

PARTICLE NUMBER COUNTING SYSTEM

CPV 38344000-8

**SPECIFICATION of ESSENTIAL CONDITIONS
of the SCOPE of ORDER (SEC)**

**OPEN TENDERING PROCEDURE
REFERRING TO PUBLIC PROCUREMENT LAW**

(ACT of 29 January 2004 PUBLIC PROCUREMENT LAW, with further amendments)

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§1 INTRODUCTION

1. The item of order is a complete system designed for the quantification of the number of particles in diluted vehicle exhaust from petrol and Diesel engines, for R&D and certification purposes.
2. The system must fulfill all requirements of European Union Euro 5 & Euro 6 emission regulations: PMP requirements; specifically Supplement 7 to the 05 Series of Amendments to UN-ECE Regulation No. 83, with changes up to and including Revision 3, Amendment 2. If any new emission regulation – or a revision to an existing regulation – is approved after signing the contract, but before delivery, the system must be adapted by the Supplier to fulfill this regulation.

§2 DESCRIPTION OF THE ITEM OF THE ORDER

A particle number counting system, which should consist of the following elements:

- A particle transfer system (PTS) consisting of a sampling probe tip (PSP) and a particle transfer tube (PTT);
- A volatile particle remover (VPR) system consisting of:
 - a first particle number diluter (PND1) (sample heating and dilution),
 - a particle evaporation tube (ET),
 - a second particle number diluter (PND2) (sample cooling by means of dilution);
- A particle number counter (PNC);
- A software package.

The system must be fully integrated into BOSMAL's existing HORIBA VETS-7000NT emissions testing system. The Supplier must be able to fully guarantee total compatibility with BOSMAL's existing system, in line with homologation specifications and all relevant legislation.

A. GENERAL DESCRIPTION

Total sample residence time for the entire system, including the particle number counter's T_{90} response time, shall be no greater than 20 seconds.

All tubing for the transfer of sample material shall be kept as short as is reasonably possible, and should follow a layout which avoids sharp angles. Sample lines should be heated where necessary. All tubing should maintain a similar cross-section throughout its entire length. Where changes in cross-section are unavoidable, the transition should be as gradual as possible.

All system components which will come into contact with diluted or undiluted exhaust gases should be designed in such a way so as to minimize deposition of particles. All tubing should be made of electrically conductive materials, and adequately earthed.

1. A particle transfer system (PTS)

The particle transfer system (PTS) should have an internal diameter of ≥ 8 mm. The PTS should be designed in such a way that all the sample has a flow Reynolds number (Re) of < 1700 , and a guaranteed total residence time in the PTS of ≤ 3 seconds.

The sampling probe tip (PSP) should be designed to be installed in the dilution tunnel of BOSMAL's existing HORIBA emission testing system.

The Supplier must guarantee that the sample flow just upstream of the VPR contains at least 99 % of the mass concentration of particles of diameter $1\text{ }\mu\text{m}$ when sampled upstream of the PTS and that the 50 % cut point of the PTS is between $2.5\text{ }\mu\text{m}$ and $10\text{ }\mu\text{m}$. If this stipulation cannot be met through the design parameters of the PTS, the Supplier should provide a suitable particle pre-classifier unit, which must be capable of meeting the conditions listed above and fully compatible with all other system components.

2. A volatile particle remover system (VPR)

The volatile particle remover system shall be capable of achieving > 99.0 % vaporization of tetracontane particles of electrical mobility diameter 30 nm , with a VPR inlet concentration of $\geq 10\,000\text{ \#/cm}^3$. For the VPR as a whole, the particle concentration reduction factors for particles of diameter 30 nm and 50 nm shall be no more than 30 % and 20 % higher, respectively, and no more than 5 % lower than the concentration reduction factor for particles of diameter 100 nm .

The first particle number dilution device (PND1) shall be designed to operate at a wall temperature of $150\text{ }^{\circ}\text{C}$ to $400\text{ }^{\circ}\text{C}$. It is recommended that the set temperature of operation should not vary by more than $10\text{ }^{\circ}\text{C}$. It should receive HEPA-filtered dilution air and be capable of dilution factors at least covering the range 10-200 times.

