-1:2006 (U) – electromagnetic compatibility;
 - PN-EN 61010-1:2004 – low voltage devices;

8. Scope of responsibility:

#	Task	BOSMAL	Supplier
1	Design of the system lay-out		x (BOSMAL acceptance required)
2	Delivery		x (DDU)
3	Unloading	x	
4	Storage	x	
5	Unpacking		x
6	Locating the system components	x	x (Technical support + supervision)
7	Assembling and integrating all system components		x

8	Supply media (power supply, compressed air)	x	
9	Commissioning		x
10	Acceptance Tests	x	x
11	Final acceptance	x	x
12	Training		x

9. Correlation tests will be carried out in 3 laboratories (Round Robin test): BOSMAL, a location to be chosen by the Supplier and an independent laboratory (chosen by BOSMAL) – BOSMAL will provide the golden car and transport to emission laboratories, emission tests costs in laboratory chosen by the Supplier, the Supplier will pay, all other costs will be borne by BOSMAL.

D. TRAINING, WARRANTY, SERVICE

The Supplier of the item of order shall be obliged to provide the following:

- Training in system operation and maintenance onsite at BOSMAL (and offsite, if required).
- Warranty for minimum 24 months and necessary maintenance within this period together with all required consumable parts and service. Warranty time starts from date of commissioning (signing acceptance protocol).
- Service response within 24 hours and service action within 5 working days during the warranty period (experienced engineer with spare parts at BOSMAL side). Maximum repair period 10 working days from notification of the fault. If the failure is not resolved in the above-mentioned period, the faulty unit has to be replaced with a new one.
- Service within 10 working days after expiry of the warranty period (experienced engineer with spare parts at BOSMAL side).
- Maintenance of the complete system just before expiry of the warranty period.

The Supplier can ask for further explanations concerning the order terms on working days during the hours: 07:00 – 14:00. The person responsible in the commercial field is Mr Zbigniew Liszewski – Purchasing Department, phone +48 33 81 30 536, room no. 328, and in the technical field is Dr Piotr Bielaczyc – Engine Research Department, phone +48 33 81 30 598, room no. 113C.

§3. CONDITIONS FOR PARTICIPATION IN THE PROCEDURE

Tenderers which fulfil the following requirements are eligible to submit offers:

1. Have the necessary knowledge and experience and have at their disposal the technical potential and personnel capable of executing the contract;
2. Have the authorisations to perform specific activities or actions, if such authorisations are required by the law;
3. Are in a financial and economic situation to ensure full completion of the contract;

4. Have reported an annual turnover above 100 million EUR;
5. Are not liable to exclusion from the tender procedure (Polish Public Procurements Law, Article 24, paragraph 1);
6. Have completed at least ten contracts similar in their nature – analyzer set for continuous analysis of undiluted exhaust gases – for carmakers, oil and fuel companies, OEM suppliers and R&D centres in the last 5 years, with at least 1 such project for BOSMAL's main customers: FIAT, FPT, or GM.
7. Have paid the deposit prior to the final date for submission of the offers, the deposit for the amount of 10 000 PLN or 2 500 EUR, to be retained during the period in which the Tenderer must maintain their offer. The deposit paid in currency shall be paid by bank transfer into either the bank account for PLN: 32 1240 4142 1111 0000 4823 8630, or for EUR: 39 1240 4142 1978 0000 4823 0559 – SWIFT: PKOPPLPW; bank: Bank Pekao SA O/Bielsko-Biala.
8. The awarding entity will retain the deposit, together with interest earned, if the Tenderer fails to submit documents, statements and powers of attorney (as referred to in Article 25 paragraph 1), in response to the request referred to in Article 26 paragraph 3 of the Act, unless the Tenderer can prove that this was due to events beyond the Tenderer's control.

§4. DESCRIPTION OF OFFER PREPARATION

1. The offer shall be prepared in Polish, using a document format which cannot be altered without leaving a trace of the amendments made. The awarding entity agrees on the submission of part of offer referring to technical description in English version (Polish Public Procurements Law, Article 9).
2. The offer should have numbered pages, beginning with 1 on the first page. Pages of documents mentioned in points 6 and 9 must also be numbered. All pages must be securely fastened together, so that no material can be removed.
3. The offer must begin with the fully completed "Offer" form (Appendix no. 1 of SEC).
4. Each page of the offer must be signed by a person authorized to sign the offer.
5. Any corrections must be signed by a person authorized to sign the offer.
6. The offer should include the following documentation:
 - I. Documents confirming fulfilment of the conditions for participation, such as:
 - a declaration that the Tenderer has the necessary knowledge and experience and has at their disposal the technical potential and personnel capable of performing the contract,
 - a declaration that the Tenderer has the authorisations to perform specific activities or actions, if such authorisations are required by the law;
 - a declaration that the Tenderer is in financial and economic situation to ensure the completion of the contract;
 - a financial declaration (Appendix no. 3 of SEC, with all required documents);

- a declaration that the Tenderer is not excluded from the tender procedure according to Polish Public Procurements Law, Article 24, paragraph 1;
- a list of contracts similar in their capacity, performed within the past 5 years for carmakers, oil and fuel companies, OEM suppliers and R&D centres, with details referring to customers and dates of delivery;
- a current copy of the relevant entry in a Register of Companies;
- a declaration that the Tenderer does not have social insurance and/or tax arrears;
- a declaration that the Tenderer has no entry in the applicable National Register of Criminal Records, according to Polish Public Procurements Law, Article 24, paragraph 1, p. 4-9.

