THE FORM DESIGNED TO DETERMINE THE ESTIMATED COMMISSION VALUE
FOR THE EXPENSE ITEM NO.19 "Flock Equipment"

The item is planned as an expense in the project no. POIR.02.01.00-00-0195/2017 called:
"Establishment of a Research & Development Centre by SANOK RUBBER COMPANY S.A.
designed to develop innovative products for the production of means of transport industry"
(hereinafter the "Project") selected by the Ministry of Development
for funding within measure 2.1. "Support for investments in R&D infrastructure of enterprises"
of the 2nd Priority Axis "Support for the environment and capacity of enterprise for R&D&I activity" of the Smart Growth 2014-2020 Operational Programme
in the call no. 1/2.1/2017 (hereinafter the "Call"), edition of <08 May 2017 – 7 July 2017. >,
conducted by SANOK RUBBER COMPANY S.A. (hereinafter referred to as the “Purchaser”).

Description of the expense item:

Name, as in the funding application: Flock Equipment
Item no., as in the funding application: 19
Key parameters affecting the commission value:

A set of devices for flocking profiles in line with the electrostatic method consisting of
- Cabin for glue application
- Air-conditioned cabin ensuring proper temperature and humidity for the flocking process
- Flock application equipment (a set of two flock application machines with electrostatic
method and a flocking machine for pneumatic shooting of flock)
- Cleaning unit
- Installation of flock recycling

Installation prepared for the application of materials:

1. Solvent-based adhesives with properties:
   - Viscosity (brookfield LVI, V=30, 25°C) mPa·s in scope (18 - 130)
   - Density (g/cm³) (0.93 - 0.97)

2. Flock (Dtex range 1.5 - 6.7)
   - polyester
   - polyamide
1. **Cabin for glue application (stable glue application conditions)**

Description: Application of flocking adhesives through hollow needles and brushes (base: organic solvent) to the surface of rubber profiles for flocking process.

- Adhesive feeding system equipped with 6 pieces of peristaltic pumps with low-pulsation heads and a pressure tank
- 6 applicators for droplet adhesive application, each powered by an independent peristaltic pump
- 12 hydraulic lockable 3D holding fixtures (6 for applicators and 6 for brushes) with identification markings for peristaltic pumps
- Compressed air preparation and distribution system,
- Scales system with notification of the minimum pre-set adhesive weight in the tank (with indication of the current weight) (scale in the EX system)
- Switching and control cabinet designed according to the VDE regulation.
- Signaling column indicating the cabin operating status
- Pressure tank for glue, placed in the separate cabin which shall be connected to air conditioning system of climatic cabin in order to maintain the proper conditions for glue storage
- Hoses transporting the glue in the scope of delivery
- Running cables from the medium with as short as possible route,
- Enabling the cabin to be moved away from the extrusion line by means of a hand pallet truck,
- Ventilation system with dry filtration of the air extracted from the cabin (air extraction from the adhesive application area), at least two-stage filter system.
- Openings in the side wall for hose routing, transparent polycarbonate front cover opened upwards,
- Lighting and extraction fan in explosion-proof execution,
- Frame structure of the ventilation chamber and the fan located on the roof of the cabin,
- Cabin rollers for profile guidance (in case of no glue application on the profile)
- The distance of profile guidance axis to front edge of cab approx. 350 mm for easy access for the operator
- Ventilation with explosion proof lighting in the space between the adhesive application and flocking cabins (distance approx. 1000 mm)
- Line height 1050 mm (+/- 10 mm)

Requirements for peristaltic pumps:

- 6 - pieces of peristaltic pumps with exchangeable low-pulsation heads with no worse parameters than those described: heads with at least 6 rollers with the possibility of leading the power supply divided into two tubes working in phase shift, which after the re-connection after leaving the pumps ensure minimizing pulsation. Stable
performance for a wide range of internal diameters, including 1.6 mm internal diameter and 2.4 mm wall thickness.

- Tubes working in pump heads should be adapted to work with the above-mentioned adhesives (e.g. made of marprene or other material with no worse chemical resistance and durability)
- Total feed rate for each pump is not less than 0.01 ml/min – 2200 ml/min (for a hose diameter of 1.6 mm, wall thickness 2.4 mm in the range not less than 0.04-90 ml/min)
- The amount of glue applied to the applicator is regulated by the amount of pump rotations adjustable on each pump
- Operating temperature 16-40°C
- At least 2 years warranty