The evaporation tube should be at a temperature greater than or equal to that of the first particle number dilution device, and within the range $300\text{ }^{\circ}\text{C}$ to $400\text{ }^{\circ}\text{C}$. Both these criteria must be met along its entire length.

The second particle number dilution device (PND2) should receive HEPA-filtered dilution air and operate either at a fixed or variable dilution factor over the range 10-15 times, such that the sample supplied to the particle number counter is at a temperature of $< 35\text{ }^{\circ}\text{C}$.

3. A particle number counter (PNC)

The particle number counter must display an accuracy of ± 10 % across the entire range from 1 cm^{-3} to the upper limit, against a traceable standard. The counter must quantify the number of particles in the sample at a frequency of at least 1 Hz and have a T_{90} response time of < 5 seconds.

The counting efficiency of the particle number counter must be 50 % (± 12 %) for particles of diameter 23 nm ($\pm 1\text{ nm}$) and > 90 % for particles of diameter 41 nm ($\pm 1\text{ nm}$).

The measuring ranges of the PNC must be 0-10 000 #/cm³ up to 0-50 000 #/cm³.

The particle number counter must register a count of < 0.5 #/cm³ when a HEPA filter (H13, EN 1822:1998) is attached to the inlet of the particulate sampling system. When such a filter is applied to the inlet of the particle number counter, the counter must report a reading of ≤ 0.2 #/cm³, rising to at least 100 #/cm³ upon removal of the filter.

4. Software package

The Supplier must provide software for operation and calibration of the system, and archiving and exportation of results obtained, to be run under the Microsoft Windows operating system.

B. OPTIONS

Additionally, the offer may provide for the following optional system components:

- a PTS facilitating the sampling of undiluted exhaust emissions,
- a sample line selector unit,
- a unit for performing linearity checks,
- a unit for returning the sample to a CVS unit,
- a unit for checking the system dilution factor,
- a unit for generating particles for checking the efficiency of the VPR.

C. INSTALLATION AND ACCEPTANCE

System documentation (in Polish and English; 2 paper copies and an electronic version on CD) must be included in the scope of the delivery, to include at least:

- All relevant technical drawings;
- Operation, repair and maintenance manuals, including a description of: measurement execution procedures, calibration procedures (to be performed before each test, daily, monthly and annually), functions of system components and software;
- A full list of spare parts;
- A list of spare parts which BOSMAL should have in stock to limit downtime in the event of system breakdown to no longer than 48 hours;
- Certificates of calibration of all measuring instruments made by an authorizing body (an accredited laboratory);
- A declaration of conformity according to research standards;
- A declaration of conformity according to at least the following safety standards:
 - EMC Directive 2004/108/EC,
 - The Low Voltage Directive 2006/95/EC,
 - EN 61326-1:2006,
 - EN 61010-1:2001.

Media parameters: power supply 230 V (±7 %); compressed air: 5.5 bar.

After completion of commissioning of the particulate counting system, correlation tests will be carried out in 3 laboratories (Round-Robin test): at BOSMAL, at a location chosen by the Supplier, and at an independent entity (to be chosen by BOSMAL). BOSMAL will provide the 'golden car' and transport to emission laboratories, emission tests costs in the laboratory chosen by the Supplier will be borne by the Supplier; all other costs relating to correlation testing will be borne by BOSMAL.

D. TRAINING, WARRANTY and SERVICING

The Supplier of the system must assure adequate provision of:

- Such spare parts as are deemed likely to be required within the warranty period;
- Training in the operation of the complete system (including software) and its maintenance;
- Warranty for a minimum period of 24 months and necessary maintenance and calibration within this period (including hire of temporary replacements), together with all required consumable parts and servicing.
- Service response within 24 hours and service action within 5 working days during warranty period (experienced engineer with spare parts at BOSMAL). The maximum repair period shall be 10 working days, starting from notification of the issue. If the failure is not fixed in the period given above, the defective unit must be replaced with a new one;
- Service within 10 working days after warranty period (experienced engineer with spare parts);
- Maintenance and calibration of the complete system just before the expiry of the warranty period.

