**Specification for two monospiral wheels intended for testing mining cables to simulate real operating conditions.**

TFK requirements:

Device description:

The subject of the order is the delivery and commissioning of a testing device with a control panel for multiple bending/rewinding of cables used in mobile applications in various industrial sectors. The device is intended to be used to check the cable's resistance to repeated bending and to continuously (optionally every 1 minute) monitor:

- number of duty cycles,

- operating speed,

- resistance of power conductors,

- continuity of: power conductors, earth conductors, earth monitoring and pilot wires,

- cable tension values

- fibre continuity, optical cable attenuation (optional);

Cables of various designs with working conductor cross-sections of 25 and 35 mm2 will be tested. Range of parameters for the planned product range:

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| Cable diameter | 24.4 – 64.3 mm |
| Cable weight | 855 – 5220 kg |
| Fixed bending radius | 4 – 8 D |
| Moving freely bending radius | 5 – 10 D |

General technical requirements:

The testing device must have all the functionalities specified later in this request and meet the required performance parameters related to its operation for the purposes of conducting the tests.

The bending device will be placed in the production hall.

The device shall be delivered to the TFKable Myślenice Production Plant, ul. Hipolita Cegielskiego 1.

The cable bending device supplied under the order must be **new,** meet the requirements of all normative and legal acts in force in Poland, on the basis of which the devices may be approved for use (e.g. they must be delivered with a **CE declaration of conformity confirming that an assessment of the device's conformity with all New Approach Directives has been carried out**). The CE declaration of conformity must apply to the entire installation and cannot be separated into individual listed elements.

**The Ordering Party reserves the right to conduct negotiations with Bidders whose bids are accepted in formal and technical terms.**

Negotiations may be conducted primarily in areas affecting the evaluation of the offer (net lump sum price, lead time, warranty period).

**Contract award procedure:** principle of competitiveness

**The delivered components of the bending/rewinding device should have the functionalities and technical parameters indicated below:**

1. Functionalities – cable bending devices

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| **Functionality –** Testing devices for repeated bending of cables | |
| 1. | Continuous (optionally every 1 minute) monitoring of parameters such as:  test temperature - current ambient temperature in the hall,  number of duty cycles,  operating speed,  power conductors resistance,  conductors continuity  cable tension values  fibre continuity, optical cable attenuation (optional);  There must be a separate current and tension ring for each conductor to be measured, 30 in total.  Data must be collected using an IT system that can be read on the control panel and can transmit or copy data. |
| 2. | Steel or other temperature-resistant structure  0°C to +40°C |
| 3. | The bending device must meet all occupational health and safety requirements and have the CE mark. |
| 4. | The operating staff (maximum two people) must be able to easily transport, replace cables and replaceable elements of the device using resources available at the plant, e.g. a forklift truck. **The test site must be fenced.** The device can operate without staff supervision 24 hours a day. |
| 5. | The device must be adapted to work without direct operator supervision. |

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| No. | **Technical parameters –** **Testing devices for bending cables** | **Value** |
| 1. | Speed of the device  (A cycle is defined as the movement from one extreme position to the other and then back to the starting position). | 1 cycle/hour |
| 2. | Cable line speed | min 40m/min  max 150m/min |
| 3. | Operating temperature range | from +10°C to +35°C |
| 4. | Measurement of the power conductor resistance for up to 6 working conductors | +/- 0,2 % measured value |
| 5. | Measurement of power conductors continuity for max. 6 conductors |  |
| 6. | Measurement of earth conductor, earth monitoring and pilot wire continuity for max. 8 wires |  |
| 7. | Attenuation measurement for optical cables: for single-mode and multi-mode G50 and G62.5 fibres | +/- 0,01 dB/km |
| 8. | Set of replaceable or adjustable profile elements (mono-spiral wheels) designed to bend round cables of various diameters (easily interchangeable in the case of replaceable elements) | Elements adapted to cables in the following diameter ranges:  from 24 to 65 mm |
| 9. | Maximum tensile load (adjustable) | 4000 N |
| 10. | Cable tension measuring accuracy | +/-20 N |
| 11. | Cable bending radius (D – cable diameter) | Ranges:  fixed: 4 - 8D  In motion: 5 - 10D |
| 12. | Minimum weight of one cable | 0.8 kg/m |
| 13. | Maximum weight of one cable | 5.3 kg/m |
| 14. | Minimum length of the section to be tested | 140m |

