**Technical Specification**

**Product description: Metal felt made of fine copper wires sintered on copper foil.**

Purpose of Use: To secure permanent electrical contact in high current sliding joints between the conductors of the TF coils of the COMPASS-U tokamak.

Composition: Metal felt composed of copper wire, 0.05 mm diameter, sintered in random distribution on 0.13 mm thick copper foil and compressed to 30 % density (40 % including copper foil).

Material: Wire: Oxygen-free copper, preferably EN CW007A,   
 CW008A, CW009A or equivalent designation UNS C10100, C10200.

Foil: Oxygen-free copper, preferably EN CW007A,   
 CW008A, CW009A or equivalent designation UNS C10100,  
 C10200. Temper H02 per AMS 4501, ASTM B152-19 or  
 equivalent.

Dimension: Wire: 0.05 mm nominal diameter, 6-12 mm long   
Foil: 0.13 mm nominal thickness  
Total: 1.00 ± 0.07 mm thick felt (including copper foil thickness)

Characteristics: Wire felt density: 30 % (of copper density) nominal  
 Overall density: 37% - 42% (of copper density)

Requirements:

Fine Ø 0.05 mm OFHC copper wires must be cut into short fibers with lengths ranging from 6 mm to 12 mm.

The copper wires must form sinter bonds with multiple contact points both among themselves and with the foil. The final copper wire felt density of 30 % must be observed (37 % - 42 % including copper foil). The density is achieved by mold pressing and sintering under the condition of using appropriate temperature and protective gas shielding (or vacuum conditions) to prevent copper oxidation.

The metal felt shall be delivered in sheets. The minimum required size of sheet area which meets the requirements of the technical specification is 635 x 279 mm. Sheets shall be delivered untrimmed.

Extent of delivery:

For the purpose of the unique testing process, the “Metal felt made of fine copper wires sintered on copper foil” contract is divided into two items of the framework agreement:

1. Delivery of 20 sheets. These sheets will be subject of visual and structural inspection to inspect the uniformity and bonding of wires. A dedicated device will be used for the evaluation of contact resistance, structural integrity and wear during 10000 cycles under specific conditions (high vacuum, liquid nitrogen temperature, current density 7 kA/cm2, 5 mm sliding movement).
2. Delivery of 60 sheets made by the same manufacturing process as item 1).

Item 2) will be ordered in the case that the sheets delivered in item 1) pass the testing process. Sheets shall be made by the same manufacturing process for both items of the framework agreement.

Inspection and Documentation:

Inspection protocol in digital format (preferably pdf, Microsoft Word or Microsoft Excel) containing:

1. Material certificate 3.1 according to EN 10204 (or equivalent standard) for the foil and the wire.
2. Measurement of total felt thickness for each delivered sheet (4 distinct locations) and description of test method.
3. Measurement of overall density for randomly selected sheets (10 % of whole delivery) and description of test method.

The Supplier of metal felt shall provide the Buyer a Certificate of Conformity with the Technical Specification.

Packaging:

The Supplier shall take such precautions so that the products are not exposed to moisture and oxidizing environment during the shipment. Use desiccators. The crate shall protect the metal felt from shock, damage from load shift, and bending.

Delivery Conditions:

The Seller assumes all of the responsibility, risk, and costs (including shipping costs, export and import duties, insurance, and any other expenses incurred during shipping to the place of delivery) associated with transporting and unloading the Product until the Buyer receives it delivered and unloaded at the following destination: U Slovanky 1770/3, 182 00 Praha 8, Czech Republic.

Delivery period 40 weeks after the Supplier´s acceptance of the Order issued by the Contracting Authority.

Acceptance criteria:

Delivery will be accepted and Acceptance Protocol will be signed if the following conditions are fulfilled. Conditions are valid for both items of the framework agreement.

1. Delivery of requested amount of product with completed documentation (including inspection documentation).
2. Randomly selected product will be checked and must fulfill requirements given by Technical Specification.