Foreign Tenderers should submit documents issued according to the legal regulations of the country of origin, in English.

II. The offer should also include a technical description of the item of the order, in Polish or English.

7. The Tenderer may submit only one offer containing one final price for the item of the order.
8. The awarding entity does not permit the possibility of submitting supply for lots; the offer must include all analysers referred to in Part B, point 1.1.
9. In cases where the Tenderer is represented by a plenipotentiary, an adequate power of attorney ought to be enclosed to the offer.
10. In cases where materials other than those required for the tender application are sent, they should be delivered as a separate package, not included in the offer.
11. Documents and information presented in the offer which are confidential to the Tenderer and which should not be made available to other participants, ought to be indicated as “**Company secret**” and delivered as a separate consignment, not attached to the offer.
12. The offer shall be delivered in closed packaging and identified: “**Offer for emissions system for continuous analysis of exhaust gases from vehicles on a chassis dynamometer**”.
13. Offers that do not fulfil the above-mentioned requirements shall be rejected in accordance with Polish Public Procurements Law, Article 89, paragraph 1.
14. The offer should contain a proposal for a maintenance agreement for at least 5 years after the expiry of the warranty period, which should ensure failure-free system operation within this period. The agreement should include the cost of necessary maintenance of the system (the item of the order) within 1 year with all necessary consumable parts – paid as a lump sum and cost of 1 example service repair (including: 3 working days of service technician, accommodation and travel expenses) – paid according to real cost estimation.

§5. EVALUATION OF THE OFFERS

1. The basic version of the offered emissions test system should fulfil all the minimum requirements, as expressed in § 2.
2. The awarding entity may require the Tenderer to provide explanations concerning the contents of submitted offer and correct any computational errors in the calculation of prices, according to Polish Public Procurements Law, Articles 87.
3. The weightings of the evaluation criteria of the offer are as follows:

Criterion	W [%]
Price of the complete system (with necessary maintenance and consumable parts during warranty period), including full integration into BOSMAL's existing emissions test system and climatic chamber, training and all relevant software	87
Extension of warranty period over 2 years	4 per year, up to a maximum of 8
Price of maintenance agreement for 5 years after expiry of the warranty period (see § 4, item 14) Values to be taken for comparison: 5 x annual maintenance cost with consumable parts + 5 x cost of 1 service repair (3 days)	5
Total	100

Tender evaluation method:

$$L_{Ci} = \frac{C_{\min}}{C_i} \times W \times 100 \text{ pts},$$

where:

- L_{Ci} is the number of points obtained for the criterion,
 C_{\min} is the lowest value of all offers,
 C_i is the value of the offer under evaluation,
 W is the relevant criterion weight [%].

4. Prices expressed in EUR will be transferred into PLN according to NBP (Polish National Bank) middle exchange rate from the day of the opening of the offers.
5. The awarding entity shall inform all Tenderers who have submitted tenders of the selection of the best offer, in writing.
6. Where the best offer cannot be selected as two or more offers represent the same balance of evaluation, the awarding entity shall call upon the Tenderers to submit additional offers, within a specified period.
7. The tender procedure may be cancelled in certain cases, as specified in Polish Public Procurements Law, article 93 (eg. the project will not be confirmed by FNI TP).

§6. TERMS**1. Submission of the offers**

Offers shall to be submitted to BOSMAL Automotive R&D Institute Ltd, Purchasing Department, room 328 or 361, ul. Sarni Stok 93, 43-300 Bielsko-Biała, by **12⁰⁰** on **05.09.2011**; any offers delivered later than this will not be considered.

2. Validity of the offers

The Tenderer must maintain their offer for a period of 60 days. The period during which the Tenderer must maintain his offer shall commence with expiry of the time limit for submission of offers (Polish Public Procurements Law, Article 85).

3. Opening of the offers

Offers shall be opened in room 401 in BOSMAL Automotive R&D Institute Ltd, ul. Sarni Stok 93, 43-300 Bielsko-Biała, on **05.09.2011** at **12³⁰**.

4. Performance of the contract

The acceptance procedure of the contract must be completed by **30.12.2011** (demanded).

§7. ADDITIONAL CONDITIONS

1. The Tenderer shall be entitled to the legal protection measures specified in Polish Public Procurements Law.
2. The awarding entity provides the award of supplementary contracts in accordance with Polish Public Procurements Law, Article 67, paragraph 1, p.7.
3. The awarding entity shall request the Tenderer to provide security on due performance of the contract for the amount of 5 % of the offered net price. The awarding entity shall return the security according to the conditions specified in the contract (Appendix no. 2 of SEC).

§8. APPENDICES

1. Offer form
2. Contract template
3. Financial declaration form
4. Schematic diagram of BOSMAL's existing climatic chamber and emissions testing system, with a concept of the additional emissions testing system and its integration.

END of the SEC.