

ENCLOSURE NO 2 TO THE REQUEST FOR QUOTATION

## TECHNICAL SPECIFICATION

ArcelorMittal Poland S.A. (hereinafter also AMP) carries out its business in various divisions in Poland, with a main focus on steel production in Kraków and Dąbrowa Górnicza and in other important production plants responsible for manufacturing of various steel products in Poland.

The subject of the order indicated in this specification applies to the project entitled "Development of the innovative Zn-Al-Mg based coating for the production of hot deep galvanized sheets" (project no.: POIR.01.02.00-00-0176/16) Measure 1.2. "Sectoral R&D programmes" of the Intelligent Development Operational Program 2014-2020 co-financed by the European Regional Development Fund.

This specification has been prepared with the most care to determine the full, unambiguous and comprehensive description of the subject of the contract so as to enable Contractors to determine all their obligations and risks and to account for the price and other elements of the initial valuation.

AMP expects a technical solution to meet the requirements of the installation. Contractors are expected to submit a basic offer considering the requirements of this Technical Specification.

The package must be complete in all respects and valuation shall include all the components/equipment required to achieve proper construction, operation and maintenance of the installation.

### Requirements of measurement system

1. Measurement of alloy Zn-Al (GI)
2. Measurement of alloy Zn-Al-Mg (Al max. 5,2%, Mg max. 3,2%)
3. Measurement range for top head 15 – 300 g/m<sup>2</sup> of zinc layer
4. Measurement range for bottom head 15 – 300 g/m<sup>2</sup> of zinc layer
5. Measurement for strip speed between 15-180 m/min
6. Measurement for strip width between 700 – 1520 mm
7. Measurement for strip thickness between 0,4 - 2 mm
8. Measurement heads based on X-ray tubes

### Functionality of measurement system

1. Measurement type:
  - a. single spot (in the middle)
  - b. three spots



- c. cross profile (traversing between edges)
  2. HMI:
    - a. actual value of zinc layer (2 sides)
    - b. measured values for strip length
    - c. cross profile of measured values
    - d. status of device
    - e. calibration of device
    - f. alarms
    - g. control of device
  3. Reports for each coil:
    - a. number of exit coil
    - b. start/stop time of measurement
    - c. zinc layer thickness setpoint (g/m<sup>2</sup>)
    - d. average zinc layer thickness (g/m<sup>2</sup>)
    - e. max. zinc layer thickness (g/m<sup>2</sup>)
    - f. min. zinc layer thickness (g/m<sup>2</sup>)
    - g. proces capability Cp oraz Cpk
    - h. zinc layer distribution on strip length
  4. HMI languages:
    - a. Polish
    - b. English
  5. Signal exchange between measurement system and existing PLC must be realized by at least 1 of the methods:
    - a. inputs/outputs digital/analog
    - b. profibus
    - c. profinet
  6. Signal exchange must include:
    - a. actual zinc thickness side A (g/m<sup>2</sup>)
    - b. actual zinc thickness side B (g/m<sup>2</sup>)
    - c. actual deviation of zinc thickness side A (g/m<sup>2</sup>)
    - d. actual deviation of zinc thickness side B (g/m<sup>2</sup>)
    - e. position of measurement heads from pass line (+/- mm)
    - f. status of device (measurement, parking position, alarm)
  7. Light indicator of opening and closing shutter

### Scope of delivery

1. Measurement heads based on X-ray tubes – 2 pcs
2. Frame with traversing system 1 pc.
3. Main control cabinet – 1 pc.
4. Local control cabinets – 1 pc.
5. Local control desk with emergency stop 1 pc.
6. Computer station:
  - a. Computer (min. processor Intel with 4 cores, 8GB+ RAM, 50GB+ HDD) - 1 pc.
  - b. Monitor LCD 26" – 1 pc.



- c. Operating system Windows 10 – 1 pc.
- d. Operator software for operating with measurement system 1 pc.
7. Technical documentation in Polish and English – hard copy 1 pc., digital 1 pc.

### **Scope of work**

1. Startup and commissioning of measurement system
2. Integration of measurement system with existing control system and visualization

### **General requirements**

1. Visit on site is recommended
2. Identification of the necessary utilities and connections – identification of take-over points.
3. Identification of the location of the local control panel.
4. Selection of materials based on thermal conditions existing in the area where the equipment operates.
5. Submission of the engineering for Investor's approval.
6. Development and delivery of complete technical documentation in Polish – hard and soft copy

### **GUARANTEED PARAMETERS**

1. Measurement of alloy Zn-Al (GI)
2. Measurement of alloy Zn-Al-Mg (Al max. 5,2%, Mg max. 3,2%)
3. Measurement range for top head 15 – 300 g/m<sup>2</sup> of zinc layer
4. Measurement range for bottom head 15 – 300 g/m<sup>2</sup> of zinc layer
5. Mean Time Between Failure MTBF of measurement system 1000 h
6. Minimum warranty period 24 months.