2. Climatic cabin for flock

Description: Air-conditioned cabin for electrostatic flocking system

- Dimensions of the cabin approx. 6000 x 5000 x 4500 (L x W x H) - the exact dimension and the layout of the cabin will be agreed with the selected supplier)
- Insulated cabin walls for effective insulation against external conditions
- Installation of 3 flocking devices and 1 pre-cleaning unit and flock cleaning/recirculation system
- The space in the cabin should allow the flocking machines to be moved backwards when not in use and the roller conveyors to be replaced.
- The body is made on a stable structure frame and equipped with hinged doors (at least 4 doors of dimensions approx. 900x2000 mm with an anti-panic system (width x height) and sliding doors from the operating side allowing the entry / exit of flocking cabins and the placement of all elements of the flocking system in the cabin (dimensions approx. 2500 mm x 3500 mm).
- A climatized cabin equipped with a precision air-conditioning cabinet shall provide the climatic conditions (as defined below) as inside the cabin for an operating electrostatic flocking system.
- Cabin interior temperature 22°C ±2°C,
- Relative humidity inside the cabin between 40% and 65% (humidity stability +/- 5%).
- Precision air-conditioning cabinet equipped with a filter system.
- Signalization of exceeding the pre-set limit values for temperature and humidity.
- Visualisation of the current level of temperature and humidity parameters inside the cabin on a digital display located outside the cabin.
- Interior lighting in EX (explosion-proof) standard.
- Execution of supply and exhaust ducts made of galvanized sheet metal, insulated with wool.
- 4 230V sockets.
- Construction of the cabin in accordance with the standards for flocking equipment.
3. **Flock application equipment consisting of 3 flocking machines and a pre-cleaning unit for removing of surplus flock from the profile**

Description: The device allows to apply flock to the surface of rubber profiles extruded in line on the basis of EPDM compound with different resistivity (at least up to $10^9$ Ohm*cm)

- Allowing flocking of profiles in a line at least up to max. 70 mm width at a maximum profile speed of not less than 20 m/min.
- A set of two cabins enabling the flock to be applied by electrostatic method on the dosing length of at least 800 mm each,
- Module for pneumatic application of the flock allows to apply flock on surfaces with complicated geometry (min. two nozzles with adjustable position in relation to the profile).
- Each flocking unit (two electrostatic and one pneumatic-electrostatic units) is powered by independent generators allowing independent operation of each unit).
- The system allows to avoid flock clumping from the level of dosing by, among others, easily replaceable dosing screens and from the level of turning by, among others, the vibrating screen facility.
- A system that allows cyclic removal of a agglomerations of flock from dosing screens without disturbing the process, e.g. by mechanically using brushes.
- Dosing screens for flock 1.7 and 3.3 DTEX
- Possibility of moving the flocking units backwards when or out from the climatic cabin – when not in use (units equipped with wheels with blockade).
- The solution for the repetitive positioning of mobile flocking cabins.
- Design solution ensuring independent operation of each unit (dosing, siftig, flock storage inside the machine frame, flock return to the dosing unit)
- Cabins equipped with a sliding grate to support and ground the profile.
- Possibility of quick and thorough cleaning of the system from residues of previously applied flock and starting to apply another type of flock, in case of change of flock type.
- Flock level indicator indicating the lack of flock in the flock collecting funnel, preventing production interruption, possibility to refill fresh flock during operation.
- High voltage generators at least 100 kV with smooth voltage regulation (independent for each flocking unit).
- Module for pre-cleaning of the flock combined with flock recovery system.
- Each cabin for flock application provided with its own lighting, the solution meets the EX requirements for the Z22 zone.

4. **Flock cleaning and recovery system**

- a system enabling the reuse of the flock recovered from the pre-cleaning unit;
- a cyclone that creates vacuum in the flocking units;
a multi-stage purification system for air polluted with flock, ensuring at least 99% purification;
- dust collector equipped with a cyclone with filters;
- flock transport installation made of pipes protected against corrosion;
- possibility of emptying the flock collecting container during operation, e.g. by means of a valve allowing to cut off the cyclone during this operation.

General requirements for electrostatic flocking installation:
- direction of the line from right to left;
- control should enable synchronization with the line in the scope of operation of safety buttons and data exchange, such as temperature, humidity, high voltage, intensity, dosing, height of screens, and sending alerts about errors with the possibility of recording these data;
- information about the current conditions in the climate cabin displayed on the main panel;
- automatic adjustment of dosing screens height from the control panel and from the level of flocking units with current position indicator;
- supply voltage 240/400V 50Hz;
- control voltage 24V DC;
- compressed air 6 bar;
- water pressure approx. 4 bar;
- high voltage supply according to EN 50223: 2015;
- marking of wires and control elements on the device in accordance with PN-EN 60204-1;
- main panel enabling central control of flocking units and archiving of process data;
- signalling columns;
- possibility of using extinguishing system from the line;
- CE declaration of conformity for a complete set of equipment;
- technical documentation;

A positive control test will be considered in the case of:

a) correct and failure-free operation of the connected devices and each device separately during the whole Test lasting approx. 3 hours of continuous operation;

b) that all the device parameters described in the contract are maintained during the control test;

c) the area of flocked profiles - pressed at different speeds - with the observance of drawing conformity and meeting the criteria of quality assessment of the products after flocking, i.e.:
   - deformation and physical damage to the profile is not allowed during any of the operations.
the surface of the flocked area itself should be uniformly flocked (no stains, no excess free flock) and have an EPDM adhesion of at least 0.5N/mm². The test will be carried out by a front flock tear-off method on 15 randomly selected gaskets. Test result tested on the basis of BMW Test Specification, p.103,104

The name of the Offerer:

Name: .......................................................................................................
Address: ...............................................................................................
Telephone: ...............................................................................................
E-mail: .................................................................................................

Price offered by the Contractor:

Net price: ...............................................................................................%
VAT (rate: ...... %): ...............................................................................................
Gross price: .............................................................................................

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(the Offerer’s seal and signature)