**QUALITY ASSURANCE / QUALITY CONTROL CENTER**

**QUALIFICATION AND TECHNICAL REQUIREMENTS, SUPPLIER’S TECHNICAL PROPOSAL**

**Designation and description of test method:**

***ASTM D6703-19*** *Standard Test Method for Automated Heithaus Titrimetry*

**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 number** | **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 D6703-19 Standard Test Method for Automated Heithaus Titrimetry. | 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 | Automatic Heithaus equipment for quantifying compatibility parameters, composed of:  - *UV-visible spectrophotometer*, with a wavelength scanning length of 200-1000 nm (operating wavelength 740 nm), with adjustable aperture or attenuator;  - Quartz flow cell, a 0.20 mm path length with 6.35 mm flanged fittings.  - *Low-flow rate metering pump*, with a flow range from 0.100 to 1.000 ml/min, flow rate consistency ±0.002 ml/min, and piston chamber resistant to damage from solvent (isooctane) contact;  - *High-flow rate metering pump*, with a flow range from 0.5 to 10.0 ml/min, flow rate consistency ±0.1 ml/min, and piston chamber resistant to damage from solvent (toluene) contact;  - 2 magnetic stirring plates,  - *TFE-fluorocarbon coated magnetic* stir bars;  - 2 special water-cooled vessels, 250 ml, one for holding reaction vessel, another for storing titrant;  - 2 *TFE-fluorocarbon covers* for 250 ml vessel:  - TFE-fluorocarbon cover No. 1, threaded to hold a 40 ml reaction vial; three holes of 1.5 mm diameter, concentric to the cover’s center, and one additional hole of 3.0 mm to allow for a temperature probe to be inserted to measure water temperature next to the reaction vial;  - TFE-fluorocarbon cover No. 2 to cover 250 ml vessel, containing titrant; thickness – 2.0 mm; diameter – 70 mm, with one 1.5 mm hole tapped through the cover’s center;  - *TFE-fluorocarbon tubing*, with 0.559 mm internal diameter and 1.575 outside diameter, length - about 2 meters;  - 4 flanged fittings, 6.35 mm, for tubing with 0.559 mm internal diameter and 1.575 outside diameter;  - 4 connecting adapters for 6.35 mm flanged fittings;  - *Tubing clamps*, sized to fit 13 mm inside diameter tubing;  - Neoprene tubing with inside diameter of 13 mm;  - 2 *laboratory jacks* to be used as stands for metering pumps;  - *Platinum resistance thermometer*, PT100, readable to the nearest 0.1 oC, with probe length of > 80 mm and probe diameter of 3.0 mm. It shall be calibrated to ±0,1oC, and shall conform to D8055, E563, E644;  - Syringe, 5000 ml, gas-sealed, resistant to toluene and isooctane. |  |
| Semi-automatic | x |  |
| Manual | x |  |
| **Equipment manufacturer, model** | x |  |
| 2. | Software | Software that automatically controls the test procedure, with a standard program for processing the data and calculating the final result. |  |
| 3. | Measuring range, accuracy | Quantification of three Heithaus compatibility parameters:  po – asphaltene peptizability with an accuracy of 0.0001;  pa – maltene peptizing power, with an accuracy of 0.01;  P value – the state of peptization, with an accuracy of 0.01. |  |
| 4. | **Sample injection system:** | | |
| Automatic | x |  |
| Separate system | x |  |
| Manual | Special 40 ml reaction vials with TFE-fluorocarbon covers – 50 pcs. |  |
| 5. | Heating/cooling system | - Refrigerated water bath circulation system, with a temperature range of 0-100oC and temperature variation of ± 0,1oC Operating temperature – 25.0 ± 0.1°C |  |
| 6. | **Connection to other equipment, auxiliaries:** | | |
| Computer | Yes |  |
| Keyboard | Yes |  |
| Printer | Yes |  |
| Computer network via LAN | Yes |  |
| Other [specify] | x |  |
| 7. | **Auxiliaries:** | | |
| Rotameter | x |  |
| Spec. set for calibration | x |  |
| Filter | x |  |
| Other [specify] | x |  |
| 8. | **Calibration and verification:** | | |
| At QA/QC Center | Yes  Calibration using toluene as 100 % transmittance spectral background |  |
| Manufacturer’s calibration and CRM verification certificates | Yes |  |
| 9. | A set of spares sufficient for 12 months. | Yes |  |
| 10. | Computer | x |  |
| 11. | Printer | x |  |
| 12. | Certified reference material |  |  |
| 13. | **Gas cylinder required (purity class):** | | |
| He | x |  |
| O2 | x |  |
| H2 | x |  |
| Ar | x (Buyer has in stock) |  |
| 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 (Buyer has in stock) |  |
| Technical | x |  |
| Other [specify] | x |  |
| 17. | **Dimensions:** | | |
| Height | x |  |
| Width | x |  |
| Depth | x |  |
| 18. | Other [specify] | x |  |

*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)**

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