

<b>– Technical specification requested by the contracting authority, reference standards</b>	
<b>Technical requirements</b>	
The purchase of FTIR research laboratory system for micro - and macro - samples (particles and materials) is requested. The system will be configured with two basic components: IR microscope coupled to FTIR spectrometer.	
<b>Technical requirements for the FTIR spectrometer:</b>	
<b>a) The main unit</b>	
The device should have a vibration-resistant construction, closed interferometer, temperature and humidity sensors; have a large sample compartment (width at least 200 mm, depth and height at least 150 mm); allow external connection for the IR microscope. The device must be able to be connected to the computer for setting, directing, sampling and analyzing the measurement results via specialized software..	
Spectral range:	7000-400 $\text{cm}^{-1}$ or wider;
Spectral resolution:	adjustable from 1 $\text{cm}^{-1}$ to 8 $\text{cm}^{-1}$ or wider;
Wavelength accuracy:	$\pm 0.001 \text{ cm}^{-1}$ or less;
Signal to noise ratio:	35000:1 or higher;
IR source:	ceramic illuminator;
Interferometer:	Michelson, with isolation, with self-alignment capabilities;
Beam splitter:	Ge-coated KBr (Ge/KBr);
Exit window:	humidity resistant KRS-5;
Detector:	DLATGS with a Peltier temperature control mechanism (or analogue without liquid nitrogen cooling);
Laser diode:	VCSEL type or an analog version;
Daily validation system:	PS foil (Polystyrene) traceable to NIST or analogue;
Computer interface:	USB;
Power supply:	220V, 50Hz.
<b>b) Accessories:</b>	
Block for researching samples in the range of 7000-400 $\text{cm}^{-1}$ or wider using the ATR mode with diamond crystal with AR coating in a set with sample holders (flexible, flat, concave, anti- evaporation holders etc.);	
Block for inter-connecting the FTIR spectrometer and the IR microscope without the need to re-align the optical system.	
<b>c) Specialized software shall:</b>	

Provide the FTIR spectrometer directing - functionality control; regimes setting; spectrum acquisition, analysis and management etc.;	
Include a validation software module for documented verification of the tool performance;	
Provide data management functions: parameter storage, real-time spectrum display, baseline correction, CO <sub>2</sub> and water vapor band compensation, peak search, peak height, under-peak area, arithmetic operations, derivatives etc.;	
Provide the creation of the spectra libraries, classification of the unknown samples by functional groups and the identification of materials by spectra libraries;	
Include a library of at least 5000 spectra of defined polymers and polymer additives obtained in the ATR-FTIR regime (polymers, plastics, polymer additives, plasticizers with well-defined structure and extensive sample information);	
Include a library of at least 2500 spectra of commercial polymers and polymer additives, obtained in the ATR-FTIR regime (polymers, plastics, polymer additives, plasticizers).	
<b>Technical requirements for the IR microscope:</b>	
<b>a) The main unit:</b>	
The device shall allow measurements in the reflection, transmission and ATR..	
To perform the measurements, the device should be connected to the FTIR spectrometer (for using its components) and to the computer (for setting, directing, sampling and analyzing the measurement results through the specialized software).	
Detector:	DLATGS with a Peltier temperature control mechanism (or analogue without liquid nitrogen cooling);
Spectral range:	7000-400 cm <sup>-1</sup> or wider;
Signal to noise ratio:	1000:1 or higher (p-p, 300 μm <sup>2</sup> , 1 min, 4 cm <sup>-1</sup> , 2200cm <sup>-1</sup> );
IR source:	of the FTIR spectrometer;
Interferometer:	of the FTIR spectrometer;
Sample stage:	automated with steering in X-Y-Z directions, auto-focusing, providing software direction mapping (including in ATR mode);
Sample viewing:	at least 3MP video camera with 3x optical zoom or higher, enabling simultaneous observation and measurement of the sample, observation of the image on the control computer screen, with automatic sample illumination in the visible range;
Steering and setting:	from the control panel and / or via software;
Power supply:	220V, 50Hz.

<b>b) Accessories:</b>	
Reflection and transmission objective:	with a magnification between 16x and 26x;
ATR objective:	with a magnification between 24x and 26x, featuring the ZnSe prism, covering the range of 7000-650 cm <sup>-1</sup> or wider;
ATR protection:	pressure sensor with audible signal and signal for automated sample stage activation.
<b>c) Specialized software shall:</b>	
Provide the direction of the FTIR microscope for joint operation with the FTIR spectrometer - functionality control; regimes setting; spectrum collection, analysis and management, etc.;	
Provide the direction of the automated sample stage; samples navigation; simultaneous observation of the chemical spectrum and the observed sample; evidence mapping; imaging FTIR etc.	
- The warranty period of the equipment: at least 24 months from the date of signing the Act of delivery-receipt of the Goods. During the warranty period, the Supplier will ensure the proper functioning of the equipment by removing any faults or non-compliant operations within a maximum of 15 business days from the moment of the request.	