The Supplier may ask for further explanation of the order terms on working days during the hours: 07⁰⁰-14⁰⁰. The person responsible in the commercial field is Mr Zbigniew Liszewski – Purchasing Department, phone +48 33 81 30 536, room 328, and in the technical field is Dr Piotr Bielaczyc – Engine Research Department, phone +48 33 81 30 598, room 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. Are in a financial and economic situation to ensure full completion of the contract;
3. Have reported an annual turnover above 100 million EUR;
4. Are not liable to exclusion from the tender procedure (Polish Public Procurements Law, article 24, paragraph 1);

5. Have completed at least 10 contracts similar in their nature – Particle Sampling System – for carmakers and R&D centers in the last 2 years, with at least 1 such project for BOSMAL's main customers: FIAT, FPT, or GM.
6. 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-Biała.
7. The awarding entity will retain the deposit, together with interest earned, if the Supplier 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 Supplier can prove that this was due to events beyond the Supplier'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). In item 2 there should be a price for an annual maintenance and calibration programme for the PNC, for at least 5 years after the expiry of the warranty period, which should include the hire of a temporary replacement device.
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 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 2 years for carmakers and OEM Suppliers with details referring to dates of delivery and customers;
- 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 each item.
8. The awarding entity does not permit the possibility of submitting supply for lots, whereas the awarding entity does permit the possibility of submitting additional options, e.g. according to §2, part B, in a separate list.
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 Particle Number Counting System”**.
13. Offers that do not fulfill the above-mentioned requirements shall be rejected in accordance with Polish Public Procurements Law, article 89, paragraph 1.

§5 EVALUATION OF THE OFFERS

1. The evaluation criteria of the offers for the system are as follows:

No.	Criterion	W [%]
1	Price of the complete system (including integration into BOSMAL's existing HORIBA VETS-7000NT emissions testing system, and – during the warranty period – necessary maintenance, calibration, consumable parts and hire of temporary replacement devices during calibration)	78
2	Price of annual PNC maintenance and calibration programme after expiry of the warranty period, including hire of a temporary replacement device	10
3	Extension of warranty period beyond 2 years	4 per year, maximum 12
	Total	100

Tender evaluation method (criteria 1 and 2):

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

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 [%].

3. Prices expressed in EUR will be transferred into PLN according to the NBP (Polish National Bank) middle exchange rate of the day of the opening of the offers;
4. The awarding entity may require the Tenderer to provide explanations concerning the contents of the offer submitted and correct any computational errors in the calculation of prices according to Polish Public Procurements Law, articles 87 and 88;
5. Decisions on the options will be taken by BOSMAL after the opening of the offers;
6. The awarding entity shall inform all Tenderers of the selection of the best offer;
7. Where the best offer cannot be selected as two or more offers represent the same balance of evaluation and the same price (criterion 1), the awarding entity shall call upon the Tenderers to submit additional offers, within a specified period;
8. The tender procedure may be cancelled in cases specified in Polish Public Procurements Law, article 93.

§6 TERMS

1. Submission of the offers

Offers shall to be submitted to the Purchasing Department, BOSMAL Automotive R&D Institute, ul. Sarni Stok 93 room 328 or 361, 43-300 Bielsko-Biała by **12⁰⁰ on 15.11.2010**; offers delivered later than this will not be considered.

2. Validity of the offers

The Tenderer must maintain their offer for a period of 30 days. The period during which the Tenderer must maintain their offer shall commence with expiry of the deadline for submission of offers (Polish Public Procurements Law, article 85).

3. Opening of the offers

Offers will be opened in room 609 of BOSMAL Automotive R&D Institute, ul. Sarni Stok 93, 43-300 Bielsko-Biała, at **12³⁰ on 15.11.2010**.

4. Performance of the contract

Delivery of the system must be completed by **31.12.2010 – demanded**.

§7 ADDITIONAL CONDITIONS

1. The Tenderer shall be entitled to legal protection measures, as 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 a 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).
4. The awarding entity foresees the possibility of changing the provisions in the contract in the case of postponed deadlines, in accordance with §2 of Sections 2 and 3 of the draft contract. These changes can be made with the consent of both parties, expressed in writing in an addendum to the agreement, on pain of annulation.

§8 APPENDICES

1. Offer form,
2. Contract template,
3. Financial declaration form.

END of SEC.