1. control panel of the cable bending device

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| **Functionality –** control panel of the cable bending device | |
| 1. | Liquid crystal control panel – it must be able to remotely transmit or copy data, and to perform statistical data processing. |
| 2. | Continuous (optionally every 1 minute) monitoring of parameters such as:  test temperature - current ambient temperature in the hall,  number of duty cycles,  operating speed,  power conductors resistance,  conductors continuity  cable tension values  fibre continuity, optical cable attenuation (optional); |
| 3. | The control panel must be adapted to operate in the temperature range from 0°C to +40°C |

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| No. | **Technical parameters -** control panel of the cable bending device | **Value** |
| 1. | Device control panel | Adjustable in angle of inclination. |

**Additional requirements:**

- The maximum weight of the device with all its elements should be around 5.5 tons with the cable and occupy a maximum area of approx. 25m2

- The colour of the structural elements of the bending device to be determined at the stage of signing the contract,

- The bending device must meet all occupational health and safety requirements and have the CE mark,

- The supplier must provide the device with an operating manual in Polish and English

- After installing the device, the supplier must provide training on how to use the device,

- The offer shall include a brief description of the principle of operation, measurement and adjustment of cable tension, adjustment of speed.

- The offer must be accompanied by an illustrative sketch of the device with approximate dimensions,

- The bidder should provide the approximate weight of the device,

- The bidder should provide a separate price for the installation and manufacture of the device

- The bidder should provide guidelines for the installation of the device (e.g. the foundation)

- The bidder may include all instruments and devices used for measuring utilities separately in the entire device

**Additional information:**

**- Appendix No. 1 Illustrative sketch of the device for multiple cable bending**

- The Ordering Party shall provide utilities for the duration of delivery and installation in the form of: electricity at the TELE-FONIKA Kable Myślenice Plant

The achievement of the required technical parameters and functionality required for the subject of the order will be verified on the basis of acceptance tests performed after delivery and commissioning of the device. Acceptance tests will be performed in accordance with the mentioned technical parameters, technical documentation and other technical standards.

Acceptance tests for the bending device:

- checking the completeness of technical documentation and user manuals,

- checking whether the device has a declaration of compliance with all Directives to which it is subject,

- carrying out one-week cable testing to confirm the correct operation of the systems and to meet functional and technical requirements.

ADDITIONAL NOTES:

* The device must have the CE mark not only for individual components, but also for the entire set.
* Full payment for the device should precede
* acceptance test at the manufacturer's premises, where we will be able to perform bending tests on the cable cross-section agreed with the machine manufacturer.
* acceptance test at TFK confirming compliance with the device specifications after final installation at TFK.
* The device manufacturer must specify the number of required calibrations and how many of them are included in the warranty period.
* The manufacturer must determine the scope of the spare/consumable parts package and whether they are can be accessed easily and quickly. What are the recommendations regarding the replacement period of such parts and their price?
* The manufacturer should provide a reference list of other users of similar devices.
* Warranty min. 12 months
* Providing authorised warranty and post-warranty service
* Response time to a reported fault up to 48 hours (counted from the date of reporting to the service centre)
* Conditions described in detail in the Warranty Card
* Delivery of the device within 4 months from the date of order and advance payment
* Unloading of the device in question, installation in the place indicated by the Ordering Party, installation and commissioning of the set will be performed by the Supplier's service
* Training min. 4 employees to operate the machine
* The manufacturer must clearly specify what utilities will be needed to power the machine

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