**TECHNICAL PROPOSAL**

**Designation and description of test method:**

ASTM D 6667-21 Standard Test Method for Determination of Total Volatile Sulfur in Gaseous Hydrocarbons and Liquefied Petroleum Gases by Ultraviolet Fluorescence.

**In view of the qualification and technical requirements provided by the Buyer, the Supplier shall fill in the below tables:**

*Table 1*

**Qualification and technical requirements applicable to laboratory equipment**

| **Item No** | **Criterion** | **Requirement [specify]** | **Information provided by Supplier** |
| --- | --- | --- | --- |
| 1. | Qualification of Supplier’s employees | Provide documented information that the Supplier's employees or those of its subcontractors have been properly trained to commission the respective equipment. |  |
| 2. | Suitability of equipment for tests according to required test method: ASTM D 6667-21 | Submit manufacturer's technical documentation or certificate proving that equipment is suitable for tests according to the said test method. |  |
| 3. | Deadline for commissioning | The term for commissioning the equipment is max 60 days. |  |
| 4. | Warranty terms and conditions | Not less than 12 months; provide the terms and conditions for after-sales service for warranty periods longer than 12 months. |  |
| 5. | Supplier's response time during the warranty period. | Response time (arrival at the Refinery if there is no other way of fixing faults) during the warranty period is max 72 hours. |  |
| 6. | Submit equipment safe operation manual (document) in the English/Lithuanian language (preferably in Lithuanian). | Undertake to present the safe operation manual (document) in the English/Lithuanian language (preferably in Lithuanian) together with the supplied equipment. |  |
| 7. | Pre-commissioning/commissioning and training to be provided after the delivery of the equipment. | Undertake to perform pre-commissioning/commissioning and training after the delivery of the equipment. |  |
| 8. | Transfer of information relating to maintenance and repair of equipment to the equipment maintenance technicians of the QA/QC Center after the expiry of the warranty period. | Undertake to submit information relating to maintenance and repair of equipment to the equipment maintenance technicians of the QA/QC Center after the expiry of the warranty period. |  |

*Table 2*

**Special technical requirements applicable to equipment**

| **Item No** | **Characteristics** | **Limit values, UoM [indicated]** | **Limit values, UoM (to be specified by Supplier)** |
| --- | --- | --- | --- |
| 1. | **Equipment type:** | | |
| Automatic | Analyzer for determining total sulfur content in LPG, vertical configuration with direct injection. Detection performed using a UVF detector, and calibration carried out using the external standard method. All flows are EPC controlled. Calculations done by licensed software. | . |
| Semi-automatic | x |  |
| Manual | x |  |
| **Equipment manufacturer, model** | PAC, ElemeNtS/S  With PAC Iris software and Accura liquefied gas introduction/vaporization system. |  |
| 2. | Software | PAC Iris software with the capability to:   * modify analysis/test conditions, * perform calibration, * customize the report template, * remove unnecessary data from the database. |  |
| 3. | Measuring range, accuracy | 1. Limit of quantification: not higher than 1 mg/kg. 2. Working range: from 1 mg/kg to 196 mg/kg, or better. 3. Linearity: calibration curve correlation coefficient > 0.9999. |  |
| 4. | **Sample injection system:** | | |
| Automatic | x |  |
| Separate system | Accura with a QC6 body, configured for liquefied-gas introduction from a sampler fitted with a QC6 quick‑connect stem; includes automated dosing of LPG samples and a heated expansion (vaporization) chamber connected to the inlet of the oxidation (combustion) zone, providing quantitatively controlled and reproducible delivery of the sample to the oxidation zone at approximately 30 mL/min. |  |
| Manual | x |  |
| 5. | Heating/cooling system | x |  |
| 6. | **Connection to other equipment, auxiliaries:** | | |
| Computer | Wiring suitable for connecting analyzer to computer and other devices. |  |
| Keyboard | x |  |
| Printer | x |  |
| Computer network via LAN | x |  |
| Other [specify] | 1. Tubes for connecting gas to the analyzer. 2. Wall-mounted pressure regulator for high-purity gas, low-pressure range (0-10 bar), with shut-off valve (2 pcs) for gas lines. 3. Cylinder-mounted pressure regulator for high-purity gas, inlet pressure 300 bar, outlet pressure 25 bar, two-stage, with purge and shutoff valves (2 pcs). 4. Gas line filters (2 pcs). 5. Gas detector (1 pcs). |  |
| 7. | **Auxiliaries:** | | |
| Rotameter | Installed in the sample introduction system and configured for the required operating flow rate. |  |
| Special calibration kit. | x |  |
| Filter | x |  |
| Other [specify] |  |  |
| 8. | **Calibration and verification:** | | |
| At the QA/QC Center | Verification using CRM is necessary. |  |
| Manufacturer’s calibration and CRM verification certificates | 1. For all equipment. |  |
| 9. | A set of spares sufficient for 12 months. | 1. All sample-transfer valves equipped with pneumatic actuators and controls, supplied as redundant units to the existing valves (1 pcs for each valve). 2. Gas line filters (2 pcs). 3. Quartz combustion tube (1 pcs).   Other spares to be listed in Table 5. |  |
| 10. | Computer | x |  |
| 11. | Printer | x |  |
| 12. | Certified reference material | Two CRMs supplied in 10-L LPG cylinders with dual outlets (vapor and liquid), liquid-phase bottom withdrawal (dip tube), DIN1 left-hand connection:   1. 5 mg/kg S (as dimethyl sulfide, DMS) in 50% propane / 50% n-butane; 2. 10 mg/kg S (as DMS) in 50% propane / 50% n-butane. |  |
| 13. | **Gas cylinder required (purity class):** | | |
| He |  |  |
| Ar |  |  |
| H2 |  |  |
| Air |  |  |
| 14. | **Sampling equipment for:** | | |
| Liquefied petroleum gas | x |  |
| Liquids | x |  |
| Refining gas | x |  |
| Other [specify] | x |  |
| 15. | **Equipment for preparation of test samples:** | | |
| Homogenizer | x |  |
| Shaker | x |  |
| Other [specify] | x |  |
| 16. | **Balance:** | | |
| Micro-analytical | x |  |
| Analytical | x |  |
| Technical | x |  |
| Other [specify] | x |  |
| 17. | **Dimensions:** | | |
| Height | x |  |
| Width | x |  |
| Depth | x |  |
| 18. | Other [specify] |  |  |

*Table 3*

**General information on the offered equipment**

|  |  |
| --- | --- |
| **Information required** | **Information provided by Supplier** |
| Name/model of equipment |  |
| Information about the manufacturer, country of origin, language of the user manuals, passport |  |
| Confirmation that the equipment complies with the requested test method; additional test methods that the offered equipment complies with. |  |
| A summary of the technical/operational characteristics, highlighting the advantages of the offered equipment. |  |

*Table 4*

**Detailed description of the equipment set, additional equipment and auxiliaries.**

**(to be specified by Supplier)**

|  |  |
| --- | --- |
| **Name** | **Quantity, units** |
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*Table 5*

**Recommended set of spares and consumables for 1 year**

**(to be specified by Supplier)**

|  |  |
| --- | --- |
| **Name** | **Quantity, units** |
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